
100
50,4
100
ZERO
SPAN
ERROR
3- 4- wire
Range I
Range II
0...20
4...20

interface

Coupling Relays

Contents – Relays

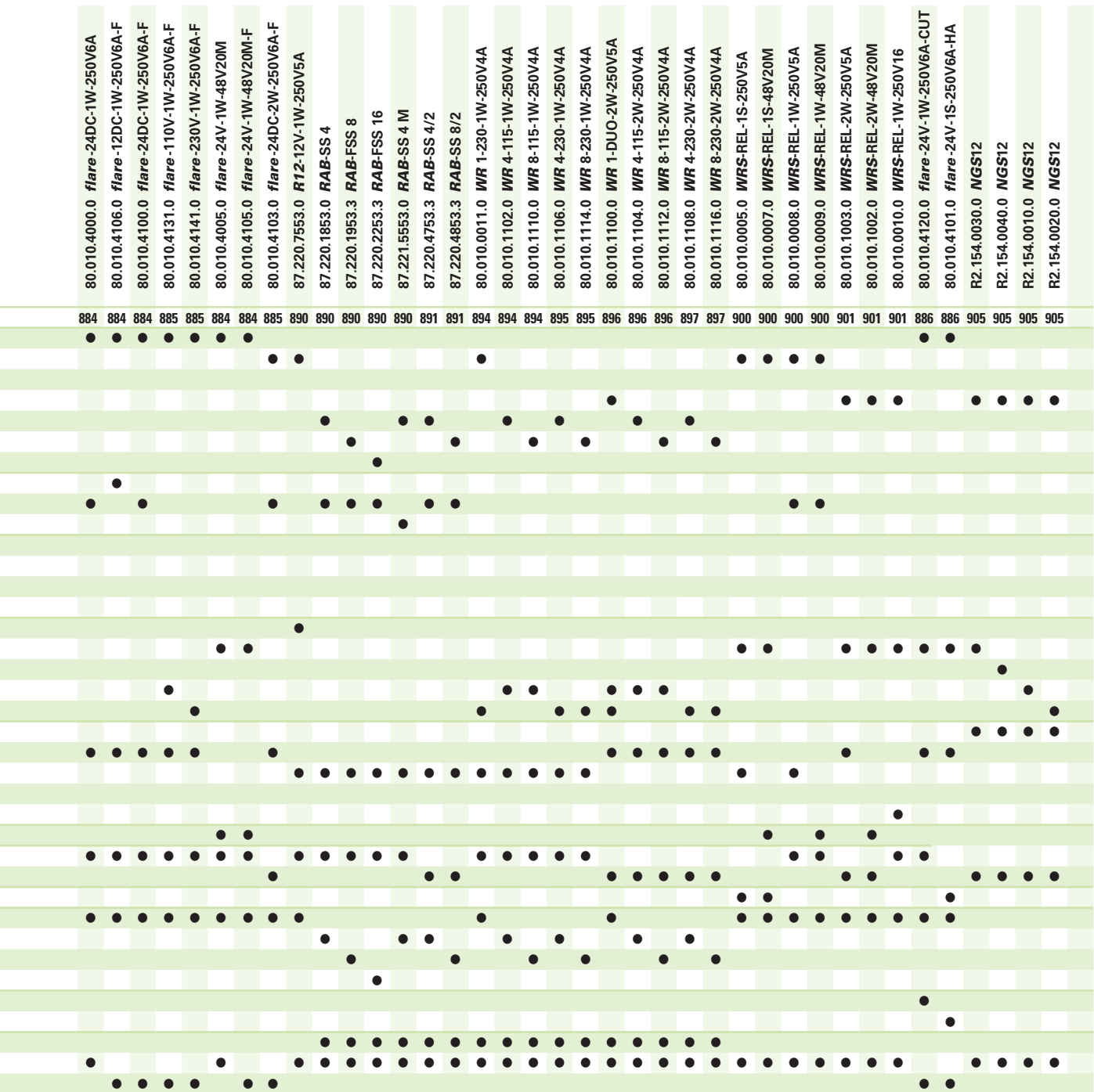
interface

Contents – Relays

PART NUMBER			80.010.4501.0 flare MOVE 12VDC-1W-6A	80.010.4521.0 flare MOVE 12 V-1W-6A	80.010.4501.1 flare MOVE 12VDC-1W-AU	80.010.4521.1 flare MOVE 12V-1W-AU	80.010.4502.0 flare MOVE 24VDC-1W-6A	80.010.4522.0 flare MOVE 24V-1W-6A	80.010.4502.1 flare MOVE 24VDC-1W-AU	80.010.4522.1 flare MOVE 24V-1W-AU	80.010.4525.0 flare MOVE 115V-1W-6A	80.010.4525.1 flare MOVE 115V-1W-AU	80.010.4526.0 flare MOVE 230V-1W-6A	80.010.4526.1 flare MOVE 230V-1W-AU	80.010.4701.2 flare MOVE 12VDC-1W-10A	80.010.4711.2 flare MOVE 12VAC-1W-10A	80.010.5101.2 flare MOVE 12VDC-2W-8A	80.010.4902.3 flare MOVE 24VDC-1W-16A	80.010.4912.3 flare MOVE 24VAC-1W-16A	80.010.5102.2 flare MOVE 24VDC-2W-8A	80.010.4915.3 flare MOVE 115AC-1W-16A	80.010.5315.2 flare MOVE 115AC-2W-8A	80.010.4916.3 flare MOVE 230AC-1W-16A	80.010.5316.2 flare MOVE 230AC-2W-8A
CATALOG PAGE			876	876	876	876	876	876	876	876	877	877	877	877	880	880	880	880	880	880	881	881	881	881
HOUSING	Width (mm)	6.2	●	●	●	●	●	●	●	●	●	●	●	●										
		12.5																						
		15.8													●	●	●	●	●	●	●	●	●	●
		22.5																						
		70																						
		128																						
		280																						
INPUT CIRCUIT	DC	+12 V DC	●		●										●		●							
		+24 V DC					●		●									●		●				
		–24 V DC																						
	AC	12 V AC														●								
		24 V AC																	●					
		115 V AC																			●	●		
		230 V AC																					●	●
	AC/DC	12 V AC/DC		●		●																		
		24 V AC/DC						●		●														
		28 V AC/DC																						
		115 V AC/DC									●	●												
		230 V AC/DC											●	●										
OUTPUT CIRCUIT	AC switching capacity[1)]	1250 VA (250 V / 5 A)																						
		1500 VA (250 V / 6 A)	●	●	●	●	●	●	●	●	●	●	●	●										
		2000 VA (250 V / 8 A)															●			●		●		●
		2500 VA (250 V / 10 A)													●	●								
		4000 VA (250 V / 16 A)																●	●		●		●	
	DC switching capacity[1)]	1 W (48 V / 20 mA)																						
	Number of change-over contacts	1	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●		●		●	
	per relay	2															●			●		●		●
	Number of normally open contacts	1																						
	Number of relays	1	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	per module	4																						
		8																						
		16																						
SPECIAL FUNCTION	Knife edge disconnect relay																							
	Hand-0-Auto relay																							
CONNECTION STYLE	Pluggable relays		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Screw connection		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Spring clamp connection																							

[1)] = See data sheet for detailed specification

Coupling relays
Selection by function



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 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

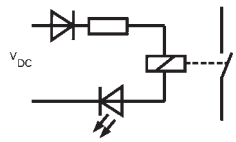
Overview of the technical data

Control side – operating voltage

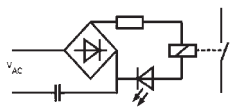
Wieland relay modules can be controlled within a defined temperature range, given operating voltage and relevant tolerance band to a 100% duty cycle.

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.

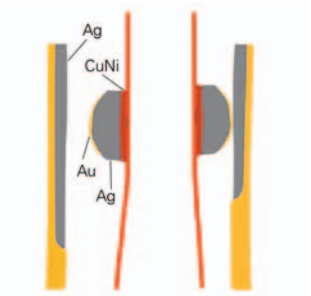
Residual voltages can occur from solid-state devices in circuit, induced voltages from high current cabling or other inductive or capacitive interference factors.

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

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.



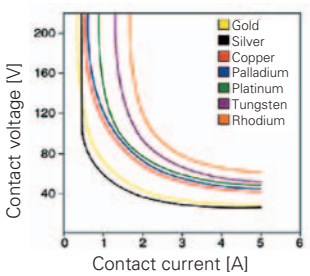
Cut-out of a 3-layer welded contact with a linear contact closure

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

Contact side – reduction of arcs

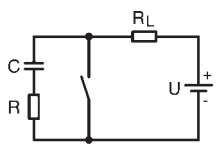
When the arc limit voltage (see diagram) which is dependent on the switching current and contact material is exceeded, discharge processes take place on the relay contact. Material transfer occurs which damages the contact. To achieve a long service life and a high level of reliability despite this type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

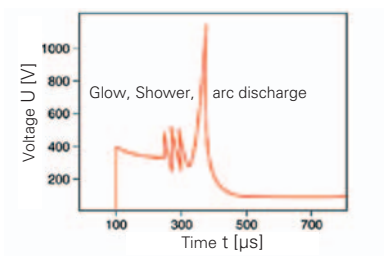
At the point of disconnection, the voltage Uc at the contact jumps from zero to the value UxR/(R+R_L) and then rises according to the function U_c=U (1-$e^{-t/T}$) whereby t=(R+R_L) x C. The resistance R must be high enough so that the combined total of the condenser discharge current and the switching 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.

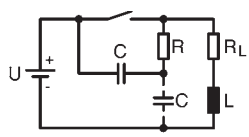
DC circuits with an inductive load

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 (µF) ≅ 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.

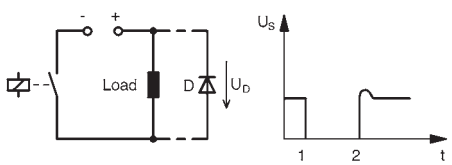
RC circuit for AC load

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.

