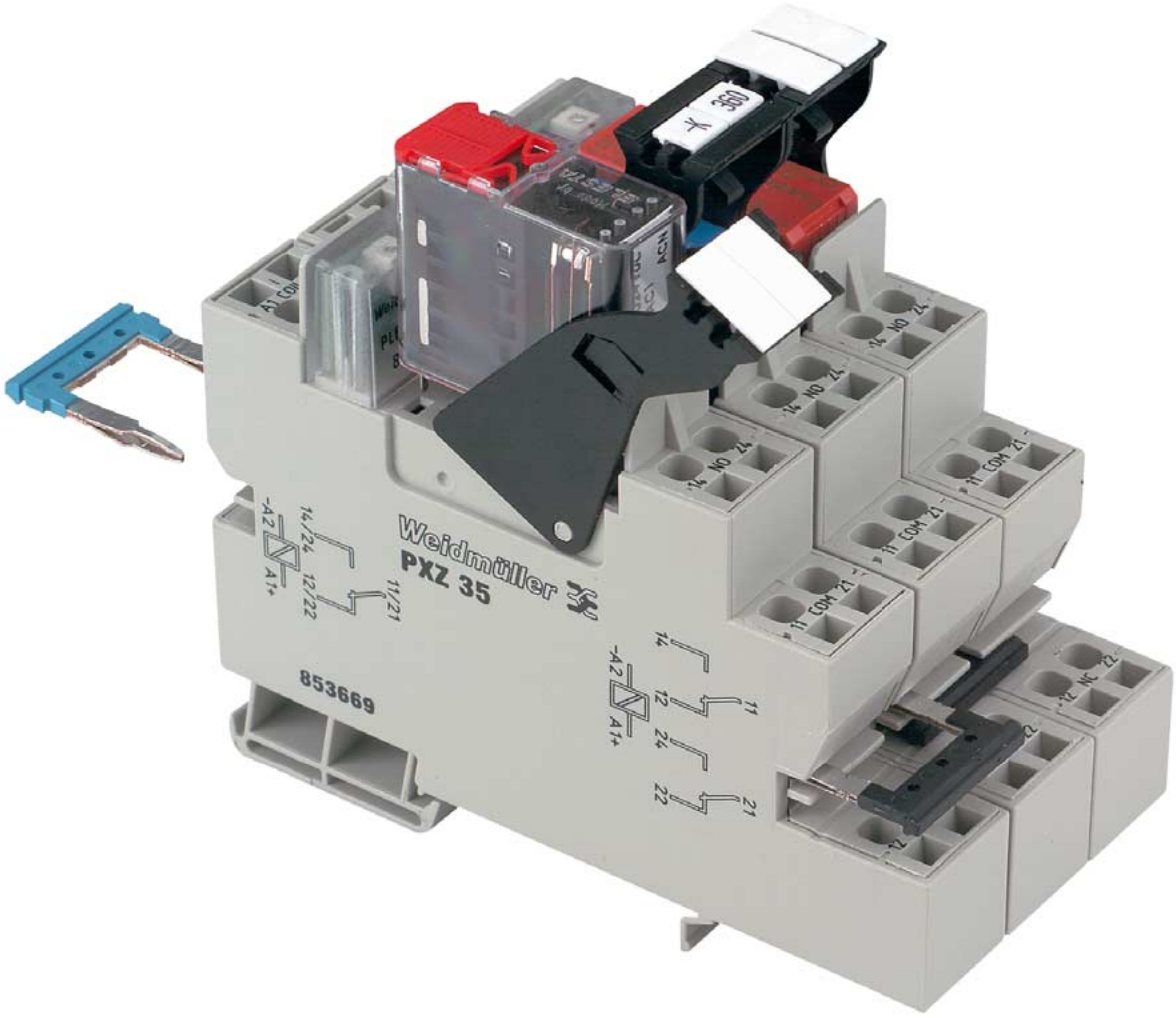

Weidmüller
PXZ 35
853669
-A2
A1+
14/24
12/22
11/21
11
12
14
21
22
24
A1 COM
14 NO 24
11 COM 21
12 NC 22

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
Fine silver	- inexpensive	universal use	1 V…250 V
AG 99 %	- average tendency to weld and average resistance to burn-off	up to medium-size loads	1 mA…5 A
	- subject to corrosion in sulphurous atmosphere		
Silver nickel	- high mechanical stability	universal use	≥ 12 V
● AgNi 0.15	- low tendency to weld	at medium-size loads	5 mA…10 A
	- low contact resistance		
	- high resistance to burn-off		
Hard silver	- mechanical stability > AgNi	for use with medium-size	≥ 12 V
AgCu3	- tendency to weld < AgNi	loads	10 mA…10 A
	- resistance to burn-off > AgNi		
	- contact resistance > AgNi		
Silver cadmium oxide	- very low tendency to weld	suitable for switching	≥ 12 V
	- resistance to burn-off > AgCu3/Ni	inductive loads	≥ 100 mA
● AgCdO			
Silver-tin-oxide	- high thermal decomposition temperature	suitable for swiching	≥ 12 V
	- more arc-resistant with low material transfer	inductive loads	≥ 100 mA
● $AgSnO_2$			
Tungsten	- very high resistance to burn-off	circuits with extremely	≥ 60 V
W	- high switching rate with short closed times	high on/off loads	≥ 1 A
Hard gold	- < lowest contact resistance	dry circuits in	µV…60 V
● AuNi	- best resistance to corrosion	damp atmospheres	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)

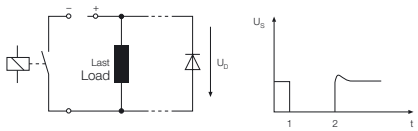
Contact material

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 AgSnO2 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:

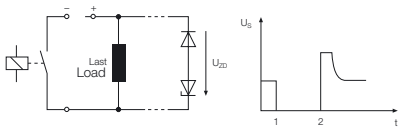
Diode:



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

Disadvantage: very long drop-out delay

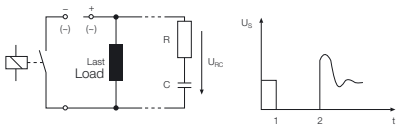
Diode and Z-diode:



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

Disadvantage: not usable for high power ratings

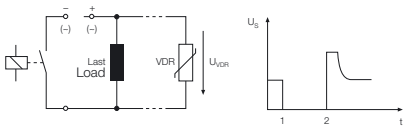
RC combination:



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_S	Voltage curve
1	Close
2	Open

Switching of small and large power ratings

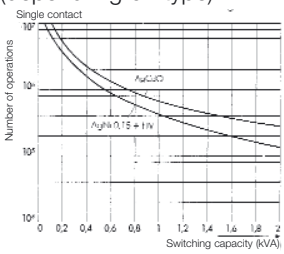
For automation technology, Weidmüller offers the EGR EGR 7 relay coupler to switch ratings up to 40 µW under resistive loads. This allows signals to be reliably relayed to control devices.
The switching of higher power ratings in power supply technology is achieved by the RS 31 relay coupler, which guarantees switching capacity up to 3.5 kVA under resistive loads.

Switching times of the relay modules

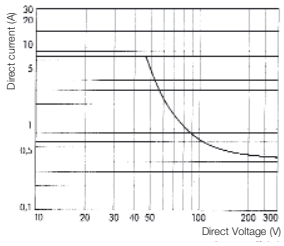
pick-up delay	typ. < 10 ms
drop-out delay	typ. < 12 ms

Switching behaviour/load limit curve

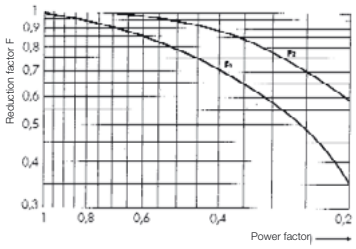
(dependimg on type)



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

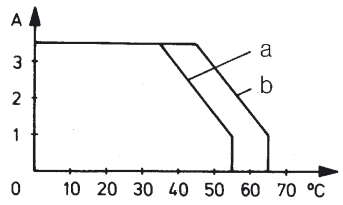
Relay couplers with plugged relays are only conditionally suitable for use in applications subject to heavy vibrations. Relay couplers with soldered relays are to be preferred.

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

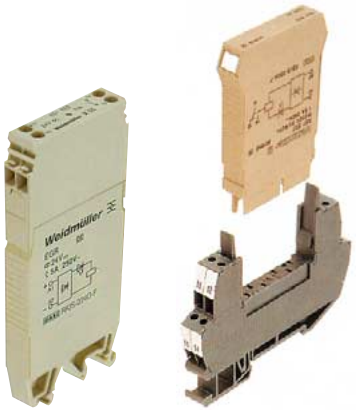
Input circuit

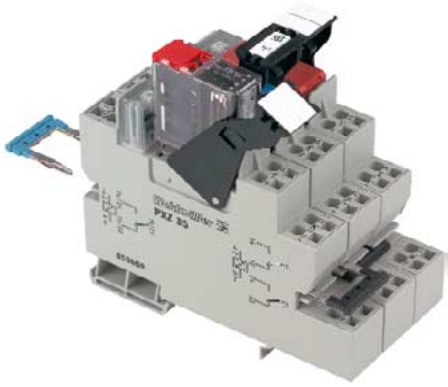
Input voltage [V]	Reference voltage at which the relay coupler operates. Typical reference voltages: => 5 V DC, 12, 24, 48, 60, 115, 230 V AC/DC
Input current [mA]	Quotient resulting from input voltage and input resistance. Input resistance => coil resistance + resistance of drive (R, LED, rect. …)
Rated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

Output circuit

Output voltage [V]	Max. voltage that can be applied to relay contact
Switching current [A]	Current that can flow for max. of 4 sec. after relay contact has closed
Continuous current [A]	Current that flows continuously after contact has closed
Switching power [W/VA]	Product of output voltage and switching current with resistive, inductive and capacitive load
Min. switching power [mW]	Smallest amount of power that can be switched via contact
Service life	Number of switching operations before contact fails - mechanical => with no electric load - electrical => with resistive or inductive AC/DC load
Pick-up lag [ms]	Length of time from application of energizing voltage until contact closes/opens
Drop-out lag [ms]	Length of time from breaking the energizing circuit until contact closes/opens
Contact bounce time [ms]	Length of time between first and last closing/opening of contact when relay picks up or drops out
Switching frequency [Hz]	Switching operations per sec. with a duty factor of 1 : 2 (t_{on} = t_{off})
Withstand voltage [kV]	Max. test voltage between input and output circuits which does not cause any discharge
Reliable separation	Feature of relay coupler that conform to VDE 0160 and VDE 0106 Part 101
Electric arc	Current flow between contact surfaces as they open, caused by ionization
Contact wear	Switching inductive loads leads to considerable changes in the composition of the materials used. The results are: => formation of pits or peaks on the surface of contacts => failure due to interlocking of contacts
Spark absorption	Limitation of transient overvoltages by connecting supplementary circuit across inductive loads => RC combinations => Z-diodes/suppressor diodes => varistors
Reduction factor	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 mm² or
flexible: 0.5...2.5 mm².

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 mm²
Changeover (RST): 0.5...2.5 mm².

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 mm², 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

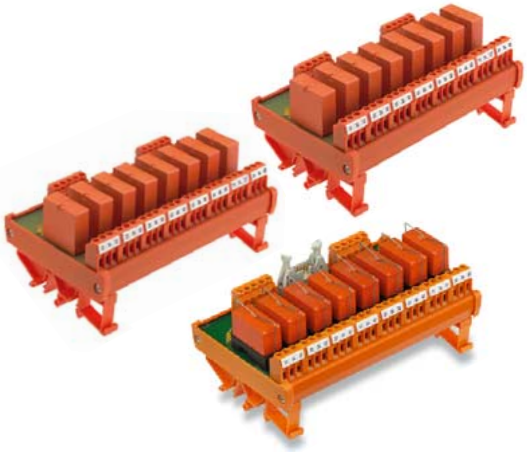
is a new generation of pluggable relay couplers. The core of this system is an innovative relay socket **PXS** or **PXZ**.
Weidmüller has combined the functionality and experience from its relay and terminal block business in this product.
The PLUGRELAY is the ideal connection technology between the 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 mm²
- 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^2
flexible: 0.5...2.5 mm^2.

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^2 or
flexible: 0.5...2.5 mm^2.
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^2 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^2.

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

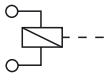
Weidmüller relay couplers are marked with the CE symbol and comply with the requirements of EN 50 081 Part 1 and EN 50 082 Part 2. They can therefore be used for both industrial as well as for applications in residential, commercial and light industry.

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 

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

* Approval by Germanischer Lloyd

Reliable separation

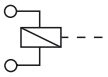
● 24 V dc
● 24 Vuc/ac

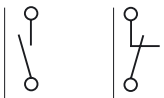
Relay Coupler

Electromechanical switching

Output

48 V



Housing			 2 x		 3 x	 2 x	 4 x	 8 x	 16 x
EG	● **0662660000** Page 72	● **0662460000** Page 72					● **0160360000** ● **0123260000** Page 73			
WAVESERIES WRS			● **8286280000** Page 74	● **8418250000** Page 76	● **8418280000** Page 77		● **8418310000** Page 78			
EG 7*	● **8092370000** Page 81	● **8092380000** Page 81	● **8216590000** Page 81							
RS 30	● **1101861001** ● **1101811001** ● **1101821001** ● **1101961001** ● **1101911001** ● **1101921001** Page 91	● **1101161001** ● **1101111001** ● **1101121001** ● **1101261001** ● **1101211001** ● **1101221001** Page 91	● **1100460000** ● **1100410000** ● **1100420000** ● **1100560000** Page 91							
RS 31			● **1150761001** Page 92							
RS 32							● **9406321001** Page 94			
							● **9406421001** ● **1122661001** Page 95			
RSM								● **1114061001** ● **1113961001** ● **1112461001** ● **1173761001** Page 97	● **1114161001** ● **1114261001** Page 97	● **1114361001** ● **1114461001** Page 97
MICROSERIES MRS / MRZ			● **8556040000** ● **8556110000** Page 87							
115 V										
EG							● **0141360000** ● **0160460000** Page 73			
WAVESERIES WRS			● **8418220000** Page 75	● **8418260000** Page 76	● **8418290000** Page 77					
EG 7*	● **8092430000** Page 81	● **8092440000** Page 81	● **8216610000** Page 81							
PLUGSERIES PRS / PRZ			● **8536510000** ● **8536610000** ● **8530640000** ● **8530790000** Page 82				● **8536520000** ● **8536630000** ● **8530660000** ● **8530720000** Page 82			
RS 30	● **1155161001** ● **1155111001** ● **1155121001** ● **1102161001** ● **1102111001** ● **1102121001** Page 91	● **1155211001** ● **1155261001** ● **1155221001** ● **1101461001** ● **1101411001** ● **1101421001** Page 91								
RS 31			● **1150361001** ● **1150461001** Page 92							
RS 32							● **1122761001** ● **9406621001** Page 95			
RSM								● **1114561001** Page 97	● **1114661001** Page 97	● **1114761001** Page 97
MCZ R			● **8420880000** ● **8467470000** Page 61							
MICROSERIES MRS / MRZ			● **8556030000** ● **8556100000** Page 87							

* Approval by Germanischer Lloyd

Reliable separation

● Vdc
● Vuc/ac

Relay Coupler

Electromechanical switching

Output

230 V

Housing				 2 x		 3 x	 2 x	 4 x	 8 x	 16 x
EG	● **0543860000** Page 72	● **0543660000** Page 72					● **0142460000** Page 73			
WAVESERIES WRS			● **8418230000** Page 75	● **8418260000** Page 76	● **8418290000** Page 77	● **8418340000** Page 79	● **8418320000** Page 78			
EG 7*	● **8092460000** ● **8178200000** Page 81	● **8092470000** Page 81	● **8216620000** ● **8216630000** Page 81							
PLUGSERIES PRS / PRZ			● **8530671001** ● **8530731001** Page 82				● **8530681001** ● **8530741001** Page 82			
RS 30	● **1102261001** ● **1102211001** ● **1102221001** Page 91	● **1101561001** ● **1101511001** ● **1101521001** Page 91	● **1100860000** Page 91							
RS 31			● **1128461001** ● **1128431001** ● **1128411001** Page 93							
RS 32							● **9406721001** ● **1122761001** Page 95			
RSM								● **1114861001** ● **1123461001** Page 97	● **1114961001** ● **1108061001** Page 97	● **1115061001** ● **1108261001** Page 97
MCZ R			● **8237710000** Page 69							
MICROSERIES MRS / MRZ			● **8556020000** ● **8556090000** Page 87							
240 V										
RS 30	● **1128561001** ● **1128511001** ● **1128521001** Page 91	● **1128661001** ● **1128611001** ● **1128621001** Page 91								

* Approval by Germanischer Lloyd

Reliable separation

● 230 Vuc/ac

Relay Coupler

Electromechanical switching

12 V

Output

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

4…60 V

Output

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

* Approval by Germanischer Lloyd

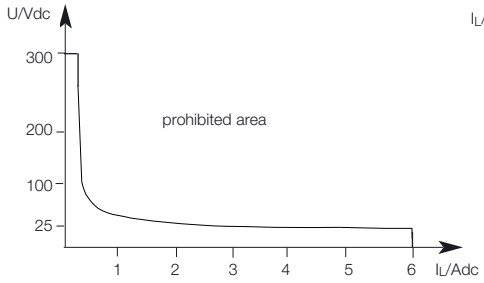
Reliable separation

● Vdc
● Vuc/ac

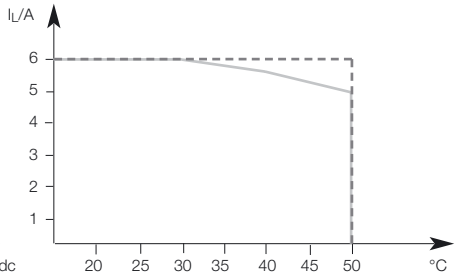
Relay Couplers in Component Housings

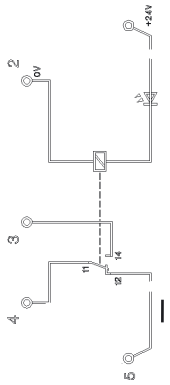
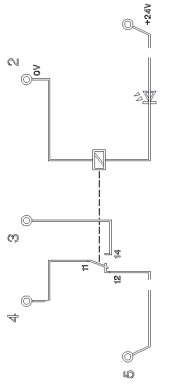
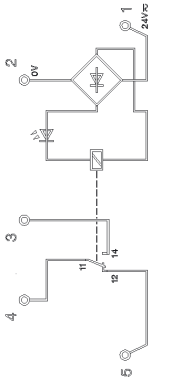
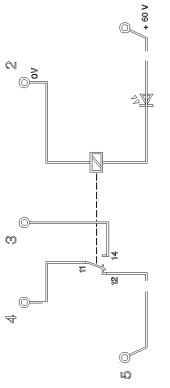
Miniconditioners MCZ R

Limit diagram



Derating curve
rowed without clearances on the mounting rail
rowed with 20 mm spacing on the mounting rail



	MCZ R 24 Vdc	MCZ R 24 Vdc/Au	MCZ R 24 Vac/dc	MCZ R 60 Vdc
Schematic circuit diagram				
				
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				
Input				
Input voltage	24 Vdc ±20 % (19.2...28.8 V)	24 Vdc ±20 % (19.2...28.8 V)	24 Vac/dc ±10% (21.6...26.4 V)	60 Vdc ±20% (48...72 V)
Input current at U_N	6.3 mA ±10 % (5.7...6.9 mA)	6.3 mA ±10 % (5.7...6.9 mA)	ac: 10.8 mA±15% (9.2...12.4 mA)	3 mA ±20 % (12.4...3.6 mA)
			dc: 6.1 mA ±15% (5.2...7.1 mA)	
Max. input power	156 mW ±10%	156 mW ±10%	ac: 160 mVA ±10 %	180 mW ±45 %
			dc: 151 mW ±10 %	
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	operating indication	operating indication	operating indication
	reverse polarity protect. diode	reverse polarity protect. diode	bridge rectifier	reverse polarity protect. diode
	free wheel diode	free wheel diode		free wheel diode
Cross-connection on pin	2, 3, 4	2, 3, 4	2, 3, 4	2, 3, 4
Output	1 changeo. cont. ($AgSnO_2$)	1 changeo. cont. (5 µ Au)	1 changeo. cont. ($AgSnO_2$)	1 changeo. cont. ($AgSnO_2$)
Switching voltage	max. 300 Vdc / 400 Vac	max. 300 Vdc / 400 Vac	max. 300 Vdc / 400 Vac	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 10^6 switching operations	20 x 10^6 switching operations	20 x 10^6 switching operations	20 x 10^6 switching operations
Max. switching frequency at nominal load	0.1 Hz	0.1 Hz	0.1 Hz	0.1 Hz
Insulation coordination acc. to EN 50178				
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	≥ 5.5 mm	≥ 5.5 mm	≥ 5.5 mm	≥ 5.5 mm
Insulation coord.- and voltage proof, input/output mounting rail	4 kV_{eff} / 1 min	4 kV_{eff} / 1 min	4 kV_{eff} / 1 min	4 kV_{eff} / 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^2	1.5 mm^2	1.5 mm^2	1.5 mm^2
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
Accessories	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

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

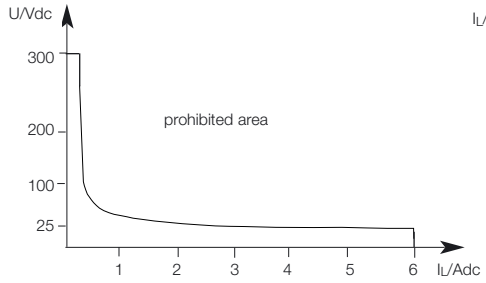
- Reduces installation and commissioning times by use of the proven Z-spring connection technology
- Pluggable cross-connections in input and output minimise wiring costs
- 6-mm width

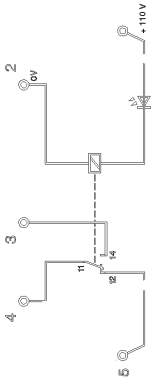
[1]) depends on load conditions

* the hard-gold plating is resistant for parameters 36 Vdc, 50 mA with 10^6 cycles

MCZ R 110 Vdc

Limit diagram





Type	Cat. No.
MCZ R 110 Vdc	**8467470000**

110 Vdc ±10%
2.85 mA ±25%
340 mW ±25%
ca. 68 V / 1.6 mA
ca. 19 V / 0.4 mA
4.5 ms
10 ms
no
operating indication
bridge rectifier
2, 3, 4
1 changeo. cont. ($AgSnO_2$)
max. 300 Vdc / 400 Vac
max. 6 A / max. 1500 VA
100 mA (at U = 10 V)
max. 6 A
see limit diagram
20 x 10^6 switching operations
0.1 Hz
300 V
4 kV
III
2
≥ 5.5 mm
4 kV_{eff} / 1 min
-25 °C…+50 °C
-40 °C...+60 °C
AWG 22...12
1.5 mm^2
CE, UL, CSA
6 mm

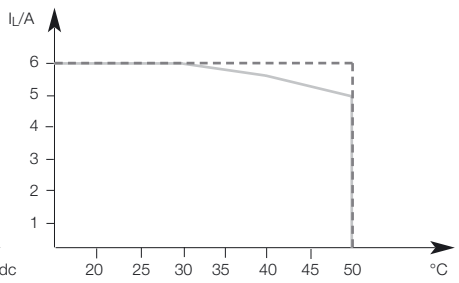
Type	Cat. No.
AP MCZ 1.5	**8389030000**
Page 305	

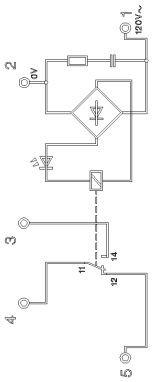
MCZ R 120 Vac

Derating curve

rowed without clearances on the mounting rail

rowed with 20 mm spacing



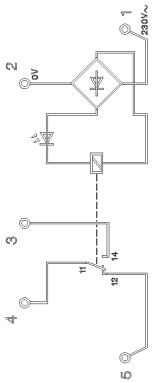


Type	Cat. No.
MCZ R 120 Vac	**8420880000**

120 Vac -15 %/+10 %
7 mA ±15 %
0.85 VA ±15 %
(380 mW ± 15 %)
ca. 70 V / 4 mA
ca. 22 V / 1.3 mA
8 ms
30 ms
yes
operating indication
bridge rectifier
2.3, 4
1 changeo. cont. ($AgSnO_2$)
max. 300 Vdc / 400 Vac
max. 6 mA / max. 1500 VA
100 mA (at U = 10 V)
max. 6 A
see limit diagram
20 x 10^6 switching operations
0.1 Hz
300 V
4 kV
III
2
≥ 5.5 mm
4 kV_{eff} / 1 min
-25 °C…+50 °C
-40 °C...+60 °C
AWG 22...12
1.5 mm^2
CE, UL, CSA
6 mm

Type	Cat. No.
AP MCZ 1.5	**8389030000**
Page 305	

MCZ R 230 Vac



Type	Cat. No.
MCZ R 230 Vac	**8237710000**

230 Vac ±10%
9.5 mA ±15 % (8...11mA)
2.1 VA ±15 %
ca. 115 V / 5 mA
ca. 60 V / 2.5 mA
8 ms
30 ms
no
operating indication
bridge rectifier
2.3, 4
1 changeo. cont. ($AgSnO_2$)
max. 300 Vdc / 400 Vac
max. 6 A / max. 1500 VA
100 mA (at U = 10 V)
max. 6 A
see limit diagram
20 x 10^6 switching operations
0.1 Hz
300 V
4 kV
III
2
≥ 5.5 mm
4 kV_{eff} / 1 min
-25 °C…+50 °C
-40 °C...+60 °C
AWG 22...12
1.5 mm^2
CE, UL, CSA
6 mm

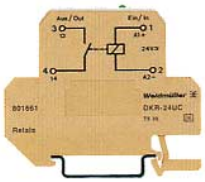
Type	Cat. No.
AP MCZ 1.5	**8389030000**
Page 305	

Relay Couplers in Component Housings Mini coupler DKR

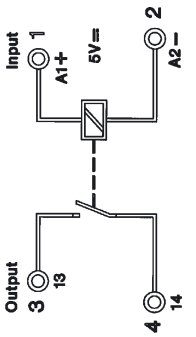
These modules are used for protective separation of input signals and adjustment of signal levels

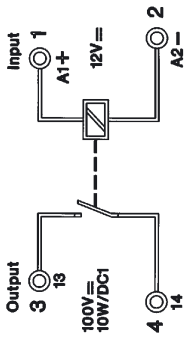
- Cost-effective solution for adjustment of power and potential
- Low input power
- Screw connection technology
- 6-mm width

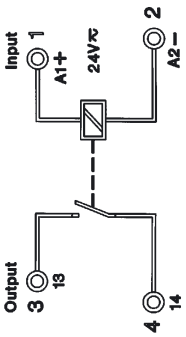
	DKR 5 Vdc	DKR 12 Vdc	DKR 24 Vac/dc	DKR 24 Vdc

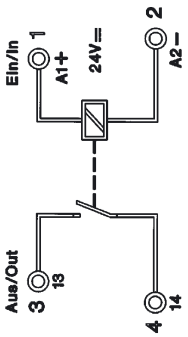


Schematic circuit diagram





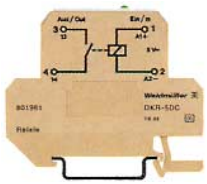


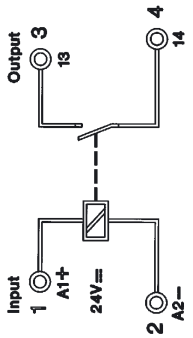


Ordering data		Type	Cat. No.	Type	Cat. No.	Type	Cat. No.	Type	Cat. No.
for TS 32	Y	DKR 5 Vdc	**8019600000**			DKR 24 Vac/dc	**8008110000**	DKR 24 Vdc	**8016620000**
for TS 35	W	DKR 5 Vdc	**8019610000**	DKR 12 Vdc	**8171100000**	DKR 24 Vac/dc	**8016610000**	DKR 24 Vdc	**8008170000**
With combination foot TS 32/TS 35									
Technical data		Input: bottom		Input: bottom		Input: bottom		Input: bottom	
Input voltage		5 Vdc ±5 %		12 Vdc ±10 %		24 Vac/dc ±20 %		24 Vdc ±20 %	
Input current		12.5 mA		12 mA		11.5 mAac/9 mAdc		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	10^9 switching operations		10^9 switching operations		10^9 switching operations		10^9 switching operations	
	at $I_{L=}$ 10 mA	5×10^8 switching operations		5×10^8 switching operations		5×10^8 switching operations		5×10^8 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		≥3 mm		≥3 mm		≥3 mm		≥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^2		0.5…4 mm^2		0.5…4 mm^2		0.5…4 mm^2	
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

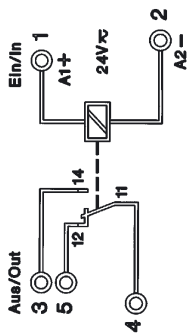




Type	Cat. No.
DKR 24 Vdc	**8215620000**
Input: top	
24 Vdc ±20 %	
9.3 mA	
225 mW	
typ. 0.7…2.5 ms	
typ. 0.2…2.0 ms	
500 mA	
10 W/10 VA	
175 Vac/dc	
500 mA	
25 Hz	
RH/RU	
1 normally-open contact	
10^9 switching operations	
5×10^8 switching operations	
150 V	
1.5 kV	
III	
2	
≥3 mm	
-25 °C…+40 °C	
-25 °C…+50 °C	
-40 °C…+60 °C	
AWG 22…12	
0.5…4 mm^2	
6 mm	

Type	Cat. No.
AP DKT4	**0687560000**
Page 305	

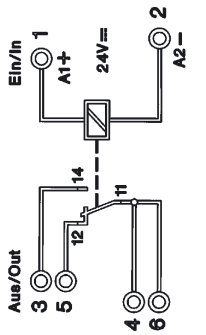
DK5R-1U



Type	Cat. No.
DK5R-1U	**9454910000**
Input: bottom	
24 Vac/dc ±20 %	
9 mAac/7 mAdc	
max. 240 mA	
6 ms	
15 ms ac/dc	
4 A	
1.5 kVA/140 W	
250 Vac/dc	
6 A	
20 Hz	
Ag Ni	
1 changeover contact	
2x10^7 switching operations	
300 V	
4 kV	
III	
2	
≥8 mm	
-40 °C...+60 °C	
-40 °C...+60 °C	
-40 °C...+60 °C	
AWG 22…12	
0.5…4 mm^2	
6 mm	

Type	Cat. No.
AP DK5	**8268870000**
Page 305	

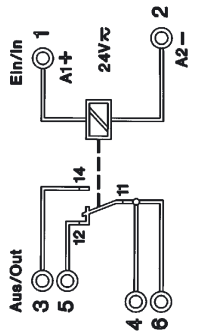
DKR 24 Vdc



Type	Cat. No.
DKR 24 Vdc	**8181980000**
Input: bottom	
24 Vdc ±20 %	
11.5 mA	
384 mW	
5 A	
2 kVA/192 W	
250 Vac/dc	
8 A	
100 mA	
25 Hz	
AgCdO	
1 changeover contact	
≥10^7 switching operations	
≥3×10^6 switching operations	
300 V	
6 kV	
IV	
2	
≥8 mm	
-25 °C…+40 °C	
-25 °C…+50 °C	
-40 °C…+60 °C	
AWG 22…12	
0.5…4 mm^2	
18 mm	

Type	Cat. No.
AP DKT4	**0687560000**
Page 305	

DKR 24 Vac/dc

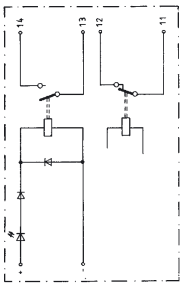
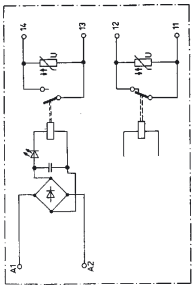
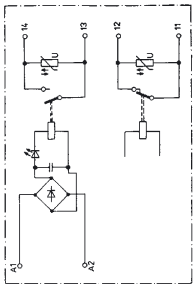
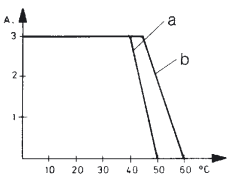
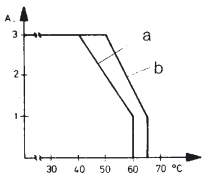
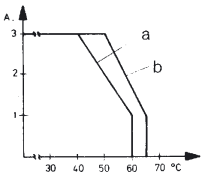
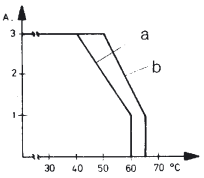


Type	Cat. No.
DKR 24 Vac/dc	**8181970000**
Input: bottom	
24 Vac/dc ±20 %	
20 mAac/16 mAdc	
max. 100 mA	
480 mWac/400 mWdc	
5 A	
2 kVA/192 W	
250 Vac/dc	
8 A	
100 mA	
ac: 5 Hz dc: 25 Hz	
AgCdO	
1 changeover contact	
≥10^7 switching operations	
≥3×10^6 switching operations	
300 V	
6 kV	
IV	
2	
≥8 mm	
-25 °C…+40 °C	
-25 °C…+50 °C	
-40 °C…+60 °C	
AWG 22…12	
0.5…4 mm^2	
18 mm	

