



100

50.4

100

ZERO

SPAN

ERROR

3-wire

4-wire

Range I

Range II

0...20 m

4...20 m

interface

Coupling Relays



Contents – Relays

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Coupling relays

Selection by function

interface

¹⁾ = See data sheet for detailed specification

Coupling relays

Selection by function

interface



Coupling relays General information *interface*

Wieland relay modules – the reliable way to implement an application-related interface

In the microchip age, many believed that electromechanical relays would no longer play a role. This is however far from the truth. Switching relays have reliably selected important tasks for many years, working in a "symbiotic relationship" with the electronics. Relays have demonstrated a high degree of flexibility over the years. The core characteristics have been maintained or even improved such as:

- ☐ Overload capability without costly protection measures
- ☐ Contact rating of μA up to $>10\text{ A}$
- ☐ Various types and number of the contacts
- ☐ High level of tolerance to electrical interference
- ☐ Switching without dependence on the direction of current (AC/DC) up to the GHz range
- ☐ Low level of switching power loss
- ☐ Electrical isolation between all contacts and the coil

Wieland offers a complete range of relay modules with a combination of properties outlined above. Depending on the required applications, relay modules are available with various operating voltages, contact arrangements, contact materials and housing designs. Timer relays or HAND-0-AUTO relays can be supplied in addition to relays with pure monostable functionality.

Product range:

flare MOVE, Pluggable, process interface relay with an overall width of 6.2 mm

flare, process interface relay / timer relay with an overall width of 6.2 mm

WRS, RAB, Multiple switching relay modules with mounting base

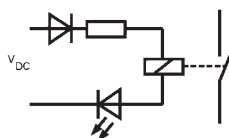
Overview of the technical data

Control side – operating voltage

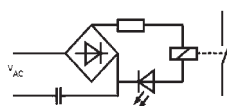
Wieland relay modules can be controlled within a defined temperature range, given operating voltage and relevant tolerance band to a 100% duty cycle.

Control side – Suppression circuit

AC/DC relay modules are available. DC relays are equipped with a polarized diode and a free-wheeling diode in the input. These functions are taken over by a power rectifier in the case of AC or AC/DC modules. All relay modules have an LED for status display in the input circuit.



Suppression circuit of input for DC operation



Suppression circuit of input for AC operation

Control side – residual voltage

To ensure the safe operation of the relay the residual voltage in the coil circuits must not exceed 5% DC and 15% AC of the operating voltage according to VDE 0435. Values above this will result in the relay remaining closed after switch off.

Residual voltages can occur from solid-state devices in circuit, induced voltages from high current cabling or other inductive or capacitive interference factors.

Corrective measures may involve the rerouting of cables away from interference or the parallel connection of RC elements.

Coupling relays

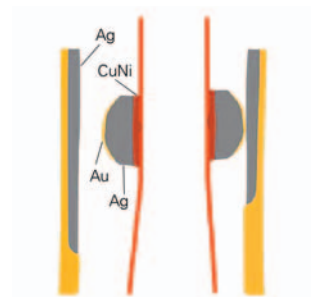
General information

interface

Load side – contact material

The contacts are used to route control signals in a power range of mW up to more than 1000 VA. The contact material that is used is largely determined by the load expected during operation (particularly with regard to current carrying capacity, switching frequency, operating speed as well as any corrosive environmental influences). Wieland uses the universally accepted AgSnO contacts for power ranges up to 1500 VA. In the lower power range, the same material is used but with a gold-plated finish.

Modules with gold-flashed AgCu contacts, AgCdO or gold-plated AgNi contacts are also available. Table 1 gives an overview of other contact materials.



Cut-out of a 3-layer welded contact with a linear contact closure

Contact material	Corrosion caused by		Typical properties	Typical applications	Scope
	Sulfur	Oxidation			
Gold silver AuAg10	no	no	Low and constant contact resistance at minimum switching capacity	Dry switching circuits, measuring circuits, unfiltered communication routes	mV...60 V mA...300 mA
Gold nickel AuNi5	no	low	Free of material transfer in broad load ranges; small contact resistance; slight electric arcs; with smaller switching capacities, higher number of operations and greater contact follow-through interference possible due to friction oxides	Used in low and medium voltage und current ranges	100 mV...60 V 1 mA...300 mA
Fine-grained silver AgNi0.15	yes	no	Higher mechanical strength; low welding tendency and higher erosion resistance than Ag; relatively low contact resistance	Universal use in medium-sized loads that are higher than with fine silver	>12 V 1 mA...1 A
Hard silver AgCu3	yes	when switching	Higher mechanical strength, low welding tendency and higher erosion resistance than fine-grained silver, but higher contact resistance	Used in medium-sized loads	>12 V 10 mA...10 A
Silver nickel AgNi10	yes	no	Higher erosion resistance, low welding tendency, higher contact resistance	Switching circuits for medium to high loads, DC circuits	>17 V >5 mA
Silver cadmium oxide AgCdO10	yes	no	Low welding tendency, high erosion resistance with higher switching capacities	Particularly suitable for switching inductive loads	>12 V >100 mA
Silver tin oxide AgSnO10	yes	no	Low welding tendency, very high erosion resistance with high switching capacities, low material transfer	Switching circuits with high power ON/OFF loads, DC circuits	>17 V >5 mA
AgNi0.15+ 5 µ Au	no	yes	Good corrosion resistance, good contact resistances	Small switching capacities for dry circuits	µV...30 V µA...200 mA
AuAg10 over AgNi+Au	no	yes	Behaves as 5-µ gold contact, but its resistance to wear is 5 times higher	Minimum switching capacities up to 100 W or 1 kVA	> 100 mV > 10 µA

Table 1: Overview of contact materials

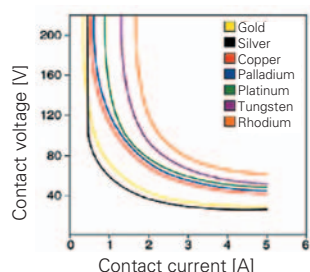
Coupling relays

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Contact side – reduction of arcs

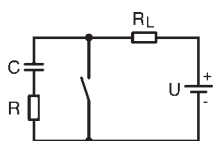
When the arc limit voltage (see diagram) which is dependent on the switching current and contact material is exceeded, discharge processes take place on the relay contact. Material transfer occurs which damages the contact. To achieve a long service life and a high level of reliability despite this type of contact loading, circuit elements are required for arc suppression. Several options are available.



Arc limit of pure contact metals

DC circuits with a resistive load

An RC element which is connected in parallel to the contact can be used for arc suppression.



RC element parallel

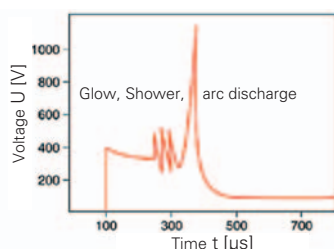
At the point of disconnection, the voltage U_c at the contact jumps from zero to the value $U \times R / (R + R_L)$ and then rises according to the function $U_c = U (1 - e^{-t/\tau})$ whereby $\tau = (R + R_L) \times C$. The resistance R must be high enough so that the combined total of the condenser discharge current and the switching current at start-up is less than the maximum permitted starting current.

$$R > U / (I_{zul} U / R)$$

At a switching frequency $1/T$, the capacitor should have discharged its load again before the contact is reopened. This is essentially guaranteed if $C < T/2R$ has been selected.

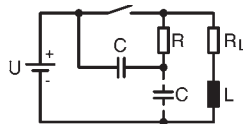
DC circuits with an inductive load

While the maximum switching voltage U is applied when a resistive load is present at the contact, voltage peaks that are approximately 10 times as high can occur in the case of an inductive load.



Voltage characteristics at the relay contact for inductive loads

To avoid harmful discharge processes, it is necessary to prevent a sudden disruption in the flow of current and simultaneously ensure that the voltage rise at the contact, which is limited by the degradation of the magnetic field, takes place at a slower rate than the opening of the contact. This counteracts the occurrence of a discharge process and an air gap is therefore created as quickly as possible after the opening of the contact whose igniting voltage far exceeds the voltage building up at the contacts. An RC element which lies parallel to the contact can also be used for this purpose.



RC element for inductive load

When the contact opens, a charging current which is subsiding after an e function, flows into the capacitor. This slows down the absorption of the current that is flowing through the inductor and the peak value of the voltage at the contact is simultaneously reduced. The following serves as a practical, approximate value for the rating of the capacitor

$$C (\mu F) \cong I^2 / 10 (A)$$

where I represents the respective switching current. The resistance must be rated so that the combined total of the capacitor discharge current and the switching current is again less than the permitted starting current.

Another possibility is the parallel connection of an RC element to the load itself (see diagram above). This protective measure is equally effective. The disadvantage of both arrangements is the use of relatively large and therefore expensive capacitors.

RC circuit for AC load

A VDR resistor (Voltage Dependent Resistor) or varistor can be connected in parallel to the load in this application in order to protect the contact. The resistance of this component is low for high voltage levels and high for low voltage levels. Varistors are therefore extremely suitable for the suppression of arcs in AC circuits. Table 2 gives an overview of further possibilities for arc suppression.

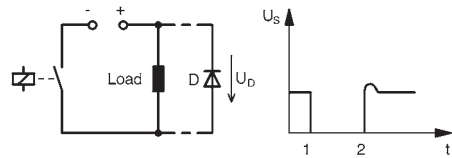
Coupling relays
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Protective circuit for load	Additional release delay	Defined limit for induced voltage	Bipolar attenuation	Benefits / Disadvantages
Diode	long	yes (U_D)	no	Benefits: Simple implementation Cost effective Reliable Non-critical dimensioning Small induced voltage Disadvantages: Attenuation only via load resistance Long release delay
Series-connected diode / Zener diode	medium to short	yes (U_{ZD})	no	Benefits: Non-critical dimensioning Disadvantages: Attenuation only above U_{ZD}
Arc suppression diode	medium to short	yes (U_{ZD})	yes	Benefits: Cost effective Non-critical dimensioning Suitable for AC voltage Limit of positive peaks Disadvantages: Attenuation only above U_{ZD}
Varistor	medium to short	yes (U_{VDR})	yes	Benefits: High absorption of energy Non-critical dimensioning Suitable for AC voltage Disadvantages: Attenuation only above U_{VDR}
RC-Combination	medium to short	no	yes	Benefits: HF attenuation of stored energy Suitable for AC voltage Attenuation is not dependent on the level Disadvantages: Exact values required High inrush current Sensitive to harmonic waves

Overview of protective measures on the switch output

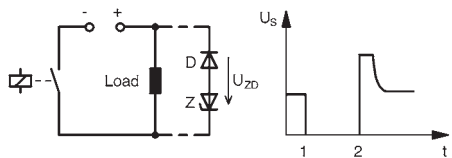
Diode:



Benefit: Can be used for all capacities, low overvoltage, compact, cost-effective

Disadvantage: Very high resetting time

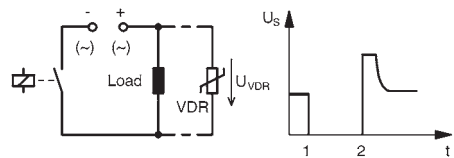
Diode and Zener diode:



Benefit: Low overvoltage (defined by Zener diode), low resetting time

Disadvantage: Cannot be used for large capacities

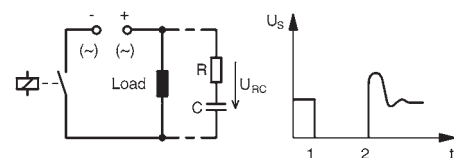
Varistor:



Benefit: Low resetting time, cost-effective

Disadvantage: Cannot be used for all operating voltages and capacities

RC combination:

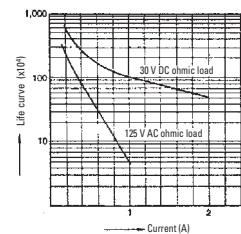


Benefit: Low overvoltage, low resetting time

Disadvantage: High current loading of the contacts at start-up, more costly and time-consuming with increased capacity

Life expectancy

A distinction is made in relay modules between mechanical and electrical life. The mechanical life defines the maximum number of operating cycles without contact loading while the electrical life describes the switching frequency at a maximum switching capacity for resistive load. A low switching capacity increases these values considerably. The following diagram indicates the typical waveform between the switching current and life of a relay. Figures for each relay module is shown on the relevant catalogue data page.



Typical life expectancy curve of a relay

Safety separation – VDE 0106

The safety separation of coupled switching circuits in the relay modules means that the isolating voltage between the control and load circuit is retained even in the event of a mechanical failure (bent solder pin, broken coil winding or spring). When using solid-state relays or electronic relays, this requirement is met using double or reinforced insulation. The norms DIN 50178, VDE 0106 and 109 form the basis for safety separation. VDE 0884 also applies to solid-state relays.

All Wieland modules meet these requirements.

Coupling relays Pluggable interface relays *flare* ^{MOVE} interface

Overall width: 6.2 mm
pluggable



flare ^{MOVE} 12 V

Input 12 V DC, AC/DC

Output 1 change-over contact 250 V 6 A (SPDT)

Approvals:

flare ^{MOVE} 24 V

Input 24 V DC, AC/DC

Output 1 change-over contact 250 V 6 A (SPDT)

Approvals:

Dimensions (mm): W x H x D
6.2 x 88 x 76

Description	AgSnO ₂	Std. Pack	AgSnO ₂ + Au (5 µ)	Std. Pack	AgSnO ₂	Std. Pack	AgSnO ₂ + Au (5 µ)	Std. Pack
12 V relay module DC	80.010.4501.0	10	80.010.4501.1	10				
24 V relay module DC					80.010.4502.0	10	80.010.4502.1	10
12 V relay module AC / DC	80.010.4521.0	10	80.010.4521.1	10				
24 V relay module AC / DC					80.010.4522.0	10	80.010.4522.1	10
Coil circuit								
Nominal operating voltage	12 V DC		12 V AC / DC		24 V DC		24 V AC / DC	
Maximum operating voltage	14.4 V DC		13.2 V AC / DC		28.8 V DC		26.4 V AC / DC	
Minimum operating voltage	9.0 V DC		8.4 V AC / DC		18.2 V DC		19.2 V AC / DC	
Nominal input current	17 mA		19 mA		9.4 mA		12 mA	
Nominal input capacity AC/DC	0.2 W		0.25 V A		0.23 W		0.3 V A	
Operating range	(0.75...1.2) U _N		(0.7 ... 1.1) U _N		(0.75...1.2) U _N		(0.75...1.2) U _N	
Connectable via pluggable jumper	Up to 20 modules				Up to 20 modules			
Status display	LED green				LED green			
Switching characteristics	AgSnO₂		AgSnO₂ + Au (5 µ)		AgSnO₂		AgSnO₂ + Au (5 µ)	
Maximum switching voltage	400 V AC				400 V AC			
Nominal switching voltage	250 V AC				250 V AC			
Maximum switching current	6 A AC / DC				6 A AC / DC			
Maximum switching capacity AC / DC	1500 V A / 150 W				1500 V A / 150 W			
Maximum starting current	10 A				10 A			
Pick-up/release delay (including bouncing)	7 ms / 11 ms				7 ms / 11 ms			
Maximum switching frequency	20 Hz (without load); 0.1 Hz (at full load)				20 Hz (without load); 0.1 Hz (at full load)			
Contact material	AgSnO₂		AgSnO₂ + Au (5 µ)		AgSnO₂		AgSnO₂ + Au (5 µ)	
Minimum selectable voltage	12 V AC / DC		5 V AC / DC		12 V AC / DC		5 V AC / DC	
Minimum selectable current	10 mA AC / DC		2 mA AC / DC		10 mA AC / DC		2 mA AC / DC	
Minimum switching capacity	500 mW		50 mW		500 mW		50 mW	
Mechanical life	1 x 10 ⁷				1 x 10 ⁷			
Electrical life 230 V AC / 6 A	6 x 10 ⁴				6 x 10 ⁴			
Rated voltage	250 V				250 V			
Isolation voltage of input/output	4 kV _{eff.}				4 kV _{eff.}			
Overvoltage category	III (according to HD 625.1S1)				III (according to HD 625.1S1)			
Degree of pollution	2 (according to HD 625.1S1)				2 (according to HD 625.1S1)			
Ambient temperature	0 °C...+50 °C				0 °C...+50 °C			
Storage temperature	-40 °C...+55 °C				-40 °C...+55 °C			
Protection type/mounting rail	IP 20 / TS35				IP 20 / TS35			
Emitted interference/interference immunity								
Wire range of screw terminal: fine-stranded/solid	0.14 mm ² – 1.5 mm ² / 0.5 mm ² – 2.5 mm ²				0.14 mm ² – 1.5 mm ² / 0.5 mm ² – 2.5 mm ²			
Accessories	Part No.	Std. Pack	Matching relay		Part No.	Std. Pack	Matching relay	
Screw holder for operating voltage (6/12/24) V DC	80.063.4001.1	10	12 or 24 V DC		80.063.4001.1	10	12 or 24 V DC	
Screw holder for operating voltage (6/12/24) V AC/DC	80.063.4021.1	10	12 or 24 V DC		80.063.4021.1	10	12 or 24 V DC	
Screw holder for operating voltage (48/60) V AC/DC	80.063.4023.1	10	60 V DC		80.063.4023.1	10	60 V DC	
Screw holder for operating voltage (110...125) V AC/DC	80.063.4025.1	10	60 V DC		80.063.4025.1	10	60 V DC	
Screw holder for operating voltage (220...240) V AC/DC	80.063.4026.1	10	60 V DC		80.063.4026.1	10	60 V DC	
Insulation plate IP SF38	80.063.4009.1	10			80.063.4009.1	10		
Comb-shaped jumper for linking the terminals, continuous current 36 A, 20 pole, KB SF38	80.063.4029.1	10			80.063.4029.1	10		
Marking plate BM SF38	80.063.4129.3	1			80.063.4129.3	1		
	AgSnO ₂	Std. Pack	AgSnO ₂ + Au (5 µ)	Std. Pack	AgSnO ₂	Std. Pack	AgSnO ₂ + Au (5 µ)	Std. Pack
6 V DC relay	80.063.4030.0	10	80.063.4030.1	10				
12 V DC relay	80.063.4031.1	10	80.063.4031.0	10				
24 V DC relay					80.063.4032.0	10	80.063.4032.1	10

Coupling relays

Pluggable interface relays *flare* ^{MOVE}

Overall width: 6.2 mm
pluggable



Dimensions (mm): W x H x D
6.2 x 88 x 76

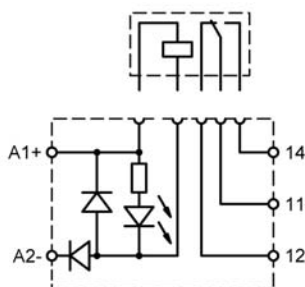
***flare* ^{MOVE} 115 V**
Input 115 V, AC/DC
Output 1 change-over contact 250 V 6 A (SPDT)
 Approvals:

***flare* ^{MOVE} 230 V**
Input 230 V, AC/DC
Output 1 change-over contact 250 V 6 A (SPDT)
 Approvals:

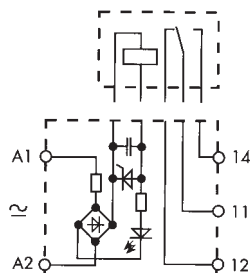
Description	AgSnO ₂	Std. Pack	AgSnO ₂ + Au (5 μ)	Std. Pack	AgSnO ₂	Std. Pack	AgSnO ₂ + Au (5 μ)	Std. Pack
115 V AC/DC relay module	80.010.4525.0	10	80.010.4525.1	10				
230 V AC/DC relay module					80.010.4526.0	10	80.010.4526.1	10
Coil circuit								
Nominal operating voltage	115 V AC/DC (50/60 Hz)				230 V AC/DC (50/60 Hz)			
Maximum operating voltage	126 V				253 V			
Minimum operating voltage	92 V				184 V			
Nominal input current	5 mA				4 mA			
Nominal input capacity	0.6 VA				0.9 VA			
Operating range	(0.8 ... 1.1) U _N				(0.8 ... 1.1) U _N			
Connectable via pluggable jumper	Up to 20 modules				Up to 20 modules			
Status display	LED green				LED green			
Switching characteristics	AgSnO₂		AgSnO₂ + Au (5 μ)		AgSnO₂		AgSnO₂ + Au (5 μ)	
Maximum switching voltage	400 V AC*				400 V AC*			
Nominal switching voltage	250 V AC				250 V AC			
Maximum switching current	6 A				6 A			
Maximum switching capacity AC 1	1500 VA				1500 VA			
Maximum starting current	10 A (0.5 sec.)				10 A (0.5 sec.)			
Pick-up/release delay (including bouncing)	7 ms / 11 ms				7 ms / 11 ms			
Maximum switching frequency	10 Hz (without load); 0.5 Hz (at full load)				10 Hz (without load); 0.5 Hz (at full load)			
Contact material	AgSnO₂		AgSnO₂ + Au (5 μ)		AgSnO₂		AgSnO₂ + Au (5 μ)	
Minimum selectable voltage	12 V		5 V		12 V		5 V	
Minimum selectable current	10 mA		2 mA		10 mA		2 mA	
Minimum switching capacity	500 mW		50 mW		500 mW		50 mW	
Mechanical life AC/DC	1 x 10 ⁷				1 x 10 ⁷			
Electrical life AC 1	6 x 10 ⁴				6 x 10 ⁴			
Rated voltage	250 V				250 V			
Isolation voltage of input/output	4 kV _{eff.}				4 kV _{eff.}			
Overvoltage category	III				III			
Degree of pollution	3				3			
Ambient temperature	-40 °C...+55 °C				-40 °C...+55 °C			
Storage temperature	-40 °C...+55 °C				-40 °C...+55 °C			
Protection type/mounting rail	IP 20 / TS35				IP 20 / TS35			
Emitted interference/interference immunity								
Wire range of screw terminal: fine-stranded/solid	0.25 mm ² – 2.5 mm ² / 0.25 mm ² – 2.5 mm ²				0.25 mm ² – 2.5 mm ² / 0.25 mm ² – 2.5 mm ²			
Accessories	Part No.	Std. Pack	Matching relay		Part No.	Std. Pack	Matching relay	
Screw holder for operating voltage (6/12/24) V DC	80.063.4001.1	10	12 or 24 V DC		80.063.4001.1	10	12 or 24 V DC	
Screw holder for operating voltage (6/12/24) V AC/DC	80.063.4021.1	10	12 or 24 V DC		80.063.4021.1	10	12 or 24 V DC	
Screw holder for operating voltage (48/60) V AC/DC	80.063.4023.1	10	60 V DC		80.063.4023.1	10	60 V DC	
Screw holder for operating voltage (110...125) V AC/DC	80.063.4025.1	10	60 V DC		80.063.4025.1	10	60 V DC	
Screw holder for operating voltage (220...240) V AC/DC	80.063.4026.1	10	60 V DC		80.063.4026.1	10	60 V DC	
Insulation plate IP SF38	80.063.4009.1	10			80.063.4009.1	10		
Comb-shaped jumper for linking the terminals A1, A2, continuous current 36 A, 20 pole, KB SF38								
20 poles	80.063.4029.1	10			80.063.4029.1	10		
Marking plate BM SF38	80.063.4129.3	1			80.063.4129.3	1		
	AgSnO ₂	Std. Pack	AgSnO ₂ + Au (5 μ)	Std. Pack	AgSnO ₂	Std. Pack	AgSnO ₂ + Au (5 μ)	Std. Pack
60 V DC relay	80.063.4034.0	10	80.063.4034.1	10	80.063.4034.0	10	80.063.4034.1	10

Circuit diagrams: **flare** MOVE – mechanical relay couplers

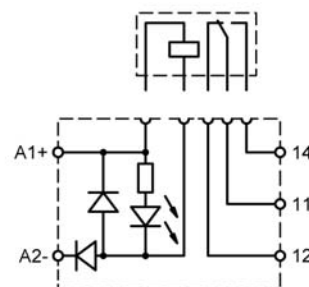
12 V DC relay,
1 change-over contact (SPDT)
Part No. 80.010.4501.0
Part No. 80.010.4501.1



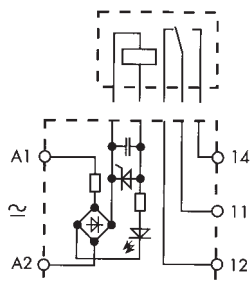
12 V DC; AC/DC relay
1 change-over contact (SPDT)
Part No. 80.010.4521.0
Part No. 80.010.4521.1



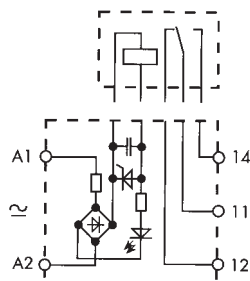
24 V DC relay,
1 change-over contact (SPDT)
Part No. 80.010.4502.0
Part No. 80.010.4502.1



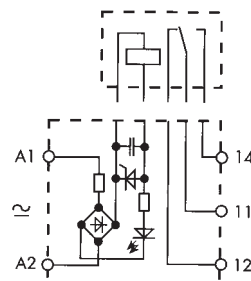
24 V DC; AC/DC relay
1 change-over contact (SPDT)
Part No. 80.010.4522.0
Part No. 80.010.4522.1



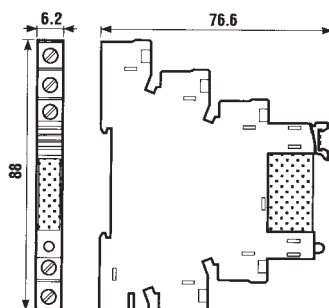
115 V AC/DC relay
1 change-over contact (SPDT)
Part No. 80.010.4525.0
Part No. 80.010.4525.1



230 V AC/DC relay
1 change-over contact (SPDT)
Part No. 80.010.4526.0
Part No. 80.010.4526.1



Dimensions



interface

Coupling relays Pluggable interface relays *flare* MOVE

Overall width: 15.8 mm, pluggable
1 change-over contact / 2 change-over contacts



flare MOVE 12 V
Input 12 V AC, DC
Output 1/2 change-over contact(s) 230 V 10/8 A
Approvals:

flare MOVE 24 V
Input 24 V AC, DC
Output 1/2 change-over contact(s) 230 V 16/8 A
Approvals:

Dimensions (mm): W x H x D
15.8 x 78.6 x 76

Description	Type	Part No.	Std. Pack	Type	Part No.	Std. Pack
Coupling relay 12V DC; 1U; AgNi; 10A	Flare move 12DC1W10A	80.010.4701.2	10			
Coupling relay 12V AC; 1U; AgNi; 10A	Flare move 12AC1W10A	80.010.4711.2	10			
Coupling relay 12V DC; 2U; AgNi; 8A	Flare move 12DC2W8A	80.010.5101.2	10			
Coupling relay 24 V DC; 1U; AgCdO; 16 A				Flare move 24DC1W16A	80.010.4902.3	10
Coupling relay 24 V AC; 1U; AgCdO; 16 A				Flare move 24AC1W16A	80.010.4912.3	10
Coupling relay 24 V DC; 2U; AgNi; 8 A				Flare move 24DC2W8A	80.010.5102.2	10
Coil circuit (same for both contact materials)	DC	AC		DC	AC	
Nominal operating voltage	12 V DC	12 V AC		24 V DC	24 V AC	
Maximum operating voltage	21 V DC	13.2 V AC		40.8 V DC	26.4 V AC	
Minimum operating voltage	8.8 V DC	9.6 V AC		17.5 V DC	19.2 V AC	
Nominal input current	41 mA	90.5 mA		22.2 mA	46 mA	
Nominal input capacity	0.5 W	1.2 VA		0.5 W	1.2 VA	
Operating range	(0.73 ... 1.75) U _N	(0.8 ... 1.1) U _N		(0.73 ... 1.75) U _N	(0.8 ... 1.1) U _N	
Connectable via pluggable jumper	Up to 8 modules			Up to 8 modules		
Status display	LED green			LED green		
Switching characteristics	1 change-over contact	2 change-over contacts		1 change-over contact	2 change-over contacts	
Maximum switching voltage	400 V AC*	250 V AC		400 V AC*	250 V AC	
Nominal switching voltage	250 V AC	250 V AC		250 V AC	250 V AC	
Maximum switching current	10 A AC/DC	8 A AC/DC		16 A	8 A AC/DC	
Maximum switching capacity AC 1	2500 VA	2000 VA		4000 VA	2000 VA	
Maximum starting current	20 A (0.5 sec.)	15 A (0.5 sec.)		30 A	15 A (0.5 sec.)	
Pick-up/release delay (including bouncing)	15 ms / 12 ms			15 ms / 12 ms		
Maximum switching frequency	10 Hz (without load); 0.5 Hz (at full load)			10 Hz (without load); 0.5 Hz (at full load)		
Contact material	AgNi			AgCdO	AgNi	
Minimum selectable voltage	5 V AC/DC			10 V AC/DC	5 V AC/DC	
Minimum selectable current	5 mA AC/DC			5 mA AC/DC		
Minimum switching capacity	300 mW			500 mW	300 mW	
Mechanical life DC/AC	2 x 10 ⁷ / 1 x 10 ⁷	2 x 10 ⁷		2 x 10 ⁷ / 1 x 10 ⁷	2 x 10 ⁷	
Electrical life AC 1	2 x 10 ⁵ / 1 x 10 ⁵	1 x 10 ⁵		1 x 10 ⁵	1 x 10 ⁵	
Rated voltage	250 V			250 V		
Isolation voltage of input/output	4 kV			4 kV		
Overvoltage category	III			III		
Degree of pollution	3	2		3	2	
Ambient temperature	-40°C...+70°C			-40°C...+70°C		
Storage temperature	-40°C...+70°C			-40°C...+70°C		
Protection type/mounting rail	IP 20 / TS35			IP 20 / TS35		
Emitted interference/interference immunity						
Wire range of screw terminal: fine-stranded/solid	0.25 mm ² – 4 mm ² / 0.25 mm ² – 6 mm ²			0.25 mm ² – 4 mm ² / 0.25 mm ² – 6 mm ²		
Relay type						
Relay 12 V DC; 1 change-over contact; AgNi; 10 A		80.063.5031.2	10			
Relay 12 V AC; 1 change-over contact; AgNi; 10 A		80.063.5041.2	10			
Relay 12 V DC; 2 change-over contacts; AgNi; 8 A		80.063.5231.2	10			
Relay 24 V DC; 1 change-over contact; AgCdO; 16 A					80.063.5132.2	10
Relay 24 V AC; 1 change-over contact; AgCdO; 16 A					80.063.5142.2	10
Relay 24 V DC; 2 change-over contacts; AgNi; 8 A					80.063.5232.2	10
Accessories	Type	Part No.	Std. Pack	Type	Part No.	Std. Pack
Variclip (plastic, black), retaining clip	VARICLIP	80.063.5009.1	10	VARICLIP	80.063.5009.1	10
Retaining clip (metal)	METALL	80.063.5019.1	10	METALL	80.063.5019.1	10
Comb shaped jumper 8 pole for linking terminals A1, A2, continuous current 10A	KB SF48	80.063.5029.2	10	KB SF48	80.063.5029.2	10
Marking tag (plastic, white)	BZ SF48	80.063.5029.3	10	BZ SF48	80.063.5029.3	10