Protective circuit for load	Additional release delay	Defined limit for induced voltage	Bipolar attenuation	Benefits / Disadvantages
Diode	long	yes (UD)	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

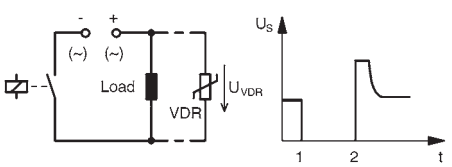
Diode:



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

Disadvantage: Very high resetting time

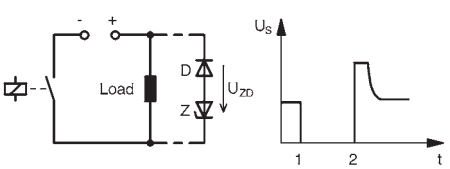
Varistor:



Benefit: Low resetting time, cost-effective

Disadvantage: Cannot be used for all operating voltages and capacities

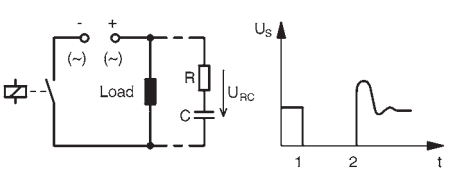
Diode and Zener diode:



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

Disadvantage: Cannot be used for large capacities

RC combination:

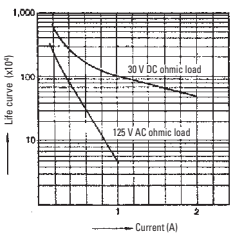


Benefit: Low overvoltage, low resetting time

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 relevent 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

Overall width: 6.2 mm
pluggable

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

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:

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	**$AgSnO_2$**		**$AgSnO_2$ + Au (5 µ)**		**$AgSnO_2$**		**$AgSnO_2$ + 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	**$AgSnO_2$**		**$AgSnO_2$ + Au (5 µ)**		**$AgSnO_2$**		**$AgSnO_2$ + 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

* The conditions of pollution degree 2 are fulfilled at 400 V

Coupling relays
Pluggable interface relays *flare* MOVE

Interface

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: cULus, CSA

flare MOVE 230 V

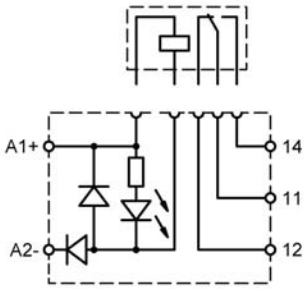
Input 230 V, AC/DC
Output 1 change-over contact 250 V 6 A (SPDT)
Approvals: cULus, CSA

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	**$AgSnO_2$**		**$AgSnO_2$ + Au (5 µ)**		**$AgSnO_2$**		**$AgSnO_2$ + 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	**$AgSnO_2$**		**$AgSnO_2$ + Au (5 µ)**		**$AgSnO_2$**		**$AgSnO_2$ + 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	1×10^7				1×10^7			
Electrical life AC 1	6×10^4				6×10^4			
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

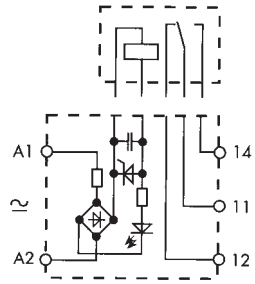
* The conditions of pollution degree 2 are fulfilled at 400 V.

Circuit diagrams: *flare* MOVE – mechanical relay couplers

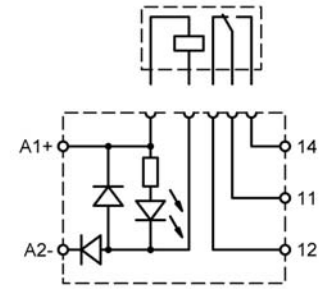
12 V DC relay,
1 change-over contact (SPDT)
Part No. 80.010.4501.0
Part No. 80.010.4501.1



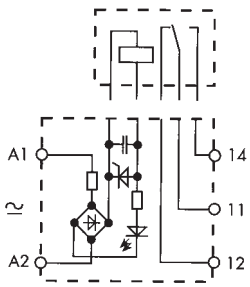
12 V DC; AC/DC relay
1 change-over contact (SPDT)
Part No. 80.010.4521.0
Part No. 80.010.4521.1



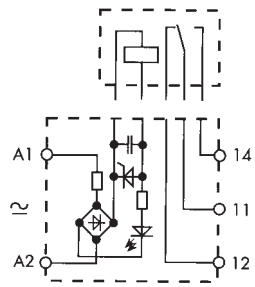
24 V DC relay,
1 change-over contact (SPDT)
Part No. 80.010.4502.0
Part No. 80.010.4502.1



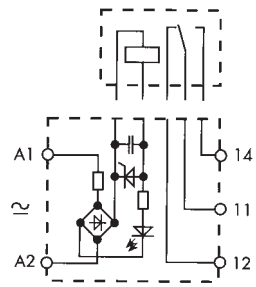
24 V DC; AC/DC relay
1 change-over contact (SPDT)
Part No. 80.010.4522.0
Part No. 80.010.4522.1



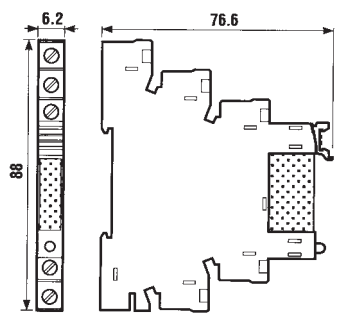
115 V AC/DC relay
1 change-over contact (SPDT)
Part No. 80.010.4525.0
Part No. 80.010.4525.1



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

interface

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

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

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

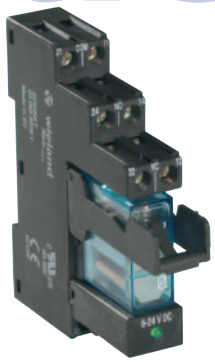
flare MOVE 24 V
Input 24 V AC, DC
Output 1/2 change-over contact(s) 230 V 16/8A
Approvals: UL, CSA

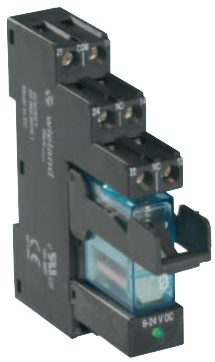
Description	Type	Part No.	Std. Pack	Type	Part No.	Std. Pack
Coupling relay 12V DC; 1U; AgNi; 10A	Flare move 12DC1W10A	80.010.4701.2	10			
Coupling relay 12V AC; 1U; AgNi; 10A	Flare move 12AC1W10A	80.010.4711.2	10			
Coupling relay 12V DC; 2U, AgNi, 8A	Flare move 12DC2W8A	80.010.5101.2	10			
Coupling 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	$2 \times 10^7 / 1 \times 10^7$	2×10^7		$2 \times 10^7 / 1 \times 10^7$	2×10^7	
Electrical life AC 1	$2 \times 10^5 / 1 \times 10^5$	1×10^5		1×10^5	1×10^5	
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 mm²– 4 mm² / 0.25 mm²– 6 mm²			0.25 mm²– 4 mm² / 0.25 mm²– 6 mm²		
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

* The conditions of pollution degree 2 are fulfilled at 400 V.

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

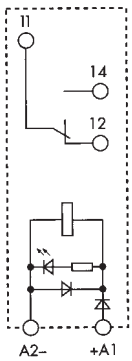
Description	Type	Part No.	Std. Pack	Type	Part No.	Std. Pack
Coupling relay 115V AC; 1U; AgCdO; 16A	Flare move 115AC1W16	80.010.4915.3	10			
Coupling relay 115V AC; 2U, AgNi; 8A	Flare move 115AC2W8	80.010.5315.2	10			
Coupling relay 230V AC; 1U; AgCdO; 16A				Flare move 230AC1W16	80.010.4916.3	10
Coupling 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	$1 \times 10^7 / 1 \times 10^7$			1×10^7		
Electrical life AC 1	$1 \times 10^5 / 1 \times 10^5$			1×10^5		
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

Subject to change without further notice

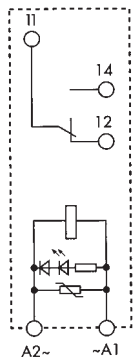
* The conditions of pollution degree 2 are fulfilled at 400 V
** Continuous current >10 A requires jumpering of the terminals 11-21, 14-24, 12-22

Circuit diagrams: *flare* MOVE – mechanical relay couplers

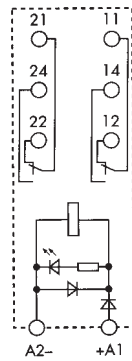
12 V DC relay
Part No. 80.010.4701.2
24 V DC relay
Part No. 80.010.4902.3



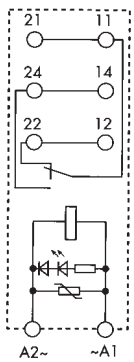
12 V AC relay
Part No. 80.010.4711.2
24 V AC relay
Part No. 80.010.4912.3



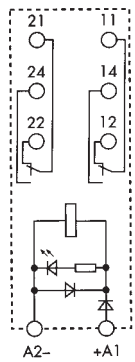
12 V DC relay
Part No. 80.010.5101.2
24 V DC relay
Part No. 80.010.5102.2



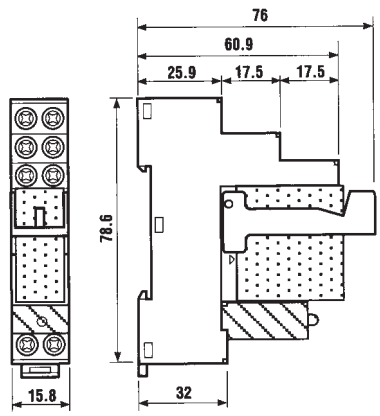
115 V AC relay
Part No. 80.010.4915.3
230 V AC relay
Part No. 80.010.4916.3



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



Dimensions



interface

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						

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	2×10^7			2×10^7		
Electrical life 24 V DC / 2 A	8×10^5			6×10^5		
Electrical life 230 V AC / 6 A	6×10^4			8×10^4		
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

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

***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:

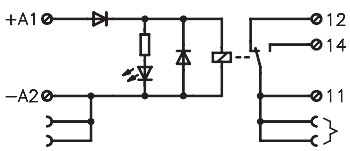
***flare* 24 V** HAND-0-AUTO relay
Input 24 V AC/DC
Output 1 normally open contact AC 250 V 6 A/DC 300 V 2 A (SPDT)
Approvals:

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

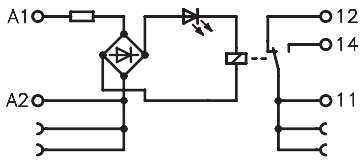
Description	Type	Part No.	Std. Pack	Type	Part No.	Std. Pack
24 V AC/DC spring clamp connection	flare-24V-1W-250V6A-CUT	80.010.4120.0	10	flare-24V-1S-250V6A-HA	80.010.4101.0	10
Coil circuit						
Operating voltage	24 V AC/DC +25 %/–20 %			24 V AC/DC +25 %/–20 %		
Nominal input current	ca. 14 mA			ca. 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	2×10^7			2×10^7		
Electrical life 24 V DC / 2 A	6×10^5			6×10^5		
Electrical life 230 V AC / 6 A	8×10^4			8×10^4		
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	10		Z8.000.0200.8	10
8 digit marking tag, unmarked, 60 pcs.		Z4.242.5153.0	10		Z4.242.5153.0	10
Contact material						
Rail	CuZn37F38-3µAg					
Plug	CuSn6FB370-3µAg					

Circuit diagrams: *flare* – mechanical relay couplers

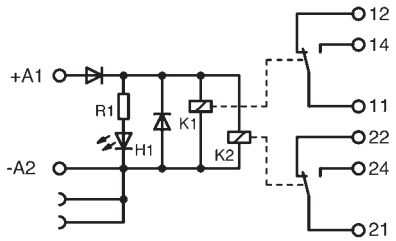
12-V-/24-V relay
1 change-over contact (SPDT)



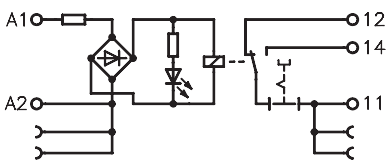
110-V-/230-V relay
1 change-over contact (SPDT)



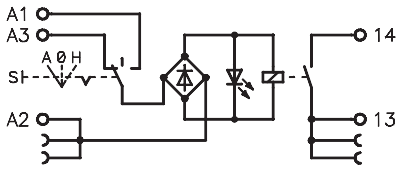
24-V relay
2 change-over contacts (DPDT)



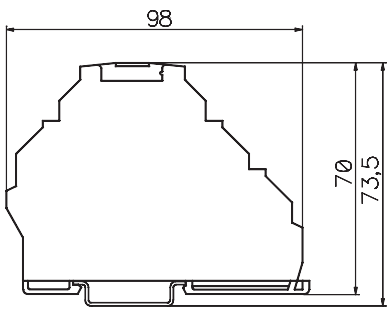
Knife edge disconnect relay



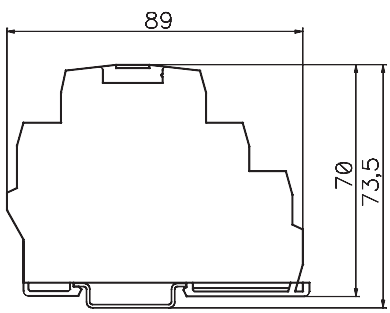
Hand-0-Auto relay
(SPST, N.O.)



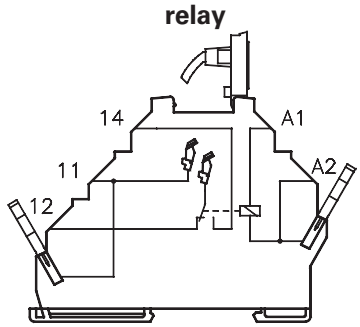
Housing with spring clamp terminals



Housing with screw terminals

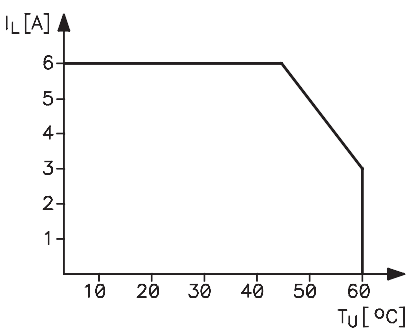


Connection of knife edge disconnect relay

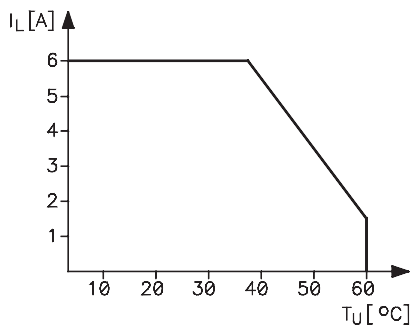


Derating: *flare* – mechanical relay couplers

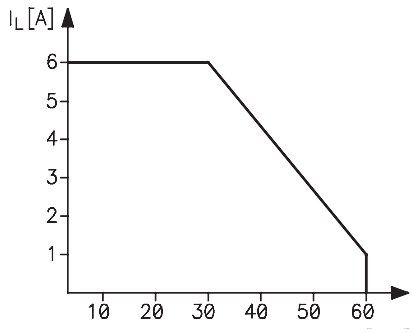
110 V relay 1 change-over contact



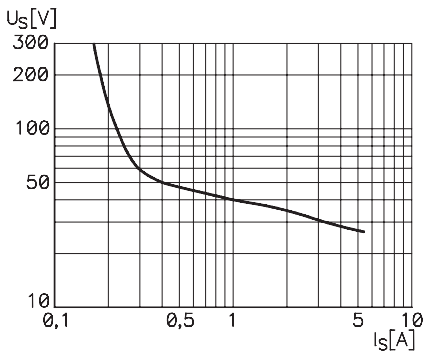
230 V relay
1 change-over contact



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

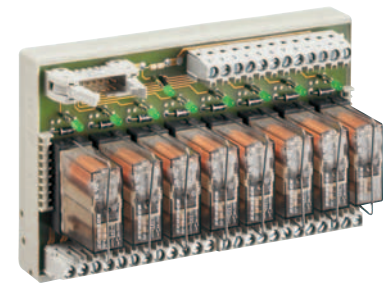


Switching capacity according to 60947-5.1

	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

Relay output modules
– 1 relay
– 4 relay
– 8 relay
– 16 relay

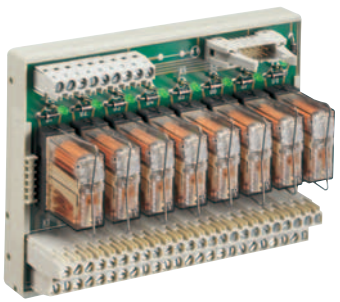


	***R12*-12V-1W** **Input 12 V AC/DC** **Output 1 change-over contact 250 V AC 5 A (SPDT)**			***RAB* 4/8/16** **Input 24 V DC** **Output 1 change-over contact 250 V AC 5 A (SPDT)**		
Dimensions (mm): W x H x D	12.5 x 80 x 58.3			70/128/280 x 80 x 71		
Description	Type	Part No.	Std. Pack	Type	Part No.	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

Relay output modules
– 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)

RAB 4/8

Input 24 V DC
Output 2 change-over contacts 250 V AC 5 A (DPDT)

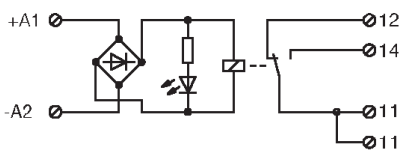
Dimensions (mm): W x H x D — 70/128 x 80 x 71

Description	Type	Part No.	Std. Pack	
1 relay				
4 relay positive switching	RAB-SS 4/2	87.220.4753.3	1	
8 relay positive switching	RAB-SS 8/2	87.220.4853.3	1	
16 relay positive switching				
4 relay negative switching				
Coil circuit	24 V DC + 10 %/– 15 %			
Operating voltage				
Nominal input current	25 mA			
Nominal input capacity	0.6 W			
Holding current at 20 °C	> 2 mA			
Status display	LED green			
Switching characteristics				
Maximum switching voltage	250 V AC / [1]V DC			
Maximum switching current	8 A AC/ [1]A DC			
Maximum switching capacity	2000 VA / 120 W			
Maximum continuous current	5 A AC/DC[1]			
Pick-up/release delay approx.	9 ms / 12 ms			
Bouncing time	4 ms			
Maximum switching frequency	40 Hz			
Contact material	AgCdO			
Minimum selectable voltage	12 V			
Minimum selectable current	100 mA			
Mechanical life	3×10^7			
Electrical life 24 V DC / 2 A	6×10^5			
Electrical life 230 V AC / 6 A	6×10^5			
Rated voltage				
Isolation voltage of input/output	$4\ kV_{eff.}$			
Overvoltage category				
Degree of pollution				
Ambient temperature	–25 °C...Derating			
Storage temperature	–40 °C...+85 °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		Z8.000.0035.5	10	

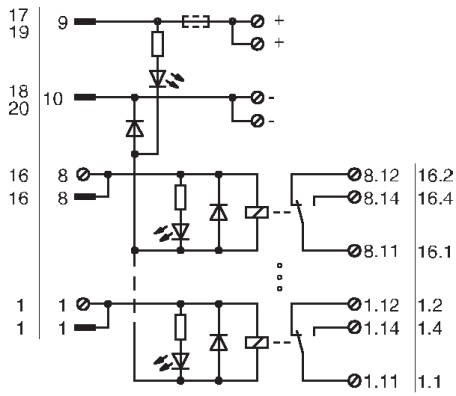
[1] See limit curve on page 892

Circuit diagrams

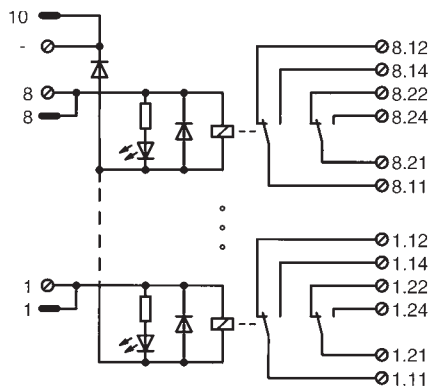
R12-12V-1W 250 V 5 A



RAB – 1 change-over contact

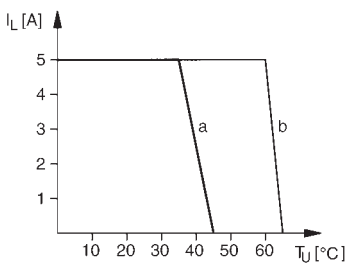


RAB – 2 change-over contacts



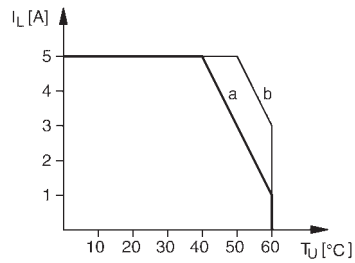
Derating

R12-12V-1W 250 V 5 A



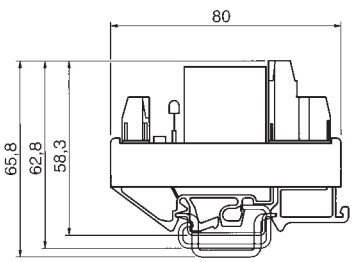
a = continuous operation
b = switching operation 50% duty cycle