Type	Cat. No.
AP DKT4	**0687560000**
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.	Type / Cat. No.	Type / Cat. No.	Type / Cat. No.
	NC **0133560000**[1]	NC **0542660000**	NC **0662460000**	NC **0543660000**
	NO **0133660000**[1]	NO **0536260000**	NO **0662660000**	NO **0543860000**
Rated data				
Input voltage	**24 V–, ±10 %**	**24 V0, ±10 %**	**48 V0, ±10 %**	**230 V~, +5 % –15 %**
Rated consumption – (W)	0.36 W	0.35 W	0.8 W	–
Rated consumption ~ (VA)	–	0.6 VA	0.9 VA	3.2 VA
Drop-out current of the relay** (at 20 °C)	1.5 mA	1.5 mA–/4 mA~	1.5 mA–/3.5 mA~	4 mA
Max. output voltage	240 V~/100 V–	240 V~/100 V–	240 V~/100 V–	240 V~/100 V–
Continuous current	3 A	3 A	1 A	1 A
Derating curve a = mounted horizontally on rail without clearance b = mounted horizontally on rail with clearance x 20 mm				
Switch-on current	5 A	5 A	5 A	5 A
Max. switching capacity with resistor load	600 VA/120 W	600 VA/120 W	600 VA/120 W	600 VA/120 W
Min. switching capacity/switching current	40 µW	40 µW	40 µW	40 µW
Bounce times	< 2 ms	< 2 ms	< 2 ms	< 2 ms
Switching times, typical				
–, pick-up lag	< 5.3 ms	< 8 ms	< 9 ms	< 5 ms
–, turn off delay	< 8.3 ms	< 22 ms	< 12 ms	< 7 ms
Max. switching frequency	50 Hz	30 Hz	37 Hz	40 Hz
Contact material	AgNi, gold-plated	AgNi, gold-plated	AgNi, gold-plated	AgNi, gold-plated
Service life, mechanical	> 10^7 switching operations	> 10^7 switching operations	> 10^7 switching operations	> 10^7 switching operations
–, 24 V–, 1 A, resistive load	> 6 x 10^5 switching operations	> 6 x 10^5 switching operations	> 6 x 10^5 switching operations	> 6 x 10^5 switching operations
–, 230 V~, 3 A, resistive load	> 10^5 switching operations	> 10^5 switching operations	> 10^5 switching operations	> 10^5 switching operations
Status indicator	Green LED	Green LED	Green LED	Green LED
Storage temperature	–40 °C…+60 °C	–40 °C…+60 °C	–40 °C…+60 °C	–40 °C…+60 °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	–25 °C…+50 °C	–25 °C…+50 °C	–25 °C…+50 °C	–25 °C…+50 °C
Approvals	CSA (013366)			
Insulation coordination acc. to EN 50178				
Overvoltage category	III	III	III	III
Pollution severity	3	3	2	2
Accessories, dimensions and connection data see	Page 306, Fig. II	Page 306, Fig. II	Page 306, Fig. II	Page 306, Fig. II

** Larger values on request

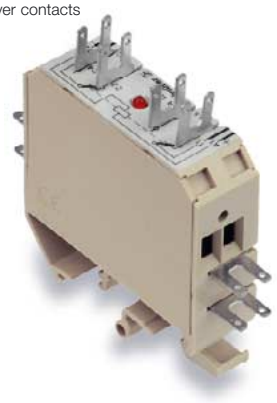
[1]) no output varistor

Relay Coupler in Component Housings EG 2

with 2.8-mm tab connection

EGR EG 2

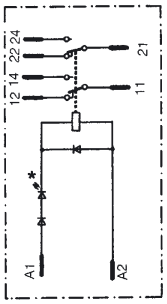
DC voltage
2 changeover contacts



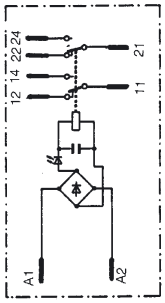
EGR EG 2

AC/DC voltage
2 changeover contacts

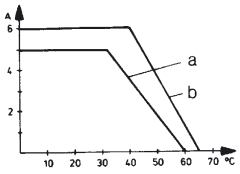
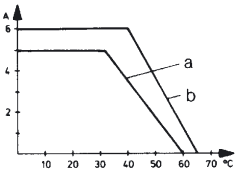
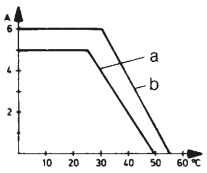
Schematic circuit diagram



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



Ordering data	Type	Cat. No.	Type	Cat. No.	Type	Cat. No.	Type	Cat. No.
	EGR 2 RT (12 V–)	**0160160000**	EGR 2 RT (48 V–)	**0160360000**	EGR 2 RT (24 V0)	**0123060000**	EGR 2 RT (115 V0)	**0141360000**
	EGR 2 RT (24 V–)	**0160260000**	EGR 2 RT (115 V–)	**0160460000**	EGR 2 RT (48 V0)	**0123260000**	EGR 2 RT (230 V0)	**0142460000**

Rated data								
Input voltage	**12 V–**	**24 V–**	**48 V–**	**115 V–**	**24 V0**	**48 V0**	**115 V0**	**230 V0**
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	
Continuous current	5 A		5 A		5 A		5 A	
Derating curve a = mounted horizontally on rail without clearance 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	23 ms	18 ms	17 ms	13 ms
–, turn off delay	20 ms	15 ms	16 ms	23 ms	25 ms	19 ms	17 ms	18 ms
Max. switching frequency	20 Hz	20 Hz	27 Hz	24 Hz	19 Hz	21 Hz	24 Hz	22 Hz
Contact material	Ag, gold-flashed		Ag, gold-flashed		Ag, gold-flashed		Ag, gold-flashed	
Service life, mechanical	30 x 10^6		30 x 10^6		30 x 10^6		30 x 10^6	
–, 24 V–, 1 A, resistive load	10^5 (1100 VA, cos : = 1)		10^5 (1100 VA, cos : = 1)		10^5 (1100 VA, cos : = 1)		10^5 (1100 VA, cos : = 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								

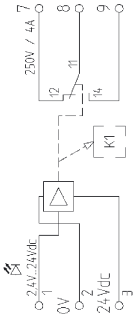
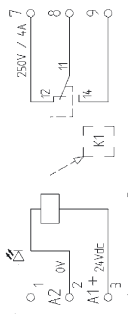
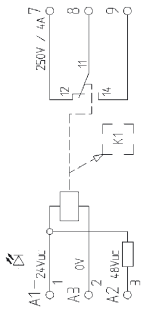
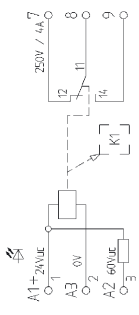
Insulation coordination acc. to EN 50178								
Overvoltage category	III		III		III		III	
Pollution severity	2		2		2		2	
Accessories, dimensions and connection data see	Page 306, Fig. III		Page 306, Fig. III		Page 306, Fig. III		Page 306, Fig. III	

** Larger values on request

WAVESERIES Relay Coupler in Component Housings

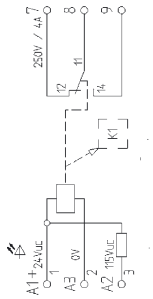
With 1 changeover contact

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**
Input				
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 mAdc ±15% at Ue 12 V	9 mAdc±15%	14 mAuc±15% at Ue 24 V 14 mAuc±15% at Ue 48V	11 mAac±15% at Ue=60 V 10 mAdc±15% at Ue=60 V 10.2 mAac±15% at Ue=24 V 9 mAdc±15% at Ue=24 V
Input power	6 mW ±15% at Ue 2.4 V	220 mW±15%	0.5 VA (W)±15% at Ue=48V 0.35 VA (W)±15% at Ue=24V	0.7 VA ±15% at Ue=60 V 0.34 VA±15% at Ue=24 V 0.6 W ±15% at Ue=60 V 0.22 W±15% at Ue=24 V
Output				
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 10^6 switching operations	20 x 10^6 switching operations	20 x 10^6 switching operations	20 x 10^6 switching operations
Electrical service life	150 x 10^3 switching operations	150 x 10^3 switching operations	1.5 x 10^5 switching operations	150 x 10^3 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
Insulation coordination acc. to EN 50178				
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
Insulation and voltage strength				
Insulation and voltage strength of entire circuit to mounting rail	4 kV_{eff} 1 min	4 kV_{eff} 1 min	4 kV_{eff} 1 min	4 kV_{eff} 1 min
Testing				
Input/output high voltage test	4 kVeff 1 s	4 kVeff 1 s	4 kVeff 1 s	4 kVeff 1 s
Accessories, dimensions and connection data see	Page 298 + 308	Page 298 + 308	Page 298 + 308	Page 298 + 308

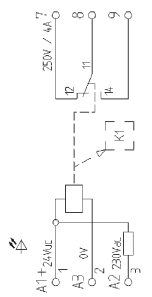
***** at ambient temperature 20°C

WRS 1 24/115 VUC

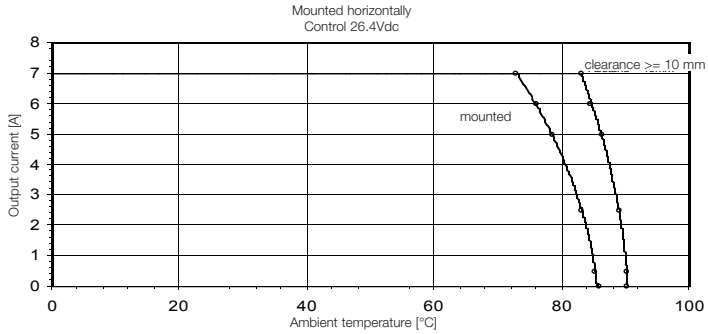


Type	Cat. No.
WRS 1 24/115 Vuc	**8418220000**
WRZ 1	**8430210000**
24 Vuc±10% / 115 Vuc±10%	
11 mAac±15% at Ue=115 V	
10.5mAdc±15% at Ue=115 V	
10.2 mAac±15% at Ue=24 V	
9 mAdc±15% at Ue=24 V	
1.3 VA ±15% at Ue=115 V	
0.34 VA±15% at Ue=24 V	
1.2 W ±15% at Ue=115 V	
0.22 W±15% at Ue=24 V	
max. 150 Vdc/250 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. 5.4 ms (NO) /	
4.2 ms (NC)	
typ. 4.4 ms (NO) /	
5.4 ms (NC)	
20 x 10^6 switching operations	
150 x 10^3 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	
≥ 5.5 mm	
4 kV_{eff} 1 min	
4 kVeff 1 s	
Page 298 + 308	

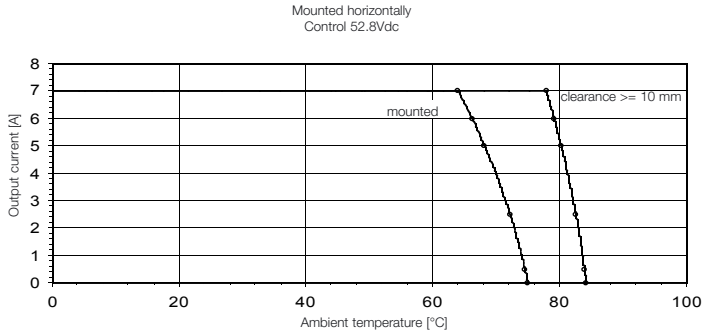
WRS 1 24 VUC 230 VAC



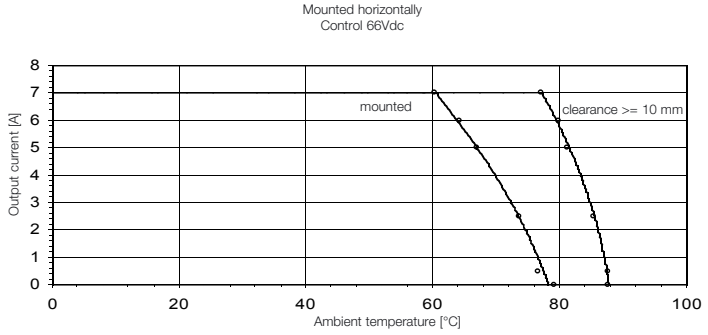
Type	Cat. No.
WRS 1 24 Vuc/230 Vac	**8418230000**
WRZ 1	**8430220000**
24 Vuc±10% / 230 Vac±10%	
15 mAac±15% at Ue=230 V	
14 mAac±15% at Ue=24 V	
13 mAdc±15% at Ue=24 V	
3.5 VA ±15% at Ue=230 V	
0.34 VA±15% at Ue=24 V	
0.32 W±15% at Ue=24 V	
max. 150 Vdc/250 Vac	
max. 5 A/max. 1250 VA*	
max. 10 A	
100 mA/5 Vdc	
Ag-alloy	
max. 30 mΩ/max. 100 mΩ	
at 1 A / 6 Vdc	
typ. 5.4 ms (NO) /	
4.2 ms (NC)	
typ. 4.4 ms (NO) /	
5.4 ms (NC)	
20 x 10^6 switching operations	
150 x 10^3 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	
≥ 5.5 mm	
4 kV_{eff} 1 min	
4 kVeff 1 s	
Page 298 + 308	



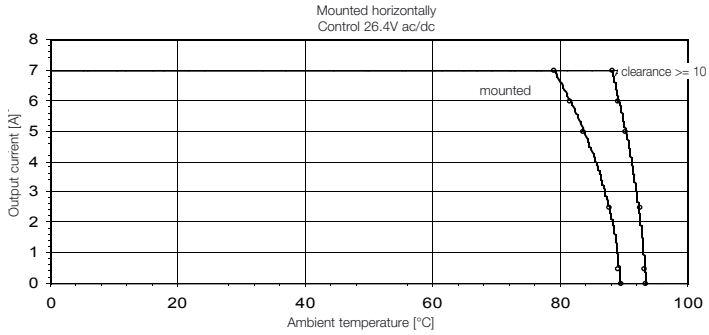
WRS 1 2.4-24 VDC • 8275320000



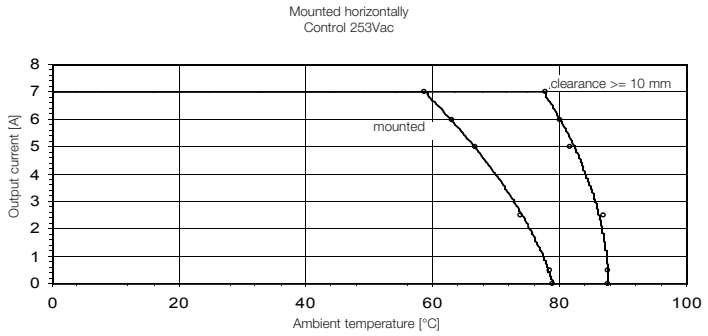
WRS 1 24/48 VUC • 8286280000



WRS 1 24/60 VUC • 8418210000



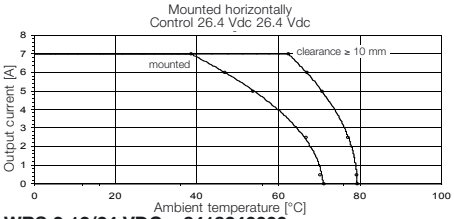
WRS 1 24/115 VUC • 8418220000



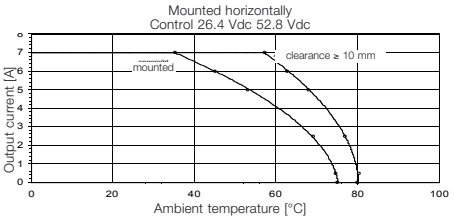
WRS 1 24 VUC/230 VAC • 8418230000

WAVESERIES Relay Coupler in Component Housings

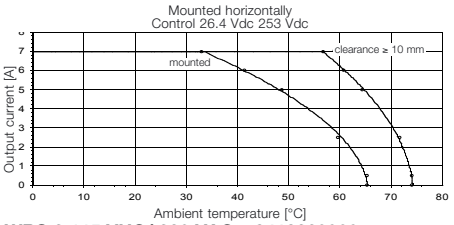
with 2 NO contacts



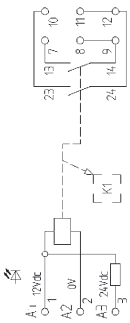
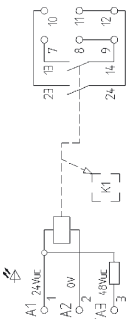
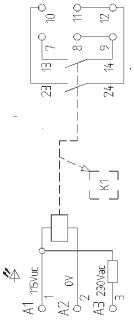
WRS 2 12/24 VDC • 8418240000



WRS 2 24/48 VUC • 8418250000



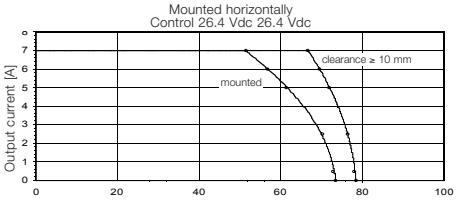
WRS 2 115 VUC/ 230 VAC • 8418260000

	WRS 2 12/24 VDC	WRS 2 24/48 VUC	WRS 2 115 VUC/ 230 VAC
			
Schematic circuit diagram			
Ordering data	Type / Cat. No.	Type / Cat. No.	Type / Cat. No.
Screw connection	WRS 2 12/24 Vdc **8418240000**	WRS 2 24/48 Vuc **8418250000**	WRS 2 115 Vuc/230 Vac **8418260000**
Tension clamp connection	WRZ 2 **8430230000**	WRZ 2 **8430240000**	WRZ 2 **8430250000**
Input			
Input voltage	12 Vdc±10 % / 24 Vdc±10 %	24 Vuc±10 % / 48 Vuc±10 %	115 Vuc±10%/ 230 Vac±10 %
Input current	21 mAdc±15% at Ue=24 V 20 mAdc±15%bei Ue=12 V	10 mAac±15% at Ue=48 V 11.5 mAac±15% at Ue=24 V 8.5 mAdc±15% at Ue=48 V 7.2 mAdc±15% at Ue=24 V	11 mAac±15% at Ue=230 V 8.5 mAuc±15% at Ue=115 V 8 mAdc±15% at Ue=115 V
Input power	0.5 W±15% at Ue=24 V 0.24 W±15% at Ue=12 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	2.5 VA±15% at Ue=230 V 1 VA±15% at Ue=115 V 0.9 W±15% at Ue=115 V
Output			
Switching voltage	max. 250 Vdc / 250 Vac (UL –> 13300/12300)	max. 250 Vdc / 250 Vac (UL –> 13300/12300)	max. 250 Vdc / 250 Vac (UL –> 13300/12300)
Continuous current AC / Switching power AC	max. 5 A / max. 1250 VA*	max. 5 A / max. 1250 VA*	max. 5 A / max. 1250 VA*
Switch-on current	max. 8 A	max. 8 A	max. 8 A
Min. switching	100 mA / 5 Vdc	100 mA / 5 Vdc	100 mA / 5 Vdc
Contact material	$AgSnO_2$	$AgSnO_2$	$AgSnO_2$
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
Pick-up delay at nominal voltage	typ. 5 ms	typ. 5 ms	---
Turn off delay	typ. 6.3 ms (NO) / 5.5 ms (NC)	---	---
Mechanical service life	50 x 10^6 switching operations	50 x 10^6 switching operations	50 x 10^6 switching operations
Electrical service life	1 x 10^5 switching operations	1 x 10^5 switching operations	1 x 10^5 switching operations
Max. switching frequency at nominal voltage	0.1 Hz	0.1 Hz	0.1 Hz
Ambient 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
Approvals	UL/CSA	UL/CSA	UL/CSA (nur 115 Vuc)
Insulation coordination acc. to EN 50178			
Rated voltage	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)
Overvoltage category	III	III	III
Pollution severity	2	2	2
Implemented clearance and creepage path	≥ 8 mm	≥ 8 mm	≥ 8 mm
Insulation and voltage strength			
Insulation and voltage strength of entire circuit to mounting rail	4 kV_{eff} 1 min	4 kV_{eff} 1 min	4 kV_{eff} 1 min
Testing			
Input/output high voltage test	4 kVeff 1 s	4 kVeff 1 s	4 kVeff 1 s
Accessories, dimensions and connection data see	Page 298 + 308	Page 298 + 308	Page 298 + 308

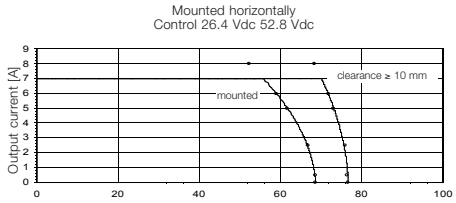
***** at ambient temperature 20°C

WAVESERIES Relay Coupler in Component Housings

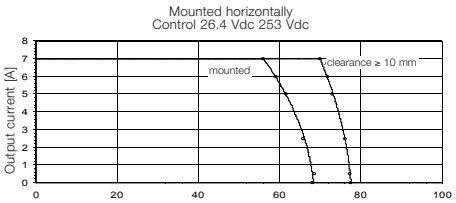
with 1NC / 1 NO



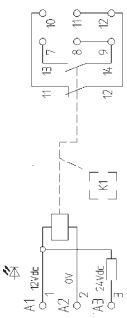
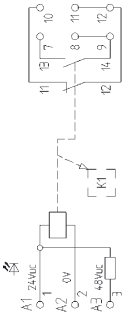
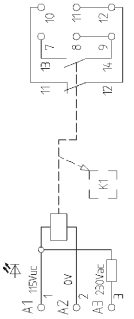
WRS 2 12/24 VDC • 8418270000



WRS 2 24/48 VUC • 8418280000

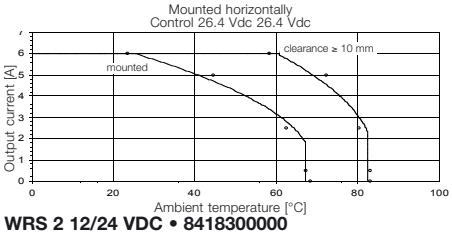


WRS 2 115 VUC/230 VAC • 8418290000

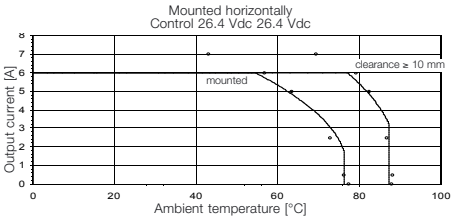
	WRS 2 12/24 VDC	WRS 2 24/48 VUC	WRS 2 115 VUC/ 230 VAC
			
Schematic circuit diagram			
Ordering data	Type / Cat. No.	Type / Cat. No.	Type / Cat. No.
Screw connection	WRS 2 12/24 Vdc **8418270000**	WRS 2 24/48 Vuc **8418280000**	WRS 2 115 Vuc/230 Vac **8418290000**
Tension clamp connection	WRZ 2 **8430260000**	WRZ 2 **8430270000**	WRZ 2 **8430280000**
Input			
Input voltage	12 Vdc±10% / 24 Vdc±10%	24 Vuc±10 % / 48 Vuc±10 %	115 Vuc±10 %/230 Vac±10 %
Input current	19.7 mAdc±15% at Ue=12 V 20.5 mAdc±15% at Ue=24 V	10 mAac±15% at Ue=48 V 11.5 mAac±15% at Ue=24 V 8.5 mAdc±15% at Ue=48 V 7.2 mAdc±15%bei Ue=24 V	11 mAac±15% at Ue=230 V 10 mAuc±15% at Ue=115 V 8 mAdc±15% at Ue=115 V
Input power	0.5 W±15% at Ue=24 V 0.24 W±15% at Ue=12 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	2.5 VA±15% at Ue=230 V 1 VA±15% at Ue=115 V 0.9 W±15% at Ue=115 V
Output			
Switching voltage	max. 250 Vdc/250 Vac	max. 250 Vdc/250 Vac	max. 250 Vdc/250 Vac
Continuous current AC / Switching power AC	max. 5 A/max. 1250 VA*	max. 5 A/max. 1250 VA*	max. 5 A/max. 1250 VA*
Switch-on current	max. 8 A	max. 8 A	max. 8 A
Min. switching	100 mA/5 V	100 mA/5 V	100 mA/5 V
Contact material	$AgSnO_2$	$AgSnO_2$	$AgSnO_2$
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
Pick-up delay at nominal voltage	typ. 5ms	---	---
Turn off delay	---	---	---
Mechanical service life	50 x 10^6 switching operations	50 x 10^6 switching operations	50 x 10^6 switching operations
Electrical service life	1 x 10^5 switching operations	1 x 10^5 switching operations	1 x 10^5 switching operations
Max. switching frequency at nominal voltage	0.1 Hz	0.1 Hz	0.1 Hz
Ambient 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
Approvals	UL/CSA	UL/CSA	UL/CSA (nur 115 Vuc)
Insulation coordination acc. to EN 50178			
Rated voltage	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)
Overvoltage category	III	III	III
Pollution severity	2	2	2
Implemented clearance and creepage path	≥ 8 mm	≥ 8 mm	≥ 8 mm
Insulation and voltage strength			
Insulation and voltage strength of entire circuit to mounting rail	4 kV_{eff} 1 min	4 kV_{eff} 1 min	4 kV_{eff} 1 min
Testing			
Input/output high voltage test	4 kVeff 1 s	4 kVeff 1 s	4 kVeff 1 s
Accessories, dimensions and connection data see	Page 298 + 308	Page 298 + 308	Page 298 + 308

***** at ambient temperature 20°C

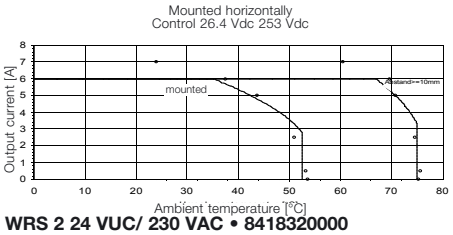
with 2 changeover contacts



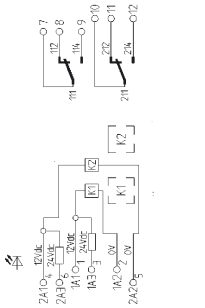
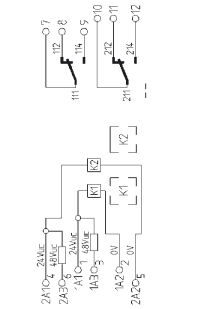
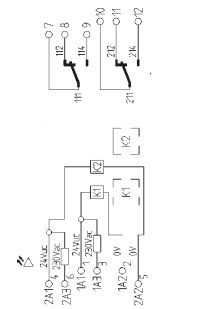
WRS 2 12/24 VDC • 8418300000



WRS 2 24/48 VUC • 8418310000



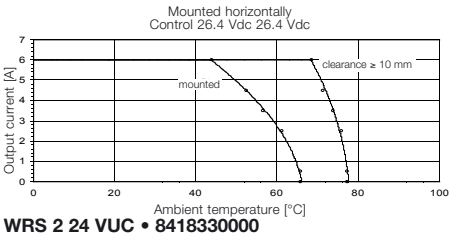
WRS 2 24 VUC/ 230 VAC • 8418320000

	WRS 2 12/24 VDC	WRS 2 24/48 VUC	WRS 2 24 VUC/ 230 VAC
			
Schematic circuit diagram			
Ordering data	Type / Cat. No.	Type / Cat. No.	Type / Cat. No.
Screw connection	WRS 2 12/24 Vdc **8418300000**	WRS 2 24/48 Vuc **8418310000**	WRS 2 24 VUC/230 Vac **8418320000**
Tension clamp connection	WRZ 2 **8430290000**	WRZ 2 **8430300000**	WRZ 2 **8430310000**
Input			
Input voltage	12 Vdc±10% /24 Vdc±10 %	24 Vuc±10% /48 Vuc±10 %	24 Vuc±10% /230 Vac±10%
Input current	21 mAdc±15% at Ue=12 V 22 mAdc±15% at Ue=24 V	14 mAuc±15% at Ue=48 V 14 mAuc±15% at Ue=24 V	15 mAac±15% at Ue=230 V 14 mAuc±15% at Ue=24 V
Input power	0.26 W±15% at Ue=12 V 0.53 W±15% at Ue=24 V	0.7 VA(W)±15% at Ue=48 V 0.35 VA(W)±15% at Ue=24 V	0.35 W±15% at Ue=24 V 3.45 VA ±15% at Ue=230 V
Output			
Switching voltage	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. 5 A/max. 1250 VA*
Switch-on current	max. 10 A	max. 10 A	max. 10 A
Min. switching	100 mA/5 Vdc	100 mA/5 Vdc	100 mA / 5 Vdc
Contact material	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
Pick-up delay at nominal voltage	typ. 6.5 ms (NO) / 4.5 ms (NC)	typ. 6.5 ms (NO) / 4.5 ms (NC)	typ. 6 ms (NO)/4.2 ms (NC)/Eingang: 24 Vuc/230 Vac
Turn off delay	typ. 8 ms (NO) / 11 ms (NC)	typ. 8 ms (NO)/ 11 ms (NC)	typ. 4.4 ms (NO)/ 5.4 ms (NC)
Mechanical service life	20 x 10^6 switching operations	20 x 10^6 switching operations	20 x 10^6 switching operations
Electrical service life	1.5 x 10^5 switching operations	1.5 x 10^5 switching operations	150 x 10^3 switching operations
Max. switching frequency at nominal voltage	0.1 Hz	0.1 Hz	0.1 Hz
Ambient 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
Approvals	UL/CSA	UL/CSA	
Insulation coordination acc. to EN 50178			
Rated voltage	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)
Overvoltage category	III	III	III
Pollution severity	2	2	2
Implemented clearance and creepage path	≥ 5.5 mm	≥ 5.5 mm	≥ 5.5 mm
Insulation and voltage strength			
Insulation and voltage strength of entire circuit to mounting rail	4 kV_{eff} 1 min	4 kV_{eff} 1 min	4 kV_{eff} 1 min
Testing			
Input/output high voltage test	4 kVeff 1 s	4 kVeff 1 s	4 kVeff 1 s
Accessories, dimensions and connection data see	Page 298 + 308	Page 298 + 308	Page 298 + 308

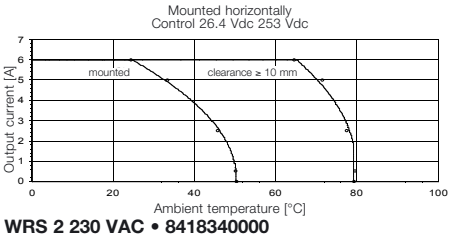
***** at ambient temperature 20°C

WAVESERIES Relay Coupler in Component Housings

with 3 NO contacts



WRS 2 24 VUC • 8418330000

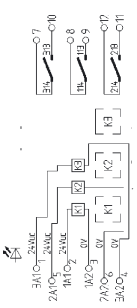


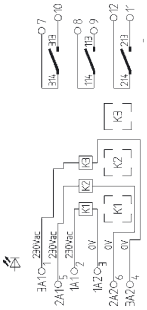
WRS 2 230 VAC • 8418340000

WRS 2 24 VUC

WRS 2 230 VAC

Schematic circuit diagram





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_{nenn} (per channel)		10.3 mAac ±15 % at U_{nenn} (per channel)	
Input power	0.3 VA ±15 % (per channel) 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	$AgSnO_2$		$AgSnO_2$	
Contact resistance (when new)	max. 100 mΩ at 1 A/24 Vdc		max. 100 mΩ 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 10^6 switching operations		20 x 10^6 switching operations	
Electrical service life	1 x 10^5 switching operations		1 x 10^5 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 kV_{eff} 1 min		4 kV_{eff} 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 fulfil 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

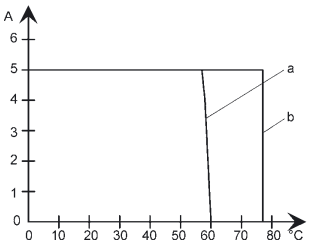
EGR EG 7

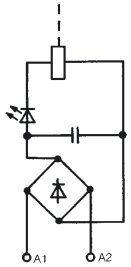
RST EG 7

RS EG 7

	12 V0	24 V–	24 V–	24 V0
Schematic circuit diagram				

Derating curve
a = mounted horizontally on rail without clearance
b = mounted horizontally on rail, rowed with clearances