Coupling relays

Pluggable interface relays *flare* ^{MOVE}

Overall width: 15.8 mm, pluggable
1 change-over contact / 2 change-over contacts



flare ^{MOVE} 115 V AC

Input 115 V AC

Output 1/2 change-over contact(s) 250 V 16/8 A

Approvals:

flare ^{MOVE} 230 V AC

Input 230 V AC

Output 1/2 change-over contact(s) 230 V 16/8 A

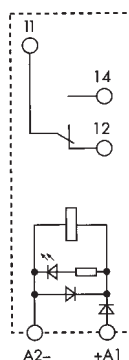
Approvals:

Dimensions (mm): W x H x D
15.8 x 78.6 x 76

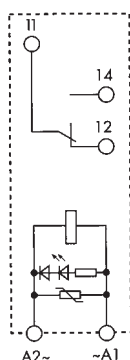
Description	Type	Part No.	Std. Pack	Type	Part No.	Std. Pack
Coupling relay 115V AC; 1U; AgCdO; 16A	Flare move 115AC1W16	80.010.4915.3	10			
Coupling relay 115V AC; 2U, AgNi; 8A	Flare move 115AC2W8	80.010.5315.2	10			
Coupling relay 230V AC; 1U; AgCdO; 16A				Flare move 230AC1W16	80.010.4916.3	10
Coupling relay 230V AC; 2U, AgNi; 8A				Flare move 230AC2W8	80.010.5316.2	10
Coil circuit						
Nominal operating voltage	115 V AC (50/60 Hz)			230 V AC (50/60 Hz)		
Maximum operating voltage	121 V AC			253 V AC		
Minimum operating voltage	88 V AC			184 V AC		
Nominal input current	10.1 mA			7 mA		
Nominal input capacity	1.2 VA			1.2 VA		
Operating range	(0.8 ... 1.1) U _N			(0.8 ... 1.1) U _N		
Connectable via pluggable jumper	Up to 8 modules			Up to 8 modules		
Status display	LED green			LED green		
Switching characteristics	1 change-over contact	2 change-over contacts		1 change-over contact	2 change-over contacts	
Maximum switching voltage	400 V AC*	250 V AC		400 V AC*	250 V AC	
Nominal switching voltage	250 V AC	250 V AC		250 V AC	250 V AC	
Maximum switching current	16 A**	8 A		16 A	8 A	
Maximum switching capacity AC 1	4000 VA	2000 VA		4000 VA	2000 VA	
Maximum starting current	30 A (0.5 sec.)	15 A (0.5 sec.)		30 A (0.5 sec.)	15 A (0.5 sec.)	
Pick-up/release delay (including bouncing)	10 ms / 10 ms			10 ms / 10 ms		
Maximum switching frequency	10 Hz (without load); 0.5 Hz (at full load)			10 Hz (without load); 0.5 Hz (at full load)		
Contact material	AgCdO	AgNi		AgCdO	AgNi	
Minimum selectable voltage	10 V AC/DC	5 V AC/DC		10 V AC/DC	5 V AC/DC	
Minimum selectable current	5 mA AC/DC	5 mA AC/DC		5 mA AC/DC	5 mA AC/DC	
Minimum switching capacity	500 mW	300 mW		500 mW	300 mW	
Mechanical life AC/DC	1 x 10 ⁷ / 1 x 10 ⁷			1 x 10 ⁷		
Electrical life AC 1	1 x 10 ⁵ / 1 x 10 ⁵			1 x 10 ⁵		
Rated voltage	250 V			250 V		
Isolation voltage of input/output	4 kV			4 kV		
Overvoltage category	III			III		
Degree of pollution	3	2		3	2	
Ambient temperature	-40 °C...+70 °C			-40 °C...+70 °C		
Storage temperature	-40 °C...+70 °C			-40 °C...+70 °C		
Protection type/mounting rail	IP 20 / TS35			IP 20 / TS35		
Emitted interference/interference immunity						
Wire range of screw terminal: fine-stranded/solid	0.25 mm ² – 4 mm ² / 0.25 mm ² – 6 mm ²			0.25 mm ² – 4 mm ² / 0.25 mm ² – 6 mm ²		
Relay type						
Relay 115 V AC; 1 change-over contact; AgCdO; 16 A		80.063.5145.2	10			
Relay 115 V AC; 2 change-over contacts; AgNi; 8 A		80.063.5245.2	10			
Relay 230 V AC; 1 change-over contact; AgCdO; 16 A					80.063.5146.2	10
Relay 230 V AC; 2 change-over contacts; AgNi; 8 A					80.063.5246.2	10
Accessories	Type	Part No.	Std. Pack	Type	Part No.	Std. Pack
Variclip (plastic, black), retaining clip	VARICLIP	80.063.5009.1	10	VARICLIP	80.063.5009.1	10
Retaining clip (metal)	METALL	80.063.5019.1	10	METALL	80.063.5019.1	10
Comb shaped jumper 8 pole for linking terminals A1, A2, continuous current 10A	KB SF48	80.063.5029.2	10	KB SF48	80.063.5029.2	10
Marking tag (plastic, white)	BZ SF48	80.063.5029.3	10	BZ SF48	80.063.5029.3	10

Circuit diagrams: **flare** ^{MOVE} – mechanical relay couplers

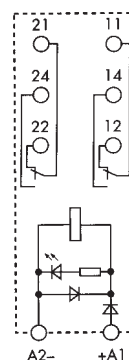
12 V DC relay
Part No. 80.010.4701.2
24 V DC relay
Part No. 80.010.4902.3



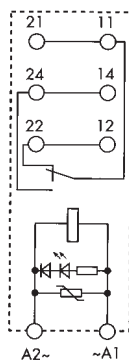
12 V AC relay
Part No. 80.010.4711.2
24 V AC relay
Part No. 80.010.4912.3



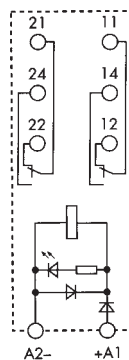
12 V DC relay
Part No. 80.010.5101.2
24 V DC relay
Part No. 80.010.5102.2



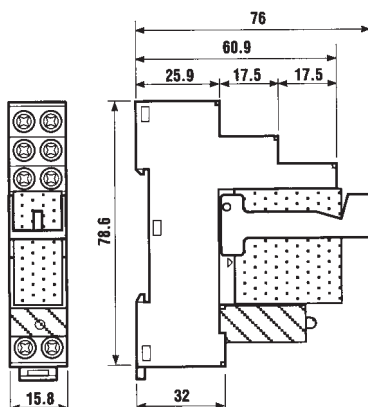
115 V AC relay
Part No. 80.010.4915.3
230 V AC relay
Part No. 80.010.4916.3



115 V AC relay
Part No. 80.010.5315.2
230 V AC relay
Part No. 80.010.5316.2



Dimensions



interface

Coupling relays Interface relays

interface

Overall width 6.2 mm
Screw or spring clamp terminal
can be selected



flare 12/24 V DC
Input 12/24 V DC
Output 1 change-over contact
AC 250 V 6 A / DC 300 V 2 A (SPDT)

Approvals:



flare 24 V AC/DC
Input 24 V AC/DC
Output 1 change-over contact DC 48 V 20 mA
(SPDT)

Approvals:

Dimensions (mm): W x H x D
6.2 x 89 x 70

Description	Type	Part No.	Std. Pack	Type	Part No.	Std. Pack
12 V DC spring clamp connection	flare-12DC-1W-250V6A-F	80.010.4106.0	10			
24 V DC spring clamp connection	flare-24DC-1W-250V6A-F	80.010.4100.0	10			
24 V DC screw connection	flare-24DC-1W-250V6A	80.010.4000.0	10			
24 V AC/DC spring clamp connection				flare-24V-1W-48V20M-F	80.010.4105.0	10
24 V AC/DC screw connection				flare-24V-1W-48V20M	80.010.4005.0	10
Coil circuit						
Operating voltage	12 V +25 % / 17 %	24 V +25 % / -20 %		24 V +25 % / -20 %		
Nominal input current	ca. 18 mA	ca. 14 mA		ca. 14 mA		
Nominal input capacity	ca. 0.22 W	ca. 0.35 W		ca. 0.35 W		
Holding current at 20 °C	> 2.3 mA	> 1.2 mA		> 1.2 mA		
Connectable via pluggable jumper	Up to 50 modules			Up to 50 modules		
Status display	LED green			LED green		
Switching characteristics						
Maximum switching voltage	250 V AC / 300 V DC			48 V DC		
Maximum switching current	6 A AC / 2 A DC			20 mA		
Maximum switching capacity	1500 VA / 120 W			1.2 W		
Maximum starting current	10 A; 4 sec.					
Pick-up/release delay	15 ms / 20 ms	8 ms / 10 ms		8 ms / 20 ms		
Bouncing time	2 ms			2 ms		
Maximum switching frequency	< 0.1 Hz (50% ED)			< 0.1 Hz (50% ED)		
Contact material	AgSnO ₂			AgSnO ₂ + 3μ Au		
Minimum selectable voltage	24 V			5 V		
Minimum selectable current	8 mA			1 mA		
Mechanical life	1 x 10 ⁷			2 x 10 ⁷		
Electrical life 24 V DC / 2 A	6 x 10 ⁵			6 x 10 ⁵		
Electrical life 230 V AC / 6 A	8 x 10 ⁴			8 x 10 ⁴		
Rated voltage						
Isolation voltage of input/output	4 kV _{eff.}			4 kV _{eff.}		
Overvoltage category	III (according to HD 625.1S1)			III (according to HD 625.1S1)		
Degree of pollution	2 (according to HD 625.1S1)			2 (according to HD 625.1S1)		
Ambient temperature	0 °C... +60 °C (Derating)			0 °C...+60 °C (Derating)		
Storage temperature	-40 °C...+85 °C			-40 °C...+85 °C		
Protection type/mounting rail	IP 20 / TS35			IP 20 / TS35		
Standards/specifications	VDE 0160; VDE 0106 T101			VDE 0160; VDE 0106 T101		
Emitted interference/interference immunity	EN 61000-6-3; EN 61000-6-2			EN 61000-6-3; EN 61000-6-2		
Wire range of screw terminal/spring clamp terminal						
fine-stranded	0.5 mm ² – 2.5 mm ² 0.25 mm ² – 1.5 mm ²			0.5 mm ² – 2.5 mm ² 0.25 mm ² – 1.5 mm ²		
solid	0.25 mm ² – 4 mm ² 0.25 mm ² – 2.5 mm ²			0.25 mm ² – 4 mm ² 0.25 mm ² – 2.5 mm ²		
CSA EX approval in range	Class I, Division 2, Groups A, B, C and D			Class I, Division 2, Groups A, B, C and D		
Accessories						
Pluggable jumper (U _{max} = 50 V, I _{max} = 2 A)		Z8.000.0200.8	10		Z8.000.0200.8	10
8 digit marking tag, unmarked, 60 pcs.		Z4.242.5153.0	10		Z4.242.5153.0	10
Comb for potential distribution, red/blue*		Z8.000.0202.3 / Z8.000.0202.4	5		Z8.000.0202.3 / Z8.000.0202.4	5
End caps for comb red/blue		Z8.000.0202.1 / Z8.000.0202.2	20		Z8.000.0202.1 / Z8.000.0202.2	20
* for screw terminals only						

Coupling relays
Interface relays

interface



Dimensions (mm): W x H x D

flare 24 V
Input 24 V DC
Output 2 change-over contacts AC 250 V 6 A / DC 300 V 2 A (DPDT)
12.4 x 89 x 70
Approvals:

flare 115/230 V AC
Input 115/230 V AC
Output 1 change-over contact AC 250 V 6 A / DC 300 V 2 A (SPDT)
6.2 x 89 x 70
Approvals:

Description	Type	Part No.	Std. Pack	Type	Part No.	Std. Pack
24 V DC spring clamp connection	flare-24DC-2W-250V6A-F	80.010.4103.0	5			
115 V AC spring clamp connection				flare-110V-1W-250V6A-F	80.010.4131.0	10
230 V AC spring clamp connection				flare-230V-1W-50V6A-F	80.010.4141.0	10
Coil circuit						
Operating voltage	24 V +25 %/-20 %			115 V +10 % / -15 %	230 V + 10 % / - 15 %	
Nominal input current	ca. 18 mA			ca. 3.9 mA	ca. 3 mA	
Nominal input capacity	ca. 0.45 W			ca. 0.48 W	ca. 0.65 W	
Holding current at 20 °C	> 2 mA			> 0.6 mA	> 0.3 mA	
Connectable via pluggable jumper	Up to 50 modules			Up to 50 modules		
Status display	LED green			LED green		
Switching characteristics						
Maximum switching voltage	250 V AC			250 V AC / 300 V DC		
Maximum switching current	6 A AC / 2 A DC			6 A AC / 2 A DC		
Maximum switching capacity	1500 VA / 120 W			1500 VA / 120 W		
Maximum starting current	10 A; 4 sec.			10 A; 4 sec.		
Pick-up/release delay	ca. 15 ms / 20 ms			8 ms / 10 ms		
Bouncing time	2 ms			2 ms		
Maximum switching frequency	< 0.1 Hz (50% ED)			< 10 Hz		
Contact material	AgSnO ₂			AgSnO ₂		
Minimum selectable voltage	12 V			24 V		
Minimum selectable current	5 mA			8 mA		
Mechanical life	2 x 10 ⁷			2 x 10 ⁷		
Electrical life 24 V DC / 2 A	8 x 10 ⁵			6 x 10 ⁵		
Electrical life 230 V AC / 6 A	6 x 10 ⁴			8 x 10 ⁴		
Rated voltage						
Isolation voltage of input/output	4 kV _{eff.}			4 kV _{eff.}		
Overvoltage category	III (according to HD 625.1S1)			III (according to HD 625.1S1)		
Degree of pollution	2 (according to HD 625.1S1)			2 (according to HD 625.1S1)		
Ambient temperature	0 °C...+60 °C (Derating)			0 °C...+60 °C (Derating)		
Storage temperature	-40 °C...+85 °C			-40 °C...+85 °C		
Protection type/mounting rail	IP 20 / TS35			IP 20 / TS35		
Standards/specifications	VDE 0160; VDE 0106 T101			VDE 0160; VDE 0106 T101		
Emitted interference/interference immunity	EN 61000-6-3; EN 61000-6-2			EN 61000-6-3; EN 61000-6-2		
Wire range of screw terminal/spring clamp terminal						
fine-stranded	0.25 mm ² – 1.5 mm ²			0.25 mm ² – 1.5 mm ²		
solid	0.25 mm ² – 2.5 mm ²			0.25 mm ² – 2.5 mm ²		
CSA EX approval in range				Class I, Division 2, Groups A, B, C and D		
Accessories						
Pluggable jumper (U _{max} = 50 V, I _{max} = 2 A)		Z8.000.0200.8	10		Z8.000.0200.8	10
8 digit marking tag, unmarked, 60 pcs.		Z4.242.5153.0	10		Z4.242.5153.0	10

Coupling relays Interface relays interface

Overall width: 6.2 mm
Isolation in the input or in the output



Dimensions (mm): W x H x D
6.2 x 89 x 70

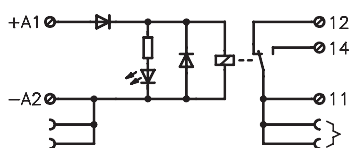
flare 24 V Knife edge disconnect relay
Input 24 V AC/DC
Output 1 change-over contact AC 250 V 6 A/DC 300 V 2 A (SPDT)
Approvals:

flare 24 V HAND-0-AUTO relay
Input 24 V AC/DC
Output 1 normally open contact AC 250 V 6 A/DC 300 V 2 A (SPDT)
Approvals:

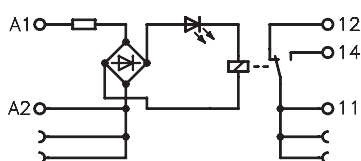
Description	Type	Part No.	Std. Pack	Type	Part No.	Std. Pack
24 V AC/DC spring clamp connection	flare-24V-1W-250V6A-CUT	80.010.4120.0	10	flare-24V-1S-250V6A-HA	80.010.4101.0	10
Coil circuit						
Operating voltage	24 V AC/DC +25 %/–20 %			24 V AC/DC +25 %/–20 %		
Nominal input current	ca. 14 mA			ca. 14 mA		
Nominal input capacity	ca. 0.35 W			ca. 0.35 W		
Holding current at 20 °C	> 1.2 mA			> 1.2 mA		
Connectable via pluggable jumper	Up to 50 modules			Up to 50 modules		
Status display	LED green			LED green		
Switching characteristics						
Maximum switching voltage	250 V AC / 300 V DC			250 V AC / 300 V DC		
Maximum switching current	6 A AC / 2 A DC			6 A AC / 2 A DC		
Maximum switching capacity	1500 VA / 120 W			1500 VA / 48 W		
Maximum starting current	10 A; 4 sec.			10 A; 4 sec.		
Pick-up/release delay	8 ms / 20 ms			8 ms / 20 ms		
Bouncing time	2 ms			2 ms		
Maximum switching frequency	< 0.1 Hz (50 % ED)			< 0.1 Hz (50 % ED)		
Contact material	AgSnO ₂			AgSnO ₂		
Minimum selectable voltage	24 V			24 V		
Minimum selectable current	8 mA			8 mA		
Mechanical life	2 x 10 ⁷			2 x 10 ⁷		
Electrical life 24 V DC / 2 A	6 x 10 ⁵			6 x 10 ⁵		
Electrical life 230 V AC / 6 A	8 x 10 ⁴			8 x 10 ⁴		
Rated voltage						
Isolation voltage of input/output	4 kV _{eff.}			4 kV _{eff.}		
Overvoltage category	III (according to HD 625.1S1)			III (according to HD 625.1S1)		
Degree of pollution	2 (according to HD 625.1S1)			2 (according to HD 625.1S1)		
Ambient temperature	0 °C...+60 °C (Derating)			0 °C...+60 °C (Derating)		
Storage temperature	–40 °C...+85 °C			–40 °C...+85 °C		
Protection type/mounting rail	IP 20 / TS35			IP 20 / TS35		
Standards/specifications	VDE 0160; VDE 0106 T101			VDE 0160; VDE 0106 T101		
Emitted interference/interference immunity	EN 61000-6-3; EN 61000-6-2			EN 61000-6-3; EN 61000-6-2		
Wire range of screw terminal	–			–		
Wire range of spring clamp terminal						
fine-stranded	0.25 mm ² – 1.5 mm ²			0.25 mm ² – 1.5 mm ²		
solid	0.25 mm ² – 2.5 mm ²			0.25 mm ² – 2.5 mm ²		
CSA EX approval in range	Class I, Division 2, Groups A, B, C and D			Class I, Division 2, Groups A, B, C and D		
Accessories						
Pluggable jumper (U _{max} = 50 V, I _{max} = 2 A)	Z8.000.0200.8			Z8.000.0200.8		
8 digit marking tag, unmarked, 60 pcs.	Z4.242.5153.0			Z4.242.5153.0		
Contact material						
Rail	CuZn37F38-3μAg					
Plug	CuSn6FB370-3μAg					

Circuit diagrams: *flare* – mechanical relay couplers

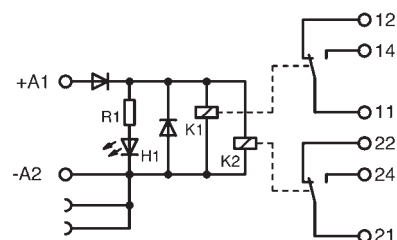
12-V-/24-V relay
1 change-over contact (SPDT)



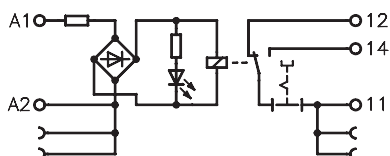
110-V-/230-V relay
1 change-over contact (SPDT)



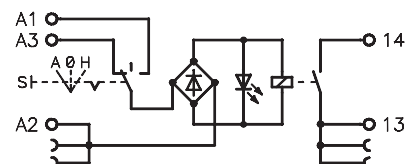
24-V relay
2 change-over contacts (DPDT)



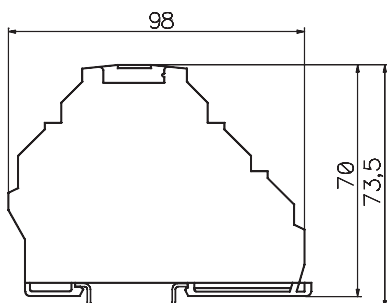
Knife edge disconnect relay



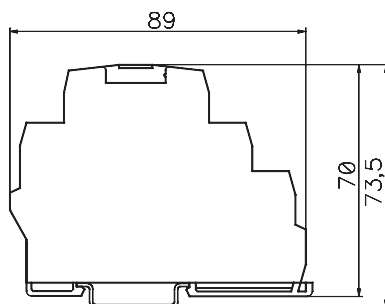
Hand-0-Auto relay
(SPST, N.O.)



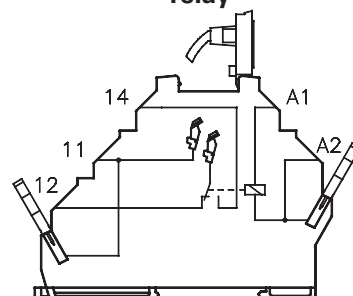
Housing with spring clamp terminals



Housing with screw terminals

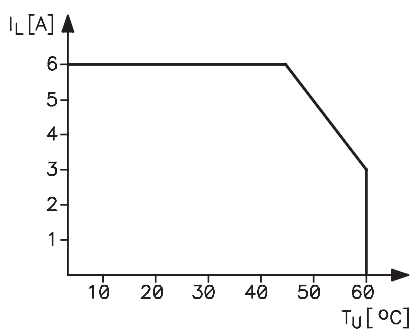


Connection of knife edge disconnect relay

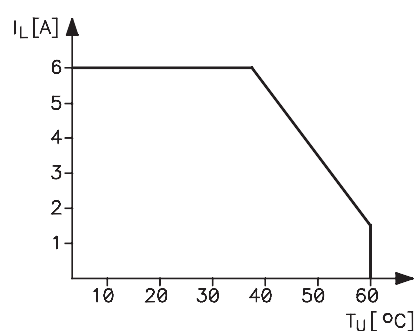


Derating: *flare* – mechanical relay couplers

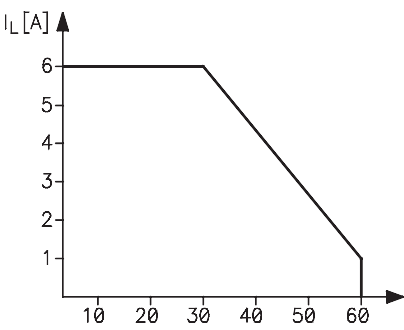
110 V relay 1 change-over contact



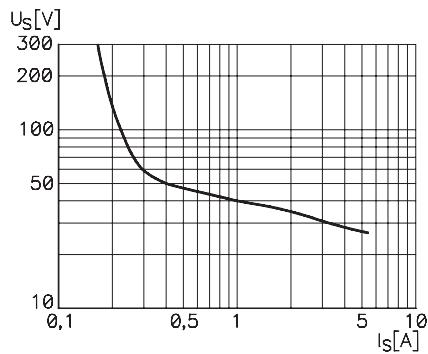
230 V relay
1 change-over contact



24 V relay 1/2 change-over contact(s)
12 V relay 1 change-over contact
Knife edged disconnect relay
HAND-0-AUTO relay



Load limit curve for DC loads



Switching capacity
according to 60947-5.1

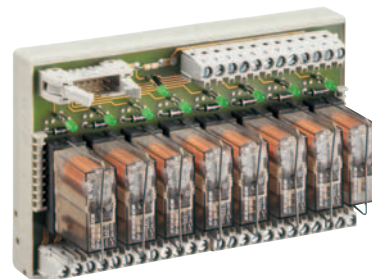
	AC 12	AC 15	DC 13
V	A	A	A
24	6	3	1
110	6	3	0,2
230	6	3	0,1

interface

Coupling relays
Relay output modules
interface

Relay output modules

- 1 relay
- 4 relay
- 8 relay
- 16 relay



R12-12V-1W

Input 12 V AC/DC

Output 1 change-over contact 250 V AC 5 A (SPDT)
12.5 × 80 × 58.3

RAB 4/8/16

Input 24 V DC

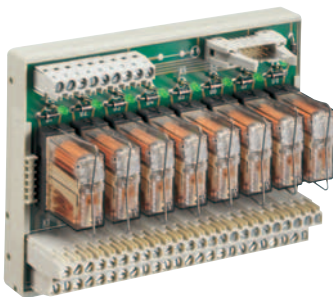
Output 1 change-over contact 250 V AC 5 A (SPDT)
70/128/280 x 80 x 71

Dimensions (mm): W x H x D

Description	Type	Part No.	Std. Pack	Type	Part No.	Std. Pack
1 relay	R12-12V-1W-250V5A	87.220.7553.0	10			
4 relay positive switching				RAB-SS 4	87.220.1853.0	1
8 relay positive switching				RAB-FSS 8	87.220.1953.3	1
16 relay positive switching				RAB-FSS 16	87.220.2253.3	1
4 relay negative switching				RAB-SS 4 M	87.221.5553.0	1
Coil circuit						
Operating voltage	12 V AC/DC ±10%			24 V DC +10%/−15%		
Nominal input current per input	34 mA			25 mA		
Nominal input capacity	0.4 W			0.6 W		
Holding current at 20 °C	> 2 mA			> 2 mA		
Status display	LED green			LED green		
Switching characteristics						
Maximum switching voltage	250 V AC / ¹⁾ V DC			250 V AC / ¹⁾ V DC		
Maximum switching current	8 A AC/ ¹⁾ A DC			8 A AC/ ¹⁾ A DC		
Maximum switching capacity	2000 VA / 120 W			2000 VA / 120 W		
Maximum continuous current	5 A AC/DC ¹⁾			5 A AC/DC ¹⁾		
Pick-up/release delay approx.	9 ms / 12 ms			9 ms / 12 ms		
Bouncing time	4 ms			4 ms		
Maximum switching frequency	40 Hz			40 Hz		
Contact material	AgCdO			AgCdO		
Minimum selectable voltage	12 V			12 V		
Minimum selectable current	100 mA			100 mA		
Mechanical life	3 x 10 ⁷			3 x 10 ⁷		
Electrical life 24 V DC / 2 A	6 x 10 ⁵			6 x 10 ⁵		
Electrical life 230 V AC / 6 A	6 x 10 ⁵			6 x 10 ⁵		
Rated voltage						
Isolation voltage of input/output	4 kV _{eff.}			4 kV _{eff.}		
Overvoltage category						
Degree of pollution						
Ambient temperature	−25 °C...Derating			−25 °C...Derating		
Storage temperature	−40 °C...+85 °C			−40 °C...+85 °C		
Mounting rail	TS 32 or TS 35			TS 32 or TS 35		
Standards/specifications						
Emitted interference/interference immunity						
Wire range, fine-stranded/solid	0.5 mm ² – 2.5 mm ² / 0.5 mm ² – 4 mm ²			0.5 mm ² – 2.5 mm ² / 0.5 mm ² – 4 mm ²		
Location of mounting rail	horizontal			horizontal		
Accessories						
Replacement relay		Z8.000.0056.9	10		Z8.000.0056.9	10
¹⁾ See limit curve on page 892						

Coupling relays Relay output modules

- 4 relay
- 8 relay



In the case of multiple modules (1 change-over contact/
2 change-over contacts), the outputs must be supplied from
the same phase (e.g. L1)

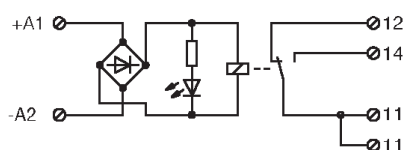
Input 24 V DC

Output 2 change-over contacts 250 V AC 5 A (DPDT)

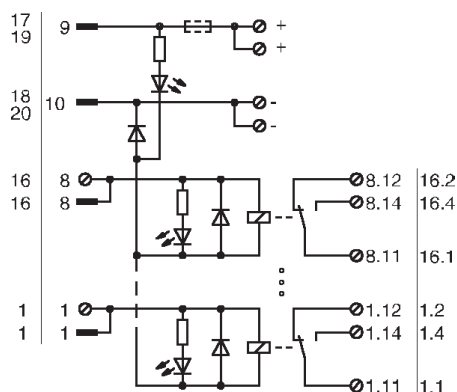
¹⁾ See limit curve on page 892

Circuit diagrams

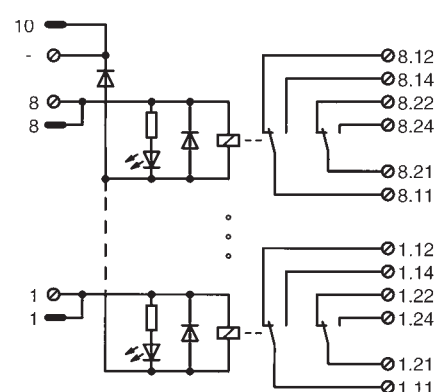
R12-12V-1W 250 V 5 A



RAB – 1 change-over contact

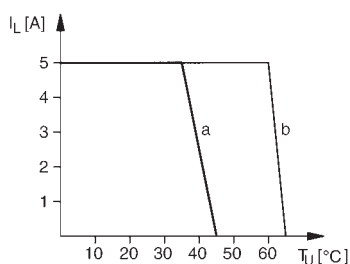


RAB – 2 change-over contacts



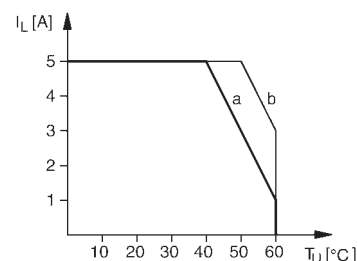
Derating

R12-12V-1W 250 V 5 A



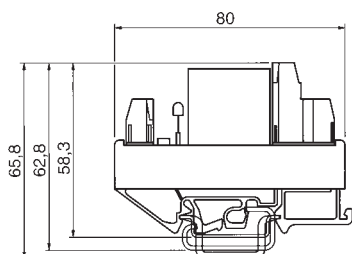
a = continuous operation
b = switching operation 50% duty cycle