RAB-FSS and RAB-SS

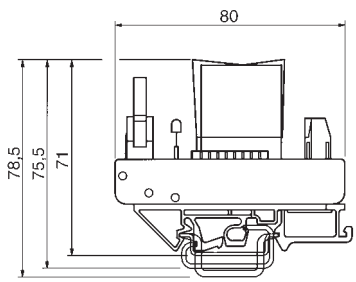


Dimensions

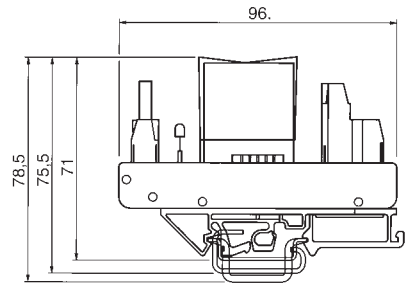
R12-12V-1W 250 V 5 A



RAB – 1 change-over contact



RAB – 2 change-over contacts

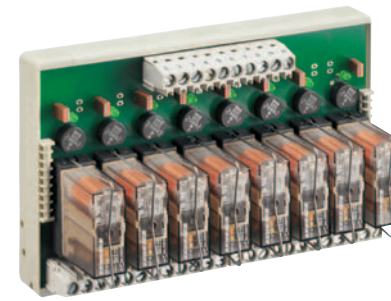


interface

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

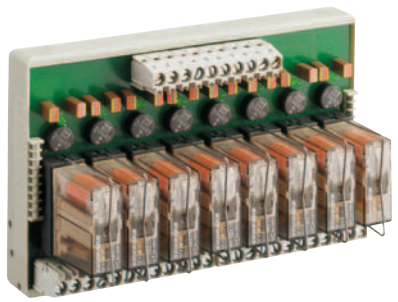
Description	Type	Part No.	Std. Pack	Type	Part No.	Std. Pack
1 relay	WR1-230-1W-250V4A	80.010.0011.0	10			
4 relay				WR4-115-1W-250V4A	80.010.1102.0	1
8 relay				WR8-115-1W-250V4A	80.010.1110.0	1
Coil circuit						
Operating voltage	230 V AC/DC +6% / –10%			115 V AC/DC +6% /–10%		
Nominal input current 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/ [1]V DC			250 V AC / [1]V DC		
Maximum switching current	8 A AC/[1]A DC			6 A AC/[1]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	3×10^7			3×10^7		
Electrical life 24 V DC / 2 A	3×10^5			1.5×10^5		
Electrical life 230 V AC / 6 A	3×10^5			1.5×10^5		
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)

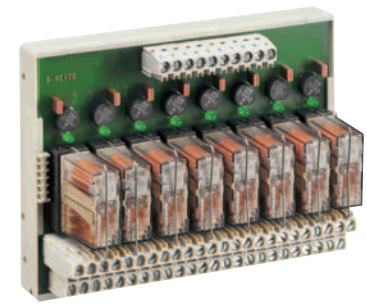
Dimensions (mm): W x H x D — 70/128 x 80 x71

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	3×10^7		
Electrical life 24 V DC / 2 A	1.5×10^5		
Electrical life 230 V AC / 6 A	1.5×10^5		
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



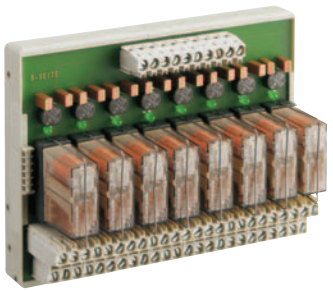
Dimensions (mm): W x H x D

	***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		
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

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)

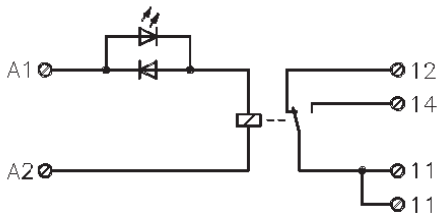
Dimensions (mm): W x H x D — 70/128 x 80 x 71

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	3×10^7		
Electrical life 24 V DC / 2 A	1.5×10^5		
Electrical life 230 V AC / 6 A	1.5×10^5		
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

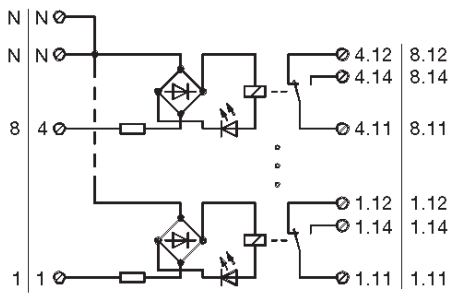
[1] See limit curve on page 899

Circuit diagrams

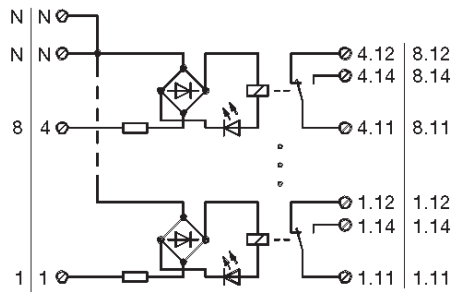
WR1-230-1W 250 V 4 A



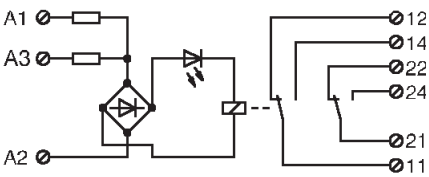
WR4/8-115-1W 250 V 4 A



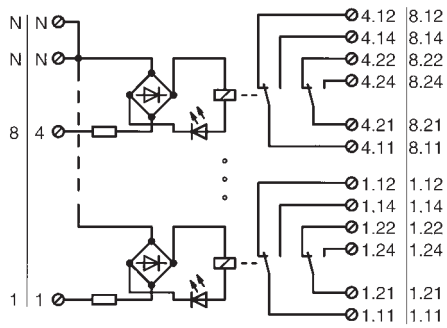
WR4/8-230-1W 250 V 4 A



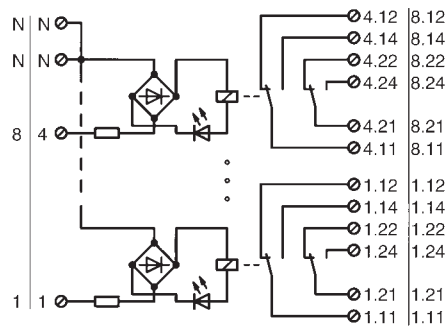
WR1-DUO-2W 250 V 5 A



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

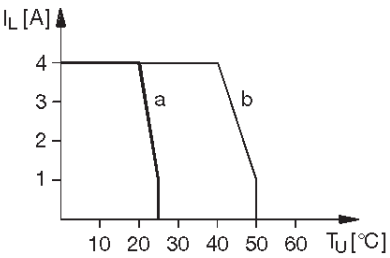


WR4/8-230-2W 250 V 4 A



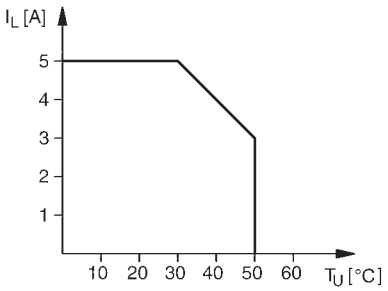
Derating

WR1 – 1 change-over contact

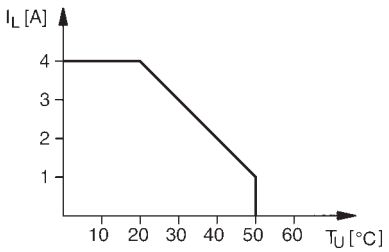


a = side by side without spacing
b = side by side with spacing of 5 mm

WR1 – DUO

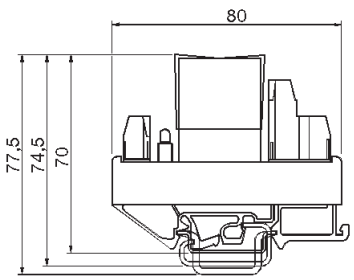


WR4/WR8 – 2 change-over contacts

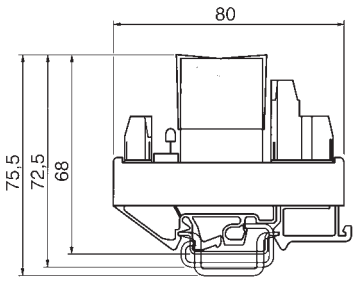


Dimensions

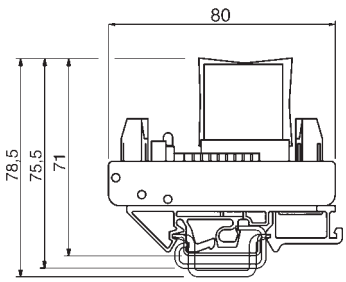
WR1 – 1 change-over contact



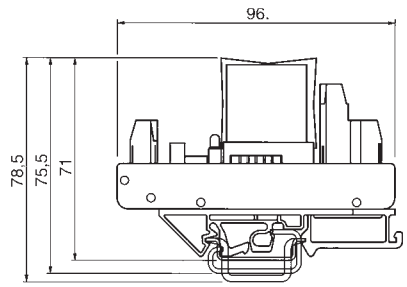
WR1 – DUO



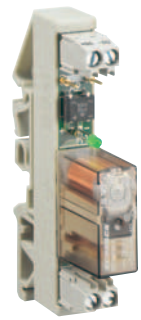
WR4/WR8 – 1 change-over contact



WR4/WR8 – 2 change-over contacts



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



WRS-REL-1S

Output 250 V AC / 48 V DC 20 mA (SPST, N.O.)
1 normally open contact
Approvals:
12.5 x 80 x 58.3