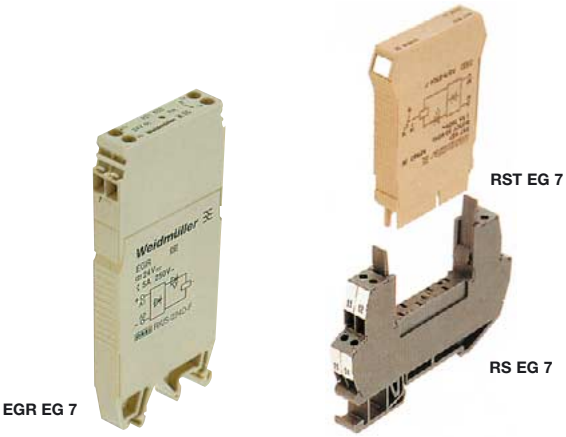
Ordering data								
Combination foot for TS 15, TS 32, TS 35	1 NO	Type	Cat. No.	Type	Cat. No.	Type	Cat. No.	Type	Cat. No.
	1 NC	EGR EG7	**8092310000**	EGR EG7	**8216520000**	EGR EG7	**8147120000**	EGR EG7	**8092340000**
		EGR EG7	**8092320000**	EGR EG7	**8216530000**	EGR EG7	**8147140000**	EGR EG7	**8092350000**
EGR EG 7 spare relays, without connection unit		EGR EG7	**8092330000**[1]	EGR EG7	**8218200000**[1]	EGR EG7	**8160030000**[1]	EGR EG7	**8092360000**[1]
Plug-in relay-coupl., without engagem. socket, 1 changeo. cont.		RST EG7	**8216550000**	RST EG7	**8216570000**	RST EG7	**8216560000**	RST EG7	**8216580000**
Engage.socket f. plug-in relay coupler w. combin.foot TS 32, 35		RS EG7	**8193830000**	RS EG7	**8193830000**	RS EG7	**8193830000**	RS EG7	**8193830000**
Rated data of the coil									
Input voltage		**12 V0 +15 % –10 %**		**24 V– +15 % –10 %**		**24 V– +15 % –10 %**		**24 V0 +15 % –10 %**	
Rated consumption		320 mW +20 % –10 %		280 mW +20 % –10 %		280 mW +20 % –10 %		280 mW +20 % –10 %	
Max. switch-on current		120 mA		12 mA		12 mA		240 mA	
Combination foot for drop current		≤ 3 mA		≤ 3 mA		≤ 3 mA		≤ 3 mA	
Connection	– NO and NC	Screw connection		Screw connection		Screw connection		Screw connection	
		0.5…1.5 mm²		0.5…1.5 mm²		0.5…1.5 mm²		0.5…1.5 mm²	
		AWG-Conductor 26…16		AWG-Conductor 26…16		AWG-Conductor 26…16		AWG-Conductor 26…16	
	– changeover contacts	0.5…2.5 mm²		0.5…2.5 mm²		0.5…2.5 mm²		0.5…2.5 mm²	
Rated data der Contacts									
Max. output voltage		250 V		250 V		250 V		250 V	
Continuous current		5 A		5 A		5 A		5 A	
Max. switch-on current		8 A		8 A		8 A		8 A	
Min. switching capacity/switching current		100 mW/10 mA		100 mW/10 mA		40 µW[2]		100 mW/10 mA	
Bounce times		≤ 1 ms		≤ 1 ms		≤ 1 ms		≤ 1 ms	
Contact material[2]		AgNi 0.15 gold-flashed		AgNi 0.15 gold-flashed		AgNi 0.15 **5 µ Au**		AgNi 0.15 gold-flashed	
Bounce times		≤ 1 ms		≤ 1 ms		≤ 1 ms		≤ 2.4 ms	
Switching times									
pick up delay		≤ 8 ms		≤ 8 ms		≤ 8 ms		≤ 11 ms	
drop-out delay		≤ 6 ms		≤ 6 ms		≤ 6 ms		≤ 10 ms	
Service life, mechanical		> 15 x 10⁶ switching operations		> 15 x 10⁶ switching operations		> 15 x 10⁶ switching operations		> 15 x 10⁶ switching operations	
–, 24 V–, 1.1 A, inductive load		≥ 2 x 10⁶ switching operations with free wheel diode		≥ 2 x 10⁶ switching operations with free wheel diode		≥ 2 x 10⁶ switching operations with free wheel diode		≥ 2 x 10⁶ switching operations with free wheel diode	
–, 230 V~, 5 A, resistive load		> 2 x 10⁵ switching operations		> 2 x 10⁵ switching operations		> 2 x 10⁵ switching operations		> 2 x 10⁵ switching operations	
Status indicator		Green LED		Green LED		Green LED		Green LED	
Storage temperature		–40 °C…+60 °C		–40 °C…+60 °C		–40 °C…+60 °C		–40 °C…+60 °C	
Ambient temperature		–25 °C…+60 °C		–25 °C…+60 °C		–25 °C…+60 °C		–25 °C…+60 °C	
Insulation coordination acc. to EN 50178									
Safe isolation according to VDE 0106 part 101		DIN VDE 0106		DIN VDE 0106		DIN VDE 0106		DIN VDE 0106	
Rated impulse voltage		8 kV		8 kV		8 kV		8 kV	
Clearances and creepage distances		≥ 8 mm		≥ 8 mm		≥ 8 mm		≥ 8 mm	
Overvoltage category		III		III		III		III	
Pollution severity		2		2		2		2	
Accessories									
Cross-connection comb. 16fold		QB 16/10.16	**1650330000**	QB 16/10.16	**1650330000**	QB 16/10.16	**1650330000**	QB 16/10.16	**1650330000**
Accessories, dimensions and connection data see		Page 304		Page 304		Page 304		Page 304	

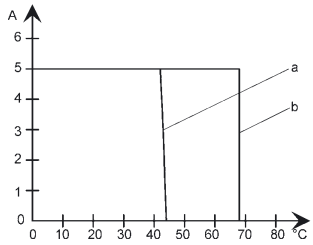
1) Serves only as a spare part for NO and NC

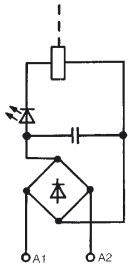
2) The following ratings can safely be switched:
a) 100 mV…60 V ac/dc/100 µA…300 mA
b) 5 V… 24 V dc/10 mA… 1.2 A
c) 24 V ... 60 V dc/10 mA... 500 mA
d) 10 V…250 V ac/10 mA… 5 A

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

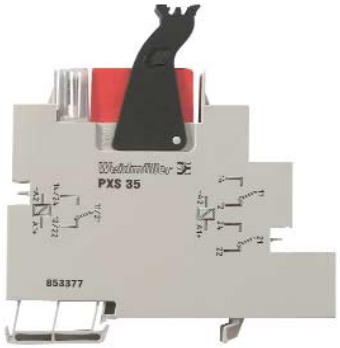
Relay Couplers in Components Housings EG 7







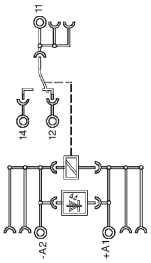
48 V0	60 V~	115 V0	230 V~	230 V~
Type / Cat. No.	Type / Cat. No.	Type / Cat. No.	Type / Cat. No.	Type / Cat. No.
EGR EG7 **8092370000**	EGR EG7 **8092400000**	EGR EG7 **8092430000**	EGR EG7 **8092460000**	EGR EG7 **8178200000**
EGR EG7 **8092380000**	EGR EG7 **8092410000**	EGR EG7 **8092440000**	EGR EG7 **8092470000**	
EGR EG7 **8092390000**[1]	EGR EG7 **8092420000**[1]	EGR EG7 **8092450000**[1]	EGR EG7 **8092480000**[1]	
RST EG7 **8216590000**	RST EG7 **8216600000**	RST EG7 **8216610000**	RST EG7 **8216620000**	RST EG7 **8216630000**
RS EG7 **8193830000**	RS EG7 **8193830000**	RS EG7 **8193830000**	RS EG7 **8193830000**	RS EG7 **8193830000**
48 V0 +15 % –10 %	**60 V0 +15 % –10 %**	**115 V0 +15 % –10 %**	**230 V~ +15 % –10 %**	**230 V~ +15 % –10 %**
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^2	0.5…1.5 mm^2	0.5…1.5 mm^2	0.5…1.5 mm^2	0.5…1.5 mm^2
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^2	0.5…2.5 mm^2	0.5…2.5 mm^2	0.5…2.5 mm^2	0.5…2.5 mm^2
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[2]
≤ 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 **5 µ Au**
≤ 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 10^6 switching operations	> 15 x 10^6 switching operations	> 15 x 10^6 switching operations	> 15 x 10^6 switching operations	> 15 x 10^6 switching operations
≥ 2 x 10^6 switching operations with free wheel diode	≥ 2 x 10^6 switching operations with free wheel diode	≥ 2 x 10^6 switching operations with free wheel diode	≥ 2 x 10^6 switching operations with free wheel diode	≥ 2 x 10^6 switching operations with free wheel diode
> 2 x 10^5 switching operations	> 2 x 10^5 switching operations	> 2 x 10^5 switching operations	> 2 x 10^5 switching operations	> 2 x 10^5 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 **1650330000**	QB 16/10.16 **1650330000**	QB 16/10.16 **1650330000**	QB 16/10.16 **1650330000**	QB 16/10.16 **1650330000**
Page 304	Page 304	Page 304	Page 304	Page 304



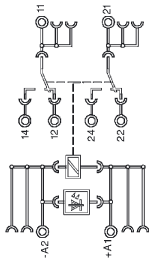
PRZ/PRS

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

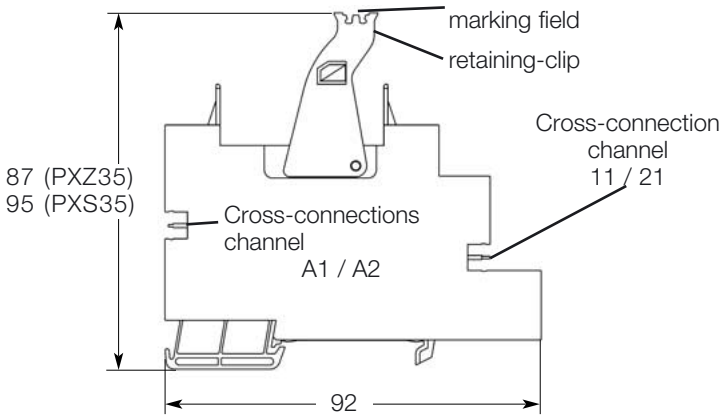
DC-Version

Type/Version	Cat. No.	Qty.
Screw connection		
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
Tension clamp connection		
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		
Technical data		
Input voltage	12 V dc ... 24Vdc ... 115Vdc	
Rated consumption, typ	400 mW	
Status indicator	pluggable LED-housing, green LED	
Output	**1 CO /2 CO contacts**	
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 10^6	
Input/output		
Clearance and creepage path	> 8mm	
Protective separation	DIN VDE 0106 T. 101	
Dielectric strength	> 4kV eff	
Insulation coordinates acc. to EN 50178	III / 2	
Miscellaneous data		
Ambient temperature	-40°C ... +50°C	
Protection class	IP 20	
Rated cross-section	0.5...2.5mm^2	
Flammability	V0	
Relay type	Schrack RT1 / RT2	
Dimensions WxHxT	15.2 x 91 x 85	
Approvals	CE, UL recognized, cUL	
Rail mounted	TS 35	
Accessories		
Cross-connection		
2-pole black	ZQV 2.5N/4-2 SW **1784270000**	60
2-pole red	ZQV 2.5N/4-2 RT **1784280000**	60
2-pole blue	ZQV 2.5N/4-2 BL **1784290000**	60
Marking tags		
	WS 10/5 **1060860000**	
	WS 15/5 **1609880000**	

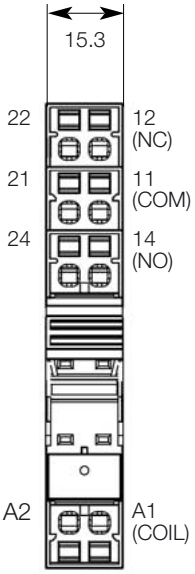
AC-Version

Type/Version	Cat. No.	Qty.
Screw connection		
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
Tension clamp connection		
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		
Technical data		
Input voltage	24Vac ...120Vac ... 230Vac	
Rated consumption, typ	760 VA	
Status indicator	pluggable LED-housing, green LED	
Output	**1 CO /2 CO contacts**	
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 10^6	
Input/output		
Clearance and creepage path	> 8mm	
Protective separation	DIN VDE 0106 T. 101	
Dielectric strength	> 4kV eff	
Insulation coordinates acc. to EN 50178	III / 2	
Miscellaneous data		
Ambient temperature	-40°C ... +50°C	
Protection class	IP 20	
Rated cross-section 0.5 mm^2	0.5...2.5mm^2	
Flammability	V0	
Relay type	Schrack RT1 / RT2	
Dimensions WxHxT	15.2 x 91 x 85	
Approvals	CE, UL recognized, cUL	
Rail mounted	TS 35	
Accessories		
Cross-connection		
2-pole black	ZQV 2.5N/4-2 SW **1784270000**	60
2-pole red	ZQV 2.5N/4-2 RT **1784280000**	60
2-pole blue	ZQV 2.5N/4-2 BL **1784290000**	60
Marking tags		
	WS 10/5 **1060860000**	
	WS 15/5 **1609880000**	

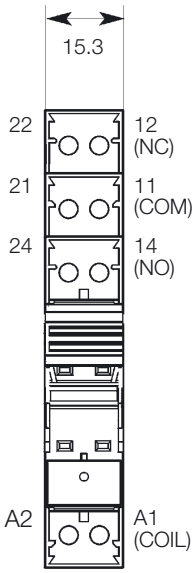
Accessories



Tension clamp



Screw connection



Empty base for rail mounted TS 35	Type	Cat. No.	Qty.
Screw connection	PXS35	**8533771001**	10
Tension clamp connection	PXZ35	**8536691001**	10

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^2
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

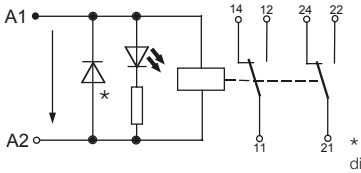
Operating indication				
LED indicator with free-wheeling diode				
	6 ... 24 Vdc	PLED 24 Vdc	**8536710000**	20
	6 ... 24 Vdc	PLED 24 Vdc red	**8611010000**	20
	48 ... 60 Vdc	PLED 48 Vdc	**8536720000**	20
	115 Vdc	PLED 115 Vdc	**8536730000**	20
	12 ... 24 Vac	PLED 24 Vac	**8536750000**	20
	115 Vac	PLED 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	Type	Cat. No.	Qty.
10 x 5 mm	WS 10/5	**1060860000**	200
	WS 15/5	**1609880000**	96

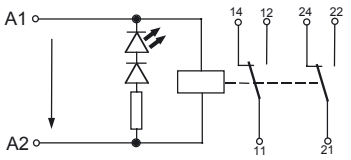
Operating indication

DC-Version



* free wheel diode

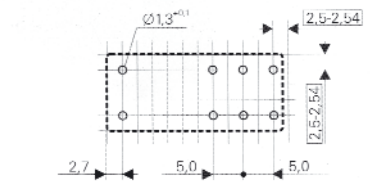
AC-Version



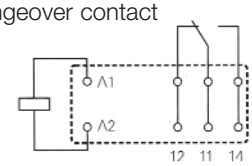
Pluggable relay types

Print figure/circuit diagram Relay type RT/SGR

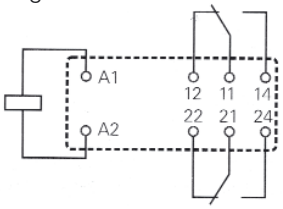
16 A, Pinning 5 mm



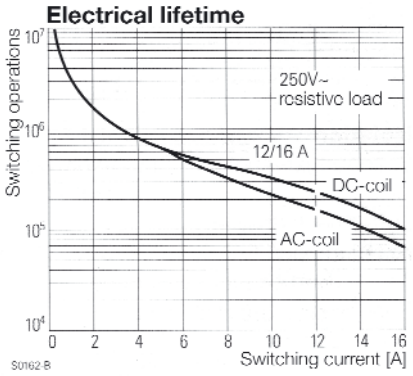
1 changeover contact

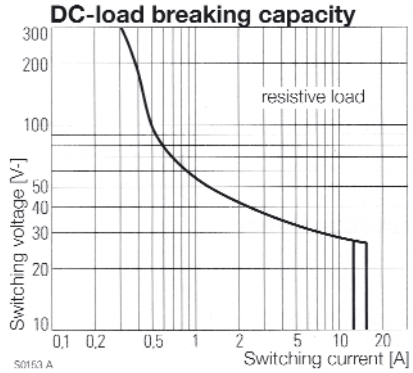


2 changeover contacts



SCHRACK RT





Pluggable relay	Type **Schrack RT**	Cat. No.	Qty.
12 Vdc 1 changeover contact	RT 314012	**4058470000**	20
12 Vdc 2 changeover contacts	RT 424012	**4058560000**	20
24 Vdc 1 changeover contact	RT 314024	**4058480000**	20
24 Vdc 1 changeover contact AU	RT 315024	**4058490000**	20
24 Vdc 2 changeover contacts	RT 424024	**4058570000**	20
24 Vdc 2 changeover contacts AU	RT 425024	**4058580000**	20
48 Vdc 1 changeover contact	RT 314048	**4058740000**	20
48 Vdc 2 changeover contacts	RT 424048	**4058750000**	20
60 Vdc 2 changeover contacts	RT 424060	**4058760000**	20
110 Vdc 1 changeover contact	RT 314110	**4058500000**	20
110 Vdc 2 changeover contacts	RT 424110	**4058590000**	20
24 Vac 1 changeover contact	RT 315524	**4058510000**	20
24 Vac 2 changeover contacts	RT 424524	**4058600000**	20
115 Vac 1 changeover contact	RT 314615	**4058520000**	20
115 Vac 1 changeover contact AU	RT 315625	**4058530000**	20
115 Vac 2 changeover contacts	RT 424615	**4058610000**	20
115 Vac 2 changeover contacts AU	RT 425615	**4058620000**	20
230 Vac 1 changeover contact	RT 314730	**4058540000**	20
230 Vac 1 changeover contact AU	RT 315730	**4058550000**	20
230 Vac 2 changeover contacts	RT 424730	**4058630000**	20
230 Vac 2 changeover contacts AU	RT 425730	**4058640000**	20

Technical data		
Contact number and type		1 changeover contact or 2 changeover contacts
Contact material		AgNi 90/10, AgNi 0.15 htv
Switching current		16 A 1We/2 x 8 A 2We
Switching voltage		250 V ac
Braking capacity		4 kVA
Min. switching current / braking capacity		10 mA /100 mW
Min. braking capacity AU contact		40 µW
Rated consumption		400 mW dc/0.55 VA ac
Dielectric strength Sp./Kont.		5 kV
Response / drop out time:	DC coil	typ. 7/3 ms
	AC coil	9/45 ms
Bounce time NO contact/normally closed contact		typ. 1/3 ms
Mechanical service life:	DC coil	> 30 x 10^6 switching operations
	AC coil	> 30 x 10^6 switching operations
Braking capacity	1-pole DC 13	1.25A, L/R = 80 ms 2.3 x 10^5
	2-pole DC 13	1.25A, L/R = 80 ms 2.8 x 10^5
	2-pole AC 15	1.2A, cosL/R = 0.3 6050x

Miscellaneous data		
Protection class		IP 40
Flammability class UL		V0
Ambient temperature	DC coil	-40°C ... +85°C
	AC coil	-40°C ... +70°C
Weight		14 g
Approvals		UL, CSA, VDE, ÖVE

ELESTA SGR
Relais with manual operation

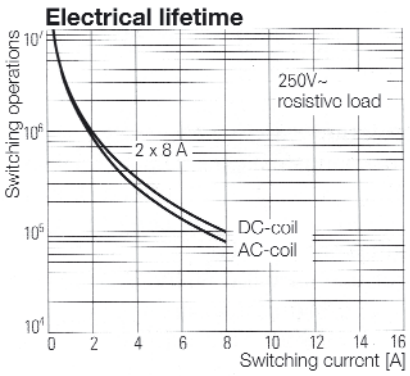
RP 3SL
Relays for high switching currents

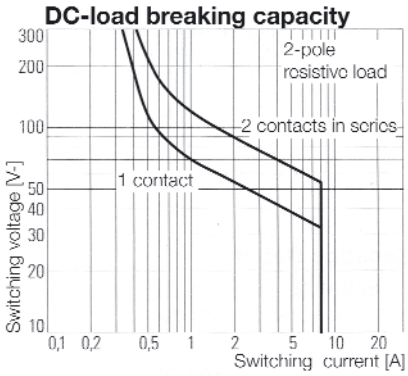
Pluggable relay		Type **ELESTA SGR** Cat. No.	Qty.	Type **Schrack RP 3SL** Cat. No.	Qty.
24 Vdc 1 changeover contact with test button		SGR 662 24 Vdc T **8550510000**	10		
24 Vdc 2 changeover contacts with test button		SGR 282 24 Vdc T **8550520000**	10		
24 Vdc 1 normally-open contact				RP3SL 24 Vdc 1NO **8588510000**	20
Technical data					
Contact number and type		2 changeover contacts with test button		1 normally-open contact	
Contact material		AgCuNi		$AgSnO_2$	
Switching current		16 A 1We/2 x 8 A 2We		25 A	
Peak inrush current				120 A / 20 ms	
Switching voltage		250 Vac		250 V	
Braking capacity		4 kVA		4 kVA	
Min. switching current / braking capacity		10 mA /100 mW			
Rated consumption		500 mW		500 mW	
Dielectric strength Sp./Kont.		5 kV		4 kV	
Response / drop out time:	DC coil	typ. 10/3 ms		typ. 8/2 ms	
Bounce time NO contact/normally closed contact		typ. 0.5/5 ms		typ. 2 ms	
Mechanical service life:	DC coil	> 30 x 10^6 switching operations		30 x 10^6 switching operations	
Miscellaneous data					
Protection class		IP 40		IP 40	
Flammability class UL		V1			
Ambient temperature	DC coil	-25°C ... +70°C		-40°C ... +70°C	
Weight		20 g		18 g	
Approvals		SEV, UL, CSA, DEMKO, VDE, PTB		SEV, UL, CSA, VDE	

Contact service life

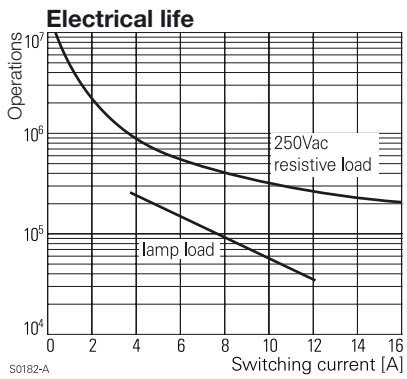
Type	Load	switch. oper.	Regulation
RP3SL	12 A, 250 V~, cosφ=1	$3x10^5$	
RP3SL	TV 8	$25x10^3$	UL 508
RP3SL	2500 W, 230 V~, halogene lamps	$>10^4$	
RP3SL	1000 W, 250 V~, glow lamps	$2.3x10^5$	
RP3SL	3000 W, 250 V~, glow lamps	$3.6x10^4$	
RP3SL	1500 VA, flurescent tubes 163 µF	10^4	

Leistungsrelais Type RT2
2 changeover contacts





Power relay RP 3SL



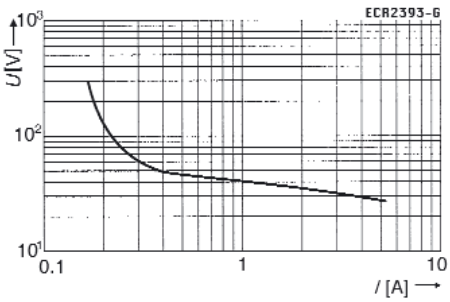
MICRORELAY MRS/MRZ

MRS 5 Vdc 1CO **MRS 12 Vdc 1CO**
MRZ 5 Vdc 1CO **MRZ 12 Vdc 1CO**

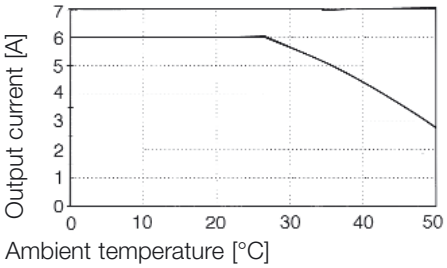
This module can be used as a universal interface between the controller and actuator for switching small to medium-sized loads.

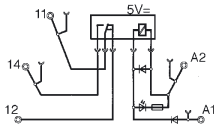
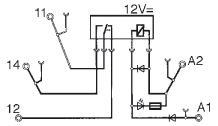
- Pluggable cross-connection in the input and output reduces wiring costs
- 6-mm width
- Flexible thanks to screw and tension clamp connection versions

Limit diagram



Current temperature-rise curve

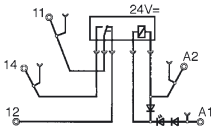
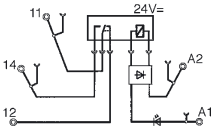
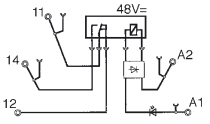
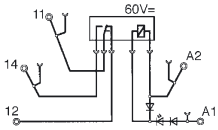
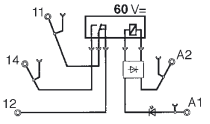
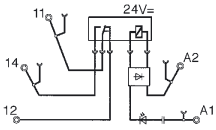


Schematic circuit diagram		
		

Ordering data	Type	Cat. No.	Type	Cat. No.
for TS 35				
Screw connection	MRS 5 Vdc 1CO	**8556080000**	MRS 12 Vdc 1CO	**8556070000**
Tension clamp connection	MRZ 5 Vdc 1CO	**8556150000**	MRZ 12 Vdc 1CO	**8556140000**

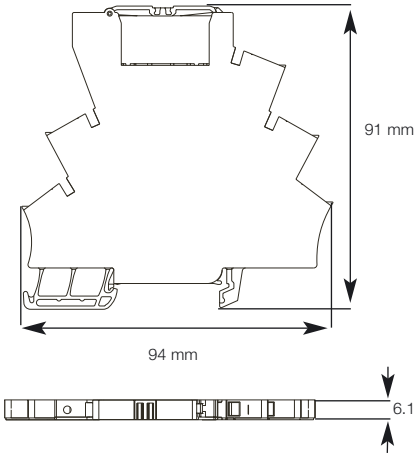
Technical data		
Input		
Input voltage	5 Vdc ± 20 % (4...6 V)	12 Vdc ±20 % (9.6...14.4 V)
Input voltage ac with U_{Nenn}		
Input voltage dc with U_{Nenn}	38 .5 mAdc ±10 %	17.2 mAdc ±10 %
Input power	193 mW ±10%	210 mW ±10%
Making threshold , (typ.)	3.2 V / 21.6 mA	6.4 V / 8.4 mA
Cut-out threshold (typ.)	1.6 V / 8 mA	2.5 V / 2.4 mA
Status indicator	Green LED	Green LED
Reaction time at U_N (typ.)	6.2 ms	5.8 ms
Release at U_N (typ.)	3.9 ms	6.9ms
Voltage of relay coil	5 V	12 V
Functionality		
Operating indication	yes	yes
Reverse polarity protection	yes	yes
Free wheel diode	yes	yes
Output	1 changeover contact	1 changeover contact
Switching voltage	250 Vac acc. to VDE	250 Vac acc. to VDE
	240 Vac acc. to UL/CSA	240 Vac acc. to UL/CSA
ac: continuous current/switching power (see derating diagram)	max. 6 A / max. 1500 VA	max. 6 A / max. 1500 VA
Switch-on current	max. 6 A	max. 6 A
dc: Continuous current/switching power	see limit diagram	see limit diagram
Min. braking capacity	12 V /10 mA	12 V /10 mA
Contact material	AgSnO	AgSnO
Mechanical service life	20 x 10^6 switching operations	20 x 10^6 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
Climate	40 °C / 93 % rel. humidity, no condensation	40 °C / 93 % rel. humidity, no condensation
Approvals	CE, cUL	CE, cUL
Insulation coordination acc. to EN 50178		
Rated voltage	300 V	300 V
Rated impulse voltage	4 kV (1.2 / 50 µs)	4 kV
Overvoltage category	III	III
Pollution severity	2	2
Insulation coord.- and voltage proof, input/output mounting rail	4 kV_{eff} / 1 min	4 kV_{eff} / 1 min
Achieved clearances and creepage distances	≥ 5.5 mm	≥ 5.5 mm

Relay Couplers on Sockets MICROSERIES in Terminal Format

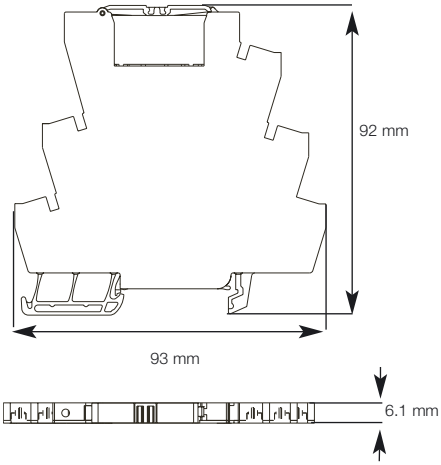
MRS 24 Vdc 1CO MRZ 24 Vdc 1CO	MRS 24 Vuc 1CO MRZ 24 Vuc 1CO	MRS 48 Vuc 1CO MRZ 48 Vuc 1CO	MRS 60 Vdc 1CO MRZ 60 Vdc 1CO	MRS 120 Vuc 1CO MRZ 120 Vuc 1CO	MRS 230 Vac 1CO MRZ 230 Vac 1CO
					
					
Type Cat. No.	Type Cat. No.	Type Cat. No.	Type Cat. No.	Type Cat. No.	Type Cat. No.
MRS 24 Vdc 1CO **8533640000** MRZ 24 Vdc 1CO **8533660000**	MRS 24 Vuc 1CO **8556050000** MRZ 24 Vuc 1CO **8556120000**	MRS 48 Vuc1CO **8556040000** MRZ 48 Vuc1CO **8556110000**	MRS 60 Vdc1CO **8556060000** MRZ 60 Vdc1CO **8556130000**	MRS 120 Vuc 1CO **8556030000** MRZ 120 Vuc 1CO **8556100000**	MRS 230 Vac1CO **8556020000** MRZ 230Vac1CO **8556090000**
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)
	11 mA ± 10 %	5 mA ±20 %		3.5 mAac ±15 %	7.6 mA ±15%
6.6 mAdc ±10 %	6.4 mA ±20 %	4 mA ±20 %	3.3 mAdc ±20 %		
160 mW ±10%	154 mW ±10 %	190 mW ±20 %	200 mW ±10 %	0.42 VA ±15 %	1.55 VA ±15 %
15.4 V / 4 mA	15.8 V / 3.6 mA	29 V / 2.2 mA	35 V / 1.6 mA	71 V / 1.8 mA	103 V / 5 mA
6.5 V / 1.2 mA	7 V / 1.3 mA	11 V / 1.3 mA	11 V / 0.6 mA	22 V / 0.5 mA	49 V / 2.5 mA
Green LED	Green LED	Green LED	Green LED	Green LED	Green LED
6.6 ms	7.3 ms	6.1 ms	5.9 ms	6.7 ms	13 ms
5.8 ms	9 ms	5.8 ms	6.5 ms	8.1 ms	11 ms
24 V	24 V	48 V	60 V	60 V	24 V
yes	yes	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 10^6 switching operations	20 x 10^6 switching operations	20 x 10^6 switching operations	20 x 10^6 switching operations	20 x 10^6 switching operations	20 x 10^6 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_{eff} / 1 min	4 kV_{eff} / 1 min	4 kV_{eff} / 1 min	4 kV_{eff} / 1 min	4 kV_{eff} / 1 min	4 kV_{eff} / 1 min
≥ 5.5 mm	≥ 5.5 mm	≥ 5.5 mm	≥ 5.5 mm	≥ 5.5 mm	≥ 5.5 mm

Accessories

Tension clamp version MRZ



Screw version MRS



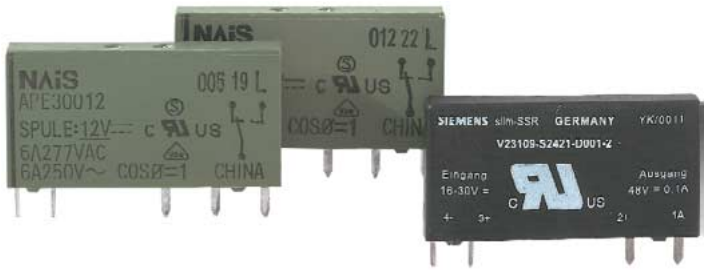
General technical data		Tension clamp version		Screw version	
Clampable conductor:					
Solid H07V-U	mm^2	0.5…2.5		0.5…4	
Fsolid H07V-K	mm^2	0.5…2.5		0.5…2.5	
„f“ with ferrules acc. to DIN 46 228/1*	mm^2	0.5…1.5		0.5…1.5	
„f“ with ferrules with plastic collar*	mm^2	0.5…1.5		0.5…1.5	
Max. clampable range in mm^2 /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

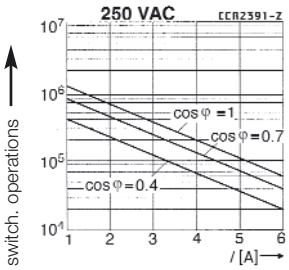
Markings	Type	Cat. No.	Qty.	Type	Cat. No.	Qty.
12 x 6 mm	WS 10/6	**1060960000**	200	WS 10/6	**1060960000**	200
	WS 12/6	**1061160000**	200	WS 12/6	**1061160000**	200

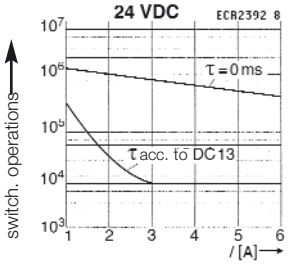
Screwdriver	Type	Cat. No.	Qty.	Type	Cat. No.	Qty.
	SD 0.6 x 3.5 x 100	**9008330000**	10	SD 0.6 x 3.5 x 100	**9008330000**	10

Accessories



Contact service life
Material $AgSnO_2$





Pluggable relay	Type **NAIS APE...**	Cat. No.	Qty.
Coil voltage 5 V, 1 changeover contact	... 30005V	**4061580000**	20
Coil voltage 12 V, 1 changeover contact	... 30012V	**4061610000**	20
Coil voltage 24 V, 1 changeover contact	... 30024V	**4060120000**	20
Coil voltage 48 V, 1 changeover contact	... 30048V	**4061620000**	20
Coil voltage 60 V, 1 changeover contact	... 30060V	**4061630000**	20
Coil voltage 24 V, 1 changeover contact, 5 µAU	... 30124V	**4061590000**	20
Coil voltage 60 V, 1 changeover contact, 5 µAU	... 30160V	**4061600000**	20

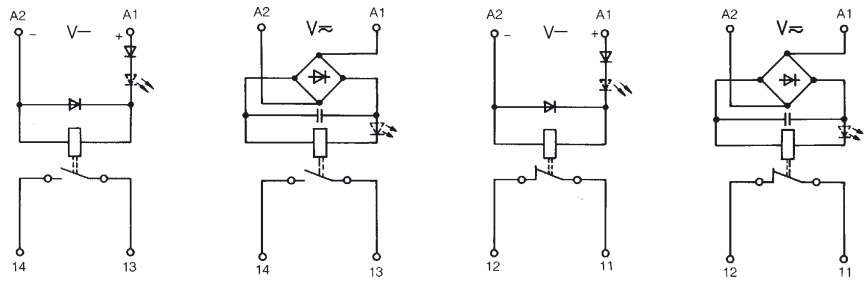
Technical data (of relay manufacturer)	
Contact number and type	1 changeover contact
Contact version	Single contact
Switching current	6 A
Switching voltage / max. Switching voltage	300 Vdc / 400 Vac
Braking capacity	1500 VA
Contact material	$AgSnO_2$
Recommended min. load	≥ 100 mA, 12 V
Typ. bounce time NO contact	1 ms
Typ. bounce time normally closed contact	5 ms

Miscellaneous data	
Flammability class UL	V-0
Ambient temperature	-40 ... +85 °C
Max. switching operations with rated load / without load	6/1200 switching operations per minute
Response / drop out time	5 / 2.5 ms
Bounce time NO contact / normally closed contact	1.5 / 5 ms
Protection class Housing	IP 67
For further data see also	www.matsushita.de

Relay Couplers on Sockets RS 30

1 NC, 1 NO
or 1 changeover contact

Schematic circuit diagram	1	2	3	4

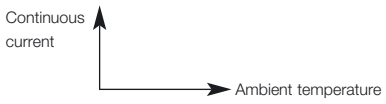


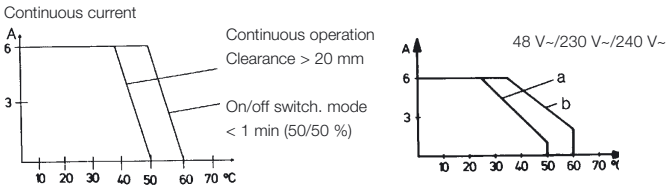
Rated data											
Input voltage 5…60 V ± 10%; 115 V/230 V + 5% – 15%	**5 VTTL**	**12 V–**	**24 V–**	**24 V0**	**48 V–**	**48 V0**	**60 V–**	**115 V~**	**115 V–**	**230 V~[2]**	**240 V~**
Rated consumption – (W)	0.45 W[1]	0.45 W	0.45 W	0.45 W	0.45 W	0.45 W	0.45 W	–	0.82 W	–	–
Rated consumption ~ (VA)	–	–	–	0.7 VA	–	0.6 VA	–	0.8 VA	–	0.8 VA	1.2 VA
Drop-out current of the relay (at 20 °C)	–	3 mA	3 mA	2.5 mA–	2 mA	2.5 mA–	1 mA–	–	2 mA–	–	0.5 mA–
Drop-out current of the relay (at 20 °C)	–	–	–	3.5 mA~	–	4.5 mA~	–	1 mA~	–	1 mA~	1 mA~
Pick-up current	–	–	12 mA	–	10 mA	–	–	6 mA	4.3 mA	–	–
Max. output voltage	250 V	250 V	250 V	250 V	250 V	250 V	250 V	250 V	250 V	250 V	250 V
Continuous current	5 A	6 A	6 A	6 A	6 A	5 A	5 A	5 A	5 A	3 A	3 A

Derating curve

a = mounted horizontally on rail without clearance

b = mounted horizontally on rail with clearance x 20 mm





Switch-on current	8 A
Switching capacity with resistive load	2000 VA/100 W
Min. switching capacity/switching current	250 mW/10 mA
Bounce times	≤ 3 ms
Switching times, typical	
–, pick-up lag	≤ 8 ms / ≤ 8 ms / ≤ 8 ms / ≤ 8 ms / ≤ 12 ms / ≤ 13 ms / ≤ 12 ms / ≤ 9 ms / ≤ 12 ms / ≤ 10 ms / ≤ 10 ms
–, turn off delay	≤ 7 ms / ≤ 7 ms / ≤ 7 ms / ≤ 16 ms / ≤ 11 ms / ≤ 12 ms / ≤ 11 ms / ≤ 8 ms / ≤ 11 ms / ≤ 9 ms / ≤ 9 ms
Max. switching frequency	70 Hz / 70 Hz / 70 Hz / 30 Hz / 70 Hz / 20 Hz / 70 Hz / 30 Hz / 70 Hz / 30 Hz / 30 Hz
Contact material	AgNi, gold-flashed
Service life, mechanical	$>10^7$ switching operations
–, 24 V–, 1 A, resistive load	$> 5 \times 10^5$ switching operations
–, 230 V~, 3 A, resistive load	$>7 \times 10^5$ switching operations
Storage temperature	–40 °C…+60 °C
Ambient temperature	
–, mounted on rail without clearance	–25 °C…+40 °C
–, mounted on rail with clearance ≥ 20 mm	–25 °C…+50 °C

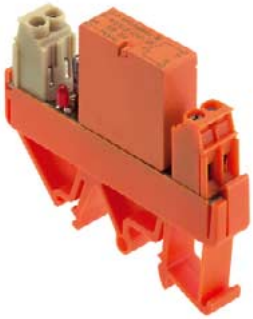
Insulation coordination acc. to EN 50178	
Overvoltage category	III
Pollution severity	2
Dimensions	
Mounting width	11.2 mm NO/NC, 25 mm changeover contacts
Length (perpendicular to mounting rail)	70 mm (74 mm BL/SL version)
Height TS 32/TS 35 x 7.5	56 mm/51.5 mm

[1]) Rated consumption with 24 VDC auxilary voltage.