RAB-FSS and RAB-SS

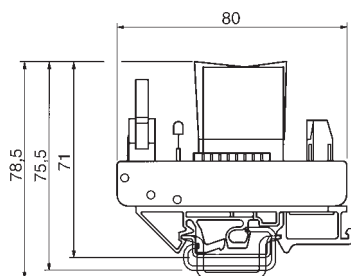


Dimensions

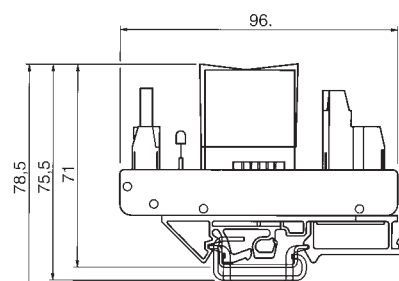
R12-12V-1W 250 V 5 A



RAB – 1 change-over contact



RAB – 2 change-over contacts

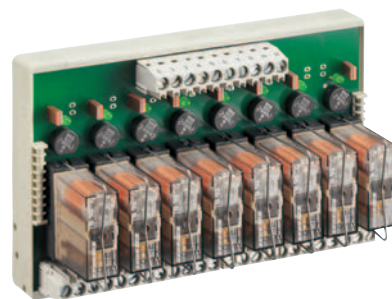


interface

Coupling relays
Relay output modules
interface

Relay modules input/output

- 1 relay
- 4 relay
- 8 relay

**WR 1-230-1W**

Input 230 V AC/DC

Output 1 change-over contact 250 V AC 4 A (SPDT)
12.5 x 80 x 70

WR 4/8-115-1W

Input 115 V AC/DC

Output 1 change-over contact 250 V AC 4 A (SPDT)
70/128 x 80 x 71

Dimensions (mm): W x H x D

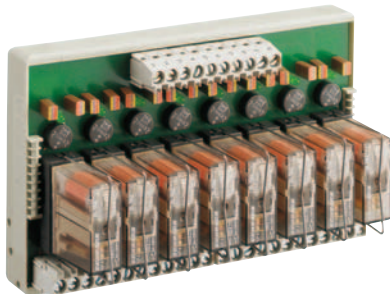
Description	Type	Part No.	Std. Pack
1 relay	WR1-230-1W-250V4A	80.010.0011.0	10
4 relay			
8 relay			
Coil circuit			
Operating voltage	230 V AC/DC +6% / -10%		115 V AC/DC +6% /-10%
Nominal input current per input	ca. 4.5 mA AC		ca. 4.8 mA AC/DC
Nominal input capacity	ca. 1.0 VA		ca. 0.6 VA/W
Holding current at 20 °C	> 0.9 mA AC		< 1 mA AC / < 0.8 mA DC
Suppression circuit for input	polarized diode, arc suppression diode		polarized diode, arc suppression diode
Status display	LED green		LED green
Switching characteristics			
Maximum switching voltage	250 V AC / 110 V DC		250 V AC / 110 V DC
Maximum switching current	8 A AC / 10 A DC		6 A AC / 10 A DC
Maximum switching capacity	2000 VA / 192 W		2000 VA / 192 W
Maximum continuous current	4 A AC/DC		4 A AC/DC
Pick-up/release delay approx.	10 ms / 15 ms		9 ms / 12 ms
Bouncing time	4 ms		< 4 ms
Maximum switching frequency	40 Hz		40 Hz
Contact material	AgNi + 4...6 µ Au		AgNi 0.15 + 0.2 µ Au
Minimum selectable voltage	µV		5 V
Minimum selectable current	µA		10 mA
Mechanical life	3 x 10 ⁷		3 x 10 ⁷
Electrical life 24 V DC / 2 A	3 x 10 ⁵		1.5 x 10 ⁵
Electrical life 230 V AC / 6 A	3 x 10 ⁵		1.5 x 10 ⁵
Rated voltage			
Isolation voltage of input/output	4 kV _{eff.}		4 kV _{eff.}
Overvoltage category			
Degree of pollution			
Ambient temperature	-25 °C...Derating		-25 °C...+50 °C
Storage temperature	-40 °C...+80 °C		-40 °C...+80 °C
Mounting rail	TS 32 or TS 35		TS 32 or TS 35
Standards/specifications			
Emitted interference/interference immunity			
Wire range, fine-stranded/solid	0.5 mm² – 2.5 mm² / 0.5 mm² – 4 mm²		0.5 mm² – 2.5 mm² / 0.5 mm² – 4 mm²
Location of mounting rail	horizontal		horizontal
Accessories			
Replacement relay		Z8.000.0181.0	10
¹⁾ See limit curve on page 899			

Coupling relays
Relay output modules

interface

Relay module input/output

- 4 relay
- 8 relay



Important note for users:
In the case of multiple modules (1 change-over contact/
2 change-over contacts), the outputs must be supplied from
the same phase (e.g. L1)

WR 4/8-230-1W
Input 230 V AC/DC
Output 1 change-over contact 250 V AC 4 A (SPDT)
70/128 x 80 x 71

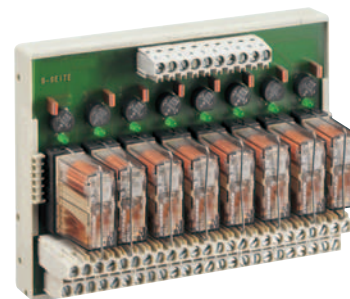
Dimensions (mm): W x H x D

Description	Type	Part No.	Std. Pack
1 relay			
4 relay	WR4-230-1W-250V4A	80.010.1106.0	1
8 relay	WR8-230-1W-250V4A	80.010.1114.0	1
Coil circuit			
Operating voltage	230 V AC/DC +6%/–10%		
Nominal input current per input	ca. 4.8 mA AC/DC		
Nominal input capacity	ca. 1.0 VA/W		
Holding current at 20 °C	> 1 mA AC / > 0.8 mA DC		
Suppression circuit for input	polarized diode, arc suppression diode		
Status display	LED green		
Switching characteristics			
Maximum switching voltage	250 V AC / ¹⁾ V DC		
Maximum switching current	6 A AC / ¹⁾ A DC		
Maximum switching capacity	2000 VA / 192 W		
Maximum continuous current	4 A AC/DC		
Pick-up/release delay approx.	9 ms / 12 ms		
Bouncing time	4 ms		
Maximum switching frequency	40 Hz		
Contact material	AgNi 0.15 + 0.2 µ Au		
Minimum selectable voltage	5 V		
Minimum selectable current	10 mA		
Mechanical life	3 x 10 ⁷		
Electrical life 24 V DC / 2 A	1.5 x 10 ⁵		
Electrical life 230 V AC / 6 A	1.5 x 10 ⁵		
Rated voltage			
Isolation voltage of input/output	4 kV _{eff.}		
Overvoltage category			
Degree of pollution			
Ambient temperature	–25 °C...+50 °C		
Storage temperature	–40 °C...+80 °C		
Mounting rail	TS 32 or TS 35		
Standards/specifications			
Emitted interference/interference immunity			
Wire range, fine-stranded/solid	0.5 mm ² – 2.5 mm ² / 0.5 mm ² – 4 mm ²		
Location of mounting rail	horizontal		
Accessories			
Replacement relay	Z8.000.0181.0	10	
¹⁾ See limit curve on page 899			

Coupling relays
Relay output modules
interface

Relay output modules with 2 change-over contacts

- 1 relay
- 4 relay
- 8 relay

**WR 1-DUO-2W**

Input 115/230 V AC/DC
Output 2 change-over contacts 250 V AC 5 A (DPDT)
 22.5 x 80 x 68

WR 4/8-115-2W

Input 115 V AC/DC
Output 2 change-over contacts 250 V AC 5 A (DPDT)
 70/128 x 80 x 71

Dimensions (mm): W x H x D

Description	Type	Part No.	Std. Pack	Type	Part No.	Std. Pack
1 relay	WR1-DUO-2W-250V5A	80.010.1100.0	5			
4 relay				WR4-115-2W-250V4A	80.010.1104.0	1
8 relay				WR8-115-2W-250V4A	80.010.1112.0	1
Coil circuit						
Operating voltage	115/230 V AC/DC +6%/-10%			115 V AC/DC +6%/-10%		
Nominal input current per input	ca. 4.8 mA / 4.8 mA AC/DC			ca. 4.8 mA AC/DC		
Nominal input capacity	ca. 0.6 VA/W / 1.2 VA/W			ca. 0.6 VA/W		
Holding current at 20 °C	> 1.0 mA AC / > 0.8 mA DC			> 1 mA AC / > 0.8 mA DC		
Suppression circuit for input	polarized diode, arc suppression diode			polarized diode, arc suppression diode		
Status display	LED green			LED green		
Switching characteristics						
Maximum switching voltage	250 V AC / ¹⁾ V DC			250 V AC / ¹⁾ V DC		
Maximum switching current	6 A AC / ¹⁾ A DC			6 A AC / ¹⁾ A DC		
Maximum switching capacity	1500 VA / 192 W			1500 VA / 192 W		
Maximum continuous current	5 A AC/DC (derating to be considered)			4 A AC/DC (derating to be considered)		
Pick-up/release delay approx.	9 ms / 12 ms			< 9 ms / < 12 ms		
Bouncing time	< 4 ms			< 4 ms		
Maximum switching frequency						
Contact material	AgNi 0.15 + 0.2 μ Au			AgNi 0.15 + 0.2 μ Au		
Minimum selectable voltage	5 V			5 V		
Minimum selectable current	10 mA			10 mA		
Mechanical life	3 x 10 ⁷			3 x 10 ⁷		
Electrical life 24 V DC / 2 A	1.5 x 10 ⁵			1.5 x 10 ⁵		
Electrical life 230 V AC / 6 A	1.5 x 10 ⁵			1.5 x 10 ⁵		
Rated voltage						
Isolation voltage of input/output	4 kV _{eff.}			4 kV _{eff.}		
Overvoltage category						
Degree of pollution						
Ambient temperature	-25 °C... +50 °C (Derating)			-25 °C... +50 °C (Derating)		
Storage temperature	-40 °C... +80 °C			-40 °C... +80 °C		
Mounting rail	TS 32 or TS 35			TS 32 or TS 35		
Standards/specifications						
Emitted interference/interference immunity						
Wire range, fine-stranded/solid	0.5 mm ² - 2.5 mm ² / 0.5 mm ² - 4 mm ²			0.5 mm ² - 2.5 mm ² / 0.5 mm ² - 4 mm ²		
Location of mounting rail	horizontal			horizontal		
Accessories						
Replacement relay	Z8.000.0176.2			10	Z8.000.0176.2	10
¹⁾ See limit curve on page 899						

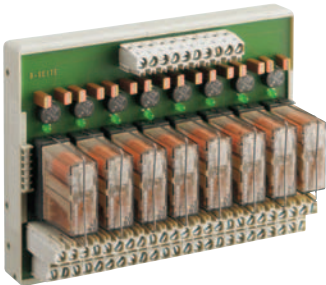
Coupling relays

Relay output modules

interface

Relay output modules with 2 change-over contacts

- 4 relay
- 8 relay



Important note for users:
In the case of multiple modules (1 change-over contact/
2 change-over contacts), the outputs must be supplied from
the same phase (e.g. L1)

WR 4/8-230-2W
Input 230 V AC/DC
Output 2 change-over contacts 250 V AC 5 A (DPDT)
70/128 x 80 x 71

Dimensions (mm): W x H x D

Description	Type	Part No.	Std. Pack
1 relay			
4 relay	WR4-230-2W-250V4A	80.010.1108.0	1
8 relay	WR8-230-2W-250V4A	80.010.1116.0	1
Coil circuit			
Operating voltage	230 V AC/DC +6%/−10%		
Nominal input current	ca. 4.8 mA AC/DC		
Nominal input capacity	ca. 1.2 VA/W		
Holding current at 20 °C	> 1 mA AC / > 0.8 mA DC		
Suppression circuit for input	polarized diode, arc suppression diode		
Status display	LED green		
Switching characteristics			
Maximum switching voltage	250 V AC / ¹⁾ V DC		
Maximum switching current	6 A AC / ¹⁾ A DC		
Maximum switching capacity	1500 VA / 192 W		
Maximum continuous current	4 A AC/DC (derating to be considered)		
Pick-up/release delay approx.	< 9 ms / < 12 ms		
Bouncing time	< 4 ms		
Maximum switching frequency			
Contact material	AgNi 0.15 + 0.2 μ Au		
Minimum selectable voltage	5 V		
Minimum selectable current	10 mA		
Mechanical life	3 x 10 ⁷		
Electrical life 24 V DC / 2 A	1.5 x 10 ⁵		
Electrical life 230 V AC / 6 A	1.5 x 10 ⁵		
Rated voltage			
Isolation voltage of input/output	4 kV _{eff.}		
Overvoltage category			
Degree of pollution			
Ambient temperature	−25 °C...+50 °C (Derating)		
Storage temperature	−40 °C...+80 °C		
Mounting rail	TS 32 or TS 35		
Standards/specifications			
Emitted interference/interference immunity			
Wire range, fine-stranded/solid	0.5 mm ² – 2.5 mm ² / 0.5 mm ² – 4 mm ²		
Location of mounting rail	horizontal		
Accessories			
Replacement relay	Z8.000.0176.2		10
¹⁾ See limit curve on page 899			

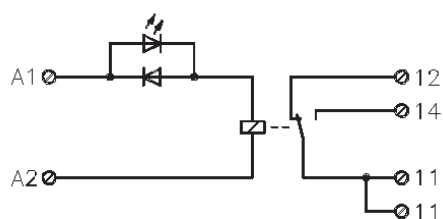
Coupling relays

Relay output modules

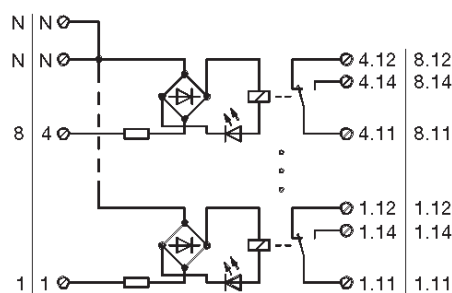
interface

Circuit diagrams

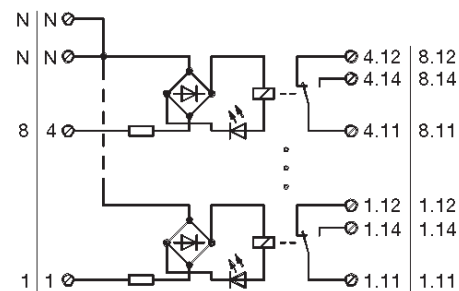
WR1-230-1W 250 V 4 A



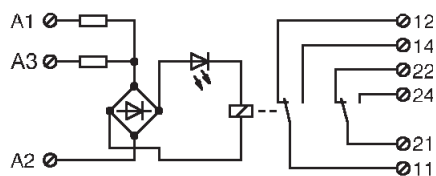
WR4/8-115-1W 250 V 4 A



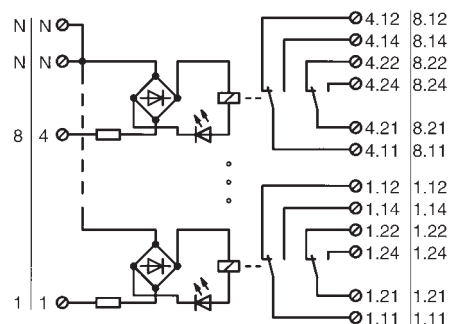
WR4/8-230-1W 250 V 4 A



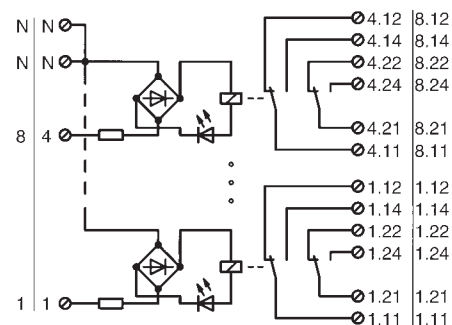
WR1-DUO-2W 250 V 5 A



WR4/8-115-2W 250 V 4 A



WR4/8-230-2W 250 V 4 A

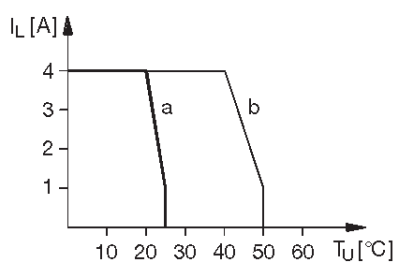


Derating

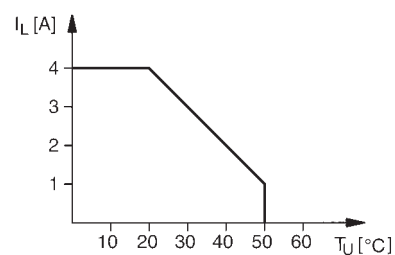
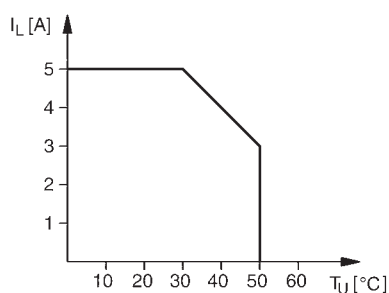
WR1 – 1 change-over contact