WRS-REL-1W

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	3×10^7	3×10^7		3×10^7	3×10^7	
Electrical life 26 V DC / 15 mA	3×10^5			3×10^5		
Electrical life 24 V DC / 5 A	2.5×10^5			2.5×10^5		
Electrical life 230 V AC / 6 A	2.5×10^5			2.5×10^5		
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

– 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

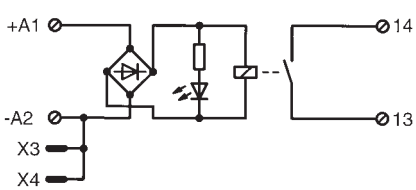
Dimensions (mm): W x H x D

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

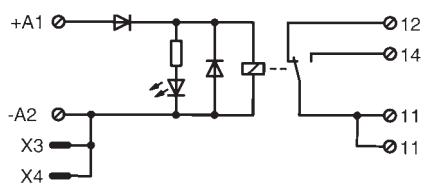
[2)] See DC limit curve and derating curve on page 903

Circuit diagrams of relay couplers

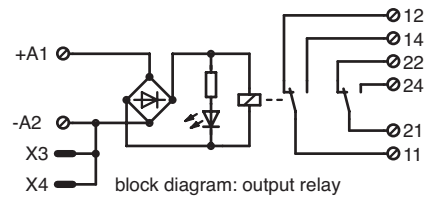
WRS-REL-1S 250 V 5 A



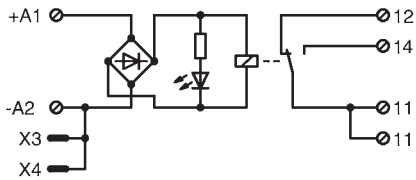
WRS-REL-1W 250 V 5 A



WRS-REL-2W 250 V 5 A

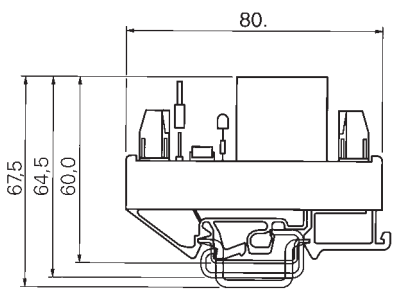


WRS-REL-1W 250 V 16 A

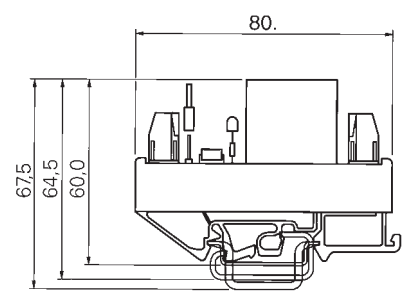


Dimensions

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

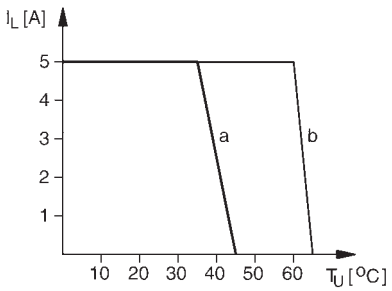


WRS-REL-1W 250 V 5 A
WRS-REL-2W 250 V 5 A



Derating

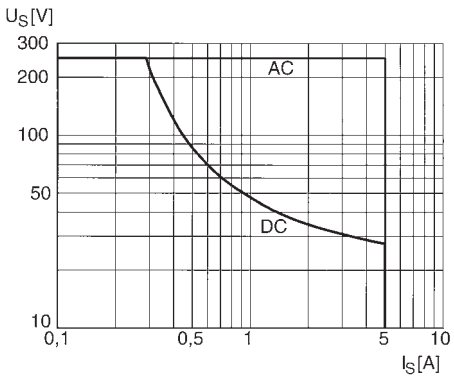
WRS-REL-1S 250 V 5 A
WRS-REL-1W 250 V 5 A



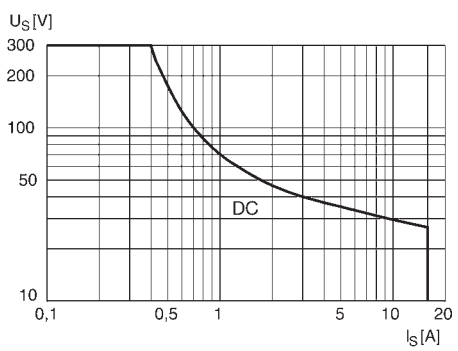
a = side by side without spacing
b = side by side with spacing > 20 mm

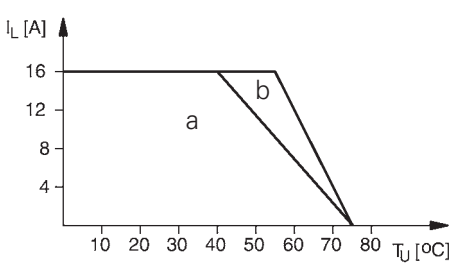
Limit curve:

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

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.

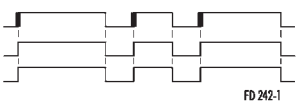
Notes

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.

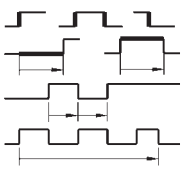
External connection to freewheeling diodes or RC combinations is not required, as the relays are wired internally accordingly.

Function diagram

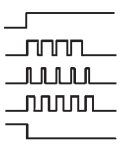


A1-A2 — Energizing quantity
LED green
11-14, 21-24 — Switching element
11-12, 21-22

Description of the drawing

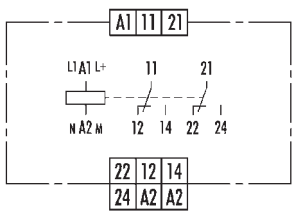


Control signal of the energizing quantity
Adjustable time
Fixed time
Adjustable cycle time
5-fold function



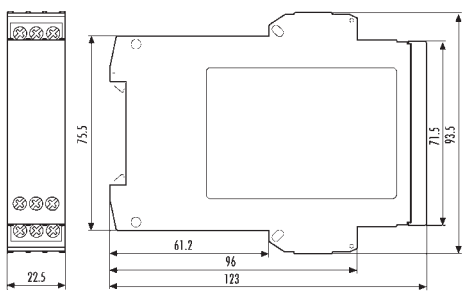
Time out – energizing quantity ON
Time on – delayed switching element in ON position
Time on – delayed switching element in OFF position
Time on – delayed switching element in ON or OFF position
Time out – energizing quantity OFF

Circuit diagram



KS 242-1

Dimension diagram



K 3-3

Coupling relays
Switching relay NGS 12

Technical data	NGS 12			
Product standard	EN 618122-1:1999-08			
Function type according to IEC 60050	Item 2.1: switching relays			
Function control	1 LED green			
Function diagram	FD 242-1			
Input circuit				
	AC/DC	AC/DC	AC/DC	AC/DC
Rated voltage U_N	24 V	28 V	110 – 127 V	220 – 240 V
Rated consumption at 50 Hz	1.1 VA / 1.0 W	1.2 VA / 1.0 W	1.7 VA / 1.4 W	1.9 VA / 1.6 W
Rated consumption at 60 Hz	1.1 VA / 1.0 W	1.2 VA / 1.0 W	1.7 VA / 1.4 W	2.0 VA / 1.7 W
Rated consumption DC	1.0 W	1.1 W	1.1 W	1.6 W
Switch-on peak	0.3 A / 0.5 ms	0.3 A / 0.5 ms	0.3 A / 0.2 ms	0.2 A / 0.1 ms
Rated voltage limits	80 – 110 %			
Rated frequency (f_n)	50 – 60 Hz ± 5 %			
Release value of the input voltage (power capacity approx. 150 pF/m)	≥ 15 % U_N; permissible line capacity 0.2 µF			
Parallel loads permissible	A1–A2 yes			
Internal half-wave rectification	A1–A2 no			
Output circuit				
Contact assignment	2 change-over contacts			
Contact material	Ag with 2 to 5 µm Au			
Rated operating voltage	AC/DC 250 V			
Rating for continuous current limit I_{th}	5 A			
Minimal contact voltage	AC/DC 15 V			
Application category according to EN 60947-5-1	AC-15 U_e AC 230 V, I_e 3 A DC-13 U_e DC 24 V, I_e 2 A			
Permissible switching frequency	≤ 3600 switching cycles/h			
Mechanical life	30×10^6 switching cycles			
Electrical life 20/2 A, AC 250 V, cos φ = 0.3	0.12×10^6 switching cycles AC-15			
Response time / release time at excitation of A1-A2	10 ms / 13 ms			
Other data				
Creepage distances and clearances	according to IEC 60664-1			
Degree of pollution	3 outside, 2 inside			
Overvoltage category	III			
Rated voltage	250 V			
Degree of protection according to IEC 60529 housing/terminals	IP 40/IP 20			
Ambient temperature, Operating range	–25 – +60 °C			
Dimension diagram (housing)	K 3-3			
Circuit diagram of the terminals	KS 242-1			
Wire range stranded or solid stranded with ferrules	1 x 0.2 – 6 or 2 x 0.2 – 2.5 mm^2 1 x 0.4 – 4 or 2 x 0.2 – 1.5 mm^2			
Weight	0.12 kg			
Accessories	–			
Approvals	–			

Overview of the devices/Part numbers

Type	Rated voltage		Delay	Part No.	Std. Pack
NGS 12	AC/DC 24 V	50 – 60 Hz	–	R2.154.0030.0	1
	AC/DC 28 V	50 – 60 Hz	–	R2.154.0040.0	1
	AC/DC 220 – 240 V	50 – 60 Hz	–	R2.154.0020.0	1
	AC/DC 110 – 127 V	50 – 60 Hz	–	R2.154.0010.0	1

PART NUMBER		80.020.4100.0 *flare*-24VDC/48VDC-0,5A	80.020.4101.0 *flare*-24VDC/48VDC-2A	80.020.4102.0 *flare*-115V/48VDC-0,5A	80.020.4103.0 *flare*-230VAC/48VDC-0,5A	80.020.4150.0 *flare*-24VDC/230VAC-0,5A	80.020.2003.0 WRS-SSDC-60V3A	80.020.2004.0 WRS-SSDC-60V5A	80.020.2001.0 WRS-SSAC1-250V4A	80.020.0004.0 WRS-SSAC1-250V6A
CATALOG PAGE		**910**	**910**	**910**	**911**	**911**	**914**	**914**	**915**	**915**
HOUSING	6.2 x 89 x 70	●	●	●	●	●				
(W x H x D in mm)	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

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.