[2]) 230 V– on request

Relay Couplers on Sockets RS 30

RS 30
Screw connection
1 NO
1 NC

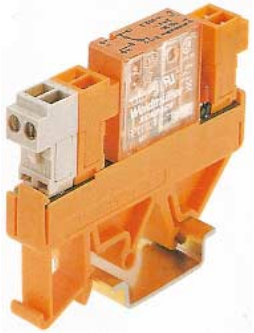


5

RS 30
Screw connection
1 changeover contact

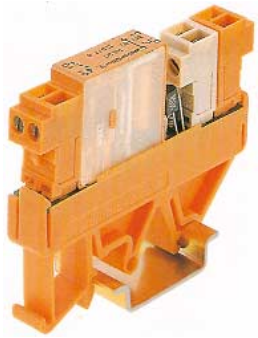
6

RS 30
Disconnect plug with
screw connection
1 changeover contact

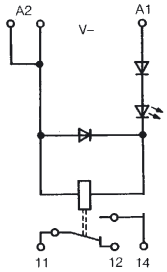


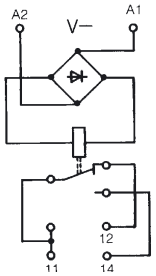
7

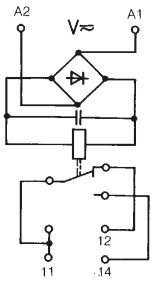
RS 30 TTL
Disconnect plug with
screw connection
1 NO and 1 NC

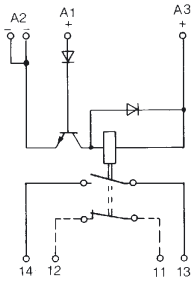


8









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								**1167760000**	**1167660000**
12 V–	None							**1129660000**		
	Red LED	**1129421001**		**1129521001**						
	None	**1101661001**		**1100961001**			**1100260000**			
24 V–	Green LED	**1101611001**		**1100911001**		**1181511001**	**1100210000**			
	Red LED	**1101621001**		**1100921001**		**1181521001**	**1100220000**			
	None		**1101761001**		**1101061001**			**1100360000**		
24 Vb	Green LED		**1101711001**		**1101011001**					
	Red LED		**1101721001**		**1101021001**					
	None	**1101861001**		**1101161001**			**1100460000**			
48 V–	Green LED	**1101811001**		**1101111001**			**1100410000**			
	Red LED	**1101821001**		**1101121001**			**1100420000**			
	None		**1101961001**		**1101261001**			**1100560000**		
48 Vb	Green LED		**1101911001**		**1101211001**					
	Red LED		**1101921001**		**1101221001**					
	None	**1102061001**					**1100660000**			
60 V–	Green LED	**1102011001**					**1100610000**			
	Red LED	**1102021001**					**1100620000**			
	None	**1155161001**		**1155261001**						
115 V–	Green LED	**1155111001**		**1155211001**						
	Red LED	**1155121001**		**1155221001**						
	None		**1102161001**		**1101461001**			**1100760000**		
115 V~	Green LED		**1102111001**		**1101411001**					
	Red LED		**1102121001**		**1101421001**					
	None		**1102261001**		**1101561001**			**1100860000**		
230 V~	Green LED		**1102211001**		**1101511001**					
	Red LED		**1102221001**		**1101521001**					
	None		**1128561001**		**1128661001**					
240 V~	Green LED		**1128511001**		**1128611001**					
	Red LED		**1128521001**		**1128621001**					

Relay Couplers on Sockets RS 30

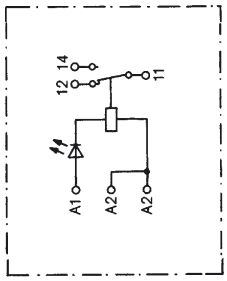
1 changeover contact

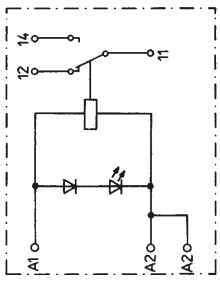
- Usable for high switching-power
- Suitable for switching inductive loads

RS 31

with power contacts

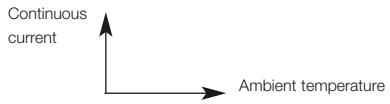
Schematic circuit diagram

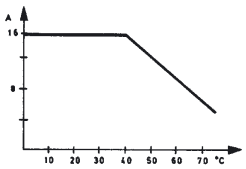




Ordering data	Type	Cat. No.	Type	Cat. No.	Type	Cat. No.	Type	Cat. No.
	RS 31, 24 V–	**1128361001**	RS 31, 48 V–	**1150761001**	RS 31, 115 V–	**1150361001**	RS 31, 115 V~	**1150461001**
	RS 31, 24 V–	**1128331001**						
	RS 31, 24 V–	**1128311001**						
Rated data								
Input voltage	**24 V–, ±10 %**		**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



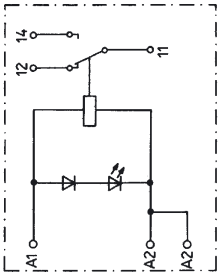


Switch-on current		**60 A/200 ms**		**60 A/200 ms**		**60 A/200 ms**		**60 A/200 ms**
Max. switching capacity with resistor load		3.5 kVA/480 W		3.5 kVA/480 W		3.5 kVA/480 W		3.5 kVA/480 W
Min. switching capacity/switching current		1 W/100 mA		1 W/100 mA		1 W/100 mA		1 W/100 mA
Bounce times		< 3 ms		< 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 10^7 switching operations		3 x 10^7 switching operations		3 x 10^7 switching operations		3 x 10^7 switching operations
– 230 V, 50 Hz, 3.5 kV A		2.5 x 10^5 switching operations		2.5 x 10^5 switching operations		2.5 x 10^5 switching operations		2.5 x 10^5 switching operations
Status indicator	Red LED	**1128361001**		**1150761001**		**1150361001**		**1150461001**
	Yellow LED	**1128331001**						
	Green LED	**1128311001**						
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
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 (perdendicular 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

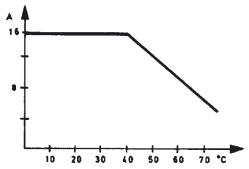
Relay Coupler on Locking Socket Profile RS 31

RS 31

with power contacts



Type	Cat. No.	
RS 31, 230 V~	**1128461001**	
RS 31, 230 V~	**1128431001**	
RS 31, 230 V~	**1128411001**	
230 V~, +5 % –15 %		
–		
1 VA		
–		
2.2 mA~		
250 V		
16 A		



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

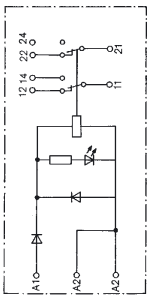
Relay Couplers on Sockets RS 32

with 2 changeover contacts

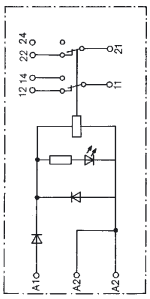
RS 32

RS 32

Schematic circuit diagram



9406021001

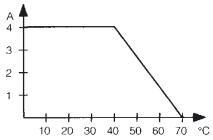


9406121001
9406321001
9406521001

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–, ±10 %**		**24 V–, ±10 %**		**24 V0, ±10 %**		**48 V–, ±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								

Continuous current

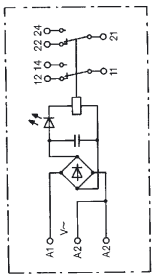
Ambient temperature



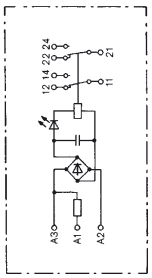
Switch-on current	2 x 6 A	2 x 6 A	2 x 6 A	2 x 6 A
Max. switching capacity with resistor load	1400 VA	1400 VA	1400 VA	1400 VA
Min. switching capacity/switching current				
Bounce times	≤ 4 ms	≤ 4 ms	≤ 4 ms	≤ 4 ms
Switching times, typical				
–, pick-up lag	≤ 13 ms	≤ 13 ms	≤ 13 ms	≤ 13 ms
–, turn off delay	≤ 10 ms	≤ 10 ms	≤ 10 ms	≤ 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	> 30x10^6 switching operations	> 30x10^6 switching operations	> 30x10^6 switching operations	> 30x10^6 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

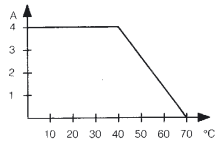


9406221001
9406421001
9406621001
9406721001



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$_0$, ±10 %		**60 V–, ±10 %**		**115 V$_0$, +5 % –15 %**		**230 V$_0$, +5 % –15 %**		**24 V/48 V$_0$, ±10 %**		**115 V/230 V$_0$, +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
> 30x10^6 switching operations	> 30x10^6 switching operations	> 30x10^6 switching operations	> 30x10^6 switching operations	> 30x10^6 switching operations	> 30x10^6 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)

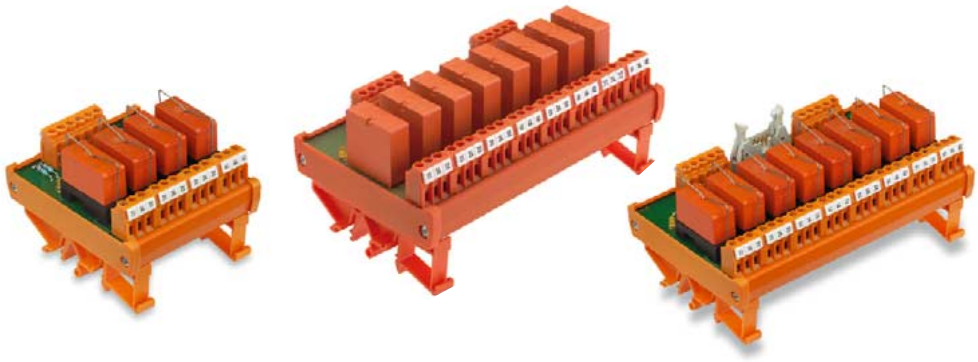
with one changeover contact each

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

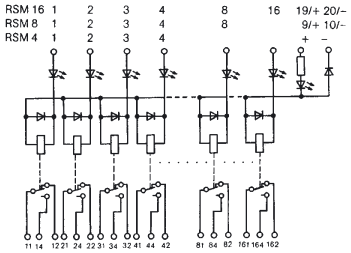


Also available as opto-coupler (max. 48 V),
See page 120/121

Fixing feet can also be mounted turned through 180°

Schematic circuit diagram

DC voltage, positive switching



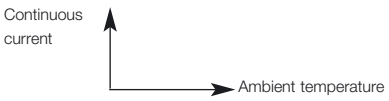
Rated data

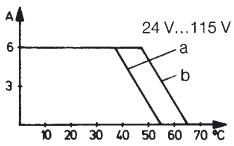
Input voltage		**24 V–**	**24 V0**	**48 V–**	**48 V0**	**115 V~**	**115 V0**	**230 V~**	**230 V0**
Rated consumption –(W)	soldered relay	0.45 W	0.45 W	0.45 W	0.45 W	–	–	–	–
	plug-in relay	0.55 W	–	0.55 W	–	–	–	–	–
Rated consumption ~(VA)	soldered relay	–	0.5 VA	–	0.6 VA	0.6 VA	0.6 VA	0.9 VA	0.9 VA
	plug-in relay	–	–	–	–	0.6 VA	0.6 VA	1.2 VA	1.2 VA
Pick-up current – (mA)	soldered relay	12 mA	–	10 mA	–	–	5 mA	–	3 mA
– (mA)	plug-in relay	23 mA	12 mA	14 mA	–	–	–	–	–
Pick-up current ~ (mA)	soldered relay	–	–	–	–	–	6 mA	–	3.5 mA
– (mA)	plug-in relay	–	16.5 mA	–	–	5 mA	–	4 mA	–
Drop-out current of the relay (at 20 °C)		2 mA		1.5 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		6 A	6 A	6 A	6 A	6 A	6 A	3 A	3 A

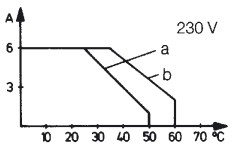
Derating-curve

a = mounted horizontally on rail without clearance

b = mounted horizontally on rail with clearance ≥ 20 mm







Switching times, typical								
–, pick-up lag (–/~)	≤ 8 ms	≤ 10 ms/10 ms	≤ 12 ms	≤ 10 ms/12 ms	≤ 10 ms	≤ 8 ms/10 ms	≤ 10 ms	≤ 8 ms/10 ms
–, turn off delay (–/~)	≤ 7 ms	≤ 15 ms/20 ms	≤ 11 ms	≤ 15 ms/20 ms	≤ 10 ms	≤ 5 ms/8 ms	≤ 10 ms	≤ 7 ms/8 ms
Bounce times	≤ 3 ms	≤ 3 ms	≤ 3 ms	≤ 3 ms	≤ 3 ms	≤ 3 ms	≤ 3 ms	≤ 3 ms
Switch-on current	8 A	8 A	8 A	8 A	8 A	8 A	8 A	8 A
Switching capacity with resistive load	2000 VA	2000 VA	2000 VA	2000 VA	2000 VA	2000 VA	2000 VA	2000 VA
Min. switching capacity/switching current	250 mW/10 mA							
Contact material	AgNi 90/10, AgNi0,15, gold-flashed							
Service life, mechanical	> $30x10^6$ switching operations							
–, 24 V–, 1 A, resistive load	>5 x 10^5 switching operations							
–, 230 V~, 3 A, resistive load	>7 x 10^5 switching operations							
Storage temperature	–40 °C…+60 °C							
Ambient temperature	–25 °C…+50 °C							

Insulation coordination acc. to EN 50178

Overvoltage category	III
Pollution severity	2

Dimensions

Conductor cross-section (screw connection)	0.5…2.5 mm^2

Spare relay (pluggable)

for 24 V-RSM types	**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
for 48 V-RSM types	48 V–	AgNi 90/10	**8630790000**	RT 314048 with yoke
	48 V–	AgNi 90/10	**4058740000**	RT 314048 without yoke
for 115 V, 230 V-RSM types	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

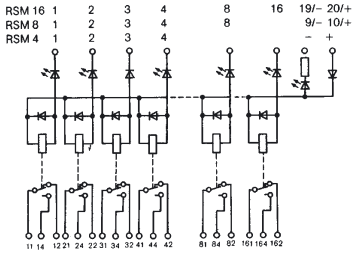
Multiple Socket Interface RSM

RSM 16 RS

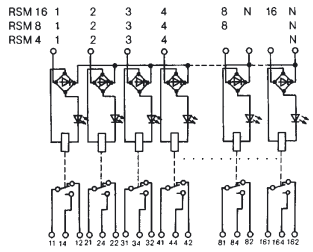
16 relays, plug-in

Red LEDs, further colours on request

DC voltage, negative switching



AC-DC/DC voltage



Ordering data

Connection technology Input/output	Input voltage	RSM 4 R/RS 4 relays	RSM 8 R/RS 8 relays	RSM 16 R/RS 16 relays	Positve switching[1])	Negative switching[2])	Relay pluggable	Relay pluggable	Relay soldered	Mounted width
Ribbon cable/	**24 VDC**		●		●		–		**1113161001**	145 mm
Screw connection			●			●			**1100061001**	145 mm
Male connector block with interlock				●	●				**1113261001**	285 mm
according to DIN 41651/Parts 1 and 2				●		●			**1100161001**	285 mm
	24 VDC	●			●		**1113361001**[3])	**8017581001**[4])	**1112361001**	75 mm
Screw connection		●				●	**1113461001**[3])		**1112761001**	75 mm
• Input: - Relay pluggable			●		●		**1113561001**[3]) •	**8003671001**[4]) •	**1107761001**	145 mm
Screw connection and			●			●	**1113661001**[3]) •		**1112661001**	145 mm
male conn. block acc. to				●	●		**1113761001**[3]) •	**8018221001**[4]) •	**1107861001**	285 mm
IEC 603-1/ DIN 41651				●		●	**1113861001**[3]) •		**1113061001**	285 mm
- Relay soldered	**24 V**0	●					**1173461001**			75 mm
male conn. block acc. to			●				**1173561001**			145 mm
IEC 603-1/ DIN 41651				●			**1173661001**			285 mm
• Output: Screw connection										
	48 VDC	●			●		**1113961001**		**1112461001**	75 mm
		●				●	**1114061001**			75 mm
			●		●		**1114161001** •			145 mm
			●			●	**1114261001** •			145 mm
				●	●		**1114361001** •			285 mm
				●		●	**1114461001** •			285 mm
	48 V0	●					**1173761001**			75 mm
	115 V0	●					**1114561001**			75 mm
			●				**1114661001**			145 mm
				●			**1114761001**			285 mm
	230 V~	●					**1114861001**			75 mm
			●				**1114961001**			145 mm
				●			**1115061001**			285 mm
	230 V0	●							**1123461001**	75 mm
			●						**1108061001**	145 mm
				●					**1108261001**	285 mm

Spare relays on request

[1]) Common negative potential, positive is switched

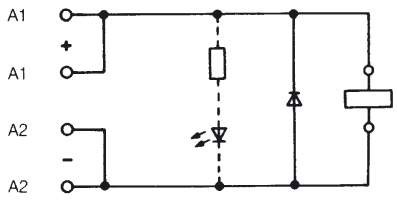
[2]) Common negative potential, negative is switched

[3]) Approval by the Germanischer Lloyd

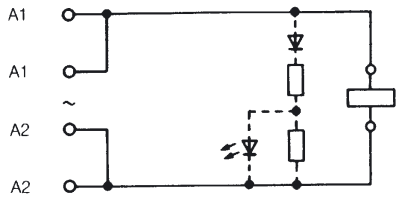
[4]) Empty modules without relays

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



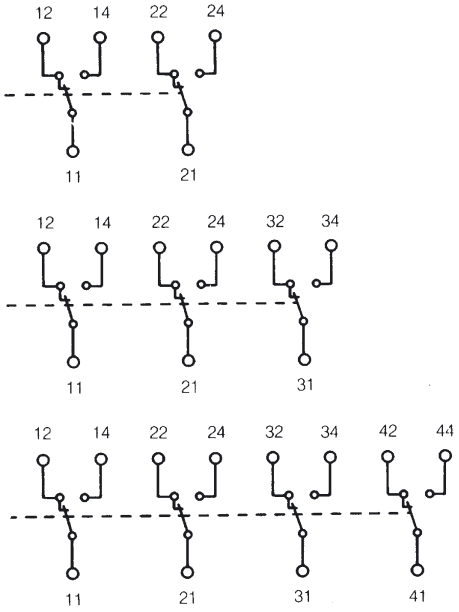
Ac voltage

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

	Group 1		**Group 2**		**Group 3**	
	International relays		European relays		Relays with socket oktal	
	• RS 3 2 changeover contacts		• RS 6 2 changeover contacts (Size 1)		• RS 21 2 changeover contacts	
	• RS 4, RS 14 4 changeover contacts		• RS 7, RS 17 3 changeover cont. (Size 2)		• RS 23 3 changeover contacts	
			• RS 8, RS 18 4 changeover cont. (Size 2)		• RS 24 2x3 changeover contacts	
			• RS 9 2 changeover cont. (Size 2)			
Manufacturer	Relay type		Relay type		Relay type	
EBERLE	•	–	•	–	•	–
	•	–	• Type 40701		• Type 41454	
			• Type 40701		• Type 41454	
			•	–		
ELESTA	•	–	•	–	• SKR 085	
	•	–	•	–	• SKR 115	
			•	–		
FEME	•	–	•	–	• RCP 8	
	•	–	•	–	• RCP 11	
			•	–	• RCP 11	
			•	–		
GRUNER	•	–	• Series 9065 G		• Series 668 B 2 changeover contacts	
	•	–	• Series 9059 G/9066 G		• Series 668 A 3 changeover contacts	
			• Series 9059 G/9066 G		• Series 668 A 3 changeover contacts	
			• Series 9059 G/9066 G			
HALLER	•	–	• Series H-561 Size 1		• HB-1/1	
	•	–	• Series H-561 Size 2		• HB-1/2	
			• Series H-561 Size 2		• HB-1/2	
			• Series H-561 Size 2			
ITT (MTI)	• MAT 2		• Type 24		•	–
	• MAT 4		• Type 25		•	–
			• Type 25		•	–
			• Type 25			
FUJITSU	• FRL 263-02		•	–	• FRL 256-02	
	• FRL 263-04		•	–	• FRL 256-04	
			•	–	• FRL 256-04	
			•	–		
KUHNKE	•	–	•	–	• Universal relays-M/-H/-U	
	• Type 111 A4		•	–	• Universal relays-M/-H/-U	
			•	–	• Universal relays-M/-H/-U	
			•	–		
KUKE	•	–	• Miniature relays Type 01		•	–
	•	–	• Miniature relays Type 02		•	–
			• Miniature relays Type 02		•	–
			• Miniature relays Type 02			
NATIONAL	• HC 2		•	–	•	–
	• HC 4		•	–	•	–
			•	–	•	–
			•	–		
OMRON	• MY 2		• MHS-2		• MK 2	
	• MY 4		• MHS-4		• MK 3	
			• MHS-4		• MK 3	
			• MHS-4			
POTTER & BRUMFIELD	•	–	•	–	• Series KAP	
	• Series KH		• Series R 10		• Series KAP	
			• Series R 10		• Series KAP	
			• Series R 10			
RAPA	•	–	• Series 012 Size 1		• Series C-Type CKR	
	•	–	• Series 012 Size 2		• Series C-Type CKR	
			• Series 012 Size 2		• Series C-Type CKR	
			• Series 012 Size 2			
Tyco/SCHRACK	• ZT 4		• Relays N, S, W Size 1		• Series RN/RC	
	• PT 4		• Relays N, S, W Size 2		• Series RN/RC	
			• Relays N, S, W Size 2		• Series RN/RC	
			• Relays N, S, W Size 2			
SDS	• HC 2		• K 2			
	• HC 4		• K 4			
			• K 4			
			• K 4			
TEC	•	–	• Type 1350		• Type 1210	
	• Type 1301		• Type 1360		• Type 1210	
			• Type 1360		• Type 1210	
			• Type 1360			
ZETTLER	•	–	• AZ E 20, AZ 420, AZ 420 W		• AZ 1010 – AZ 509 2 C	
	• TEC 1401		• AZ E 21, AZ 421, AZ 421 W		• AZ 1010 – AZ 509 3 C	
			• AZ E 21, AZ 421, AZ 421 W		• AZ 1010 – AZ 509 3 C	
			• AZ E 21, AZ 421, AZ 421 W			

Relay Sockets for Industry Relays

PT 4 industry relays

4-pole, with test button

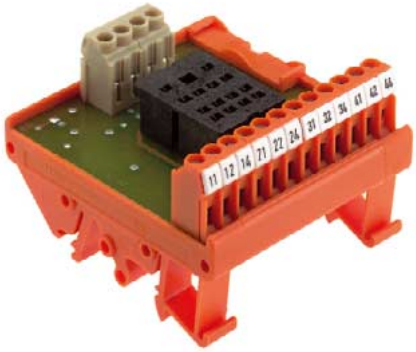
Rated data		
Contact data		
Contact number and type		4 changeover contacts
Contact version		Single contacts
Contact material		AgNi 90/10, AgNi 90/10 htv
Max. braking capacity AC		1500 VA
Rated voltage		250 V~
Continuous current		6 A / contact
Switch-on current		12 A / contact
Min. contact rating		24V, 10 mA / 20 m, 1 mA htv
Mechanical service life		DC coil > $30x10^6$
		AC coil > $20x10^6$
Response / drop out time		15/10 ms
Bounce time		5 ms
Test voltage		2.5 kV_{eff} 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
• Relay sockets Type RS 3, RS 4 and RS 14
• Alternatives to ZT 4 see table on page 99

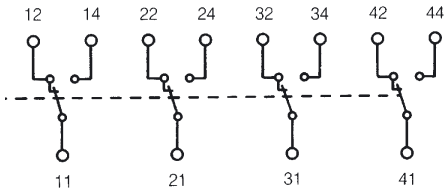
Ordering data	Type (ZT 4)	Best.-Nr
6 V–	PT 570006	**8074650000**
12 V–	PT 570012	**8054360000**
24 V–	PT 570024	**1180700000**
48 V–	PT 570048	**8074670000**
60 V–	PT 570060	**8074680000**
115 V–	PT 570110	**8074700000**
6 V~	PT 570506	**8074710000**
12 V~	PT 570512	**8074730000**
24 V~	PT 570524	**1181800000**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

Relay Sockets for Industry Relays

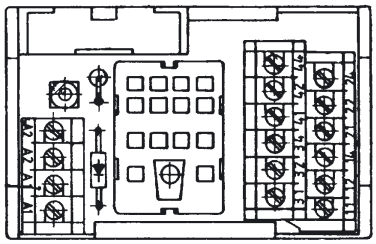


Relay sockets for DC and AC voltage relays

with fixing foot for TS 32/TS 35x7.5 and TS 35x15



0125661001



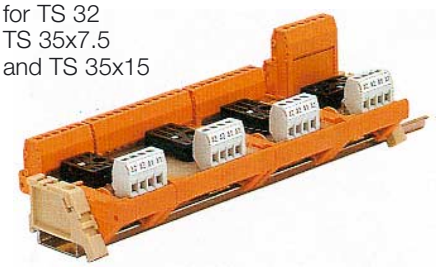
	RS 3	RS 4	RS 14
Relay type*	Schrack Type PT 5 4-pole	Schrack Type PT 5 4-pole	Schrack Type PT 5 4-pole
Contacts on module	2 changeover contacts	4 changeover contacts	4 changeover contacts
Ordering data Sockeltyp	**RS 3**	**RS 4**	**RS 14**
Relay socket for **AC relays** (without diode)	**0115161001**	**0116261001**	**0125561001**
With red LED (230 V~)			**1157561001**
Relay socket for **DC relays** with suppressor diode and reserve voltage protection (diode 1 N 4007)	**0115061001**	**0116161001**	**0125661001**
With red LED (24 V–)		**0116121001**	**1127661001**
With green LED (24 V–)	**0115011001**		**8025451001**
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^2	0.5…4 mm^2	0.5…4 mm^2
Screw connection, flexible	0.5…2.5 mm^2	0.5…2.5 mm^2	0.5…2.5 mm^2
Conductor cross-section	AWG 26…14	AWG 26…14	AWG 26…14
Rated data			
Coil voltage (types without LED)	250 V0	250 V0	250 V0
Contact voltage	250 V~	125 V~	125 V~
Contact current	5 A	5 A	5 A

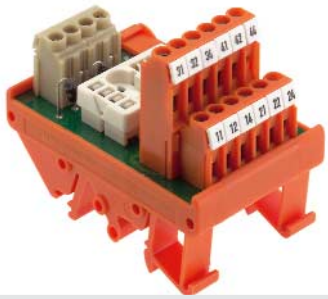
Accessories	Type	Cat. No.	Qty.	Type	Cat. No.	Qty.
Mounting rail (2 m lenghts)	TS 32	**0122800000**	–	TS 32	**0122800000**	–
	TS 35x7.5	**0383400000**	–	TS 35x7.5	**0383400000**	–
	TS 35x15	**0498000000**	–	TS 35x15	**0498000000**	–
End bracket (thickness mm)	EWK 2	**0199360000**	50	EWK 2	**0199360000**	50
	EW 35	**0383560000**	50	EW 35	**0383560000**	50
Insert tag (blanc)**	ESo 7	**0515200000**	–	ESo 7	**0515200000**	–
Protective strip, transparent**	SSt 7	**0515300000**	100	SSt 7	**0515300000**	100
Retainer clip for Schrack relays	ZG 28800	**0116000000**	25	ZG 28800	**0116000000**	25

* Relay not included in delivery

Relay Sockets for Industry Relays

Relay socket for DC and AC voltage relays
with locking foot
for TS 32
TS 35x7.5
and TS 35x15



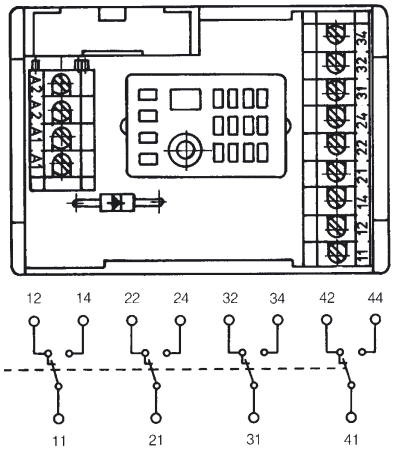


Assigning commercially available relays to the Weidmüller relay sockets RS 6...RS 24:

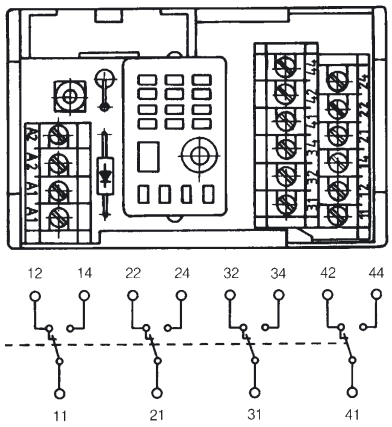
- **Relay socket RS 6**
  Siemens cradle relay, size I
  Zettler cradle-operated relay AZ 420
  RAPA range 012, size 1
- **Relay socket type RS 7, RS 8, RS 9, RS 17 and RS 18**
  Siemens cradle relay, size II
  Zettler cradle-operated relay AZ 421
  RAPA range 012, size II
- **Relay socket type RS 21, RS 23 and RS 24**
  Siemens/Schrack Universal
  Industry relay RS/RN/RC
  Siemens industry relay 10
  Kuhnke universal relay
  Zettler industrial relay AZ 1010
  RAPA range C

(No claim is made that this is a complete list of manufacturers of relays or types of relays.)