WR1 – DUO

WR4/WR8 – 2 change-over contacts



a = side by side without spacing
b = side by side with spacing of 5 mm

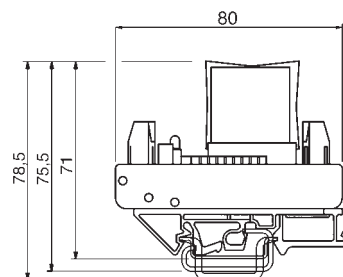
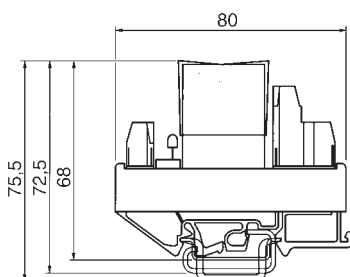
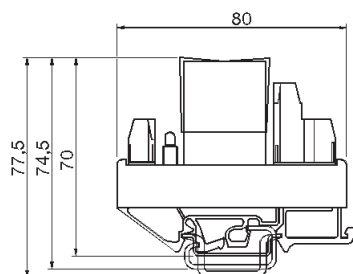


Dimensions

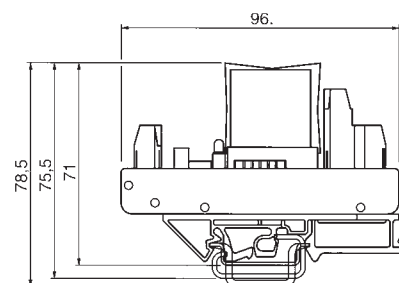
WR1 – 1 change-over contact

WR1 – DUO

WR4/WR8 – 1 change-over contact



WR4/WR8 – 2 change-over contacts



interface

- 24 V input signal
- 4 kV separation between I/O at a creepage and clearance distance of 8 mm



**Output 250 V AC / 48 V DC 20 mA (SPDT)
1 change-over contact**

Approvals:

12.5 x 80 x 60

Dimensions (mm): W x H x D

Description	Type	Part No.	Std. Pack	Type	Part No.	Std. Pack
WRS relay system	WRS-REL-1S-250V5A	80.010.0005.0	10	WRS-REL-1W-250V5A	80.010.0008.0	10
WRS relay system	WRS-REL-1S-48V20M	80.010.0007.0	10	WRS-REL-1W-48V20M	80.010.0009.0	10
WRS high-current relays						
Coil circuit						
Operating voltage	24 V AC/DC +10%/−15%			24 V DC +10%/−15%		
Nominal input current per input	25 mA			25 mA		
Nominal input capacity	ca. 0.6 W/VA			ca. 0.6 W/VA		
Holding current at 20 °C	≥ 2 mA			≥ 2 mA		
Parallel connection of max.	20 relays			20 relays		
Suppression circuit for input	Polarized diode, arc suppression diode			Polarized diode, arc suppression diode		
Status display	LED green			LED green		
Switching characteristics	Output	Input		Output	Input	
Maximum switching voltage	250 V AC/DC ²⁾	48 V DC		250 V AC/DC ²⁾	48 V DC	
Maximum switching current	8 A AC/DC ²⁾	20 mA		8 A AC/DC ²⁾	20 mA	
Maximum switching capacity	2000 VA / 192 W	1.2 W		2000 VA / 192 W	1.2 W	
Maximum continuous current	5 A AC/DC			5 A AC/DC		
Pick-up/release delay approx.	8 ms / 8 ms	10 ms / 10 ms		8 ms / 8 ms	10 ms / 10 ms	
Bouncing time	3 ms	3 ms		3 ms	3 ms	
Contact material	AgCdO	AgNi 0.15 + 10 μ Au		AgCdO	AgNi 0.15 + 10 μ Au	
Minimum selectable voltage	12 V	μV		12 V	μV	
Minimum selectable current	100 mA	μA		100 mA	μA	
Mechanical life	3 x 10 ⁷	3 x 10 ⁷		3 x 10 ⁷	3 x 10 ⁷	
Electrical life 26 V DC / 15 mA	3 x 10 ⁵			3 x 10 ⁵		
Electrical life 24 V DC / 5 A	2.5 x 10 ⁵			2.5 x 10 ⁵		
Electrical life 230 V AC / 6 A	2.5 x 10 ⁵			2.5 x 10 ⁵		
Rated voltage						
Isolation voltage of input/output	4 kV _{eff.}	4 kV _{eff.}		4 kV _{eff.}	4 kV _{eff.}	
Overvoltage category						
Degree of pollution						
Ambient temperature	−25 °C...+65 °C (Derating)	−25 °C...+50 °C		−25 °C...+65 °C (Derating)	−25 °C...+50 °C	
Storage temperature	−40 °C...+85 °C	−40 °C...+85 °C		−40 °C...+85 °C	−40 °C...+85 °C	
Mounting rail	TS 32 or TS 35			TS 32 or TS 35		
Standards/specifications						
Emitted interference/Interference immunity						
Wire range, fine-stranded/solid	0.5 mm ² – 2.5 mm ² / 0.5 mm ² – 4 mm ²			0.5 mm ² – 2.5 mm ² / 0.5 mm ² – 4 mm ²		
Location of mounting rail	horizontal			horizontal		
Accessories						
Pluggable jumper (I _{max} = 0.5 A AC/DC)	Z8.000.0103.4		10	Z8.000.0103.4		10
²⁾ See DC limit curve on page 903						

Coupling relays Relay systems

- 24 V input signal
- 4 kV separation between I/O at a creepage and clearance distance of 8 mm

High current relay for 16 A



WRS-REL-2W

Output 250 V AC / 48 V DC 20 mA (DPDT)

2 change-over contacts

Approvals:

22.5 x 80 x 60

WRS-REL-1W

Output 250 V AC 16 A (SPDT)

1 change-over contact

Approvals:

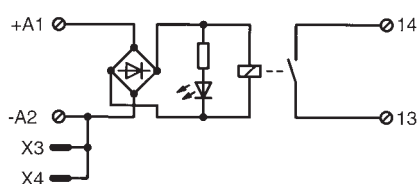
22.5 x 80 x 60

Dimensions (mm): W x H x D

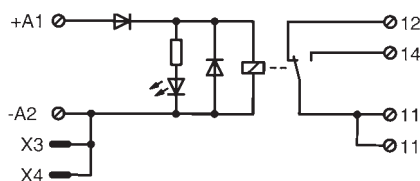
Description	Type	Part No.	Std. Pack	Type	Part No.	Std. Pack
WRS relay system	WRS-REL-2W-250V5A	80.010.1003.0	5			
WRS relay system	WRS-REL-2W-48V20M	80.010.1002.0	5			
WRS high-current relays				WRS-REL-1W-250V16	80.010.0010.0	5
Coil circuit	Output	Input				
Operating voltage	24 V AC/DC +10%/−15%	24 V DC +10%/−15%		24 V AC/DC +10%/−15%		
Nominal input current		25 mA		25 mA		
Nominal input capacity		ca. 0.6 W/VA		ca. 0.6 W/VA		
Holding current at 20 °C		≥ 2 mA		≥ 2 mA		
Parallel connection of max.		20 relays		20 relays		
Suppression circuit for input	Rectifier			Polarized diode		
Status display	LED green			LED green		
Switching characteristics	Output	Input				
Maximum switching voltage	250 V AC/DC ²⁾	48 V DC		250 V AC / V DC ²⁾		
Maximum switching current	6 A AC/DC ²⁾	20 mA		16 A AC / V DC ²⁾		
Maximum switching capacity	1500 VA / 144 W	1.2 W		4000 VA / 400 W ²⁾		
Maximum continuous current	5 A AC/DC			16 A AC/DC ²⁾		
Pick-up/release delay approx.	10 ms / 5 ms	10 ms / 10 ms		10 ms / 5 ms		
Bouncing time	3 ms	3 ms		3 ms		
Contact material	AgNi+HV	AgNi 0.15 + 10 μ Au		AgCdO		
Minimum selectable voltage	12 V	μV		12 V		
Minimum selectable current	100 mA	μA		100 mA		
Mechanical life	3 x 10 ⁷	3 x 10 ⁷		3 x 10 ⁷		
Electrical life 26 V DC / 15 mA		3 x 10 ⁵				
Electrical life 24 V DC / 5 A	2.5 x 10 ⁵			1.8 x 10 ⁵		
Electrical life 230 V AC / 6 A	2.5 x 10 ⁵			1.8 x 10 ⁵		
Rated voltage						
Isolation voltage of input/output	4 kV _{eff.}	4 kV _{eff.}		4 kV _{eff.}		
Overvoltage category						
Degree of pollution						
Ambient temperature	−25 °C...+50 °C	−25 °C...+50 °C		−25 °C...+75 °C (Derating)		
Storage temperature	−40 °C...+85 °C	−40 °C...+85 °C		−40 °C...+85 °C		
Mounting rail	TS 32 or TS 35			TS 32 or TS 35		
Standards/specifications						
Emitted interference/interference immunity						
Wire range, fine-stranded/solid	0.5 mm ² – 2.5 mm ² / 0.5 mm ² – 4 mm ²			0.5 mm ² – 2.5 mm ² / 0.5 mm ² – 4 mm ²		
Location of mounting rail	horizontal			horizontal		
Accessories						
Pluggable jumper (I _{max} = 0.5 A AC/DC)		Z8.000.0103.4	10		Z8.000.0103.4	10
²⁾ See DC limit curve and derating curve on page 903						

Circuit diagrams of relay couplers

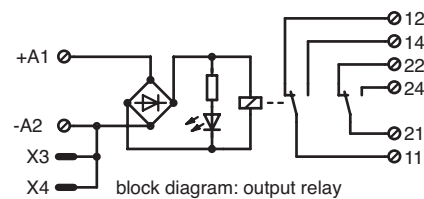
WRS-REL-1S 250 V 5 A



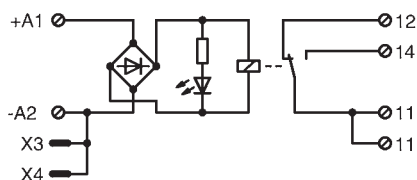
WRS-REL-1W 250 V 5 A



WRS-REL-2W 250 V 5 A

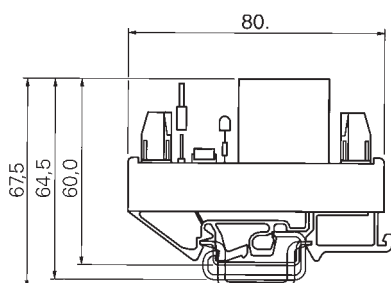


WRS-REL-1W 250 V 16 A

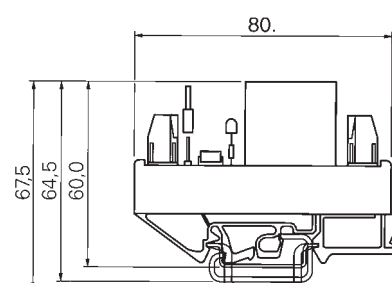


Dimensions

WRS-REL-1S 250 V 5 A
WRS-REL-1W 250 V 16 A

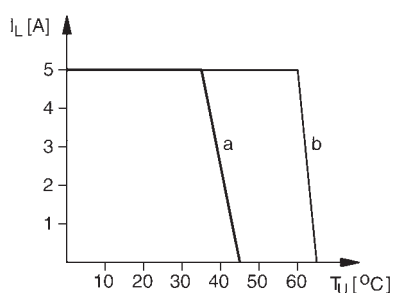


WRS-REL-1W 250 V 5 A
WRS-REL-2W 250 V 5 A



Derating

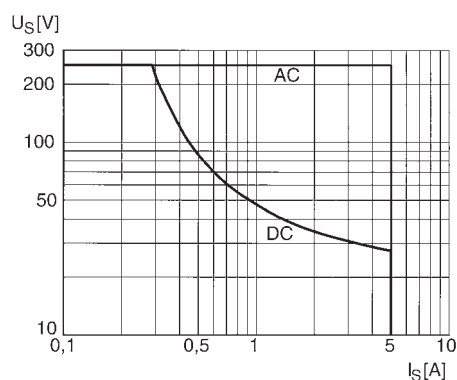
WRS-REL-1S 250 V 5 A
WRS-REL-1W 250 V 5 A



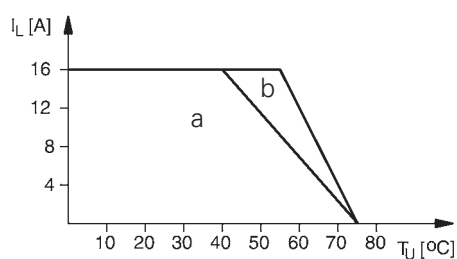
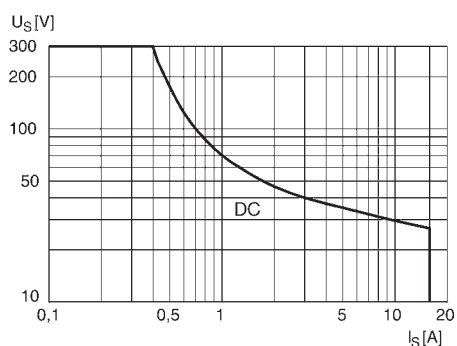
a = side by side without spacing
b = side by side with spacing > 20 mm

Limit curve:

WRS-REL-1S 250 V 5 A
WRS-REL-1W 250 V 5 A
WRS-REL-2W 250 V 5 A



DC limit curve and derating curve: WRS-REL-1W 250 V 16 A



a = side by side without spacing
b = side by side with spacing of 5 mm

Coupling relays

Switching relay NGS 12

interface

Electronic coupling relays

- 4 mono voltages AC/DC available
- 1 function: coupling relay
- 2 change-over contacts
- 1 LED for function control



NGS 12

Input 24/28/115/230 V AC/DC

Output 2 change-over contacts 250 V AC 5 A

Function

By applying supply voltage to terminals A1 and A2, the two change-over contacts switch into the ON position. If the supply voltage is switched off, they will switch back into the OFF position.

The LED shows the switching position of the contacts.

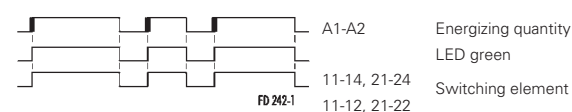
Notes

Phase L1 or L+ must be connected to terminal A1; neutral conductor N or M must be connected to terminal A2.

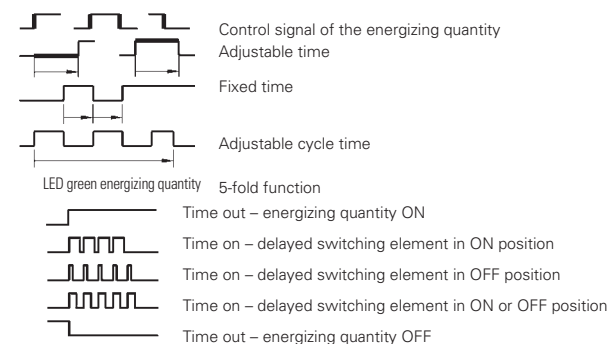
The internal switching relays are controlled electronically in order to ensure safe switching of the coupling relays even under the most difficult conditions.