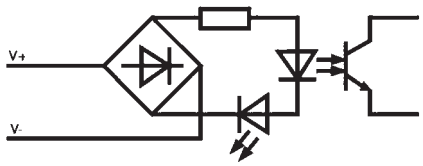
WRS, solid-state relays in a mounting base with input voltages of 24 V DC up to 230 V AC and switching currents up to 6 A.

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.

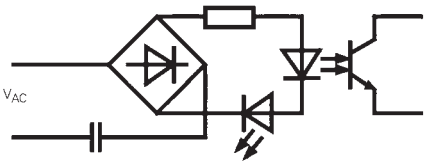
Overview of technical data

Input circuit/control side

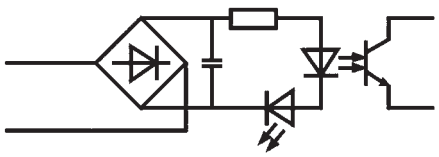
Wieland solid-state relays can be controlled with direct or alternating voltage, depending on their type. Each of the modules contains a suppression circuit against polarity reversal and an LED for status display in the input circuit.



Wiring diagram of DC input



Wiring diagram of AC input



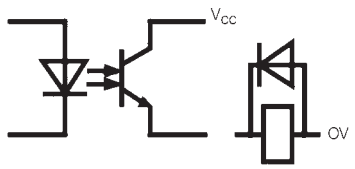
Wiring diagram of AC/DC input

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.

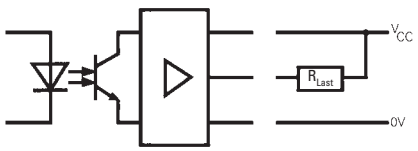
Output circuit/loadside

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



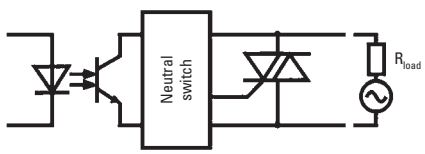
Wiring diagram of 2 wire output



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.

Overall width: 6.2 mm

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

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:

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

Overall width: 6.2 mm

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

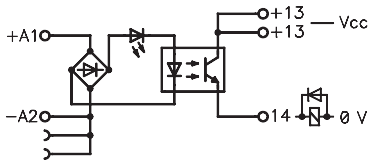
flare-230 V AC
Input 230 V AC
Output 48 V DC 0.5 A
Approvals:

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

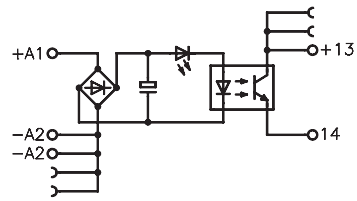
Description	Type	Part No.	Std. Pack	Type	Part No.	Std. Pack
24 V DC, 500 mA spring clamp connection				flare-24VDC/230VAC-0,5A	80.020.4150.0	10
230 V AC spring clamp connection	flare-230VAC/48VDC-0,5A	80.020.4103.0	10			
Control side						
Nominal input voltage	230 V AC			24 V DC		
Voltage range "ON"	90...250 V AC			10 V...53 V DC		
Voltage range "OFF"	0...40 V AC			0 V...5 V DC		
Power consumption	ca. 7.5 mA			ca. 6 mA		
Status display	LED yellow			LED yellow		
Load side						
Nominal output voltage	48 V DC			230 V AC		
Min. switching voltage	4.4 V DC			12 V AC		
Max. switching voltage	53 V DC			250 V AC		
Min. switching current	0.1 mA			0.1 mA		
Max. switching current	500 mA			500 mA		
On-state voltage	1.2 V DC			1.5 V AC		
Pick-up delay	25 ms			10 ms		
Release delay	25 ms			10 ms		
Switching frequency (resistive load)	10 Hz			20 Hz		
Minimum selectable current	Arc suppression diode			Arc suppression diode		
Suppression circuit						
General data						
Rated voltage						
Isolation voltage of input/output	3.75 kV			2.5 kV		
Overvoltage category	III			III		
Degree of pollution	2			2		
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 / 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

Circuit diagrams: *flare* – solid-state relays

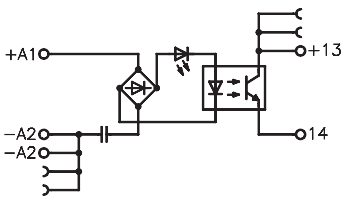
24 V/48 V DC; 500 mA; 2 A



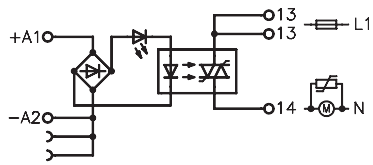
115 V AC/DC / 48 V DC; 500 mA



230 V AC / 48 V DC; 500 mA

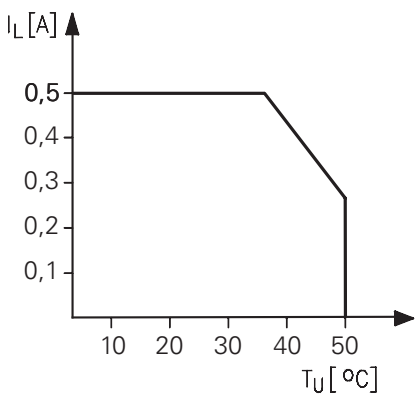


24 V DC / 230 V AC; 500 mA

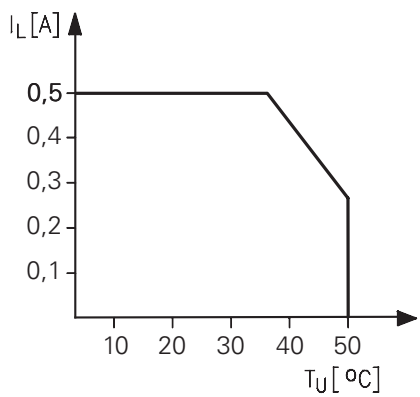


Derating: solid-state relays

24VDC/48VDC-0,5A

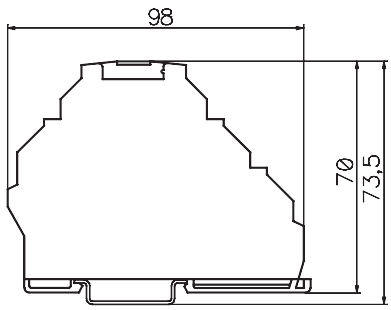


115V AC/DC / 48 V DC; 500 mA
230 V AC / 48 V DC; 500 mA
24 V DC / 230 V AC; 500 mA



Dimensions of *flare* relays

Housing with spring clamp terminals



– 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

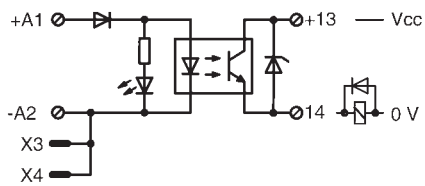
Description	Type	Part No.	Std. Pack	Type	Part No.	Std. Pack
Wieland relay system	WRS-SSDC-60V3A	80.020.2003.0	10	WRS-SSDC-60V5A	80.020.2004.0	10
Coil circuit						
Operating voltage	24 V DC +10%/–15%			24 V DC +10%/–15%		
Nominal input current per input	16 mA			16 mA		
Nominal input capacity	0.4 W			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^2t 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

	***WRS*-SSAC1** **Input 24 V DC; output 250 V AC 4 A** **2 wire output** Approvals: cULus SP			***WRS*-SSAC1** **Input 24 V DC; output 250 V AC 6 A** **2 wire output** cULus SP		
Dimensions (mm): W x H x D	12.5 x 80 x 56			25.6 x 80 x 70		
Description	Type	Part No.	Std. Pack	Type	Part No.	Std. Pack
Wieland relay system	WRS-SSAC1-250 V4A	80.020.2001.0	10	WRS-SSAC1-250 V6A	80.020.0004.0	5
Coil circuit						
Operating voltage	24 V DC +15%/–15%			24 V DC +15%/–15%		
Nominal input current	20 mA			15 mA		
Nominal input capacity	0.5 W			0.4 W		
Parallel connection of max	20 relays			20 relays		
Switching characteristics						
Nominal switching voltage	250 V AC			24 V – 250 V AC		
Maximum switching voltage	280 V AC			250 V AC		
Minimum switching voltage	48 V AC			24 V AC		
Peak off-state voltage	1200 Vs			600 Vs		
Critical rate of rise of voltage	500 V/µs			500 V/µs		
Effective on-state voltage	1.4 V			1.6 V		
Maximum effective current	4 A AC			6 A AC		
Minimum effective current	60 mA			60 mA		
Maximum impulse current	250 A AC (20 ms)			10 A AC		
Maximum residual current	0.1 mA			0.1 $mA_{eff.}$		
Power factor φ	> 0.5			> 0.5		
Zero sequence voltage switch	yes			yes		
I^2t value	260 A^2s			260 A^2s		
Fusing, note I^2t value	FF			FF		
Internal Suppression circuit				Varistor		
Maximum pick-up/release delay	10 ms			10 ms		
Maximum switching frequency	15 Hz			15 Hz		
Isolation voltage of input/output	4 $kV_{eff.}$			4 $kV_{eff.}$		
Capacity of input/output	10 pF			10 pF		
Overvoltage category						
Degree of pollution						
Ambient temperature	–25 °C...+50 °C (Derating)			–25 °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