0115461001



0126061001



Relay type*	RS 6	RS 6	RS 8	RS 9	RS 17	RS 18
	Kamm-R.®	Kamm-R.®	Kamm-R.®	Kamm-R.®	Kamm-R.®	Kamm-R.®
	Gr. I	Gr. II	Gr. II	Gr. II	Gr. II	Gr. II
	2 changeov. c. (e. g. B 104)	3 changeov. c. (e. g. B 110)	4 changeov. c. (e. g. B 110)	2 changeov. c. (e. g. B 104)	3 changeov. c. (e. g. B 110)	4 changeov. c. (e. g. B 110)
	RS 6	**RS 7**	**RS 8**	**RS 9**	**RS 17**	**RS 18**
Ordering data Socket type						
Relay socket for **AC relays** (without diode)	**0115361001**					
Relay socket for **DC relays** with suppressor diode and reserve voltage protection (diode 1 N 4007)	**0115261001**	**0115461001**	**0116361001**	**0188961001**	**0125861001**	**0126061001**
With red LED (24 V–)						
With green LED (24 V–)						**0126011001**
Dimensions						
Relay socket width	35 mm	50 mm	65 mm	35 mm	35 mm	45 mm
Insulation stripping length	7 mm	7 mm	7 mm	7 mm	7 mm	7 mm
Connection data						
Screw connection, solid	0.5…4 mm²	0.5…4 mm²	0.5…4 mm²	0.5…4 mm²	0.5…4 mm²	0.5…4 mm²
Screw connection, flexible	0.5…2.5 mm²	0.5…2.5 mm²	0.5…2.5 mm²	0.5…2.5 mm²	0.5…2.5 mm²	0.5…2.5 mm²
Conductor cross-section	AWG 26…14	AWG 26…14	AWG 26…14	AWG 26…14	AWG 26…14	AWG 26…14
Rated data						
Coil voltage (types without LED)	250 V0	250 V0	250 V0	250 V0	50 V0	250 V0
Contact voltage	250 V~	250 V~	125 V~	250 V~	125 V~	125 V~
Contact current	5 A	5 A	5 A	5 A	5 A	5 A

Accessories	Type	Cat. No.	Qty.	Type	Cat. No.	Qty.
Mounting rail (2 m lenghts)	TS 32	**0122800000**	–	TS 32	**0122800000**	–
	TS 35x7.5	**0383400000**	–	TS 35x7.5	**0383400000**	–
	TS 35x15	**0498000000**	–	TS 35x15	**0498000000**	–
End bracket (thickness mm)	EWK 2	**0199360000**	50	EWK 2	**0199360000**	50
	EW 35	**0383560000**	50	EW 35	**0383560000**	50
Insert tag (blanc)**	ESo 7	**0515200000**	–	ESo 7	**0515200000**	–
Protective strip, transparent**	SSt 7	**0515300000**	100	SSt 7	**0515300000**	100
Retainer clip for Schrack relays						

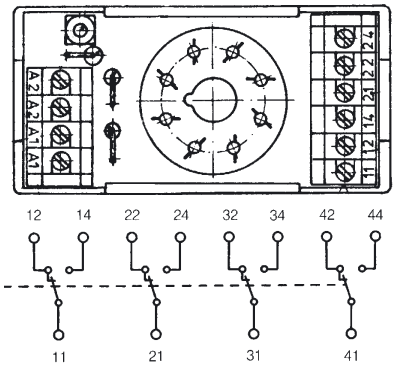
* Relay not included in delivery

** Not suitable for RS 12

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^2	0.5…4 mm^2	0.5…4 mm^2
0.5…2.5 mm^2	0.5…2.5 mm^2	0.5…2.5 mm^2
AWG 26…14	AWG 26…14	AWG 26…14
250 V⎓	250 V⎓	250 V⎓
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

Opto-coupler

Opto-coupler

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:

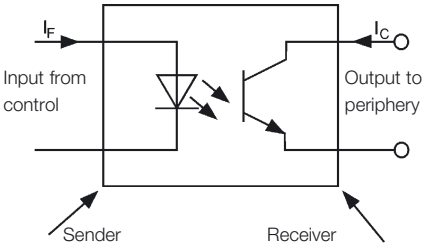
- low power uptake on control side
- high switching frequency
- no contact bounce
- wear-free switching
- insensitive to vibration
- use independent of location
- no mechanical parts
- long life
- high insulation voltage

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.



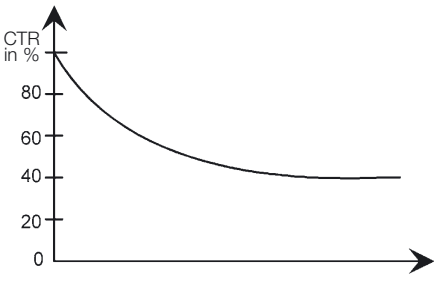
An important parameter of this type of modules is the CTR = current transfer rate.

The CTR is given in % and is the ratio between the input current IF and the maximum available output current IC.

Example: IF = 10 mA; CTR = 100%
=> IC = 10 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.



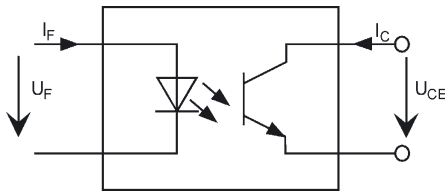
CTR as a function of operating life

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

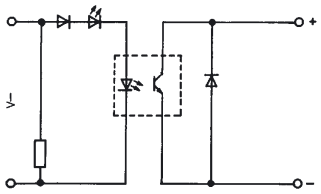
The most important precondition for achieving protective separation with opto-electronic coupling modules is the partial discharge test in accordance with DIN VDE 0884. Double or reinforced insulation for protective separation must be discharge proof. High voltage tests, as are usual with relays, cannot 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.

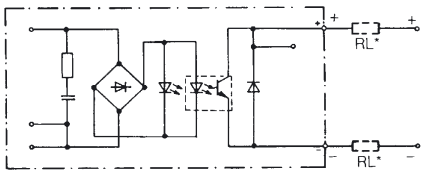
Control side of the opto-coupler interface

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 wich prevents the opto-coupler from being destroyed if the input polarity is reversed.

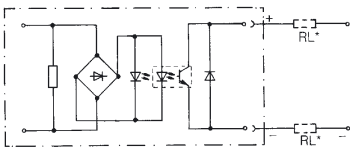


- as an **AC/DC input:**



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

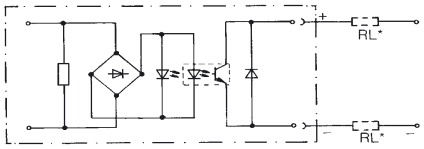
Weidmüller opto-coupler are designed and sized for a wide variety of applications. Demands regarding the load side of opto-couple modules could be:

- 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.

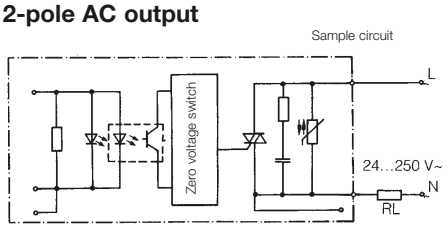
Opto-coupler

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

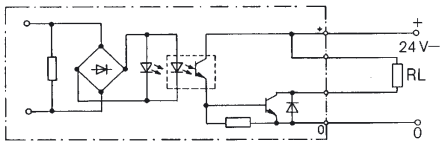


A special semiconductor element (TRIAC) in the output stage of the opto-coupler is used to switch AC voltages.

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 allways 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).

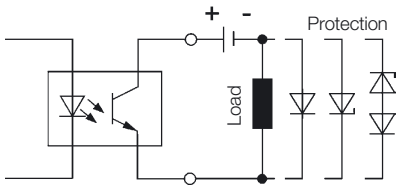
Standards

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

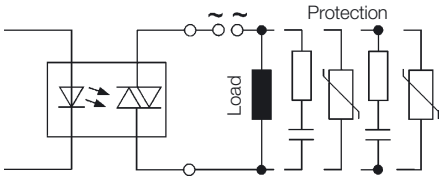
Protective circuit

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.

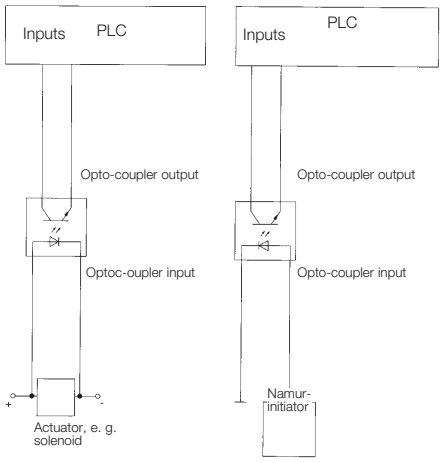


Protective circuit for DC output



Protective circuit for AC output

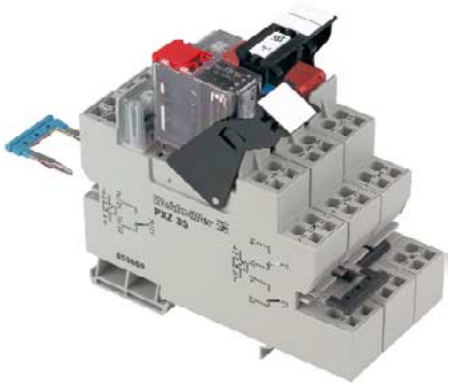
Application example



Monitoring an actuator

Position monitoring with namur intiator

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 mm² or
flexible conductors: 0.5…2.5 mm².

The component housing EG 7 has a special status. Is 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 mm²
Locking socket: 0.5…2.5 mm².

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
- BLFZ 5.08 optional tension clamp/plug and socket connector
- Marking option with WS tags
- Suitable for snap-fitting on TS 35

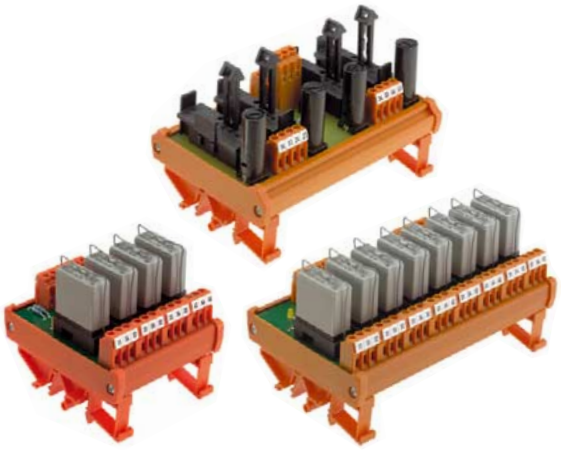
Connection systems
Available are BLZ screw-type connectors as well as the BLZF tension clamp system for up to 2.5 mm² flexible conductors for maximum wiring flexibility.
Printed-circuit board removal
This takes place by pushing in the locking hooks in way of the cover and with drawing of the terminal 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.

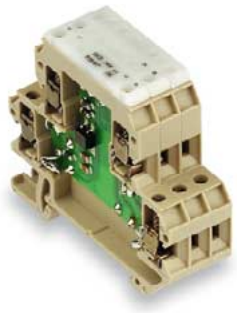
Modular system PLUGSERIES/PLUGopto
is a new generation of pluggable SSR. The core is an innovative relay socket **PXS** or **PXZ**.
Both products combine Weidmüller functionality and experience gained from the relay and terminal business.
The PLUGopto is the ideal connection technology between SSR and the application.

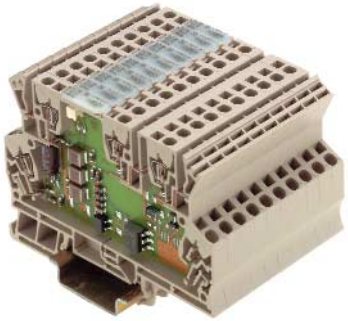
Modular principle

The new PLUGSERIES is particularly service friendly. Commercially available SSRs are simply plugged: holding / dismounting 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 mm2
- Robust holding / dismounting 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 mm²
flexible conductors: 0.5…2.5 mm².

Locking socket with multiple interfaces

Multiple interfaces RSM are optionally available assembled with 4, 8 or 16 pluggable opto-couplers. Versions are available with joint positive and negative potentials in order to reduce wiring on the input side.
PCB clamping yoke screw connecter elements have clamping yoke units for connecting conductors with the following cross-sections:
solid conductors: 0.5...4 mm²
flexible conductors: 0.5...2.5 mm²

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 mm². 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 slimest 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 mm².

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

Housing	5 - 48 V ≤ 20 mA	5 - 48 V ≤ 0.1 A	5 - 48 V ≤ 0.5 A	5 - 48 V ≤ 20 mA	5 - 48 V ≤ 2.5 A	5 - 48 V ≤ 5 A	24 - 250 V ≤ 3.5 A	5 - 48 V ≤ 0.1 A 4 x	5 - 48 V ≤ 0.1 A 8 x	5 - 48 V ≤ 0.1 A 16 x
EG	● **0558160000** Page 122	● **0609860000** Page 123				● **8220870000** Page 130				
WAVESERIES WOS						● **8275190000** Page 126		● **8237720000** Page 128		
EG 7					● **8269050000** Page 131	● **8281720000** Page 131				
		● **8092530000** ● **8234580000** Page 132								
RS 40	● **1160961001** ● **1161761001** ● **1177860000** Page 137	● **1117461001** ● **8065031001** ● **1119460000** Page 137								
RSM								● **1123861001** ● **1123761001** ● **1125161001** ● **8017581001** ● **1124900000** ● **1170200000** ● **1153200000** ● **1121300000** Page 139	● **1124261001** ● **1125261001** ● **8003671001** ● **1124900000** ● **1170200000** ● **1153200000** ● **1121300000** ● **8021391001** ● **1124900000** ● **1170200000** ● **1153200000** ● **1121300000** Page 139	● **1124661001** ● **8018220000** ● **1124900000** ● **1170200000** ● **1153200000** ● **1121300000** ● **8082471001** ● **1124900000** ● **1170200000** ● **1153200000** ● **1121300000** Page 139
DKO 32	● **8008090000** Page 116		● **8019580000** Page 117							
DKO 35	● **8008150000** Page 116 ● **8028300000** ● **8215640000** ● **8248790000** Page 117		● **8019590000** Page 117 ● **8215630000** Page 118		● **8215600000** ● **8181990000** Page 118					
DKO 35/32	● **8228640000** Page 119				● **8228630000** Page 118					
MCZ O	● **8365940000** Page 114	● **8398940000** Page 115			● **8287730000** Page 114					
	● **8324610000** (5 V TTL) Page 115									
PLUGSERIES POS/POZ						● **8610840000** ● **8610920000** ● **8610900000** ● **8610970000** ● **8610890000** ● **8610960000** ● **8615600000** ● **8615640000** ● **8615620000** ● **8615650000** Page 134	● **8610860000** ● **8610930000** ● **8610910000** ● **8610980000** ● **8615590000** ● **8615630000** Page 134			

Reliable separation

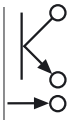
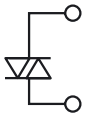
● 24 V dc
● 24 Vuc/ac
● Replacement opto-coupler dc and ac/dc
● Empty socket

Opto-coupler

Electronic switching

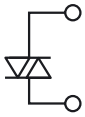
Output

48 V

Housing	 5 - 48 V ≤ 20 mA	 5 - 48 V ≤ 0.1 A	 5 - 48 V ≤ 0.5 A	 5 - 48 V ≤ 20 mA	 5 - 48 V ≤ 2.5 A	 5 - 48 V ≤ 5 A	 24 - 250 V ≤ 3.5 A	 4 x 5 - 48 V ≤ 0.1 A	 8 x 5 - 48 V ≤ 0.1 A	 16 x 5 - 48 V ≤ 0.1 A
EG 7		● **8092550000** Page 132								
		● **8234590000** Page 132								
RS 40		● **1161061001** Page 137								
		● **1161860000** Page 137								
DKO 35	● **8151230000** Page 120									

Output

115 V

Housing	 5 - 48 V ≤ 20 mA	 5 - 48 V ≤ 0.1 A	 5 - 48 V ≤ 0.5 A	 5 - 48 V ≤ 20 mA	 5 - 48 V ≤ 2.5 A	 5 - 48 V ≤ 5 A	 24 - 250 V ≤ 3.5 A	 4 x 5 - 48 V ≤ 0.1 A	 8 x 5 - 48 V ≤ 0.1 A	 16 x 5 - 48 V ≤ 0.1 A
EG		● **0131860000** Page 123								
WAVESERIES WOS			● **8235180000** Page 125			● **8296250000** Page 126	● **8259950000** Page 127	● **8275360000** Page 128		
EG 7		● **8092570000** ● **8234600000** ● **8397420000** ● **8315590000** Page 133								
RS 40		● **1161161001** ● **1161960000** Page 137								
DKO 32	● **8027980000** Page 119									
DKO 35	● **8077860000** Page 119 ● **8131660000** Page 120									
MCZ O		● **8421060000** Page 114								

Digital signal processing

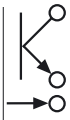
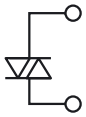
Reliable separation
● Vdc
● Vuc/ac

Opto-coupler

Electronic switching

Output

230 V 

Housing	5 - 48 V ≤ 20 mA	5 - 48 V ≤ 0.1 A	5 - 48 V ≤ 0.5 A	5 - 48 V ≤ 20 mA	5 - 48 V ≤ 2.5 A	5 - 48 V ≤ 5 A	24 - 250 V ≤ 3.5 A	5 - 48 V ≤ 0.1 A	5 - 48 V ≤ 0.1 A	5 - 48 V ≤ 0.1 A
								 4 x	 8 x	 16 x
EG		● **0546360000** Page 123								
WAVESERIES WOS			● **8275380000** Page 125			● **8275220000** Page 126	● **8275400000** Page 127	● **8275340000** Page 128		
EG 7		● **8092590000** ● **8234610000** ● **8387580000** ● **8394990000** Page 133								
RS 40		● **1161461001** ● **1162060000** ● **8182690000** Page 137								
DKO 32	● **8008100000** Page 119									
DKO 35	● **8008160000** Page 119									
MCZ O	● **8421380000** Page 114									

● 230 Vuc/ac

Opto-coupler

Electronic switching

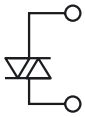
Output

12 V







4 x

8 x

16 x

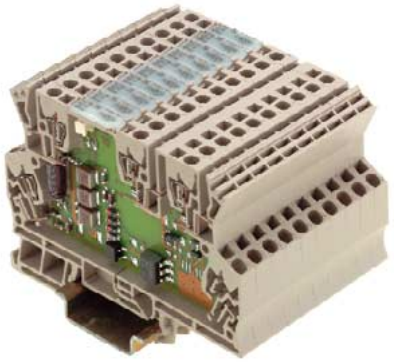
Housing	5 - 48 V ≤ 20 mA	5 - 48 V ≤ 0.1 A	5 - 48 V ≤ 0.5 A	5 - 48 V ≤ 20 mA	5 - 48 V ≤ 2.5 A	5 - 48 V ≤ 5 A	24 - 250 V ≤ 3.5 A	5 - 48 V ≤ 0.1 A	5 - 48 V ≤ 0.1 A	5 - 48 V ≤ 0.1 A
EGO	● **8011250000** Page 122	● **0114260000** Page 122								
WAVESERIES WOS			● **8275500000** Page 124							
EGO 7		●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

Reliable separation

● 12 Vdc
● 12 Vuc/ac
● Replacement opto-coupler dc and ac/dc
● Empty socket

Opto-coupler in component housing mini coupler MCZ

Opto-couplers MCZ O



MCZ O 24 Vac/dc 20 mA

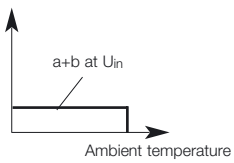
MCZ O 24 Vac/dc 2 A[2*]

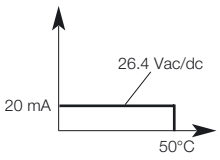
MCZ O 120 Vac/dc

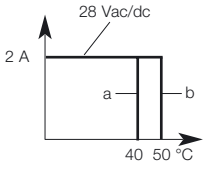
MCZ O 230 Vac

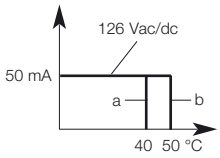
Derating curve
rated to ambient temperature

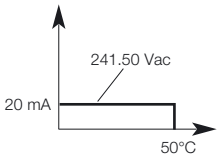
a = rowed without clearances on the mounting rail
b = rowed with clearances ≥ 20 mm







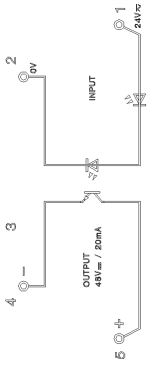


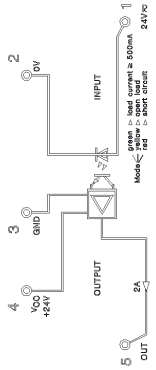


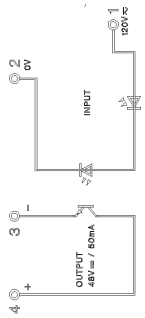
Schematic circuit diagram

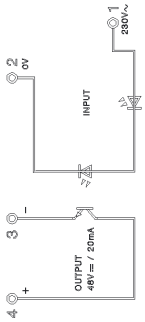
This module can be used:
- between controller and sensor, for feedback of different statuses.
- for direct switching of load currents up to a Adc, but also provides "online" information about the behaviour of the load current.

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









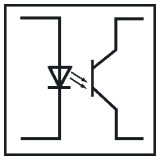
Ordering data	Type	Cat. No.	Type	Cat. No.	Type	Cat. No.	Type	Cat. No.
For TS 35	MCZ O 24 Vac/dc	**8365940000**	MCZ O 24 Vac/dc	**8287730000**	MCZ O 120 Vac/dc	**8421060000**	MCZ O 230 Vac	**8421380000**

Technical data				
Input				
Input voltage	24 Vac/dc ±10 % (21.6...26.4ac/dc)	24 Vac/dc ±20 % (19.2...28.8ac/dc)	120 Vac/dc -15 % +5 %	230 Vac -15 % +5 %
Making threshold	ac: 14.1 Vac / dc: 16.8 Vdc	approx.16 Vac/dc	approx.65 Vac/approx.70 Vdc	approx.170 Vac
Input current at U_{nom}	ac: 11.4 mA / dc: 9.6 mA	ac: 13 mA / dc: 12 mA	approx.3 mA	ac: 10 mA
Rated input consumption		ac: approx.220 mW		
		dc: ca.195 mW		
Max. input frequency	ac: 5 Hz duty factor 1:2	ac: ≤10 Hz duty factor 1:2	ac: 5 Hz duty factor 1:2	ac: 5 Hz duty factor 1:2
	dc: 10 Hz duty factor 1:2	dc: ≤ 30 Hz duty factor 1:2	dc: 20 Hz duty factor 1:2	
Capacity working resistance to reduction at dissipated energy	no	no	no	yes
Functionality	operating indication	operating indication	operating indication	operating indication
Output				
Supply voltage	5...48 Vdc	24 Vdc ±20 % (19.2...28.8 Vdc)	5...48 Vdc	5...48 Vdc
Max. output current	20 mA	2 A	50 mA	20 mA
Voltage drop at max. load current	≤ 1 V		< 1.6 V	< 1.6 V
Pulse duration, limiting overload current (not periodic)	< 150 mA / 10 ms		< 150 mA / 10 ms	< 150 mA / 10 ms
Reverse current (close-circuit current) at U_{out} = 48 V	max. 0.16 mA		max.0.16 mA	max.0.16 mA
Reverse polarity protection		present		
Free-wheel diode	present	external necessary	present	present
- typ. Switch-on delay (at ac phase position dependent)	ac: ≤ 10 ms / dc: ≤ 20 ms		≤ 30 ms	
- typ. Switch-off delay (at ac phase position dependent)	ac: ≤ 45 ms / dc: ≤ 40 ms		≤ 40 ms	
Short-circuit proof		yes		
Insulation coordin./Reliable separation acc. to EN 50 178				
Rated voltage	300 V	300 V	300 V	300 V
Rated impulse voltage	6 kV	6 kV	6 kV	6 kV
Overvoltage category	III	III	III	III
Pollution severity	2	2	2	2
Clearances and creepage distances	≥ 5.5 mm	≥ 5.5 mm	≥ 5.5 mm	≥ 3 mm
Insulation coordin.- and voltage proof, input/output mounting rail	4 kV_{eff} / 1 min	4 kV_{eff} / 1 min	4 kV_{eff} / 1 min	4 kV_{eff} / 1 min
Opto-coupler	acc. to VDE 0884	acc. to VDE 0884	acc. to VDE 0884	acc. to VDE 0884
Ambient temperature rowed on mounting rail without clearances	-25 °C…+50 °C	-25 °C…+40 °C	-25 °C…+40 °C	-25 °C…+50 °C
Ambient temperature rowed with clearances ≥ 20 mm		-25 °C…+50 °C	-25 °C…+50 °C	
Storage temperature	-40 °C...+85 °C	-40 °C…+60 °C	-40 °C…+60 °C	-40 °C...+85 °C
Conductor	AWG 22...12	AWG 22...12	AWG 22...12	AWG 22...12
Conductor cross-section	1.5 mm^2	1.5 mm^2	1.5 mm^2	1.5 mm^2
Approvals	CE, UL, CSA	CE, UL, CSA	CE, UL, CSA	CE, UL, CSA
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 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	Page 305		Page 305		Page 305		Page 305	

Opto-coupler in component housing mini coupler MCZ

Opto-couplers MCZ O



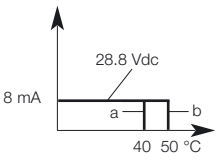
This module can be used:
1* - between controller and actuator, for the signal conversion of 24 Vdc to 5 VTTL
2* - between controller and actuator, for the signal conversion of 5 VTTL to 5...48 Vdc

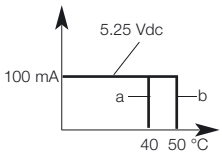
MCZ O 24 Vdc/5 VTTL[1*]

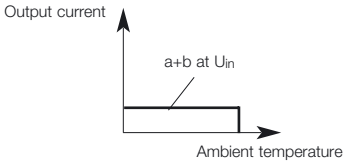
MCZ O 5 V TTL/5...48 Vdc[2*]

Derating curve
rated to ambient temperature

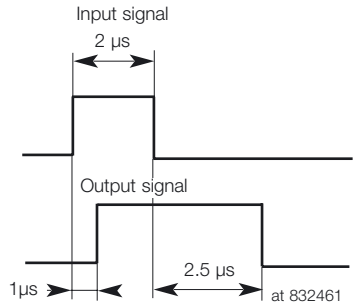
a = rowed on the mounting rail without clearances
b = rowed with clearances ≥ 20 mm

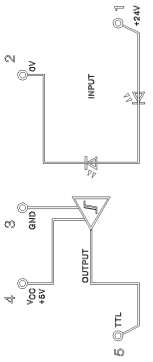


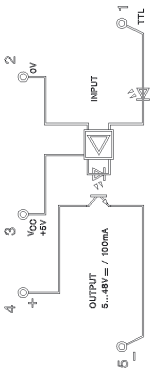




Schematic circuit diagram







Ordering data	Type	Cat. No.	Type	Cat. No.
For TS 35	MCZ O 24 Vdc	**8324610000**	MCZ O 24 Vdc	**8398940000**

Technical data		
Input		
Supply voltage		5 Vdc ± 5 %
Input voltage	24 Vdc ±16 % (20…28 Vdc)	5 V TTL
Making threshold	approx.17 Vdc	
Input current at U_{nom}	4.7 mA (2.9.2..6.5 mA)	I_{IL} = 1 µA / I_{IH} = 8 µA
Rated input consumption	dc: 112 mW	
Max. input frequency	100 kHz switching ratio 1:2	2.4 kHz
	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)	5...48 Vdc
Max. output current	8 mA, Fan Out = 20 LS-TTL	100 mA
Voltage drop at max. load current		≤ 1.8 V
Pulse duration, limiting overload current (not periodic)		
Reverse current (static current) at U_{out} = 48 V		
Reverse polarity protection		present (input)
Free-wheel diode		present
- typ. switch-on delay	1 µs (at 20 Vdc)	approx.27 µs
- typ. switch-off delay	2.5 µs (at 28 Vdc)	approx.210 µs

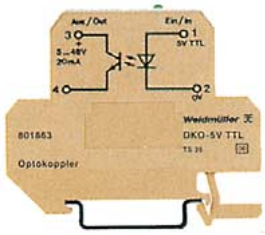
Insulation coordin./Reliable separation acc. to EN 50178		
Rated voltage	300 V	300 V
Rated impulse voltage	6 kV	6 kV
Overvoltage category	III	III
Pollution severity	2	2
Clearances and creepage distances	≥ 5.5 mm	≥ 5.5 mm
Insulation coordination/dielectric strength I/O to TS	4 kV_{eff} / 1 min	4 kV_{eff} / 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 ≥ 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^2	1.5 mm^2
Approvals	CE, UL, CSA	CE, UL, CSA
Overall width	6 mm	6 mm

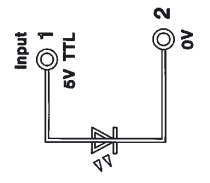
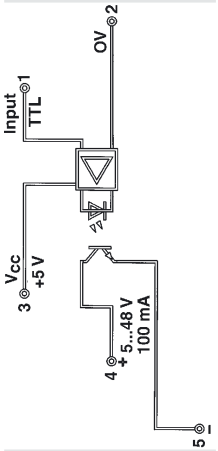
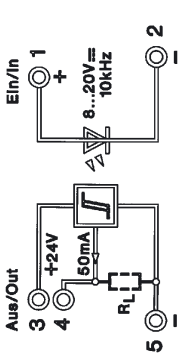
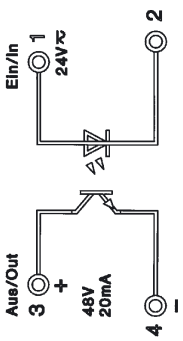
Accessories	Type	Cat. No.	Type	Cat. No.
End plate	AP MCZ 1.5	**8389030000**	AP MCZ 1.5	**8389030000**
Further accessories, dimensions and connection data	Page 305		Page 305	

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

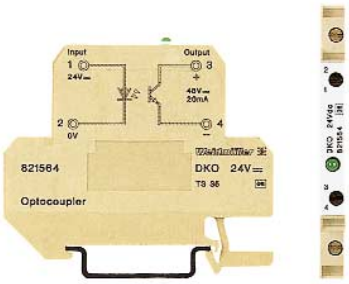


	DKO 5 Vdc	DKO 5 VTTL	DKO 12 Vdc	DKO 24 Vac/dc
Schematic circuit diagram				
Ordering data	Type / Cat. No.	Type / Cat. No.	Type / Cat. No.	Type / Cat. No.
For TS 32 Y	DKO 5 Vdc **8018620000**			DKO 24 Vac/dc **8008090000**
For TS 35 W	DKO 5 Vdc **8018630000**		DKO 12 Vdc **8184030000**	DKO 24 Vac/dc **8008150000**
With combination foot TS 32/TS 35		DKO DK5 5 VTTL **8228650000**		
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 mAdc
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
Operating temperature 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 mm²	0.5…4 mm²	0.5…4 mm²	0.5…4 mm²
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

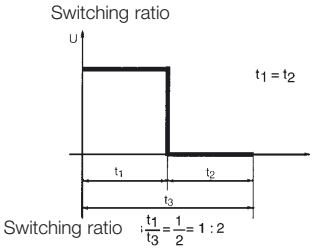
Opto-coupler in component housing mini coupler DK

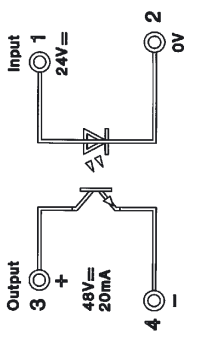
Opto-couplers DKO

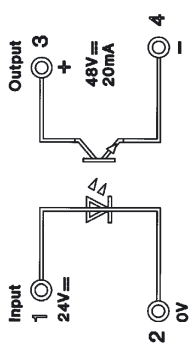
	DKO 24 Vdc	DKO 24 Vdc	DKO 24 Vdc	DKO 24 Vdc

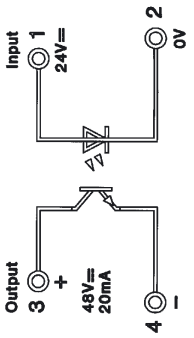


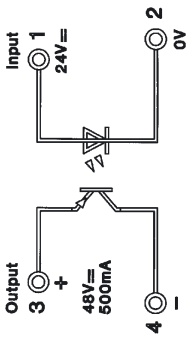
Schematic circuit diagram











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	**8028300000**	DKO 24 Vdc	**8215640000**	DKO 24 Vdc	**8248790000**	DKO 24 Vdc	**8019590000**