External connection to freewheeling diodes or RC combinations is not required, as the relays are wired internally accordingly.

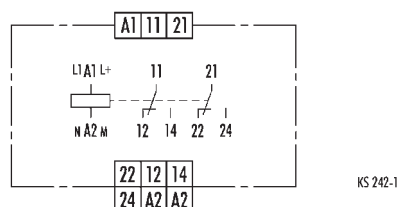
Function diagram



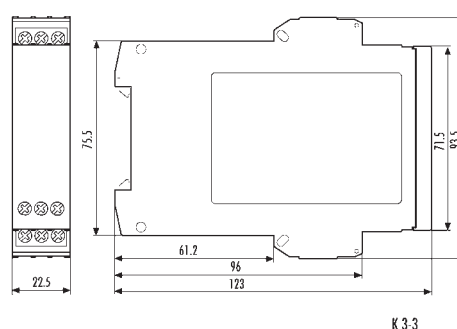
Description of the drawing



Circuit diagram



Dimension diagram



Coupling relays

Switching relay NGS 12

interface

Subject to change without further notice

Coupling relays

Selection by function – Solid-state relays

interface

PART NUMBER		80.020.4100.0	80.020.4101.0	80.020.4102.0	80.020.4103.0	80.020.4150.0	80.020.2003.0	80.020.2004.0	80.020.2001.0	80.020.0004.0
		flare-24VDC/48VDC-0,5A	flare-24VDC/48VDC-2A	flare-115V/48VDC-0,5A	flare-230VAC/48VDC-0,5A	flare-24VDC/230VAC-0,5A	WRS-SSDC-60V3A	WRS-SSDC-60V5A	WRS-SSAC1-250V4A	WRS-SSAC1-250V6A
CATALOG PAGE		910	910	910	911	911	914	914	915	915
HOUSING (W x H x D in mm)	6.2 x 89 x 70	●	●	●	●	●				
	12.5 x 80 x 56								●	
	12.5 x 80 x 59							●		
	12.5 x 80 x 64						●			
	25.6 x 80 x 70									●
INPUT CIRCUIT ¹⁾	+24 V DC	●	●			●	●	●	●	●
	230 V AC				●					
	115 V AC/DC			●						
OUTPUT CIRCUIT ²⁾	48 V DC; 0.5 A	●	●	●						
	48 V DC; 2 A		●							
	60 V DC; 3 A						●			
	60 V DC; 5 A							●		
	230 V AC; 0.5 A					●				
	250 V AC; 4 A								●	
	250 V AC; 6 A									●

¹⁾ = See data sheet for detailed specification

Coupling relays

Selection by function – Pluggable solid-state relays

		Module base Type/Part No.	M-PB 1 SR 87.220.1353.3	M-PB 4 SP 87.220.0753.3	M-PB 8 SP 87.220.0853.3	M-PB 4 SG 87.220.1453.3	M-PB 8 SG 87.220.1553.3
		Catalog page	918	918	918	919	919
	Housing	26 x 96 x 70.3	●				
	(W x H x D in mm)	70 x 96 x 70.3		●		●	
		138 x 96 x 70.3			●		●
Solid-state relays Type/Part No.	Catalog page						
M-IDC 24 A Z5.580.8100.0	920	Input circuit ¹⁾	+24 V DC				
		Auxiliary supply voltage	+24 V DC	●		●	●
		Output circuit ¹⁾	max. 32 V DC / 32 mA				
M-IAC 24 Z5.580.7800.0	920	Input circuit ¹⁾	240 V AC/DC				
		Auxiliary supply voltage	+24 V DC	●		●	●
		Output circuit ¹⁾	max. 32 V DC / 32 mA				
OAC 3-32 V/24-280 V Z8.000.0156.9	921	Input circuit ¹⁾	3-32 V DC				
		Output circuit ¹⁾	24-280 V AC / 3 A	●	●	●	●
ODC 3-32 V/3-60 V Z8.000.0169.8	921	Input circuit ¹⁾	3-32 V DC				
		Output circuit ¹⁾	3-60 V DC / 3 A	●	●	●	●
ODC 3-32 V/3-200 V Z8.000.0169.9	922	Input circuit ¹⁾	3-32 V DC				
		Output circuit ¹⁾	3-60 V DC / 3 A	●	●	●	●

¹⁾ = See the data sheet for detailed specification

interface

Coupling relays

General information – Solid-state relays

Wieland solid-state relay modules, the powerful addition

Solid-state relays are used in the same way as electromechanical relays as a connecting element between field devices and electronic control and signalling equipment. These modules can offer additional functionalities to the switching tasks that are required during processing. The core characteristics of the solid-state relays are:

- ❑ High switching frequencies up to several kHz
- ❑ Almost unlimited service life due to lack of mechanics
- ❑ High tolerance to vibration and impulse loads
- ❑ Bounce-free and noise-free switching
- ❑ Control power in the lower mW range

Wieland offers a full range of solid-state relay modules with the properties outlined above. Depending on the required applications, a superior selection of relay modules are available with various operating voltages, output arrangements and housings.

Product ranges:

flare, solid-state relays with an overall width of 6.2 mm with input voltages of 24 V DC up to 230 V AC and switching currents up to 2 A.

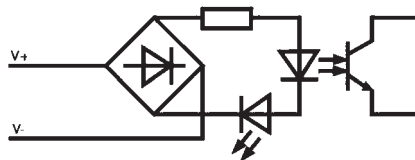
WRS, solid-state relays in a mounting base with input voltages of 24 V DC up to 230 V AC and switching currents up to 6 A.

M-PB, pluggable, one- to eight-channel solid-state relays in a mounting base with input voltages of 24 V DC up to 230 V AC and switching currents up to 3 A.

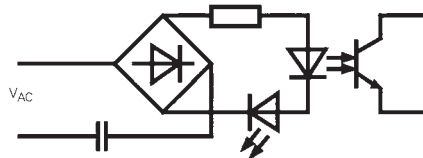
Overview of technical data

Input circuit/control side

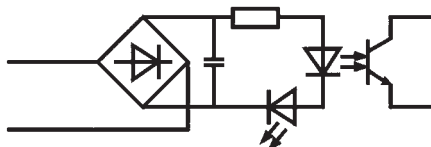
Wieland solid-state relays can be controlled with direct or alternating voltage, depending on their type. Each of the modules contains a suppression circuit against polarity reversal and an LED for status display in the input circuit.



Wiring diagram of DC input



Wiring diagram of AC input



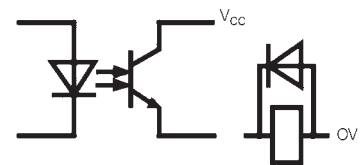
Wiring diagram of AC/DC input

To ensure safe operation of the relay the residual voltage in the control circuit must not exceed 5% DC or 15% AC of this operating voltage as specified in VDE 0435.

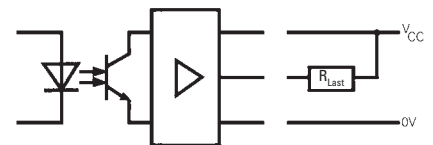
Output circuit/loadside

A solid-state relay for either DC or AC loads can be selected depending on the application. Also with DC outputs there are 2 types of connection available.

- ❑ 2 wire output
- ❑ 3 wire output, with negative switching



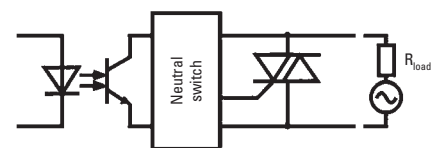
Wiring diagram of 2 wire output



Wiring diagram of 3 wire output

To guarantee error-free operation it is important to select a relay with a rating that meets the voltage and current requirement and also to add a protective circuit to the output as shown in the wiring diagram above – such as a varistor or RC element.

If a solid-state relay is operated with an inductive load, the load must be equipped with a protective suppression circuit such as a free-wheeling diode. In all cases, it must be ensured that the protection level of the protective device lies below the respective off-state voltage of the relay.



Wiring diagram of AC output

Solid-state relays for the AC loads incorporate a triac as the switching element. A triac is a zero voltage switch and is used to avoid high inrush and back EMF peaks by connecting the load at zero voltage and disconnecting the load at zero current.

As for DC loads, care should be taken that the protection level of the protective measures lies below the off-state voltage of the Triac.

Coupling relays Solid-state relays interface

Overall width: 6.2 mm



flare-24 V DC

Input 24 V DC

Output 48 V DC 0.5/2A (SPST, N.O.)

Approvals:

flare-115 V AC/DC

Input 115 V AC/DCV

Output 48 V DC 0.5 A

Approvals:

Dimensions (mm): W x H x D
6.2 x 89 x 70

Description	Type	Part No.	Std. Pack	Type	Part No.	Std. Pack
24 V DC, 500 mA spring clamp connection	flare-24VDC/48VDC-0.5A	80.020.4100.0	10			
24 V DC, 2 A spring clamp connection	flare-24VDC/48VDC-2A	80.020.4101.0	10			
115 V AC/DC spring clamp connection				flare 115V/48VDC-0.5A	80.020.4102.0	10
Control side	500 mA	2 A				
Nominal input voltage	24 V DC	24 V DC		115 V AC/DC		
Voltage range "ON"	10 V...53 V DC	10 V...53 V DC		70 V...122 V AC/DC		
Voltage range "OFF"	0 V...5 V DC	0 V...5 V DC		0 V...30 V AC / 40 V DC		
Power consumption	ca. 6 mA	ca. 7 mA		ca. 3 mA		
Status display	LED yellow	LED yellow		LED yellow		
Load side						
Nominal output voltage	48 V DC	48 V DC		48 V DC		
Min. switching voltage	4.4 V DC	4.4 V DC		4.5 V DC		
Max. switching voltage	53 V DC	53 V DC		53 V DC		
Min. switching current	0.1 mA	1 mA		0.1 mA		
Max. switching current	500 mA	2 A		500 mA		
On-state voltage	1.2 V DC	0.3 V DC		1.2 V DC		
Pick-up delay	0,05 ms	1 ms		30 ms		
Release delay	0.2 ms	5 ms		20 ms		
Switching frequency (resistive load)	500 Hz	5 Hz		10 Hz		
Suppression circuit	Arc suppression diode	Arc suppression diode		Varistor		
General data						
Rated voltage						
Isolation voltage of input/output	3.75 kV/2.5 kV			3.75 kV		
Overvoltage category	III			III		
Degree of pollution	2			2		
Ambient temperature	0 °C – +50 °C (Derating)			0 °C – +50 °C (Derating)		
Storage temperature	-40 °C – +55 °C			-40 °C – +55 °C		
Protection type/mounting rail	IP 20 / TS 35			IP 20 / TS 35		
Standards/specifications	VDE 0160; VDE 0106 T101			VDE 0160; VDE 0106 T101		
Emitted interference/interference immunity	EN 61000-6-3; EN 61000-6-2			EN 61000-6-3; EN 61000-6-2		
Wire range of screw terminal	–			–		
Wire range of spring-clamp terminal						
fine-stranded	0.25 mm ² – 1.5 mm ²			0.25 mm ² – 1.5 mm ²		
solid	0.25 mm ² – 2.5 mm ²			0.25 mm ² – 2.5 mm ²		
CSA EX approval in range	Class I, Division 2, Groups A, B, C and D			Class I, Division 2, Groups A, B, C and D		
Accessories		Part No.	Std. Pack		Part No.	Std. Pack
Pluggable jumper (U _{max} = 50 V, I _{max} = 2 A)		Z8.000.0200.8	10		Z8.000.0200.8	10
8 digit marking tag, unmarked, 60 pcs.		Z4.242.5153.0	10		Z4.242.5153.0	10

Coupling relays Solid-state relays



Input 230 V AC
Output 48 V DC 0.5 A
Approvals:

Input 24 V DC
Output 230 V AC 0.5 A
Approvals:

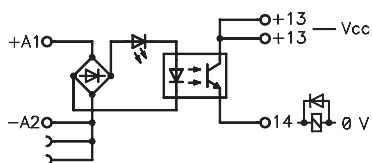
Dimensions (mm): W x H x D
62 x 89 x 70

[illegible]

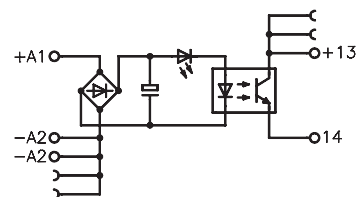
Coupling relays Solid-state relays *interface*

Circuit diagrams: *flare* – solid-state relays

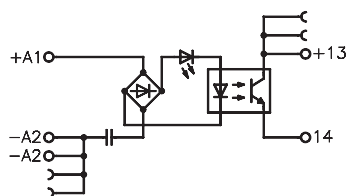
24 V/48 V DC; 500 mA; 2 A



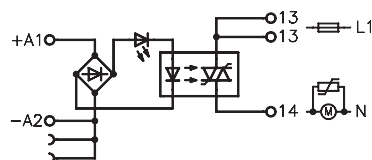
115 V AC/DC / 48 V DC; 500 mA



230 V AC / 48 V DC; 500 mA

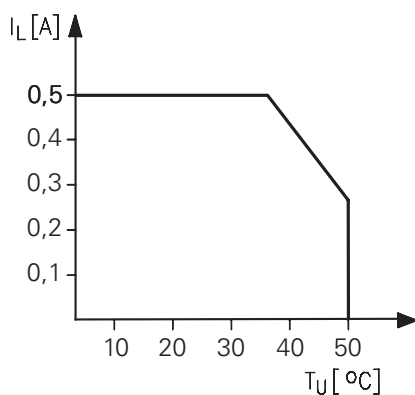


24 V DC / 230 V AC; 500 mA

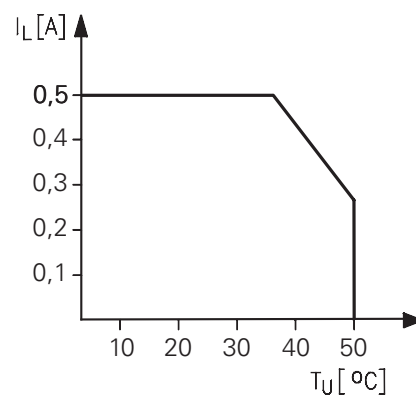


Derating: solid-state relays

24VDC/48VDC-0,5A

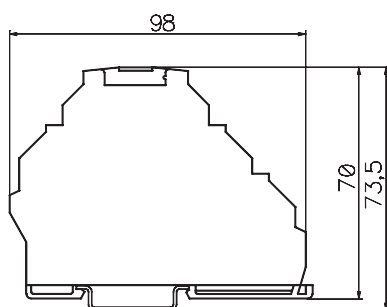


115V AC/DC / 48 V DC; 500 mA
230 V AC / 48 V DC; 500 mA
24 V DC / 230 V AC; 500 mA



Dimensions of *flare* relays

Housing with spring clamp terminals



Coupling relays Solid-state relays interface

- 24 V input signals
- 2.5-kV separation between I/O at a creepage and clearance distance of 8 mm



WRS-SSDC

Input 24 V DC; output 60 V DC 3 A,

2 wire output

Approvals:

12.5 x 80 x 64



WRS-SSDC

Input 24 V DC; output 60 V DC 5 A

2 wire output

Approvals:

12.5 x 80 x 59

Dimensions (mm): W x H x D

Description	Type	Part No.	Std. Pack	Type	Part No.	Std. Pack
Wieland relay system	WRS-SSDC-60V3A	80.020.2003.0	10	WRS-SSDC-60V5A	80.020.2004.0	10
Coil circuit						
Operating voltage	24 V DC +10%/–15%			24 V DC +10%/–15%		
Nominal input current per input	16 mA			16 mA		
Nominal input capacity	0.4 W			0.4 W		
Parallel connection of max	20 relays			20 relays		
Switching characteristics						
Nominal switching voltage	24 V DC			24 V DC		
Maximum switching voltage	60 V DC			60 V DC		
Minimum switching voltage	3 V DC			3 V DC		
Effective on-state voltage	1.5 V DC at I_{rated}			0.5 V DC		
Maximum effective current	3 A DC (Derating)			5 A DC		
Minimum effective current	20 mA			20 mA		
Maximum impulse current	5 A DC (1 sec.)			60 A DC (1 ms)		
Maximum residual current	1 mA at 60 V DC			1 µA DC		
Fusing, note I ² t value	–			FF		
Internal Suppression circuit	Z-Diode 68 V / 5 W			Z-Diode 68 V / 5 W		
Maximum pick-up/release delay	100 µs			1 ms		
Maximum switching frequency	1 kHz			100 Hz		
Isolation voltage of input/output	4 k V _{eff.}			2.5 kV _{eff.}		
Capacity of input/output	8 pF			15 pF		
Overvoltage category						
Degree of pollution						
Ambient temperature	–20 °C...+50 °C (Derating)			–20 °C...+50 °C (Derating)		
Storage temperature	–25 °C...+85 °C			–25 °C...+85 °C		
Mounting rail	TS 32 or TS 35			TS 32 or TS 35		
Standards/specifications						
Emitted interference/interference immunity						
Wire range, fine-stranded/solid	0.5 mm ² – 2.5 mm ² / 0.5 mm ² – 4 mm ²			0.5 mm ² – 2.5 mm ² / 0.5 mm ² – 4 mm ²		
Location of mounting rail	horizontal			horizontal		
Accessories						
Pluggable jumper		Z8.000.0103.4	10		Z8.000.0103.4	10

Coupling relays Solid-state relays



WRS-SSAC1

Input 24 V DC; output 250 V AC 6 A

2 wire output

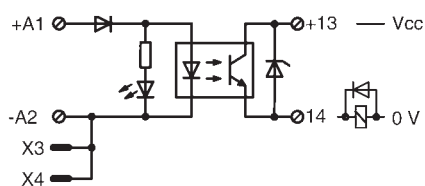
UL US

25.6 x 80 x 70

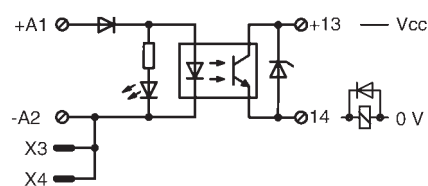
WRS solid-state relay

Circuit diagram

WRS-SSDC-60 V 3 A

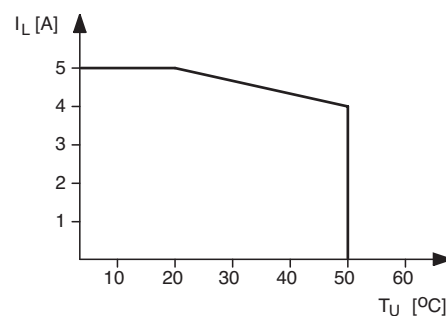
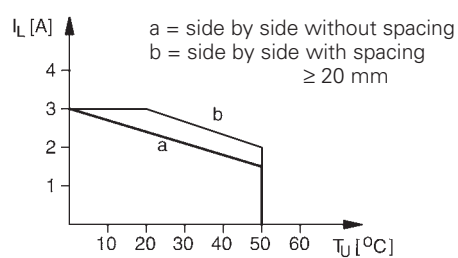


WRS-SSDC-60 V 5 A

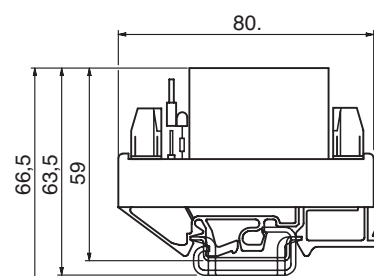
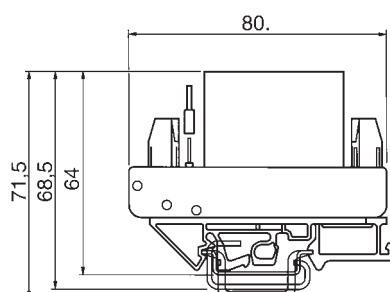


Derating

Derating
Solid-state relay WRS-SSDC 60V 3A



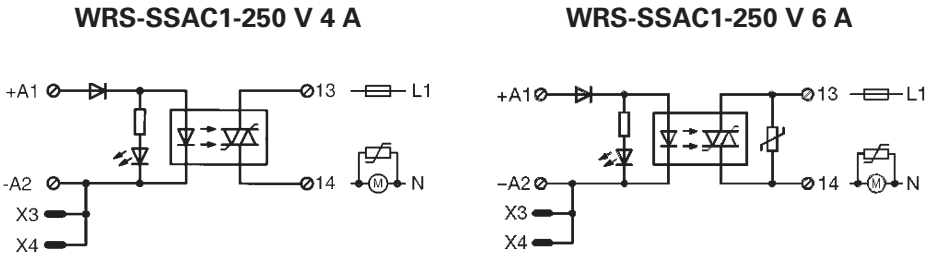
Dimensions



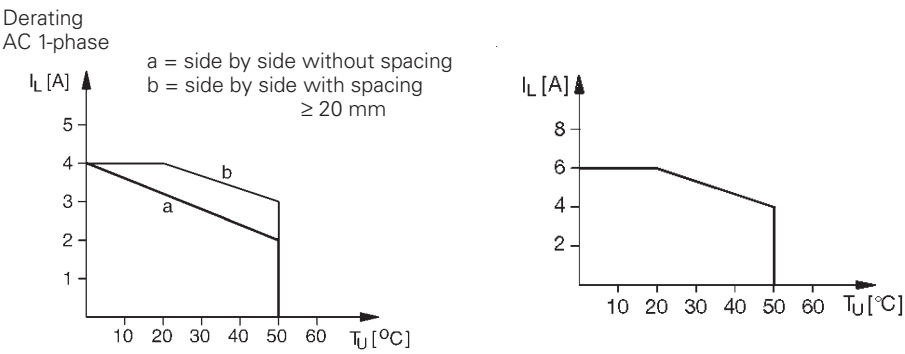
Coupling relays
Solid-state relays

interface

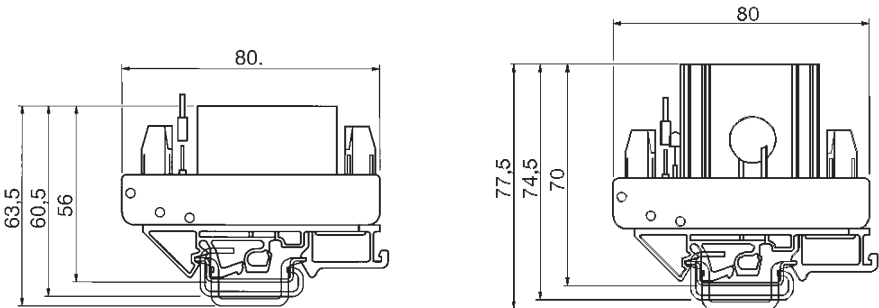
Circuit diagram



Derating



Dimensions

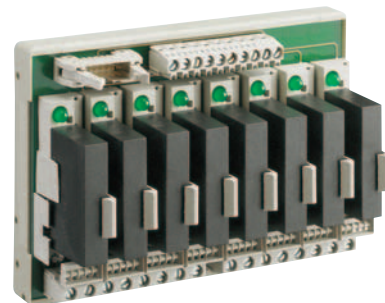


Coupling relays

Pluggable solid-state relays, module bases

- 1 relay
- 4 relay
- 8 relay

The module bases are supplied without solid-state relays or miniature fuses



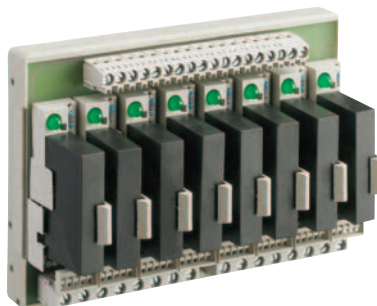
M-PB 1 SR
Module base 1 relay
26 x 96 x 70.3

M-PB 4/8 SP
Module base 4/8 relays
 70/138 x 96 x 70.3

Dimensions (mm): W x H x D

[illegible]

Coupling relays
Pluggable solid-state relays, module bases



The module bases are supplied without solid-state relays or miniature fuses.

Important notice:

In the case of multiple modules (2 change-over contacts), the outputs must be supplied from the same phase (e.g. L1)

M-PB 4/8 SG
Module bases 4/8 relay

Dimensions (mm): W x H x D

[illegible]

Pluggable solid-state relays, modules

Integration of fine fuse possible



M-IDC-24
Input 24 V DC; output 32 V DV 32 mA

10.2 x 26.3 x 43.2

[illegible]

Coupling relays
Pluggable solid-state relays, modules

Integration of LED indicator possible
Integration of fine fuse possible



OAC 3-32 V

Input 3-32 V DC; output 230 V AC 3 A

10.5 x 25.4 x 43

ODC 3-32 V

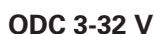
Input 3-32 V DC; output 60 V DC 3 A

10.5 x 25.4 x 43

Dimensions (mm): W x H x D

[illegible]

interface



Dimensions (mm): W x H x D
10.2 x 26.3 x 43.2

922 **wieland**

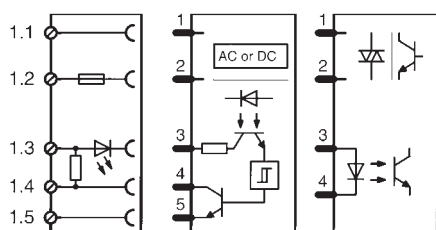
Coupling relays

Pluggable solid-state relays, modules

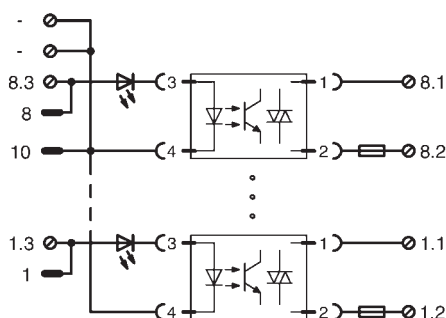
interface

Circuit diagrams: M-PB module bases

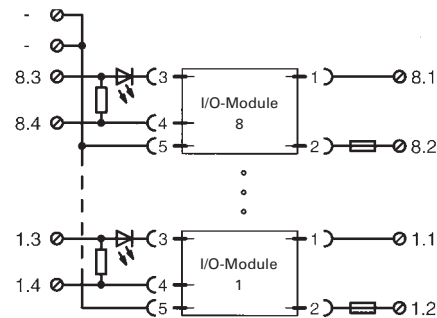
M-PB 1SR



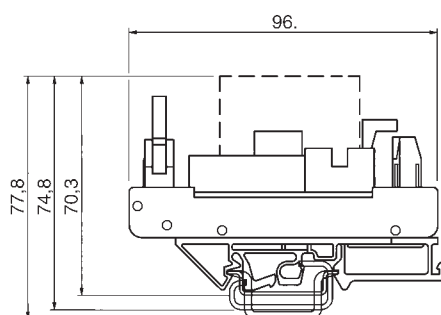
M-PB 4/8 SP



M-PB 4/8 SG

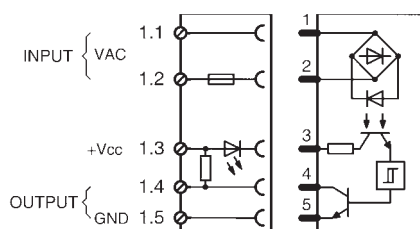


Dimensions of module bases

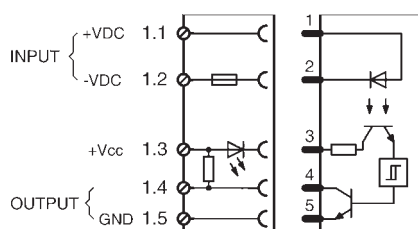


Circuit diagrams: M-PB solid-state relays

M-IAC 24 A

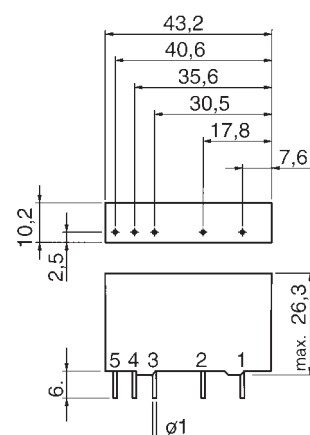


M-IDC 24



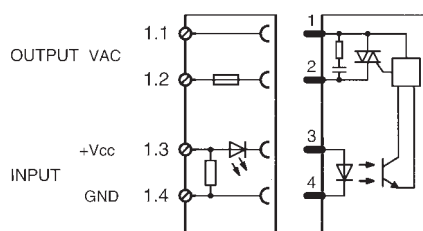
Dimensions

M-IAC 24 A / M-IDC 24 A

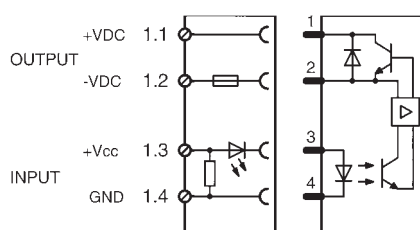


Circuit diagrams + derating: M-PB solid-state relays

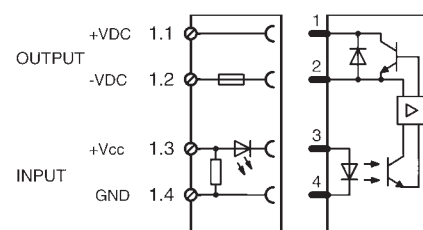
OAC 3–32 V/24–280 V



ODC 3–32 V/3–60 V

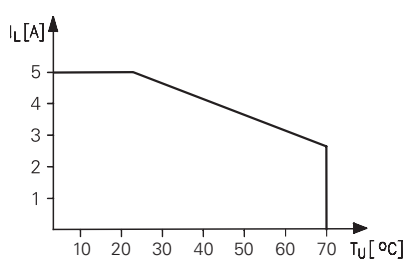


ODC 3–32 V/3–200 V

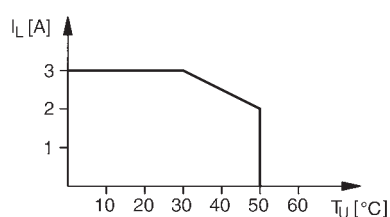


Derating

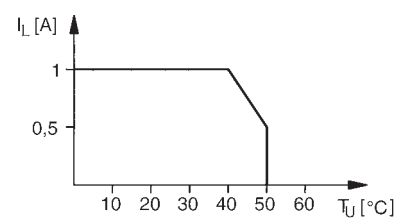
Output 230 V AC



Output 60 V DC

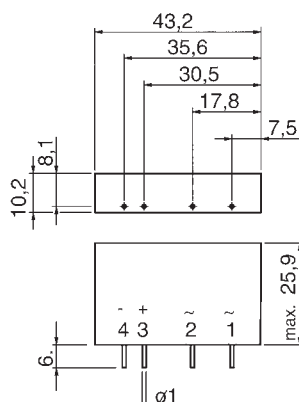


Output 200 V DC



Dimensions

OAC 3–32 V/24–280 V



interface