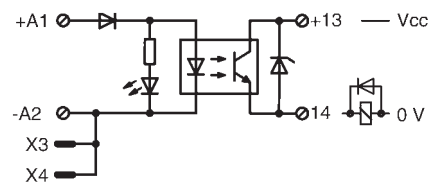
WRS solid-state relay

Circuit diagram

WRS-SSDC-60 V 3 A

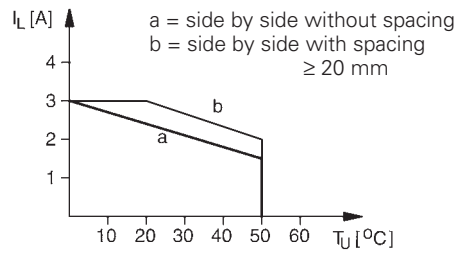


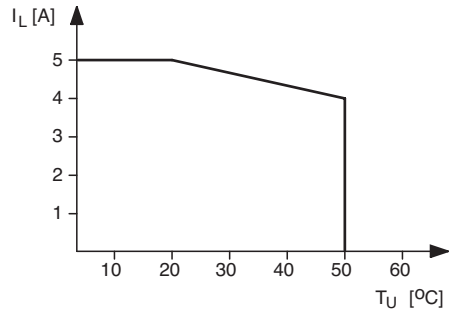
WRS-SSDC-60 V 5 A



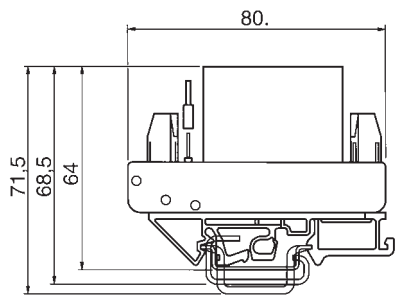
Derating

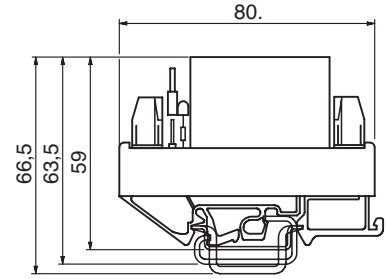
Derating
Solid-state relay WRS-SSDC 60V 3A





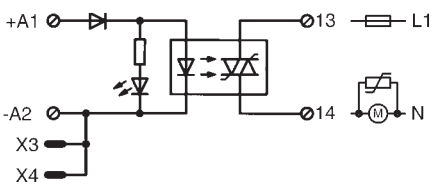
Dimensions



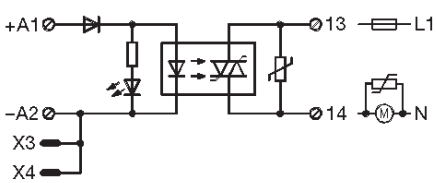


Circuit diagram

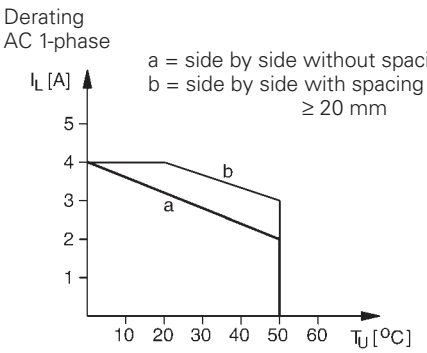
WRS-SSAC1-250 V 4 A

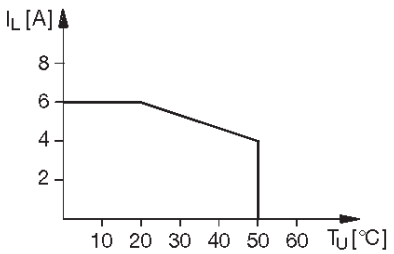


WRS-SSAC1-250 V 6 A

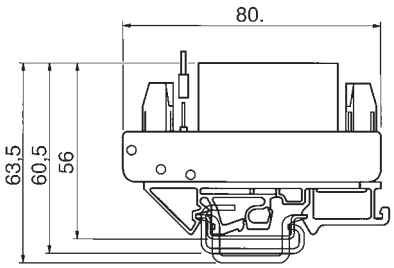


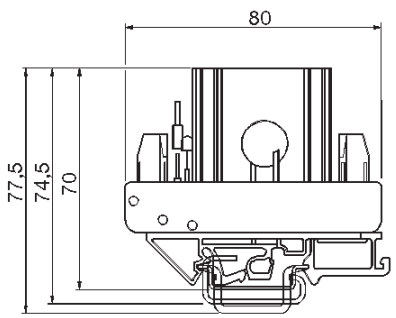
Derating





Dimensions

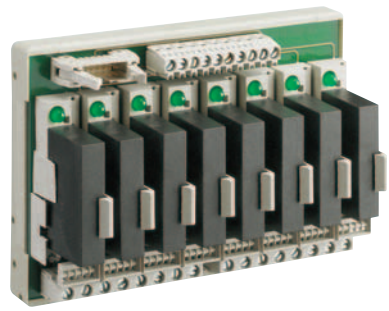




Coupling relays
Pluggable solid-state relays, module bases

Module bases for solid-state relays
– 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

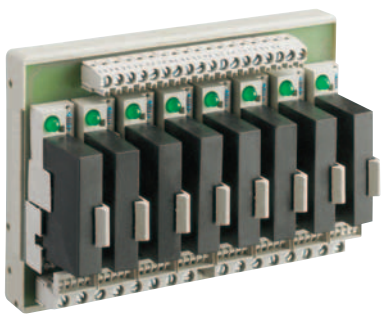
M-PB 4/8 SP
Module base 4/8 relays
70/138 x 96 x 70.3

Dimensions (mm): W x H x D

Description	Type	Part No.	Std. Pack	Type	Part No.	Std. Pack
1 relay module bases	M-PB 1 SR	87.220.1353.3	2			
4 relay module bases				M-PB 4 SP	87.220.0753.3	1
8 relay module bases				M-PB 8 SP	87.220.0853.3	1
Switching variations						
Input with positive/negative switching	+ / –					
Output with positive/negative switching	+ / –			+		
Notice: Please allow for the voltage drop at the LED						
Switching characteristics						
See technical data of input/output relays						
on pages 920 to 922						
General data						
Voltage drop at the LED	2 V			2 V		
Ambient temperature	–30 °C...+40 °C			–30 °C...+40 °C		
Storage temperature	–25 °C...+85 °C			–25 °C...+85 °C		
IDC header DIN 41651	–			8 relay, 10 pole		
Miniature fuse holder	5 x 20 mm			5 x 20 mm		
Wire diameter of solid-state relay connection	max 1.05 mm			max 1.05 mm		
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		
Mounting rail	TS 32 or TS 35					
Location of mounting rail	horizontal			horizontal		
Accessories						
Solid-state relay input (see page 920)	M-IDC24	Z5.580.8100.0	10			
Solid-state relay input (see page 920)	M-IAC24	Z5.580.7800.0	10			
Solid-state relay output (see page 921)	ODC 3–32 V / 3–60 V	Z8.000.0169.8	10	ODC 3–32 V / 3–60 V	Z8.000.0169.8	10
Solid-state relay output (see page 922)	ODC 3–32 V / 3–200 V	Z8.000.0169.9	10	ODC 3–32 V / 3–200 V	Z8.000.0169.9	10
Solid-state relay output (see page 921)	OAC 3–32 V / 24–280 V	Z8.000.0156.9	10	OAC 3–32 V / 24–280 V	Z8.000.0156.9	10

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 — 70/138 x 96 x 70.3

Description	Type	Part No.	Std. Pack
1 relay module bases			
4 relay module bases	M-PB 4 SG	87.220.1453.3	1
8 relay module bases	M-PB 8 SG	87.220.1553.3	1
Coil circuit			
Input with positive/negative switching	–		
Output with positive/negative switching	+ / –		
Notice: Please allow for the voltage drop at the LED			
Switching characteristics			
See technical data of input/output relays			
on pages 920 to 922			
General data			
Voltage drop at the LED	2 V		
Ambient temperature	–30 °C...+40 °C		
Storage temperature	–25 °C...+85 °C		
IDC header DIN 41651	–		
Miniature fuse holder	5 x 20 mm		
Wire diameter of solid-state relay connection	max 1.05 mm		
Wire range, fine-stranded/solid	0.5 mm^2 – 2.5 mm^2 / 0.5 mm^2 – 4 mm^2		
Mounting rail	TS 32 or TS 35		
Location of mounting rail	horizontal		
Accessories			
Solid-state relay input (see page 920)	M-IDC24	Z5.580.8100.0	10
Solid-state relay input (see page 920)	M-IAC24	Z5.580.7800.0	10
Solid-state relay output (see page 921)	ODC 3–32 V / 3–60 V	Z8.000.0169.8	10
Solid-state relay output (see page 922)	ODC 3–32 V / 3–200 V	Z8.000.0169.9	10
Solid-state relay output (see page 921)	OAC 3–32 V / 24–280 V	Z8.000.0156.9	10

Integration of LED indicator possible
Integration of fine fuse possible

M-IAC-24 A
Input 240 V AC; output 24 V DC 16 mA

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

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

Description	Type	Part No.	Std. Pack	Type	Part No.	Std. Pack
Solid-state relay	M-IAC 24 A	Z5.580.7800.0	10	M-IDC 24	Z5.580.8100.0	10
Pin base input						
Pin base output						
Coil circuit						
Nominal operating voltage	240 V AC			24 V DC		
Maximum operating voltage	280 V AC/DC			32 V DC		
Minimum operating voltage	180 V AC/DC			3.3 V DC		
Nominal input current	5 mA AC			34 mA		
Breaking current	1.5 mA AC			1 mA DC		
Resistance	75 kΩ			1 kΩ		
Maximum voltage without reaction at output	50 V AC/DC			2 V DC		
Maximum current without reaction at output	2 mA AC			1.5 mA DC		
Switching characteristics						
Nominal switching voltage	24 V DC			24 V DC		
Maximum switching voltage	30 V DC			30 V DC		
Minimum switching voltage	20 V DC			20 V DC		
Maximum current	16 mA DC			16 mA DC		
Leakage current	10 µA DC			10 µA DC		
Logic voltage	30 V DC			30 V DC		
Logic current	50 mA DC			50 mA DC		
Logic leakage current	10 µA DC			10 µA DC		
Logic voltage drop	200 mA DC			100 mA DC		
Maximum pick-up/release delay	20 ms / 30 ms			1 ms / 1 ms		
Maximum switching frequency	10 Hz			1 kHz		
Mains frequency	47–63 Hz			–		
Isolation voltage of input/output	4 $kV_{eff.}$ (1 sec.)			4 $kV_{eff.}$ (1sec.)		
Capacity of input/output	8 pF			8 pF		
Overvoltage category						
Degree of pollution						
Ambient temperature	–30 °C...+80 °C			–30 °C...+80 °C		
Storage temperature	–40 °C...+100 °C			–40 °C...+100 °C		
Standards/specifications						
Emitted interference/interference immunity						
Accessories						
Pin base	See pin base on page 918 and 919			See pin base on page 918 and 919		