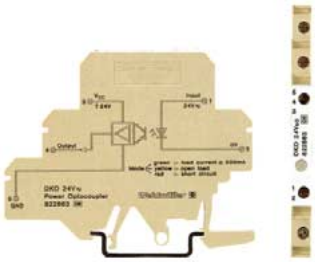
Technical data		Input: top	Input: bottom	Input: bottom	Input: bottom
Input voltage		24 Vdc ±10 %	24 Vdc ±10 %	24 Vdc ±10 %	24 Vdc ±10 %
Switch-on voltage		approx.19 V/7.5 mA	approx.19 V/7.5 mA	approx.19 V/7.5 mA	approx.17 V
Input current		≤15 mA	≤15 mA	≤8.5 mA	6 mA
Max. input power		360 mW	360 mW	204 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
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	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	-25 °C…+40 °C	-25 °C…+40 °C	-25 °C…+40 °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^2	0.5…4 mm^2	0.5…4 mm^2	0.5…4 mm^2
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	Page 305		Page 305		Page 305		Page 305	

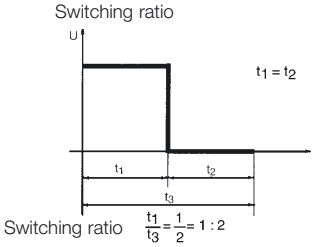
Opto-coupler in component housing mini coupler DK

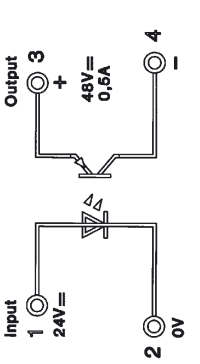
Opto-couplers DKO

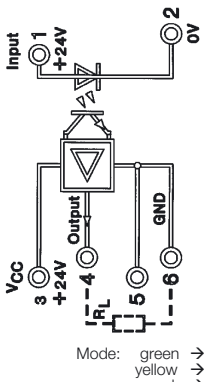
- Coupling of digital sensor-/actuator-signals between PLC and process
- Low cost solution for level- and potential-equalization
- Low input power
- Screw clamp connection technology
- 6 mm width

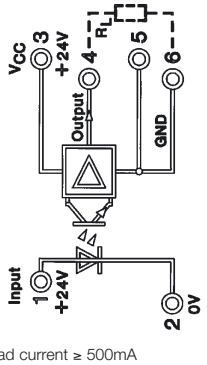


Schematic circuit diagram

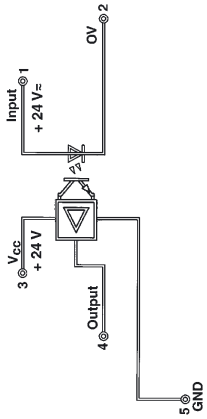








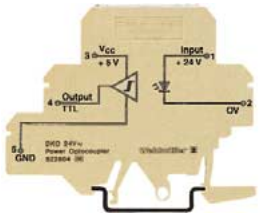
Mode: green → Load current ≥ 500mA
yellow → Idling
red → Short circuit



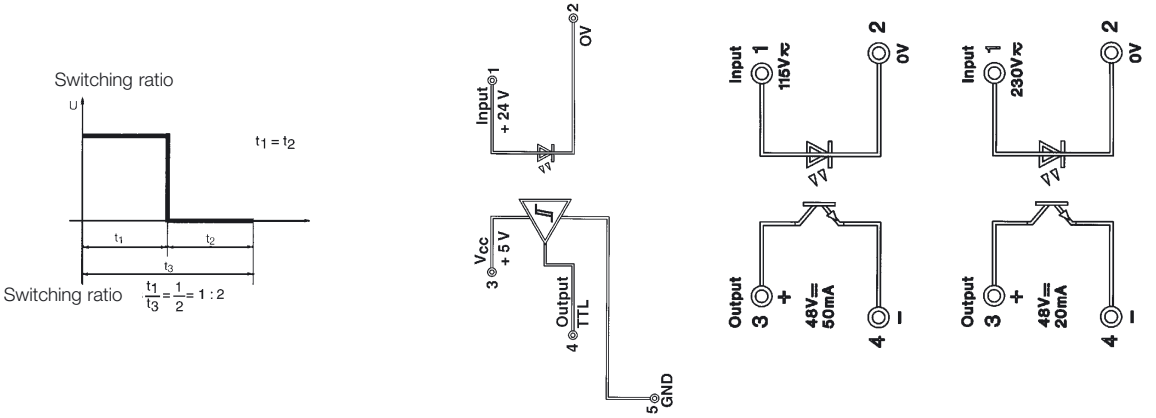
Ordering data		Type	Cat. No.	Type	Cat. No.	Type	Cat. No.	Type	Cat. No.
For TS 32	Y								
For TS 35	W	DKO 24 Vdc	**8215630000**	DKO 24 Vdc	**8181990000**	DKO 24 Vdc	**8215600000**		
With combination foot TS 32 / TS 35								DKO 24 Vac/dc	**8228630000**
Technical data		Input: top		Input: bottom		Input: top		Input: bottom	
Input voltage		24 Vdc ±10 %		24 Vdc ±10 %		24 Vdc ±10 %		24 Vac/dc ±20 %	
Switch-on voltage		approx.17 Vdc		approx.18 Vdc		approx.18 Vdc		approx.16 Vac/dc	
Input current		6 mA		12 mA		12 mA		13 mAac/12 mAdc	
Max. input power		145 mW		290 mW		290 mW		220 mVA/195 mW	
Output voltage		5…48 Vdc		24 Vdc ±10 %		24 Vdc ±10 %		24 Vdc ±20 %	
Max. output current		500 mA		2 A		2 A		2 A	
Min. output current		50 µA							
Max. switching frequency; switching ratio 1: 2		200 Hz		100 Hz		100 Hz		ac: 10 Hz dc: ≤30 Hz	
Switch-on delay		approx.40 µs						2 ms	
Switch-off delay		approx.65 µs						7 ms	
Voltage drop at max. load		≤800 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		≥4 mm		≥3 mm		≥3 mm		≥5.5 mm	
Operating temperature	without clearances	-25 °C…+40 °C		-25 °C…+40 °C		-25 °C…+40 °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 mm²		0.5…4 mm²		0.5…4 mm²		0.5…4 mm²	
Overall width		6 mm		12 mm		12 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



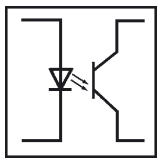
Schematic circuit diagram

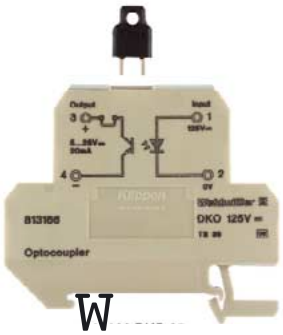


Ordering data		Type	Cat. No.	Type	Cat. No.	Type	Cat. No.
For TS 32	Y			DKO 115 Vac/dc	**8027980000**	DKO 230 Vac/dc	**8008100000**
For TS 35	W			DKO 115 Vac/dc	**8077860000**	DKO 230 Vac/dc	**8008160000**
With combination foot TS 32/TS 35		DKO 24 Vdc	**8228640000**				
Technical data		Input: top		Input: bottom		Input: bottom	
Input voltage		24 Vdc ±20 %		115 Vac/dc +5 % -15 %		230 Vac/dc +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 mAdc		1.8 mAac/1.7 mAdc	
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 µA	
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 µs		17.4 ms		20 ms	
Switch-off delay		2.5 µs		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		≥5.5 mm		≥5.5 mm		≥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…4mm^2		0.5…4 mm^2		0.5…4 mm^2	
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	

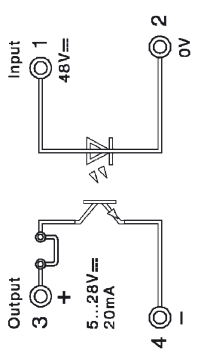
Opto-coupler in component housing mini coupler DK

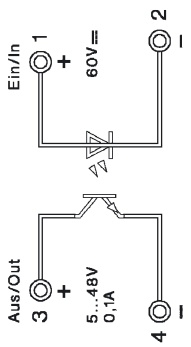
Opto-couplers DKO

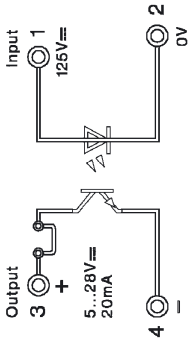


	DKO 35 48 Vdc	DKO 35 60 Vdc	DKO 35 125 Vdc
			

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_{eff} / 5.3 kVdc		3.75 kV_{eff} / 5.3 kVdc		3.75 kV_{eff} / 5.3 kVdc	
Dielectric strength to mounting rail		4 kV_{eff}		4 kV_{eff}		4 kV_{eff}	
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 mm^2		0.5…4 mm^2		0.5…4 mm^2	
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**

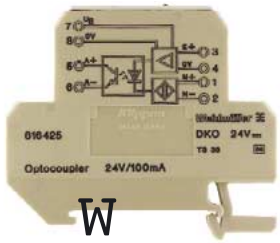
Opto-coupler in component housing mini coupler DK

Opto-couplers DKO S0 signal sensor

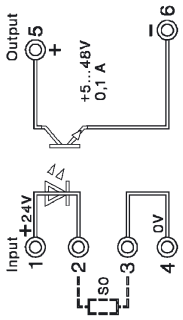
Application example:
Signals for consumers are normally transferred via an interface. Generally, this interface must conform with DIN 43867 (interface for signal transmission). There must be a differentiation between the passive interface and active S0 interface. The actual signals, that are correspondingly 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 mAdc
U_{max} = 27 Vdc
f_{max} = 16.66 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



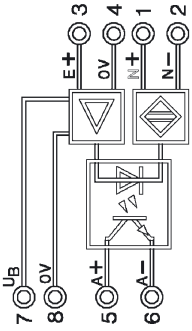
Schematic circuit diagram



Ordering data		Type	Cat. No.
For TS 32	Y	DKO DK4 S0	**8467030000**
For TS 35	W	DKO DK4 S0	**8100180000**
With combination foot TS 32 / TS 35			
Technical data			
Input			
Input voltage		24 Vdc ±10 %	
Input current		≤13 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_{eff}	
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		≥5.5 mm	
Operating temperature	without clearances	-25 °C…+40 °C	
	with clearances	-25 °C…+50 °C	
Storage temperature		-40 °C…+60 °C	
Conductor		AWG 22…12	
Conductor cross-section		0.5…4 mm^2	
Overall width		12 mm	
Accessories		Type	Cat. No.
End plate		AP DKT4	**0687560000**

DKO

Schematic circuit diagram



Ordering data		Type	Cat. No.
For TS 32	Y		
For TS 35	W	DKO	**8164250000**
With combination foot TS 32 / TS 35			
Technical data			
Input			
Input voltage		24 Vdc ±20 %	
Input current		≤35 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 µs	
Switch-off delay		approx.450 µs	
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.20µs	
Switch-off delay		approx.400 µs	
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_{eff}	
Operating temperature	without clearances	-25 °C…+40 °C	
	with clearances	-25 °C…+50 °C	
Storage temperature		-40 °C…+60 °C	
Conductor		AWG 22…12	
Conductor cross-section		0.5…4 mm^2	
Overall width		12 mm	
Accessories		Type	Cat. No.
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

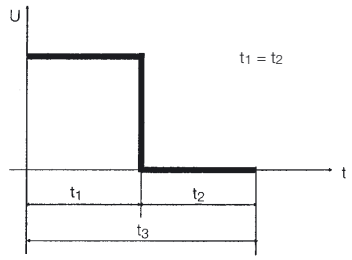
EGO 1 5 V

EGO 1 12 V

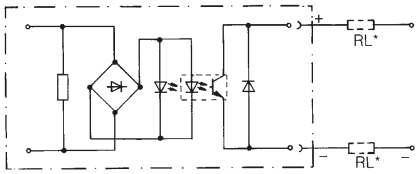
EGO 1 24 V

Schematic circuit diagram

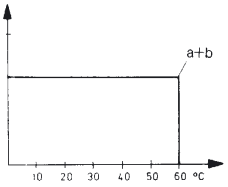
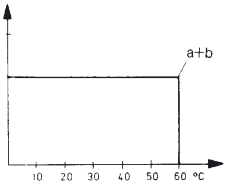
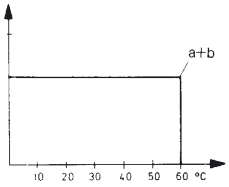
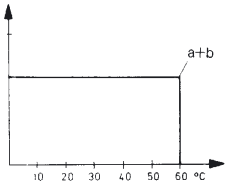
Switching ratio



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



* Wiring option

Ordering data	Type	Cat. No.	Type	Cat. No.	Type	Cat. No.	Type	Cat. No.
	EGO 1, 5 V	**0266160000**	EGO 1, 12 V	**8011250000** [3]	EGO 1, 12 V	**0114260000**	EGO 1, 24 V	**0558160000**
Rated data								
Input voltage	**3…5 V–** [2]		**3…12 V–**		**12 V0, ±10 %**		**24 V–, ±10 %**	
Rated consumption – (W)	9…45 mW		30…280 mW		0.35 W		0.6 W	
Rated consumption ~ (VA)	–		–		0.45 VA		–	
Output supply voltage	5…48 V– [1]		5…48 V– [1]		5…48 V– [1]		5…48 V– [1]	
Voltage drop at max. load current	<1 V		<1 V		<1.6 V		<1 V	
Output current	20 mA		20 mA		100 mA		20 mA	
Derating curve a = mounted on rail without clearance b = mounted on rail without clearance ≥ 20 mm Continuous current Ambient temperature								
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)	≤12 µs		22 µs		≤6 ms		≤ 30 µs	
Switching-off time (cyclic operation)	≤180 µs		44 µs		≤13 ms		≤100 µs	
Max. switching frequency, DC	100 Hz		**5000 Hz/5000 Hz**		20 Hz		**3000 Hz**	
Max. switching frequency, AC					<10 Hz			
Switching ratio	1 : 2		1 : 2/1 : 4		1 : 2		1 : 2	
Min. input impulse width			50 µs					
Storage temperature	–40 °C…+60 °C		–40 °C…+85 °C		–40 °C…+85 °C		–40 °C…+85 °C	
Ambient temperature								
–, rowed on mounting rail without clearances	–25 °C…+60 °C		–25 °C…+60 °C		–25 °C…+60 °C		–25 °C…+60 °C	
–, rowed with clearances ≥ 20 mm	–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	

[1]) Not TTL-compatible
[2]) Conditionally level-compatible
[3]) At Ue ≤ 5 V, the LED only lights weakly or not at all. Output switching function is not affected.

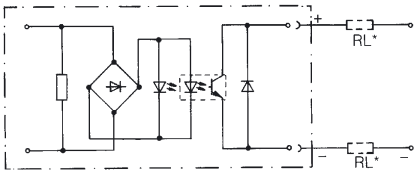
Opto-coupler in component housing EG

EGO 1 24 V

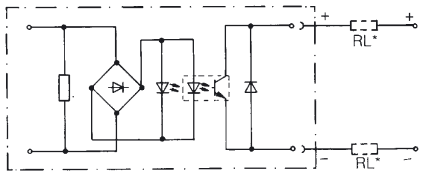
EGO 2 115 V0

for low voltage

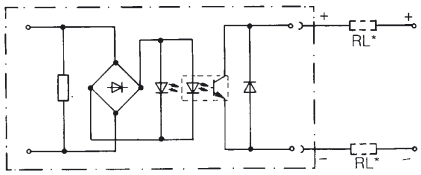
EGO 2 230 V0



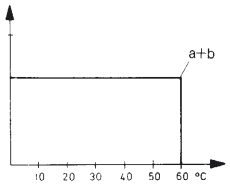
* Wiring option



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.

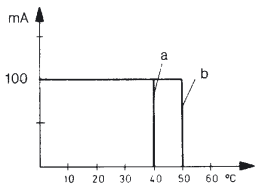


Type	Cat. No.
EGO 1, 24 V	**0609860000**
24 V0, ±10 %	
0.5 W	
0.6 VA	
5…48 V–[1])	
<1.6 V	
100 mA	



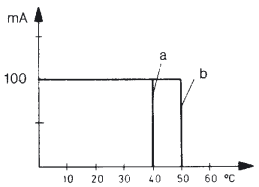
0.8 A/10 ms
0.16 mA
≤ 2 ms
≤ 15 ms
20 Hz
<10 Hz
1 : 2
–40 °C…+85 °C
–25 °C…+60 °C
–25 °C…+60 °C
III
2
Page 306, Fig. I

Type	Cat. No.
EGO 2, 115 V0	**0131860000**
117 V0, ±10 %	
0.8 W	
0.9 VA	
5…48 V–	
<1.6 V	
100 mA	



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

Type	Cat. No.
EGO 2, 230 V0	**0546360000**
230 V0, +5 %-15 %	
1.2 W	
1.4 VA	
5…48 V–	
<1.6 V	
100 mA	



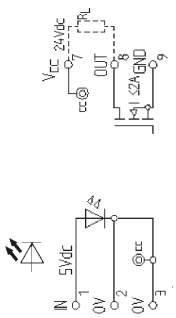
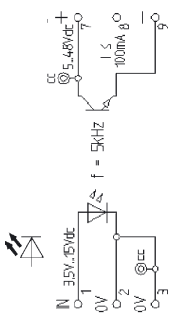
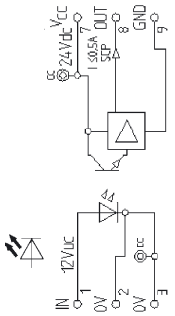
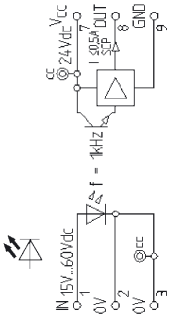
0.8 A/10 ms
0.16 mA
≤ 13 ms
≤ 10 ms
20 Hz
< 10 Hz
1 : 2
–40 °C…+85 °C
–25 °C…+40 °C
–25 °C…+50 °C
III
2
Page 306, Fig. I

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	WOS 1 3.5-15 VDC	WOS 1 12 VUC	WOS 1 15-60 VDC
	negative switching			
				
Schematic circuit diagram				
				

Ordering data	Type	Cat. No.	Type	Cat. No.	Type	Cat. No.	Type	Cat. No.
Screw connection	WOS 1 5 Vdc	**8275430000**	WOS 1 3.5-15 Vdc	**8275390000**	WOS 1 12 Vuc	**8275500000**	WOS 1 15-60 Vdc	**8237730000**
Tension clamp connection	WOZ 1	**8430030000**	WOZ 1	**8430040000**	WOZ 1	**8429990000**	WOZ 1	**8430090000**

Input				
Input voltage	4.0 Vdc...**5 Vdc**...6.0 Vdc	3.5 Vdc...15 Vdc	10 Vdc...**12 Vdc**...14 Vdc	15 Vdc...60 Vdc[1]
Input current	7.5 mA at 4.0 V	10.5 mA at 3.5.0 V	15.3 mA **ac** at 12 V	1.4 mA at 15 V
	13.5 mA at 5.0 V	12.5 mA at 5.0 V	12.4 mA **dc** at 12 V	2.5 mA at 24 V
	19.0 mA at 6.0 V	25.0 mA at 15 V		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 **ac** and 4 ms **dc**	90 us
Switch-off delay	1 ms	35 us	20 ms **ac** and 18 ms **dc**	250 us
Status indicator	LED green in input	LED green in input	LED green in output	LED green in output

Output	**negative switching**		**short-circuit protection**	**short-circuit protection**
Output current range			10 mA...0.6 A	10 m A...0.6 A
Nominal output current	max. 2 A*	max. 100 mA	max. 500 mA	max. 500 mA
Output voltage	18 Vdc...**24 Vdc**...30 Vdc	5 Vdc...48 Vdc	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	≤ 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...**24Vdc**...28Vdc	12 Vdc...**24 Vdc**...28 Vdc
Short-circuit in output	no	no	yes / max. 96 h	yes / max. 96 h

Temperature				
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

Mechanical data				
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
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	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

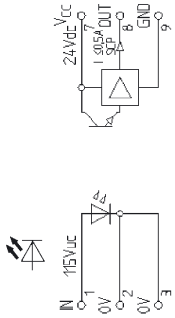
[1] **Caution:** Cross-connections may only be used for voltages ≤ **50 Vdc** (extra-low voltage).

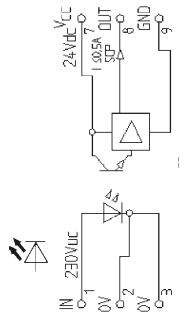
Opto-coupler in component housing WAVESERIES

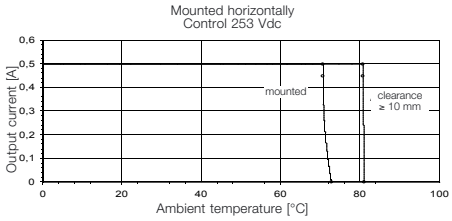
Opto-couplers WAVESERIES

	WOS 1 115 VUC	WOS 1 230 VUC

Schematic circuit diagram







WOS 1 230 VUC • 8275380000

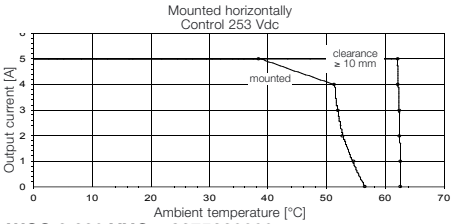
Ordering data	Type	Cat. No.	Type	Cat. No.
Screw connection	WOS 1 115 Vuc	**8235180000**	WOS 1 230 Vuc	**8275380000**
Tension clamp connection	WOZ 1	**8430100000**	WOZ 1	**8430050000**
Input				
Input voltage	115 Vuc, max. 130 Vuc		230 V, max. 250 Vuc	
Input current	3.1 mA **ac** at 115 V		11.5 mA **ac** at 230 V	
	2.9 mA **dc** at 115 V		1.8 mA **dc** at 230 V	
Making threshold	ca.75 V **ac** and 71 **dc**		ca.170 V **ac** and 140 V **dc**	
Breaking threshold	ca.70 Vuc		ca.130 V **ac** and 135 V **dc**	
Input frequency	-		-	
Switch-on delay	10 ms **ac** 10 ms **dc**		25 ms **ac** 15 ms **dc**	
Switch-off delay	15 ms **ac** 15 ms **dc**		25 ms **ac** 20 ms **dc**	
Status indicator	LED green in output		LED green in output	
Output	**short-circuit protection**		**short-circuit protection**	
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

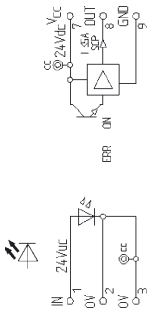
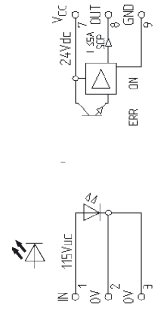
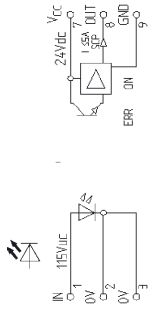
Opto-coupler in component housing WAVESERIES

Opto-couplers WAVESERIES

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



WOS 2 230 VUC • 8275220000

	WOS 2 24 VUC	WOS 2 115 VUC	WOS 2 230 VUC
			
Schematic circuit diagram			
Ordering data	Type / Cat. No.	Type / Cat. No.	Type / Cat. No.
Screw connection	WOS 2 24 Vuc **8275190000**	WOS 2 115 Vuc **8296250000**	WOS 2 230 Vuc **8275220000**
Tension clamp connection	WOZ 2 **8430080000**	WOZ 2 **8429980000**	WOZ 2 **8430060000**
Input			
Input voltage	21.6 V...**24 V**...26.4 V	115 V, max. 130 Vuc	230 V, max. 250 Vuc
Input current	16.3 mA **ac** at 24 V 13.5 mA **dc** at 24 V	3.1 mA **ac** at 115 V 2.8 mA **dc** at 115 V	12.0 mA **ac** at 230 V 1.8 mA **dc** at 230 V
Making threshold	ca.16 V	ca.70 V	ca.140 V ca.100 V
Breaking threshold	ca.11 V	ca.55 V	ca.100 V ca.120 V
Switch-on delay	8 ms **ac** 7 ms **dc**	10 ms **ac** 15 ms **dc**	10 ms **ac** 15 ms **dc**
Switch-off delay	25 ms **ac** 25 ms **dc**	30 ms **ac** 30 ms **dc**	30 ms **ac** 30 ms **dc**
Status indicator normal operation	LED green in output	LED green in output	LED green in output
Status indicator short-circuit, underload, overload	LED red in output*¹⁾	LED red in output*¹⁾	LED red in output*¹⁾
Underload	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	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	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	**short-circuit protection**	**short-circuit protection**	**short-circuit protection**
Output current	5 Adc*	5 Adc*	5 Adc*
Closed supply-circuit current (output not switched)	approx.15 mA at 28.8 V	approx.15 mA at 28.8 V	approx.15 mA at 28.8 V
Voltage supply	19.2 Vdc...**24 Vdc**...28.8 Vdc	19.2 Vdc...**24 Vdc**...28.8 Vdc	19.2 Vdc...**24 Vdc**...28.8 Vdc
Residual voltage	max. 400 mV	max. 400 mV	max. 400 mV
Protection circuit	Polarity protection, varistor	Polarity protection, varistor	Polarity protection, varistor
Short-circuit in output	yes / max. 96 h	yes / max. 96 h	yes / max. 96 h
Temperature			
Operating temperature**	-25 °C...+50 °C rowed	-25 °C...+50 °C rowed	-25 °C...+50 °C rowed
Storage temperature	-40 °C...+85 °C	-40 °C...+85 °C	-40 °C...+85 °C
Mechanical data			
Overall width	22.5 mm	22.5 mm	22.5 mm
Housing material	Polyamide PA 66	Polyamide PA 66	Polyamide PA 66
Approvals	UL/CSA	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	300 V
Rated impulse voltage	4 kV	4 kV	4 kV
Overvoltage category	III	III	III
Pollution severity	2	2	2
Clearance/creepage path	≥ 5.5 mm	≥ 5.5 mm	≥ 5.5 mm
Accessories, dimensions and connection data see	Page 298 + 308	Page 298 + 308	Page 298 + 308

* at ambient temperature 20 °C/horizontal installation

*¹⁾ **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 recognised, both LEDs are lit.
The output is switched through

Opto-coupler in component housing WAVESERIES

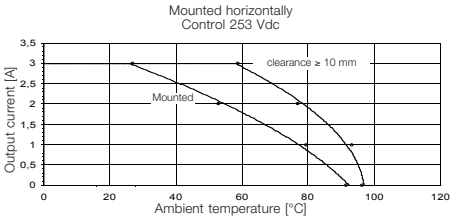
Opto-coupler WAVESERIES

with AC voltage output and
zero voltage switch

WOS 2 15-60 VUC

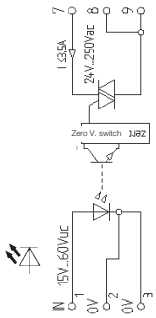
WOS 2 115 VUC

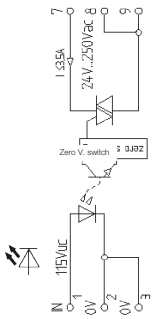
WOS 2 230 VUC

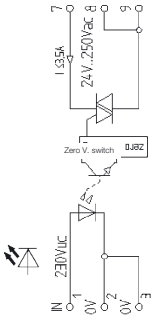


WOS 2 15-60 VUC • 8275440000

Schematic circuit diagram







Ordering data	Type	Cat. No.	Type	Cat. No.	Type	Cat. No.
Screw connection	WOS 2 15-60 Vuc	**8275440000**	WOS 2 115 Vuc	**8259950000**	WOS 2 230 VUC	**8275400000**
Tension clamp connection	WOZ 2	**8430010000**	WOZ 2	**8430160000**	WOZ 2	**8430150000**

Input			
Input voltage	15 Vuc...60 Vac/66 Vdc	115 Vuc max. 130 Vuc	230 Vuc max. 250 Vuc
Input current	3.3 mA **ac** at 15 V	7.2 mA **ac** at 115 V	11.8 mA **ac** at 230 V
	3.8 mA **dc** at 15 V	3.8 mA **dc** at 115 V	3.3 mA **dc** at 230 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		
Making threshold	approx.11 V **dc** approx.15 V **ac**	approx.90 V **dc** approx.90 V **ac**	approx.180 V **dc** approx.200 V **ac**
Breaking threshold	approx.5 V **dc** approx.14 V **ac**	approx.70 V **dc** approx.70 V **ac**	approx.150 V **dc** approx.140 V **ac**
Switch-on delay	max. 20 ms	max. 20 ms	max. 25 ms
Switch-off delay	max. 20 ms	max. 20 ms	max. 25 ms
Status indicator normal operation	LED green in input	LED green in input	LED green in input

Output	**AC voltage output**	**AC voltage output**	**AC voltage output**
Output current	max. 230 V/3.5 A ac*	max. 230 V/3.5 A ac*	max. 230V/3.5A ac*
Closed supply-circuit current (output not switched)	2 mA	2 mA	2 mA
Voltage supply	24 Vac...250Vac (50Hz-60Hz)	24Vac...250 Vac (50Hz-60Hz)	24 Vac..250 Vac (50Hz-60Hz)
Residual voltage	max. 1.6 V	max. 1.6 V	max. 1.6 V
Protection circuit	RC-combination with varistor	RC-combination with varistor	RC-combination with varistor
Short-circuit in output	–	–	–
Temperature			
Operating temperature**	-25 °C...+50 °C rowed	-25 °C...+50 °C rowed	-25 °C...+50 °C rowed
Storage temperature	-40 °C...+85 °C	-40 °C...+85 °C	-40 °C...+85 °C
Mechanical data			
Overall width	22.5 mm	22.5 mm	22.5 mm
Housing material	Polyamide PA 66	Polyamide PA 66	Polyamide PA 66
Approvals	UL/CSA	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	300 V
Rated impulse voltage	4 kV	4 kV	4 kV
Overvoltage category	III	III	III
Pollution severity	2	2	2
Clearance/creepage path	≥ 5.5 mm	≥ 5.5 mm	≥ 5.5 mm
Accessories, dimensions and connection data see	Page 298 + 308	Page 298 + 308	Page 298 + 308

* at ambient temperature 20 °C/horizontal installation

Opto-coupler in component housing WAVESERIES

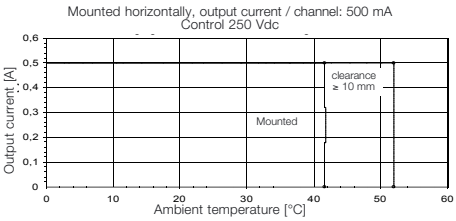
Opto-coupler WAVESERIES

(4-channel, short-circuit proof)

WOS 2 24 VUC

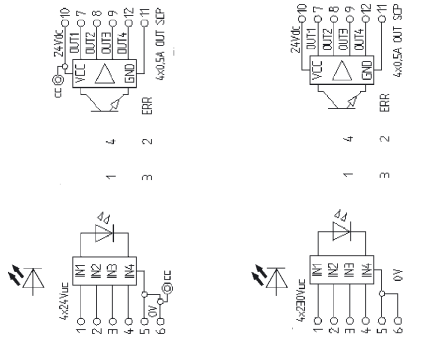
WOS 2 115 VUC

WOS 2 230 VUC



WOS 2 230 VUC • 8275340000

Schematic circuit diagram



Ordering data	Type	Cat. No.	Type	Cat. No.	Type	Cat. No.
Screw connection	WOS 2 24 Vuc	**8237720000**	WOS 2 115 Vuc	**8275360000**	WOS 2 230 Vuc	**8275340000**
Tension clamp connection	WOZ 2	**8430110000**	WOZ 2	**8430130000**	WOZ 2	**8430140000**

Input						
Input voltage	18 Vuc ... 30 Vuc		115 Vuc, max. 130 Vuc		230 V, max. 250 V	
Input current	2.8 mA **ac** at 24 V		1.4 mA **ac** at 115 V		1.4 mA **ac** at 230 V	
	3.7 mA **dc** at 24 V		2.0 mA **dc** at 115 V		2.0 mA **dc** at 230 V	
Making threshold	ca.13 V **dc**	ca.14 V **ac**	ca.60 V **dc**	ca.60 V **ac**	ca.150 V **dc**	ca.120 V **ac**
Breaking threshold	ca.10 V **dc**	ca.13 V **ac**	ca.50 V **dc**	ca.50 V **ac**	ca.110 V **dc**	ca.110 V **ac**
Switch-on delay	20 ms **ac** 7.0 ms **dc**		40 ms **ac** 15 ms **dc**		40 ms **ac** 14 ms **dc**	
Switch-off delay	46 ms **ac** 50 ms **dc**		60 ms **ac** 70 ms **dc**		95 ms **ac** 140 ms **dc**	
Status indicator normal operation	LED green in output		LED green in output		LED green in output	
Status indicator short-circuit, underload, overload	LED red in output*		LED red in output*		LED red in output*	
					* LED red, one LED for all channels	

Output[1]	**short-circuit protection**	**short-circuit protection**	**short-circuit protection**
Output current	max. 500 mA per channel	max. 500 mA per channel	max. 500 mA per channel
Output total current	max. 2 A	max. 2 A	max. 2 A
Voltage supply	12 Vdc...**24 Vdc**...28 Vdc	12 Vdc...**24 Vdc**...28 Vdc	12 Vdc...**24 Vdc**...28 Vdc
Response threshold	typ. 0.9 A	typ. 0.9 A	typ. 0.9 A
	min. 0.65 A, max. 1.2 A, R_L2Ω	min. 0.65 A, max. 1.2 A, R_L2Ω	min. 0.65 A, max. 1.2 A, R_L2Ω
Residual voltage	≤ 0.65 V, at 500 mA	≤ 0.65 V, at 500 mA	≤ 0.65 V, at 500 mA
Protection circuit	Polarity protection, varistor	Polarity protection, varistor	Polarity protection, varistor
Synchronisation factor	100 %	100 %	100 %
Lamp load	max. 3 W	max. 3 W	max. 3 W
Temperature			
Operating temperature	-25 °C...+50 °C rowed	-25 °C...+50 °C rowed	-25 °C...+50 °C rowed
Storage temperature	-40 °C...+85 °C	-40 °C...+85 °C	-40 °C...+85 °C
Mechanical data			
Overall width	22.5 mm	22.5 mm	22.5 mm
Housing material	Polyamide PA 66	Polyamide PA 66	Polyamide PA 66
Approvals	UL/CSA	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	150 V	150 V	300 V
Rated impulse voltage	2.5 kV	2.5 kV	4 kV
Overvoltage category	III	III	III
Pollution severity	2	2	2
Clearance/creepage path	≥ 3 mm	≥ 3 mm	≥ 5.5 mm
Accessories, dimensions and connection data see	Page 298 + 308	Page 298 + 308	Page 298 + 308

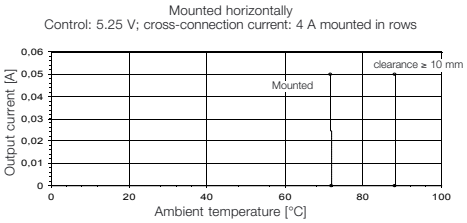
[1] Protection circuit for output load necessary, page 107

Opto-coupler in component housing WAVESERIES

Opto-coupler WAVESERIES
with high switching frequency

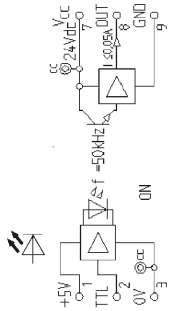
WOS 1 5 VTTL 50 kHz

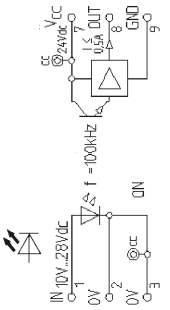
WOS 1 12-28 VDC 100 kHz



WOS 1 5 VTTL 50 kHz • 8275210000

Schematic circuit diagram





Ordering data	Type	Cat. No.	Type	Cat. No.
Screw connection	WOS 1 5 VTTL 50 kHz		WOS 1 12-28 Vdc/100 kHz	
		8275210000		**8275450000**
Tension clamp connection	WOZ 2	**8430070000**	WOZ 2	**8430000000**

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	**50 kHz** at R_{load} = 470 Ω	**100 kHz** at R_{load} = 470 Ω
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...**24 Vdc**...26.4 Vdc	21.6 Vdc...**24 Vdc**...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
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

Opto-coupler in component housing EG5

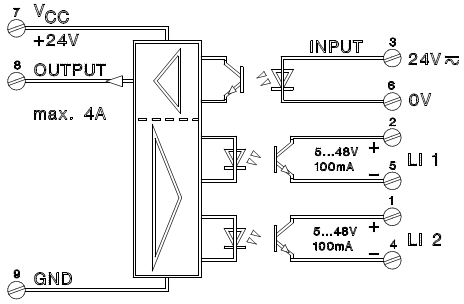
power opto-couplers

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_{eff}
- Clearance and creepage distances ≥ 8 mm

EGO 5 PKR 24 Vac/dc

Schematic circuit diagram



Indication and check-back indication of load ratio

Input	Load Indication	LI 1	LI 2	LED	Output
Low	xxx	L	L	off	low
High	Normal	L	H	green	high
High	Error[1])	H	L	red	low
High	Open Load[2])	H	H	yellow	high

Ordering data	Type	Cat. No.
	EGO 5 PKR	**8220870000**

Rated data	
Input	Screw connection 0.5…4 mm^2
Input voltage	24 Vac/dc, min 20 Vac/dc, max 30 Vac/dc
Input current (at U_N)	12 mA (24 Vdc) 13 mA (24 Vac)
Rated input consumption	195 mW, 220 mVA
Max. input frequency dc	≤ 30 Hz, switching ratio 1 : 2
Typ. switch-on delay	2 ms
Typ. switch-off delay	7 ms
Max. input frequency ac	≤ 10 Hz
Output	Screw connection 0.5…4 mm^2
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	≤ 12 A. output switches off and on again automatically after certain time.
Load Indication LI 1, LI 2	
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
Insulation coordination EN 50 178	
Overvoltage category	IV
Pollution severity	2
Accessories, dimensions and connection data see	Page 307, Fig. VII

[1]) Error: short-circuit, overload, over- or under voltage at output, overtemperature in the module

[2]) Open load: Underload recognition at active input: type 500 mA (max. 1.5 A) at 25 °C. Open load wil be indicated at I_{Load} ≥ 500 mA depending on switching status.

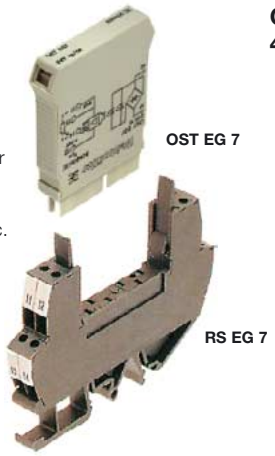
Opto-coupler in component housing EG7

power opto-couplers

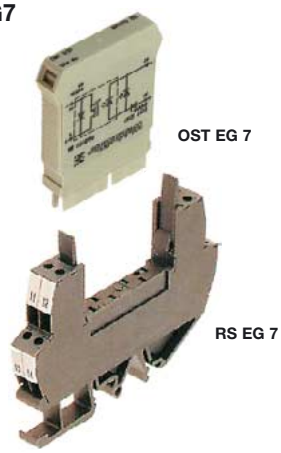
– Pluggable on socket RS EG 7 with combination foot TS 32, 35
– Overall width **10 mm**

OST EG7 2 A

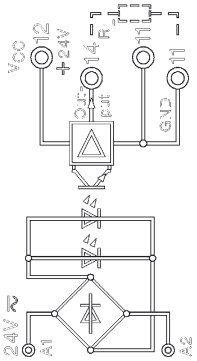
- Short circuit protected and over load-safe output
- 3-colour status-LED for output current indication
- Reliable separation acc. to DIN VDE 0884

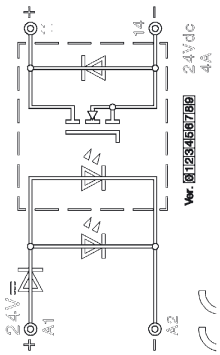


OST EG7 4 A



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 **8193830000**		Lugs for socket RS EG7 **8193830000**
Input voltage		24 Vac/dc ± 20 %	21.6 Vdc	**24 Vdc** 26.4 Vdc
Input current		dc: 5.5 mA ac: 6 mA	10.5 mA	**11.2 mA** 12.0 mA
Input power		dc: 132 mW ac: 145 mW	230 mW	**270 mW** 320 mW
Relaibly switched on		19.2 V	21.6 V	
Reliably 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 µs	
Switch-off delay		17 ms	typ. 45 µs	
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 ± 30 %	21.6…26.4 Vdc	
Switching current		2 A	4 A	
Voltage drop at max. load current		≤ 0.2 V, short-circuit proof and overload proof	≤ 0.2 V, not short-circuit proof and not overload proof	
Status indicator:				
	Green LED	output set normal function, 500 mA...2 A		output set normal function
	Yellow LED	output set, no activity, < 500 mA		
	Red LED	output set, short-circuit		
	LED off	output not set		
Storage temperature		- 25…+ 60 °C		- 25…+ 60 °C
Operating temperature				
- rowed on mounting rail without clearances		0…+ 40 °C		0…+ 40 °C
- rowed with clearances		0…+ 50 °C		0…+ 50 °C
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

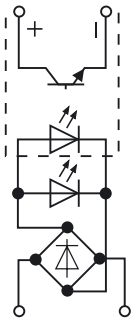
Opto-coupler in component housing EG7

Opto-couplers

EGO EG 7
OST EG 7
RS EG 7

– 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**

	5 V–	**12 V**0	**24 V**0	**48 V**0
Schematic circuit diagram				



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								
Input voltage	**5 V– ±20 %**		**12 V0 ±20 %**		**24 V0 ±20 %**		**48 V0 ±20 %**	
Switch-on current			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	3 V–		6.5 V–		15.5 V–		31.5 V–	
	–		7.5 V~		16.5 V~		45 V~	
Rated input current DC	6.8 mA		3 mA		2.8 mA		2.8 mA	
Rated input current AC	–		33.5 mA		3.4 mA		3.2 mA	
Rated input consumption			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_N = 5 V–		6 ms for U_N = 12 V–		5 ms for U_N = 24 V–		5 ms for U_N = 48 V–	
Switch-off time	12 ms for U_N = 5 V–		12 ms for U_N = 12 V–		15 ms for U_N = 24 V–		15 ms for U_N = 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 accesories, dimensions and connection data see	Page 304		Page 304		Page 304		Page 304	

Opto-coupler in component housing EG7

EGO EG 7

EGO EG 7

Opto-couplers
for long control cables

- with combination foot for TS 15, TS 32 or TS 35
- plugs onto locking socket RS EG 7 with combination TS 32, 35
- overall width **10 mm**
- **protective separation acc. to DIN VDE 0884**
- RC-input for suppressing noise signals
- reliable switching performance by interference on the control side

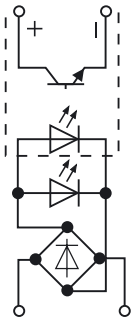
EGO EG 7 RC/ OST EG 7 RC

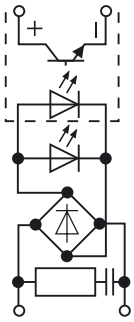
OST EG 7 RC

RS EG 7 RC

115 V0	**230 V9**	**230 Vdc**

Schematic circuit diagram





Type	Cat. No.	Type	Cat. No.	Type	Cat. No.	**Ordering data**	Type	Cat. No.	Type	Cat. No.
EGO EG7	**8092570000**	EGO EG7	**8092590000**			Combination foot for TS 15, TS 32, TS 35	EGO EG7	**8397420000**	EGO EG7	**8387580000**
OST EG7	**8234600000**	OST EG7	**8234610000**	OST EG7	**8621190000**	Pluggable opto-coupler, without locking socket	OST EG7	**8315590000**	OST EG7	**8394990000**
RS EG7	**8193830000**	RS EG7	**8193830000**			Locking socket for pluggable opto-coupler with combin. foot TS 32, 35	RS EG7	**8193830000**	RS EG7	**8193830000**
115 V0 ±20 %		**230 V~ ±20 %**		**230 Vdc ±20 %**		**Rated data**				
115 V/90 mA for 5 ms		230 V/110 mA for 2 ms		230 V~ /110 mA for 2 ms		**Input voltage**	**115 V0 ±20 %**		**230 V~ ±20 %**	
70 V–		140 V~		140 V~ (for testing only)		Switch-on current	115 V/90 mA for 5 ms		230 V/110 mA for 2 ms	
72 V~		–		–		Making threshold,typ,	70 V–		140 V~	
3.3 mA		3.8 mA		1.8 mA			72 V~		–	
5.5 mA		–		–		Rated input current DC	3.3 mA		14 mA/110 mA (2 ms)	
400 mW/500 mVA		836 mVA				Rated input current AC	9 mA/90 mA (5 ms)		–	
5…48 V–		5…48 V–				Rated input consumption	400 mW/500 mVA		836 mVA	
100 mA		100 mA		100 mA		Output supply voltage	5…48 V–		5…48 V–	
300 mA		300 mA		300 mA		Output current	100 mA		100 mA	
						Max. output current	300 mA		300 mA	
5 ms for U_N = 115 V–		5 ms for U_N = 230 V–				Switch-on time (first time)	9 ms for U_N = 115 V–		15 ms for U_N = 230 V–	
18 ms for U_N = 115 V–		18 ms for U_N = 230 V–				Switch-off time	25 ms for U_N = 115 V–		15 ms for U_N = 230 V–	
15 Hzdc		12 Hz				Switching frequency	12 Hzdc		12 Hz	
–40…+60 °C		–40…+60 °C		–40…+60 °C		Storage temperature	–40…+60 °C		–40…+60 °C	
–25…+60 °C		–25…+60 °C		–25…+60 °C		Ambient temperature	–25…+60 °C		–25…+60 °C	
				Screw connection 0.5…1.5mm², AWG 22…16		**Insulation coordination to**	**EN 50 178**			
acc. to DIN VDE 0884		acc. to DIN VDE 0884		acc. to DIN VDE 0884		Reliable separation	acc. to DIN VDE 0884		acc. to DIN VDE 0884	
≥ 5.5 mm		≥ 5.5 mm		≥ 5.5 mm		Clearances / creepage distances	≥ 5.5 mm		≥ 5.5 mm	
6 kV		6 kV		6 kV		Rated impulse voltage	6 kV		6 kV	
III		III		III		Overvoltage category	III		III	
2		2		2		Pollution severity	2		2	
Type	Cat. No.	Type	Cat. No.	Type	Cat. No.	**Accessories**	Type	Cat. No.	Type	Cat. No.
QB 16/10.16	**1650330000**	QB 16/10.16	**1650330000**	QB 16/10.16	**1650330000**	Cross connec. comb 16-pole	QB 16/10.16	**1650330000**	QB 16/10.16	**1650330000**
Page 304		Page 304		Page 304		Futher Accessories, dimensions and connection data see	Page 304		Page 304	

Solid State relay on locking socket PLUGSERIES

Complete module

DC version

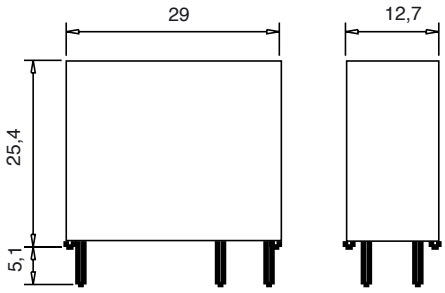
Type/Version	Cat. No.
Screw connection	
POS 24Vdc/24Vdc 2.5A	**8610840000**
POS 24Vdc/230Vac 2A	**8610860000**
POS 24Vdc/24Vuc 1A	**8610890000**
POS 24Vdc/24Vdc 5A	**8610900000**
POS 24Vdc/230Vac 4A	**8610910000**
Tension clamp connection	
POZ 24Vdc/24Vdc 2.5A	**8610920000**
POZ 24Vdc/230Vac 2A	**8610930000**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

AC version

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

Accessories SSR Standard

Dimensions

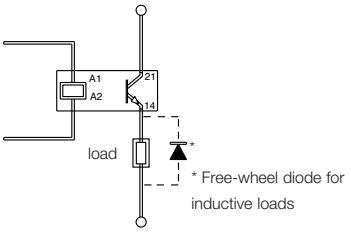


- Compact dimensions (29 x 25.4 x 12.7)
- Combines with PLUGSERIES socket PXS / PXZ, LED indicator PLED and PRC holding clamp to a complete functioning unit.
- Fully compatible with electromechanical relays in standard design
- Control voltage 24 VAC / DC
- Rated switching current 24 VDC, 24 VAC/DC,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

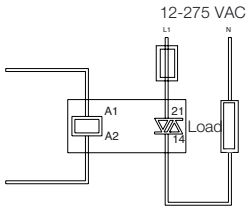
Ordering data	Type	Cat. No.	Type	Cat. No.
	SSR 24 VUC/24VDC 5A		SSR 24 VUC/230VAC 4A	
		8576350000		**8576360000**

Technical data	DC Version	AC Version
Input (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
Output		
max. switching current DC	**5 A**	
max. switching current AC		**3 A (4 A at 20 °C)**
min. switching current DC	1 mA	
min. switching current AC		50 mA
Rated switching voltage DC	24 V	
Rated switching voltage AC		230 V ~
Switch voltage range DC	0...30 V	
Switch voltage range AC		12...275 V
max. forward anode voltage at max. switching current DC	0.3 V	
max. forward anode voltage at max. switching current AC		1.1 V
max. switch-on time DC	2 ms	
max. switch-on time AC (50 Hz)		12 ms
max. switch-off time DC	18 ms	
max. switch-off time AC (50 Hz)		20 ms
Insulation		
Test voltage control circuit - switching circuit DC	2.5 kV_{eff}	
Test voltage control circuit - switching circuit AC		4 kV_{eff}
Further data		
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

DC version

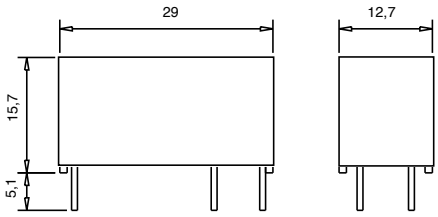


AC version



Accessories SSR / RT

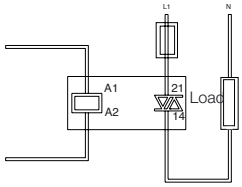
Dimensions



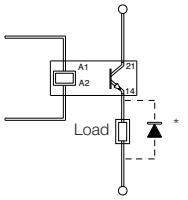
- Compact dimensions (29 x 15.7 x 12.7)
- Combines with PLUGSERIES socket PXS / PXZ, LED indicator PLED and PRC holding clamp to a complete functioning unit.
- Fully compatible with standard electromechanical relays RT
- Control voltage 24 VAC / DC
- Rated switching current 24 VDC, 24 VAC/DC, or 230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

AC version

12-275 VAC

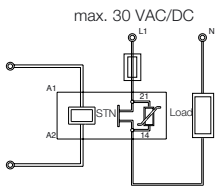


DC version



* Free-wheel diode for inductive loads

AC/DC version

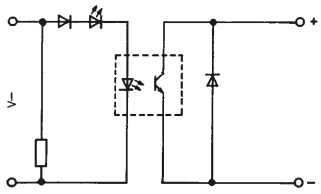


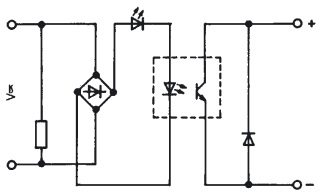
Ordering data	Type	Cat. No.	Type	Cat. No.	Type	Cat. No.
	SSR 24 VUC/24VDC 2.5A		SSR 24 VUC/230VAC 2A		SSR 24 VUC/24VUC 1A	
		8576340000		**8576370000**		**8576380000**
Technical data	**DC Version**		**AC Version**		**AC/DC Version**	
Input						
(typical values at 20 °C)						
Input voltage min. AC/DC	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	
Resistancs	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_{eff}					
Test voltage control circuit - switching circuit AC			4 kV_{eff}			
Test voltage control circuit - switching circuit AC/DC					4 kV_{eff}	
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	**5 V–[2])**	**12 V0 ± 10 %**	**24 V– ± 10 %**	**24 V0 ± 10 %**	**48 V0 ± 10 %**	**115 V0, +5%-15%**	**230 V~, +5%-15%**
Rated consumption – (W)	0.045 W	0.25 W	0.51 W	0.34 W	0.55 W	0.33 W	
Rated consumption ~ (VA)		0.32 VA		0.5 VA	0.65 VA	0.65 VA	0.52 VA
Output supply voltage	5…48 V–[1])	5…48 V–[1])	5…48 V–[1])	5…48 V–[1])	5…48 V–[1])	5…48 V–[1])	5…48 V–[1])
Voltage drop at max. load current	< 0.9 V	< 1.6 V	< 0.9 V	< 1.6 V	< 1.6 V	< 1.5 V	< 1.5 V
Output current	20 mA	100 mA	20 mA	100 mA	100 mA	100 mA	100 mA
Derating curve							
a = rowed on mounting rail without clearances							
b = rowed with clearances ≥ 20 mm							
Continuous current → Ambient temperature							
Pulse duration, limiting overload current (not periodic)	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
Sperrstrom (Ruhestrom), max. at U = 48 V	0.16 mA	0.16 mA	0.16 mA	0.16 mA	0.16 mA	0.16 mA	0.16 mA
Switch-on time (cyclic operation)	≤ 12 µs	≤ 6 ms	≤ 30 µs	≤ 2 ms	≤ 5 ms	≤ 10 ms	≤ 6 ms
Switch-off time (cyclic operation)	≤ 15 µs	≤ 13 ms	≤ 60 µs	≤ 15 ms	≤ 20 ms	≤ 23 ms	≤ 18 ms
Max. switching frequency DC voltage	3 kHz	20 Hz	3 kHz	20 Hz	< 20 Hz	10 Hz	
Max. switching frequency AC voltage		< 10 Hz			< 10 Hz		
Switching ratio	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	300 V	300 V	300 V	300 V	300 V	300 V	300 V
Rated impulse voltage	6 kV	6 kV	6 kV	6 kV	6 kV	6 kV	6 kV
Overvoltage category	IV	IV	IV	III	IV	IV	IV
Pollution severity	2	2	2	2	2	2	2
Clearances and creepage distances	≥ 5.5 mm	≥ 5.5 mm	≥ 5.5 mm	≥ 5.5 mm	≥ 5.5 mm	≥ 5.5 mm	≥ 5.5 mm
Opto-coupler	according to DIN VDE 0884	according to DIN VDE 0884	according to DIN VDE 0884	according to DIN VDE 0884	according to DIN VDE 0884	according to DIN VDE 0884	according to DIN VDE 0884
Test voltage (corresponds 100% module test)	according to DIN VDE 0884 non-destructive test 1 kV	according to DIN VDE 0884 non-destructive test 1 kV	according to DIN VDE 0884 non-destructive test 1 kV	according to DIN VDE 0884 non-destructive test 1 kV	according to DIN VDE 0884 non-destructive test 1 kV	according to DIN VDE 0884 non-destructive test 1 kV	according to DIN VDE 0884 non-destructive test 1 kV
Module is immune to interference	acc. to IEC 801-4 severity 4	acc. to IEC 801-4 severity 4	acc. to IEC 801-4 severity 4	acc. to IEC 801-4 severity 4	acc. to IEC 801-4 severity 4	acc. to IEC 801-4 severity 4	acc. to IEC 801-4 severity 4
Insulation voltage							
Input – output/mounting rail	4 kV~eff 1 min.					4 kV~eff 1 min.	
Storage temperature	–40 °C…+85 °C					–40 °C…+70 °C	
Ambient temperature							
–, rowed on mounting rail without clearances	–25 °C…+60 °C					–25 °C…+40 °C	
–, rowed with clearances ≥ 20 mm	–25 °C…+60 °C					–25 °C…+45 °C	

[1]) Not TTL-compatible

[2]) 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[2]	Yellow LED	**1118861001**	**1161560000**
	12 V0	Green LED	**1118761001**	**1161660000**
	24 V–	Yellow LED	**1160961001**	**1161760000**
				1177860000[1]
	24 V0	Yellow LED	**1117461001**	**1119460000**
		Green LED	**8065031001**	
	48 V0	Green LED	**1161061001**	**1161860000**
	115 V0	Green LED	**1161161001**	**1161960000**
	230 V~	Green LED	**1161461001**	**1162060000**
	230 V~	Red LED		**8182690000**

Connection data			
Insulation stripping length		7 mm	6 mm
Conductor cross-section	0.5…2.5 mm^2	0.5…1.5 mm^2	
		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

[1]) Output 5 VTTL-compatible
[2]) Conditionally level-compatible

Opto coupler on locking socket with multiple interface RSM

(Opto-couplers)

Note!

During operation and maintenance please observe the relevant ESD measures.

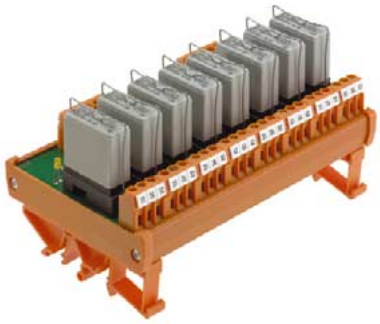
(ESD endangered area)

RSM 4 OS

4 opto-couplers

RSM 8 OS

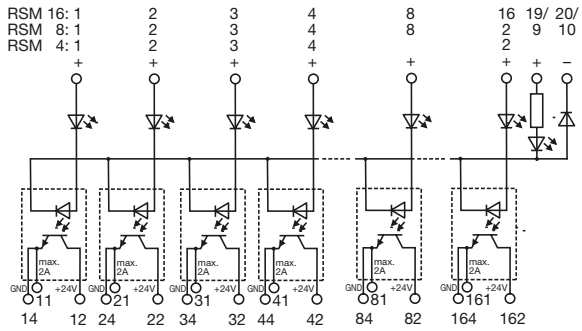
8 opto-couplers



Also available as relay coupler, see page 84/85

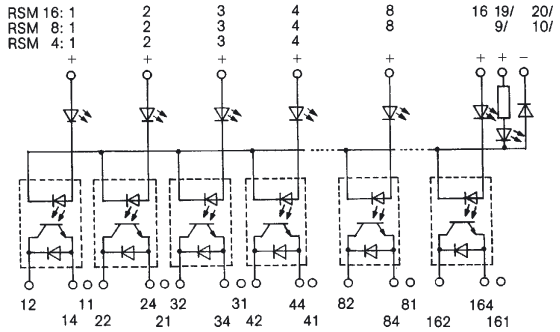
Schematic circuit diagram

Opto coupler 24 Vdc / 2A



DC voltage/positive switching (joint negative)

Standard Opto coupler 5…48 Vdc / 100 mA

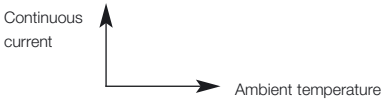


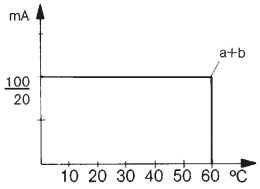
Rated data				
Input voltage	**5 V–[1] ±10 %**	**24 V– ±10 %**	**24 V0 ±10 %**	**24 V– +10 %**
Rated consumption – (W)	60 mW	400 mW	300 mW	288 mW
Rated consumption ~ (VA)	–	–	0.35 VA	–
Output operating voltage	5…48 V[1])	5…48 V[1])	5…48 V[1])	24 V ±10 %
Voltage drop at max. load current	<1.6 V	<1.6 V	<1.6 V	≤0.4 V
Output current	0.1 A	0.1 A	0.1 A	2 A

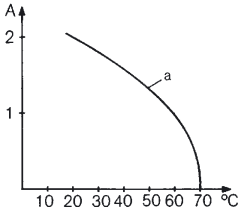
Derating curve

a = Continous operation

b = Switching mode







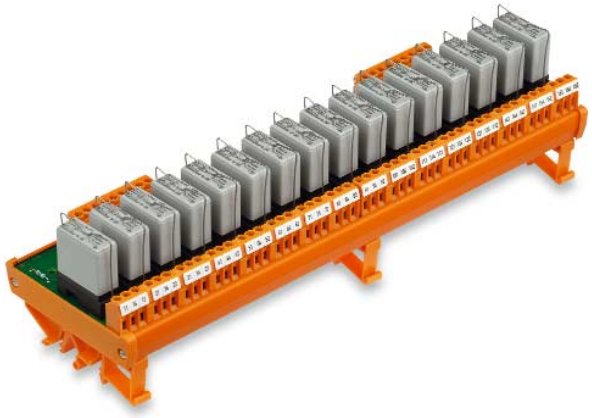
Pulse duration, limiting overload current (not periodic)	0.8 A/10 ms	0.8 A/10 ms	0.8 A/10 ms	12 A/10 ms
Max. reverse current (static current), at U	0.16 mA	0.16 mA	0.16 mA	12 mA
Switching frequency	100 Hz	100 Hz	20 Hz	max. 100 Hz
Storage temperature	–40 °C…+85 °C	–40 °C…+85 °C	–40 °C…+85 °C	–40 °C…+60 °C
Ambient temperature				
–, rowed on mounting rail without clearances	–25 °C…+60 °C	–25 °C…+60 °C	–25 °C…+60 °C	–25 °C…+60 °C
–, rowed with clearances x 20 mm	–25 °C…+60 °C	–25 °C…+60 °C	–25 °C…+60 °C	–25 °C…+60 °C
Dimensions				
Mounting width				
RSM 4	75 mm	75 mm	75 mm	75 mm
RSM 8	145 mm	145 mm	145 mm	145 mm
RSM 16	285 mm	285 mm	285 mm	285 mm
Length (perpendicular to mounting rail)	87 mm	87 mm	87 mm	87 mm

[1]) Not TTL-compatible

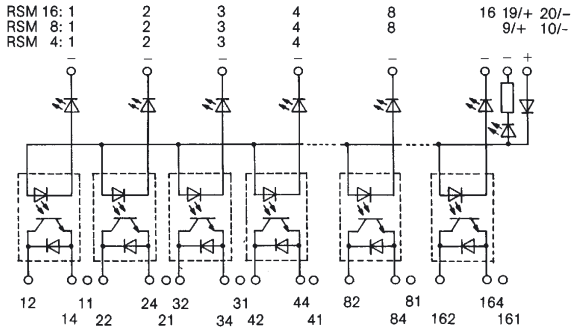
Opto coupler on locking socket with multiple interface RSM

RSM 16 OS

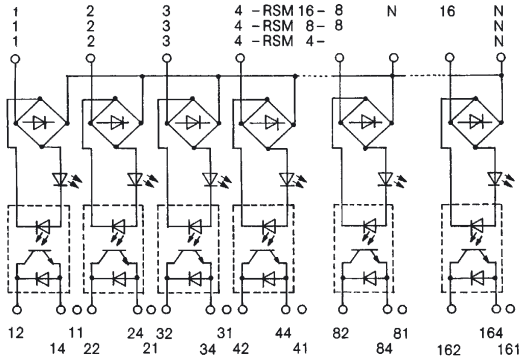
16 Opto couplers



DC/negative switching (common positive)



DC/AC voltage



Ordering data

Conn. method Input/output	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[3]	Negative switching[4]	Cat. No.	Mount. width (mm)
Screw/			●					●		**1123661001**	75
	5 V–[2]				●			●		**1124061001**	145
							●	●		**1124461001**	285
		●						●		**8017581001**	75
			●*					●		**1123861001**	75
			●*						●	**1123761001**	75
				●				●		**8003671001**	145
	24 V–			●					●	**8021391001**	145
					●*			●		**1124261001**	145
						●		●		**8018221001**	285
						●			●	**8082471001**	285
							●*	●		**1124661001**	285
			●*							**1125161001**	75
	24 V0				●*					**1125261001**	145

***** 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 mm²/AWG 26…14

Replacement opto-c.	Type	Input voltage	Output voltage	Output current	Cat. No.
	OS	5 V–[5] ±10 %	24 V– ±20 %	0.1 A	**1121100000**
	OS	12 V–[5] ±10 %	5…48 V–	0.1 A	**1124800000**
	OS	12 V0 ±10 %	5…48 V–	0.1 A	**1121200000**
	OS	24 V–[5] ±10 %	5…48 V–	0.1 A	**1124900000**
	OS	24 V–[5] ±10 %	24 V– +10 %	2.0 A	**1170200000**
	OS	24 V–[5] ±10 %	250 V~	0.1 A	**1153200000**
	OS	24 V0 ±10 %	5…48 V–	0.1 A	**1121300000**

[2] 5 V TTL Input voltage on request

[3] Common negative potential, positive is switched

[4] Common positive potential, negative is switched

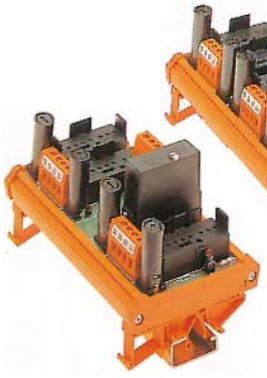
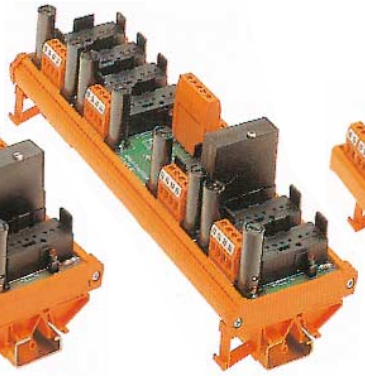
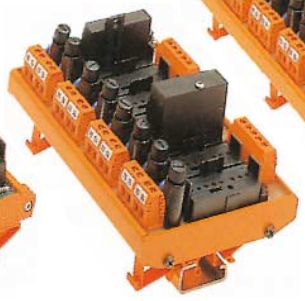
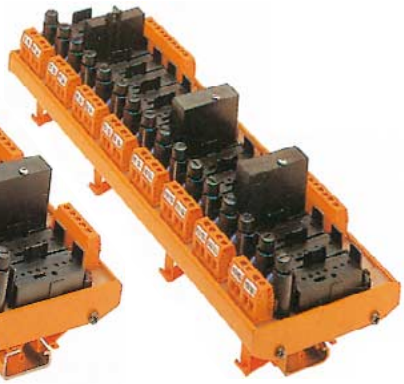
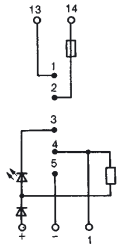
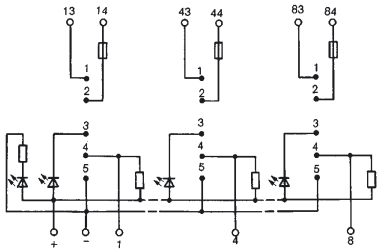
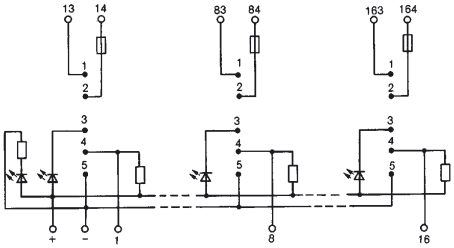
[5] Not suitable for DC/AC version

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 electomagnetic interferences
- High insulation-voltage between load and control circuit

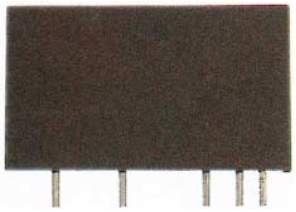
Note!
The relevant ESD measures are to be observed during commissioning and maintenance (ESD endangered area)

	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**[3]	RSM 8 HR **1167161001**[3]	RSM 8 HR-100 **1166261001**[3]	RSM 16 HR-100* **1167261001**[3]
Rated data (with inpu module)[1]					
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
Rated data (with output module)[1]					
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
Auxilary 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
Connection data					
Conductor cross-section					
Screw connection	0.5…2.5 mm²	0.5…2.5 mm²	0.5…2.5 mm²	0.5…2.5 mm²	0.5…2.5 mm²
Male connect. block DIN 41651[2]	–	–	10-pole	10-pole	20-pole
„Sub-D"-connection[2]	–	–	15-pole	15-pole	25-pole
Dimensions					
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

[1] The rating data depend on the used module
[2] on request
[3] Mixed placement of input and output modules is not valid.

Solid state relays for signal input and output

Input module HRE 24
DC/DC

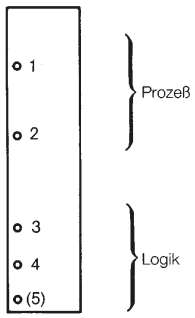


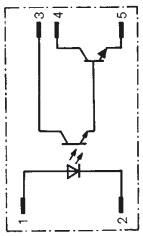
Input module HRE 115/HRE 230
AC/DC

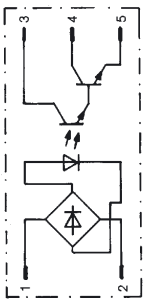
Output module HRA 230
DC/AC

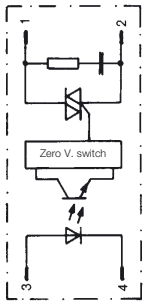
Output module HRA 60
DC/DC

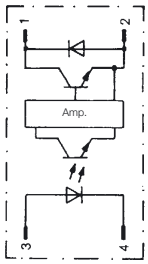
Schematic circuit diagram



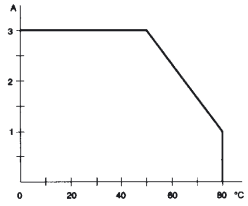








Ordering data	Type	Cat. No.	Type	Cat. No.	Type	Cat. No.	Type	Cat. No.	Type	Cat. No.
	HRE 24	**117440000**	HRE 115	**1174500000**	HRE 230	**1174600000**	HRA 230	**1174100000**	HRA 60	**1174300000**

Rated data					
Input voltage	**10…32 V– (process)**	**90…140 V0 (process)**	**180 V…280 V0 (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)[1]	18…32 V (Logic)[1]	18…32 V (Logic)[1]	24…250 V~[1][2] (process)	5…60 V~[1][2] (process)
Voltage drop at max. load current	0.4 V	0.4 V	0.4 V	–	–
Max. output current (Continous test)	100 mA	100 mA	100 mA	3 A	3 A, resistive load
Derating curve a = self-cooling b = mounted on 2 k/W 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_{min} 100 µs	unlimited, t_{min} 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

[1] 250 V max. in connection with HR modules. Only negative-switching when used on HR-socket!

[2] For inductive loads the module must be protected with diode or varistor.


A1
15
25/21
1-10min
6-60min
1-10h
10-100h
R
Un
Ac
Bw
ITM
multifunction
Weidmüller
28/24 26/22
18

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 = **I**ndustry

T = **T**imer

R = **R**esponse Delay

Wo = **W**iping contact relay with**o**ut control input

Ww = **W**iping contact relay **w**ith control input

To = **T**urn -off delay with**o**ut control input

Tw = **T**urn-off delay **w**ith control input

TT = **T**wo **T**imes

M = **M**ultifunction

MF = **M**ultifunction **F**our

Time ranges and supply voltages of delay timer relays

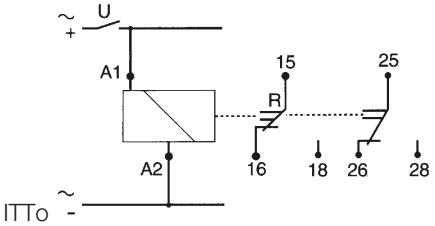
The modules' functions for 4 or 7 time can be precisely selected via the rotary button.

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

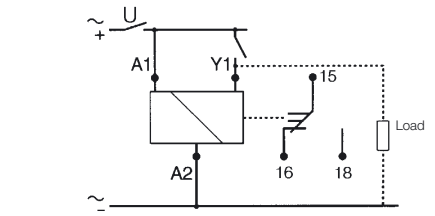
Product	Time	Range		Voltage supply
ITR	0.1s - 100h	0.1 s - 1 s	1 min - 10 min	24 VDC/24…24UVAC
ITWo, ITTT		1 s - 10 s	0.1 h - 1 h	
ITTw		0.1 min - 1 min	1 h- 10 h	
ITWw		10 h - 100 h		
ITMF, ITM				
ITTo	0.06 s - 160 s	0.06 s - 0.6 s	2 s - 20 s	24 V - 240 VAC
		0.25 s - 2.5 s	16 s - 160 s	24 VDC

Output of the timing relays

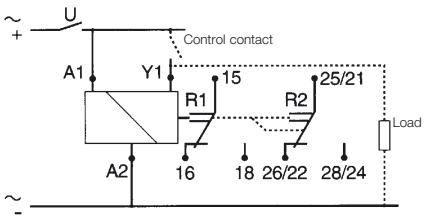
The load in every module is switched by a changeover relay (250 V, 8 A).
The multifunction module (ITM) switches both changeover relays immediately or, one changeover relay immediately and the other changeover relay delayed.



ITTo



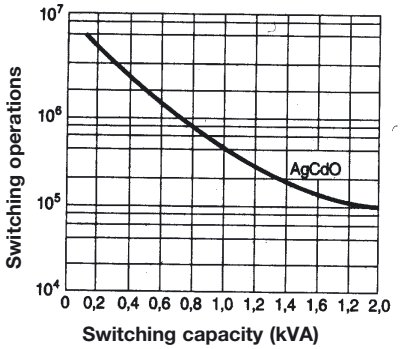
ITR, ITP, ITWo, ITWw, ITTw,ITTT, ITMF

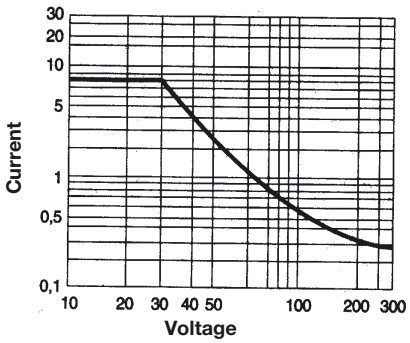


ITM

Characteristic data of output contacts

Limit values by resistive load
Service life of contacts by resistive load

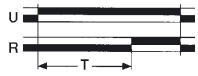




Functions of the Timers

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

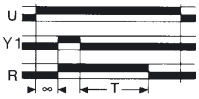
As soon as the operating voltage is applied, a pulse (e. g. 50 ms) or a voltage is applied to control input Y1. Output R connects the load immediately. After the preset delay period T has expired, output R disconnects the load.

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.

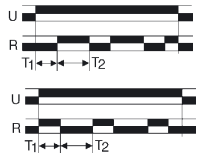
Turn-off delay timer relay with control input ITTw

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.



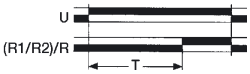
Pulse generator ITTT

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



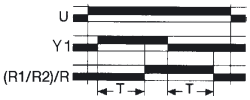
Multifunction ITM/ITMF

Function A: Response delay



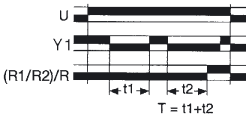
As soon as the operating voltage is applied, the preset delay period T begins. After time period T has expired, output R connects the load.

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

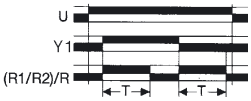


As soon as the operating voltage has been applied and delay period T has expired, output R connects the load. At control input Y1 the contact break intervals are accumulated (additive process). As soon as the operating voltage is switched off, the load at output R is disconnected.

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

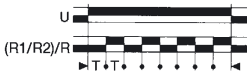


The operating voltage must be applied. As soon as a voltage is applied to control input Y1, output R connects the load for the prest time T. After time period T has expired, output R disconnects the load. As soon as the control input is opened, output R once more connects the load for the duration of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

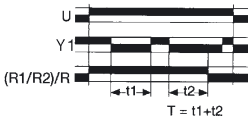
Function Di: Pulse generator
(begins in the operating position)

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

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.

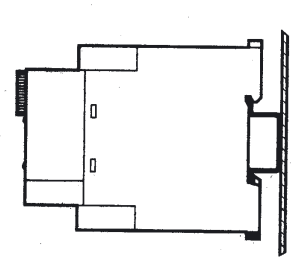
Control lamp for verifying contact

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

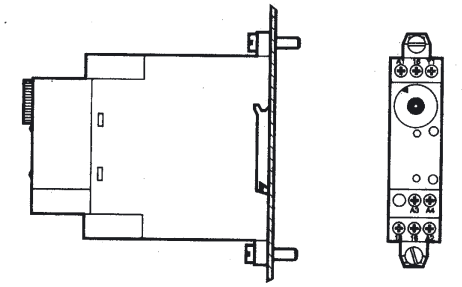
Assembly

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.

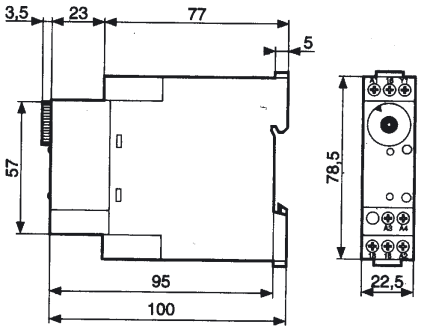
- IEC 255 static measuring relays
- IEC529 testers and test procedures
- IEC 664 regulations for high-voltage fuses for motor circuits
- IEC 801 EMC compatibility
- VDE 0110 insulation coordination for low-voltage electrical equipment
- VDE 0435 relays with fixed times

Connection technology

Clamping yoke has the following capacities:

- 2 x 1.5 mm^2 with ferrule
- 2 x 2.5 mm^2 without ferrule
- 1 x 4 mm^2 without ferrule

Dimensions IT



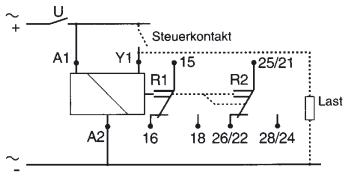
Multifunctional Timers

- 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

ITM

Multifunctional timer relay

Schematic circuit diagram



Ordering data		Type	Cat. No.
		ITM	**8362550000**
Contact		changeover	
Time periods		0.1 s - 100 h	
		1 s, 10 s, 1 min	
		1 h, 10 h, 100 h	
Repeat accuracy (const. parameter)		± 0.5%	
Accuracy of indication acc. to IEC 1812-1		± 10% (25 °C)	
Input			
Input voltage		**12 V...240 Vac/dc / 50...60 Hz**	
Voltage tolerance		85 - 110% U_N	
Duty factor		100 %	
Rated power consumption		7 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		2 changeover	
Contact material		AgCdO	
Service life	- mechanical	5×10^6 switching operations	
	- electrical	10^5 switching operations at 2000 VA resistive load	
Switching current	- max.	8 A0 / changeover contact	
	- min.	100 mA0	
Max. switching voltage		250 V0	
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	- Storage temperature	–30°C...+70°C	
	- Operating temperature	–20°C...+60°C	
Clearance/creepage path. acc. to IEC 664/VDE 0110		4 kV	
Protection category IEC 529	- Terminal block	IP 20	
	- Front	IP 50	
Mounting		DIN rail 35 mm	
Installation category to IEC 664		Category III	
Connection			
- with ferrule		2 x 1.5 mm^2	
- without ferrule		2 x 2.5 mm^2 / 1 x 4 mm^2	
Enclosure material		self extinguishing	
Weight, typ.		110 g	

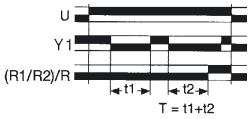
Function A: Response delay

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

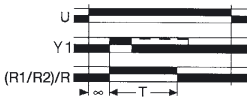
As soon as operating voltage has been applied and control input Y1 has closed, delay period T begins. After time period T has expired, output R connects the load (delayed response). When control input Y1 is opened, the output disconnects the load after the preset time period has expired (delayed turn-off).

Function At: Additive response delay



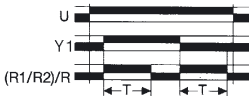
As soon as the operating voltage has been applied and delay period T has expired, output R connects the load. At control input Y1 the contact break intervals are accumulated (additive process). As soon as the operating voltage is switched off, the load at output R is disconnected.

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

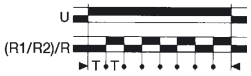


The operating voltage must be applied. As soon as a voltage is applied to control input Y1, output R connects the load for the prest time T. After time period T has expired, output R disconnects the load. As soon as the control input is opened, output R once more connects the load for the duration of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

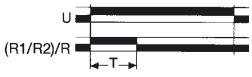


As soon as the operating voltage has been applied, output R simultaneously switches the load alternately between the zero position and operating position for the period of the preset time T. With this function, the cycle begins at the zero position.

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

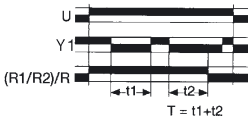
As soon as the operating voltage has been applied, output R simultaneously switches the load alternately between the zero position and operating position for the period of the preset time T. With this function, the cycle begins at the operating position.

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

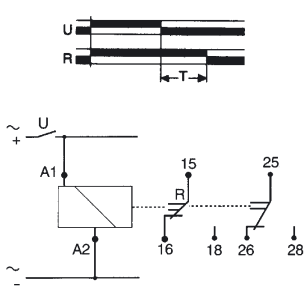
ITTo

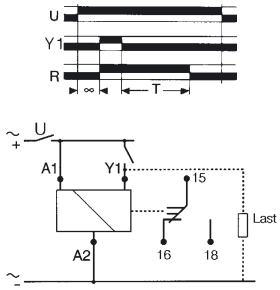
Turn-off delay timer relay **without** control input

ITTw

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

Schematic circuit diagram





Ordering data		Type	Cat. No.	Type	Cat. No.
		ITTo	**8362600000**	**ITTw**	**8362610000**
Contact		Changeover		Changeover	
Time periods		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%	
Anzeigegenauigkeit gemäß IEC 1812-1		± 10% (25 °C)		± 10% (25 °C)	
Input					
Input voltage		**24 Vdc/ 24…240 Vac / 50...60 Hz**		**24 Vdc/ 24…240 Vac / 50...60 Hz**	
Voltage tolerance		85 - 110% U_N		85 - 115% U_N (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	
Output		**Relay output**		**Relay output**	
Contact		2 changeover		1 changeover	
Contact material		AgCdO		AgCdO	
Service life	- mechanical	5×10^6 switching operations		5×10^6 switching operations	
	- electrical	10^5 switching operations at 1250 VA resistive load		10^5 switching operations at 2000 VA resistive load	
Switching current	- max.	8 A⎓ / changeover contact		8 A⎓	
	- min.	100 mA⎓		100 mA⎓	
Max. switching voltage		250 V⎓		250 V⎓	
Switching current		1250 VA / 80 W		2000 VA / 80 W	
Status indicators					
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	- Storage temperature	–30°C...+70°C		–30°C...+70°C	
	- Operating temperature	–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	
	- Front	IP 50		IP 50	
Mounting		DIN rail 35 mm		DIN rail 35 mm	
Installation category to IEC 664		Category III		Category III	
Connection					
- with ferrule		2×1.5 mm^2		2×1.5 mm^2	
- without ferrule		2×2.5 mm^2 / 1×4 mm^2		2×2.5 mm^2 / 1×4 mm^2	
Enclosure material		self extinguishing		self extinguishing	
Weight, typ.		100 g		100 g	

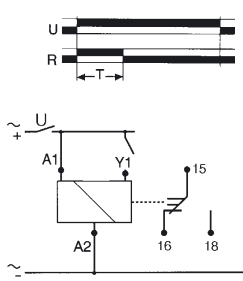
ITWo

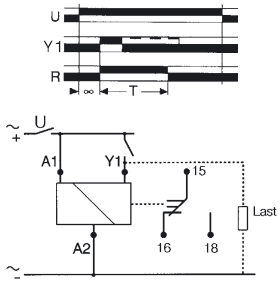
Wiping contact timer relay **without** control input

ITWw

Wiping contact timer relay **with** control input

Schematic circuit diagram





Ordering data		Type	Cat. No.	Type	Cat. No.
		ITWo	**8362580000**	**ITWw**	**8362590000**
Contact		Changeover		Changeover	
Time periods		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)	
Input					
Input voltage		**24 Vdc/ 24…240 Vac / 50...60 Hz**		**24 Vdc/ 24…240 Vac / 50...60 Hz**	
Voltage tolerance		85 - 115% U_N (110% for 240 V)		85 - 115% U_N (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	
Output		**Relay output**		**Relay output**	
Contact		1 changeover		1 changeover	
Contact material		AgCdO		AgCdO	
Service life	- mechanical	5×10^6 switching operations		5×10^6 switching operations	
	- electrical	10^5 switching operations at 2000 VA resistive load		10^5 switching operations at 2000 VA resistive load	
Switching current	- max.	8 A⎓		8 A⎓	
	- min.	100 mA⎓		100 mA⎓	
Max. switching voltage		250 V⎓		250 V⎓	
Switching current		2000 VA / 80 W		2000 VA / 80 W	
Status indicators					
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	- Storage temperature	–30°C...+70°C		–30°C...+70°C	
	- Operating temperature	–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	
	- Front	IP 50		IP 50	
Mounting		DIN rail 35 mm		DIN rail 35 mm	
Installation category to IEC 664		Category III		Category III	
Connection					
- with ferrule		2×1.5 mm^2		2×1.5 mm^2	
- without ferrule		2×2.5 mm^2 / 1×4 mm^2		2×2.5 mm^2 / 1×4 mm^2	
Enclosure material		self extinguishing		self extinguishing	
Weight, typ.		100 g		100 g	

Timers

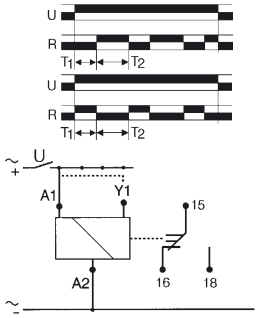
ITTT

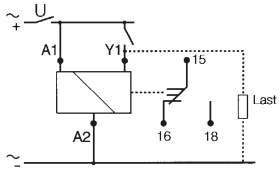
Pulse generator

ITMF

Multifunction - timer relay

Schematic circuit diagram



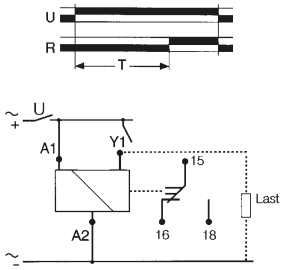


Ordering data		Type	Cat. No.	Type	Cat. No.
		ITTT	**8324050000**	**ITMF**	**8287770000**
Contact		Changeover		Changeover	
Time periods		0.1 s - 100 h		0.1 s - 100 h	
		(0.1 - 1 s, 1 s - 10 s, 0.1 min. - 1 min.,		(0.1 - 1 s, 1 s - 10 s, 0.1 min. - 1 min.,	
		1 min. - 10 min., 0.1 h - 1 h, 1 h - 10 h, 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)	
Input					
Input voltage		**24 Vdc/ 24…240 Vac / 50...60 Hz**		**24 Vdc/ 24…240 Vac / 50...60 Hz**	
Voltage tolerance		85 - 115% U_N (110% for 240 V)		85 - 115% U_N (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	
Output		**Relay output**		**Relay output**	
Contact		1 changeover		1 changeover	
Contact material		AgCdO		AgCdO	
Service life	- mechanical	5×10^6 switching operations		5×10^6 switching operations	
	- electrical	10^5 switching operations at 2000 VA resistive load		10^5 switching operations at 2000 VA resistive load	
Switching current	- max.	8 A		8 A	
	- min.	100 mA		100 mA	
Max. switching voltage		250 V		250 V	
Switching current		2000 VA / 80 W		2000 VA / 80 W	
Status indicators					
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	- Storage temperature	–30°C...+70°C		–30°C...+70°C	
	- Operating temperature	–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	
	- Front	IP 50		IP 50	
Mounting		DIN rail 35 mm		DIN rail 35 mm	
Installation category to IEC 664		Category III		Category III	
Connection					
- with ferrule		2×1.5 mm^2		2×1.5 mm^2	
- without ferrule		2×2.5 mm^2 / 1×4 mm^2		2×2.5 mm^2 / 1×4 mm^2	
Enclosure material		self extinguishing		self extinguishing	
Weight, typ.		100 g		100 g	

ITR

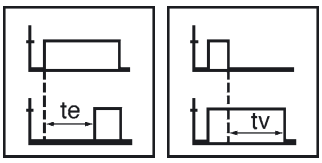
Response delay timer relay

Schematic circuit diagram



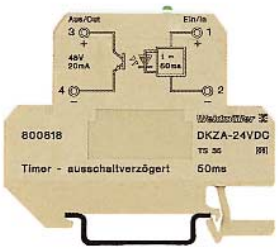
Ordering data		Type	Cat. No.
		ITR	**8362570000**
Contact		Changeover	
Time periods		0.1 s - 100 h	
		(0.1 - 1 s, 1 s - 10 s, 0.1 min. - 1 min.,	
		1 min. - 10 min., 0.1 h - 1 h, 1 h - 10 h, 100 h)	
Repeat accuracy (const. parameter)		± 0.5%	
Accuracy of indication acc. to IEC 1812-1		± 10% (25 °C)	
Input			
Input voltage		**24 Vdc/ 24…240 Vac / 50...60 Hz**	
Voltage tolerance		85 - 115% U_N (110% for 240 V)	
Duty factor		100 %	
Rated power consumption		0.5 W / 24 V-	
		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	- mechanical	5×10^6 switching operations	
	- electrical	10^5 switching operations at 2000 VA resistive load	
Switching current	- max.	8 A0	
	- min.	100 mA0	
Max. switching voltage		250 V0	
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	- Storage temperature	–30°C...+70°C	
	- Operating temperature	–20°C...+60°C	
Clearance/creepage path. acc. to IEC 664/VDE 0110		4 kV / 2	
Protection category IEC 529	- Terminal block	IP 20	
	- Front	IP 50	
Mounting		DIN rail 35 mm	
Installation category to IEC 664		Category III	
Connection			
- with ferrule		2×1.5 mm^2	
- without ferrule		2×2.5 mm^2 / 1×4 mm^2	
Enclosure material		self extinguishing	
Weight, typ.		100 g	

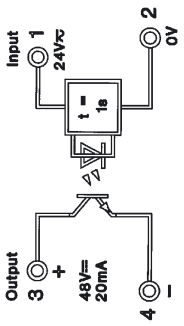
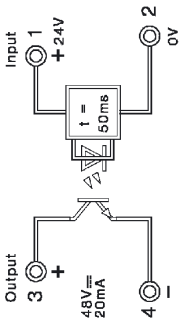
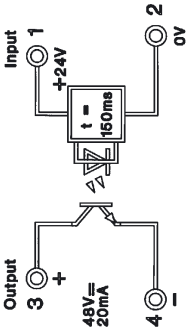
Signal conditioning
DKZ/DKZA timer modules



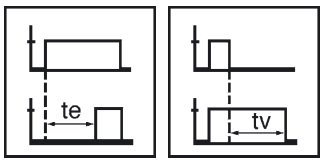
DKZ DKZA

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

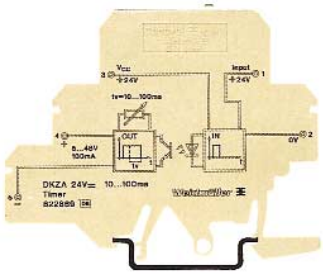


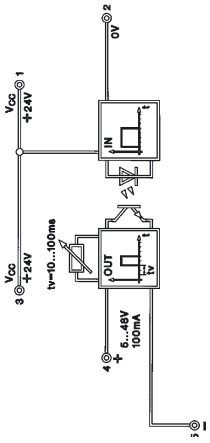
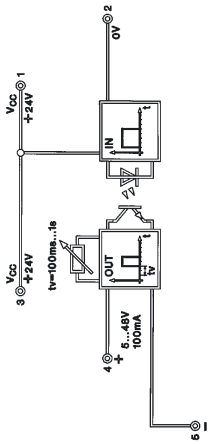
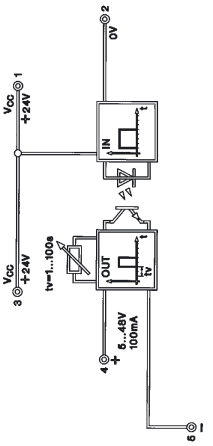
	DKZ 24 Vac/dc	DKZA 24 Vac/dc	DKZA 24 Vac/dc
Schematic circuit diagram			
Ordering data	Type / Cat. No.	Type / Cat. No.	Type / Cat. No.
For TS 32 Y	DKZ 24 Vac/dc 32 **8008130000**	DKZA 24 Vdc 32 **8008120000**	DKZA 24 Vdc 32 **8020990000**
For TS 35 W	DKZ 24 Vac/dc 35 **8008190000**	DKZA 24 Vdc 35 **8008180000**	DKZA 24 Vdc 35 **8022110000**
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 voltage	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 kV_{eff}	4 kV_{eff}	4 kV_{eff}
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^2	0.5…4 mm^2	0.5…4 mm^2
Reverse polarity protection	ja	ja	ja
Accessories	Type / Cat. No.	Type / Cat. No.	Type / Cat. No.
End plate	AP DKT4 **0687560000**	AP DKT4 **0687560000**	AP DKT4 **0687560000**
Dimensions see	Page 305	Page 305	Page 305

Pulse conditioning
DKZ/DKZA timer modules

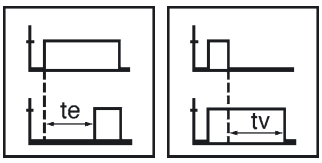


DKZ DKZA

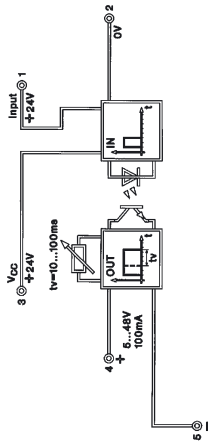
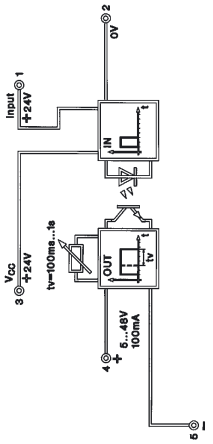
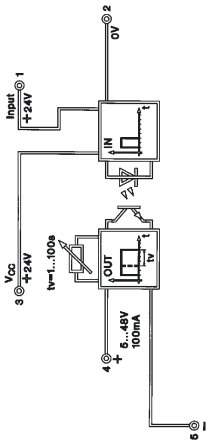


	DKZ DK5	DKZ DK5	DKZ DK5
Schematic circuit diagram			
			
Ordering data	Type / Cat. No.	Type / Cat. No.	Type / Cat. No.
For TS 32			
For TS 35			
With combi foot TS32/TS 35	DKZ DK5 **8228680000**	DKZ DK5 **8243780000**	DKZ DK5 **8019650000**
Technical data			
Input			
Supply voltage	24 Vdc ± 20 %	24 Vdc ± 20 %	24 Vdc ± 20 %
Supply current	ca. 12 mA	ca. 12 mA	ca. 12 mA
Control voltage			
Control input current			
Output			
Output voltage	5…48 Vdc	5…48 Vdc	5…48 Vdc
Max. output current	100 mA	100 mA	100 mA
Internal voltage drop	≤ 1.6 V	≤ 1.6 V	≤ 1.6 V
Range of switch-on delay	10…100 ms (adjustable)	100 ms…1 s (adjustable)	1…100 s (adjustable)
Isolation coordinates acc. to DIN VDE 0160, Draft11/94			
Rated voltage	300 V	300 V	300 V
Rated impulse voltage	6 kV	6 kV	6 kV
Overvoltage category	IV	IV	IV
Pollution severity	2	2	2
Clearance and creepage distances	≥ 5.5 mm	≥ 5.5 mm	≥ 5.5 mm
Voltage proof, input/output-TS	4 kV_{eff}	4 kV_{eff}	4 kV_{eff}
Operating temperature without clearances	-25 °C…+40 °C	-25 °C…+40 °C	-25 °C…+40 °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^2	0.5…4 mm^2	0.5…4 mm^2
Accessories	Type / Cat. No.	Type / Cat. No.	Type / Cat. No.
End plate	AP DK5 **8268870000**	AP DK5 **8268870000**	AP DK5 **8268870000**
Dimensions see	Page 305	Page 305	Page 305

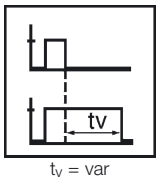
Signal conditioning
DKZA timer modules



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

	DKZA DK5		DKA DK5		DKZA DK5	
Schematic circuit diagram						
Ordering data	Type	Cat. No.	Type	Cat. No.	Type	Cat. No.
For TS 32						
For TS 35						
With combi foot TS 32/TS 35	DKZA DK5	**8228690000**	DKZA DK5	**8243770000**	DKZA DK5	**8019630000**
Technical data						
Input:						
Supply voltage	24 Vdc ± 20 %		24 Vdc ± 20 %		24 Vdc ± 20 %	
Supply current	ca. 11 mA		ca. 11 mA		ca. 11 mA	
Control voltage	24 Vdc ± 20 %		24 Vdc ± 20 %		24 Vdc ± 20 %	
Control input curren	ca. 0.5 mA		ca. 0.5 mA		ca. 0.5 mA	
Min. pulse duration of input voltage	2 ms		2 ms		2 ms	
Output:						
Output voltage	5…48 Vdc		5…48 Vdc		5…48 Vdc	
Max. output current	100 mA		100 mA		100 mA	
Internal voltage drop	≤ 1.6 V		≤ 1.6 V		≤ 1.6 V	
Range of switch-off delay	10…100 ms (adjustable)		100 ms…1s (adjustable)		1…100 s (adjustable)	
Isolation coordinates acc. to DIN VDE 0160, Draft11/94						
Rated voltage	300 V		300 V		300 V	
Rated impulse voltage	6 kV		4 kV_{eff}		4 kV_{eff}	
Overvoltage category	IV		IV		IV	
Pollution severity	2		2		2	
Clearance and creepage distances	≥ 5.5 mm		≥ 5.5 mm		≥ 5.5 mm	
Voltage proof input/output-TS	4 kV_{eff}		6 kV		6 kV	
Storage temperature	-25 °C…+40 °C		-40…+85 °C		-40…+85 °C	
Operating temperature without clearances	-25 °C…+50 °C		-25…+40 °C		-25…+40 °C	
with clearances	-40 °C…+85 °C		-25…+50 °C		-25…+50 °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^2		0.5…4 mm^2		0.5…4 mm^2	
Accessories	Type	Cat. No.	Type	Cat. No.	Type	Cat. No.
End plate	AP DK5	**8268870000**	AP DK5	**8268870000**	AP DK5	**8268870000**
Dimensions see	Page 305		Page 305		Page 305	

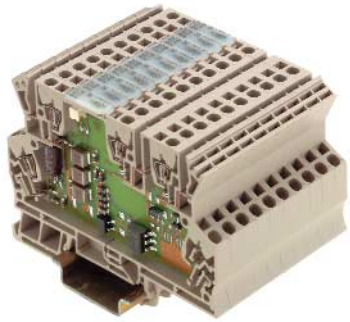
Turn off delay module MCZ TO



t_V = var

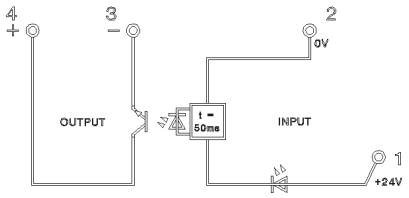
The timer module can be used for extending short pulses and fixed times. Provides PLC versions with switch off delay.

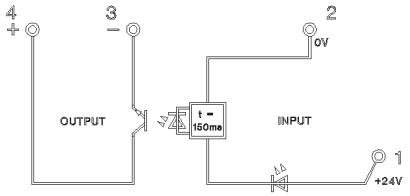
MCZ TO 24 Vdc turn-off delay 50 ms



MCZ TO 24 Vdc turn-off delay 150 ms

Schematic circuit diagram





Ordering data	Type	Cat. No.	Type	Cat. No.
For TS 35	MCZ TO 24 Vdc turn-off delay 50 ms	**8324590000**	MCZ TO 24 Vdc turn-off delay 150 ms	**8286410000**

Technical data		
Input		
Input voltage	24 Vdc ± 10 %	24 Vdc ± 10 %
Min. pulse duration	2 ms	2.5 ms
Power consupmtion	6.7 mA ± 10 %	6.7 mA ± 10 %
Input power	160 mW	160 mW
Power consumption when pulse applied	200 mA	200 mA
Output		5…48 Vdc
Output voltage	5…48 Vdc	20 mA
Max. output current	20 mA	≤ 1.6 V
Max. voltage drop at max. load	≤ 1.6 V	200 mA
Impulse loading/limiting overload current	200 mA	max. 0,16 mA
Reverse current at 48 V (static current)	max. 0,16 mA	150 ms
Switch-off delay	50 ms	5 Hz
Switching frequency dc	20 Hz	
Insulation coordination/safe disconnection to EN 50178		
Rated voltage	300 V	300 V
Rated impulse voltage	6 kV	6 kV
Overvoltage category	III	III
Pollution severity	2	2
Clearance and creepage distances	≥ 5.5 mm	≥ 5.5 mm
Voltage proof, input/output mounting rail	4 kV_{eff} / 1 min	4 kVeff / 1 min
Opto coupler	to VDE 0884	to VDE 0884
Ambient temperature	-25 °C…+50 °C	-25 °C…+50 °C
Storage temperature	-40 °C…+85 °C	-40 °C…+85 °C
Conductor	AWG 22…12	AWG 22…12
Conductor cross-section	1.5 mm^2	1.5 mm^2
Approvals	CE, UL, CSA	CE, UL, CSA
Total width	6 mm	6 mm