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**			**ODC 3-32 V** **Input 3-32 V DC; output 60 V DC 3 A**		
Dimensions (mm): W x H x D	10.5 x 25.4 x 43			10.5 x 25.4 x 43		
Description	Type	Part No.	Std. Pack	Type	Part No.	Std. Pack
Solid-state relay	OAC 3-32 V/24-280 V	Z8.000.0156.9	10	ODC 3-32 V/3-60 V	Z8.000.0169.8	10
Coil circuit						
Operating voltage	3 – 32 V DC			3 – 32 V DC		
Nominal input current	1 – 22 mA			3 – 32 mA		
Minimum closing voltage	3 V DC			3 V DC		
Maximum opening voltage	1 V DC			1 V DC		
Maximum reverse voltage	32 V DC			6 V DC		
Resistance	1.5 kΩ			1 kΩ		
Switching behaviour						
Switching voltage	48 – 256 V_{eff} V AC			3 – 60 V DC		
Peak off-state voltage	650 Vs			60 V DC		
Critical rate of rise of voltage	100 V/µs			–		
Maximum effective on-state voltage	1.6 V			1.5 V		
Maximum effective current	5 A / 3 A (AC1 / AC3)			3 A DC (DC 13), (5 A / 1 sec)		
Minimum effective current	50 mA			1 mA		
Maximum impulse current (20 ms)	90 As			–		
Maximum leakage current	5 mA			1 mA		
Power factor φ	≥ 0.5			–		
Zero sequence voltage switch	yes			–		
I^2t value	42 A^2s			–		
Fusing of solid-state relay	FF 2.5 A			FF 2.5 A		
Fusing of load circuit	F 3.15 A			F 3.15 A		
Maximum pick-up/release delay	10 ms			100 µs / 1 ms		
Maximum switching frequency	–			1 kHz		
Isolation voltage of input/output	4 $kV_{eff.}$			4 $kV_{eff.}$		
Capacity of input/output	8 pF			8 pF		
Overvoltage category						
Degree of pollution						
Ambient temperature	–20 °C...+70 °C (Derating)			–40 °C...+50 °C (Derating)		
Storage temperature	–40 °C...+100 °C			–40 °C...+100 °C		
Standards/specifications						
Emitted interference/interference immunity						
Accessories						
Pin base	See pin base on page 918 and 919			See pin base on page 918 and 919		

ODC 3-32 V

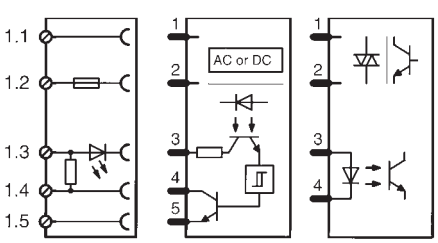
Input 3-32 V DC; output 200 V DC 1 A

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

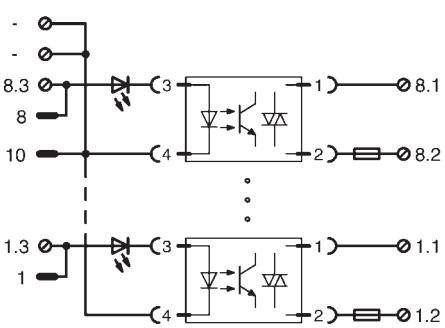
Description	Type	Part No.	Std. Pack	
Solid-state relay	ODC 3-32 V/3-200 V	Z8.000.0169.9	10	
Coil circuit				
Operating voltage	3–32 V DC			
Nominal input current per input	3–32 mA			
Minimum closing voltage	3 V DC			
Maximum opening voltage	1 V DC			
Maximum reverse voltage	6 V DC			
Resistance	1 kΩ			
Switching characteristics				
Nominal switching voltage	3–200 V DC			
Peak off-state voltage	200 V DC			
Critical rate of rise of voltage	–			
Maximum effective on-state voltage	1.5 V			
Maximum effective current	1 A (DC13); 2 A (1 sec)			
Minimum effective current	1 mA			
Maximum impulse current	–			
Maximum residual current	1 mA			
Power factor φ	–			
Zero sequence voltage switch	–			
I^2t value	–			
Fusing, note I2t value	FF 2.5 A			
	F 1.25 A			
Maximum pick-up/release delay	100 µs / 1 ms			
Maximum switching frequency	1 kHz			
Isolation voltage of input/output	4 $kV_{eff.}$			
Capacity of input/output	8 pF			
Overvoltage category				
Degree of pollution				
Ambient temperature	–40 °C...+50 °C (Derating)			
Storage temperature	–40 °C...+100 °C			
Standards/specifications				
Emitted interference/interference immunity				
Accessories				
Pin base	See pin base on page 918 and 919			

Circuit diagrams: M-PB module bases

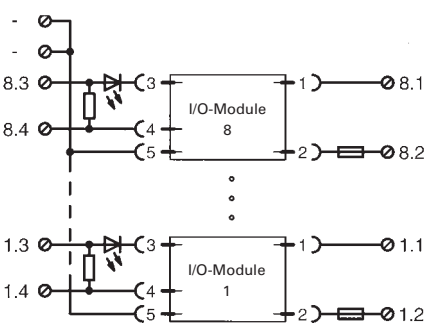
M-PB 1SR



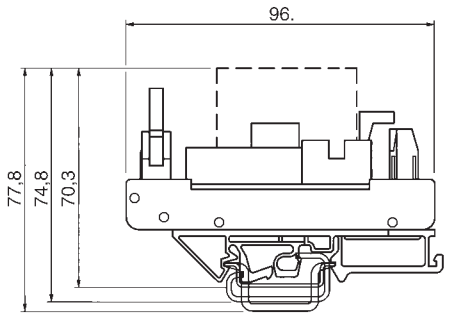
M-PB 4/8 SP



M-PB 4/8 SG

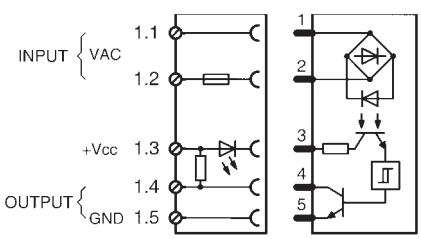


Dimensions of module bases

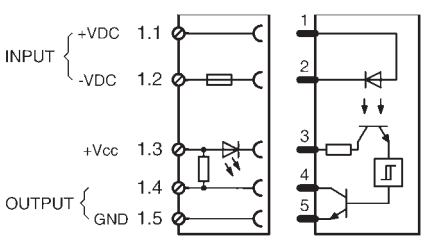


Circuit diagrams: M-PB solid-state relays

M-IAC 24 A

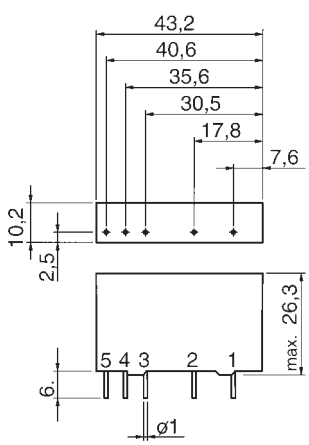


M-IDC 24



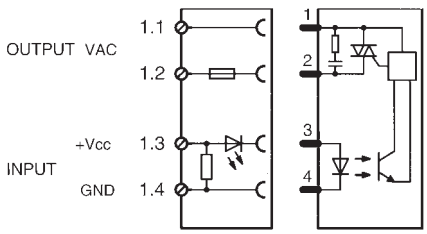
Dimensions

M-IAC 24 A / M-IDC 24 A

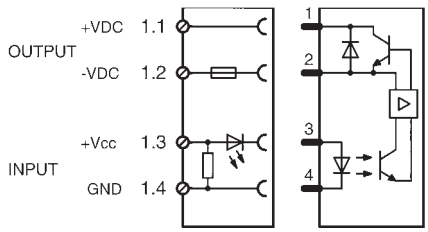


Circuit diagrams + derating: M-PB solid-state relays

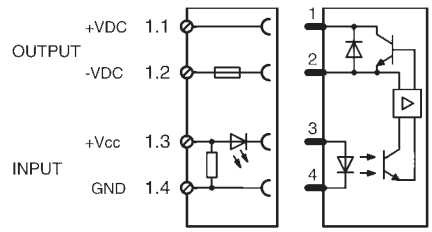
OAC 3–32 V/24–280 V



ODC 3–32 V/3–60 V

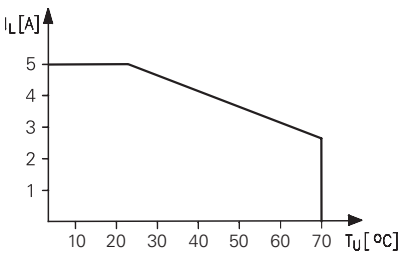


ODC 3–32 V/3–200 V

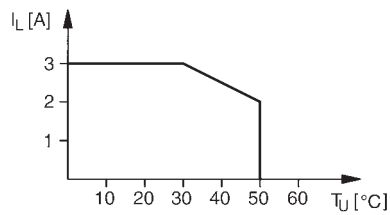


Derating

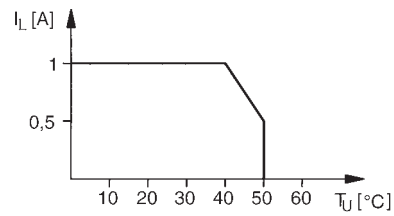
Output 230 V AC



Output 60 V DC

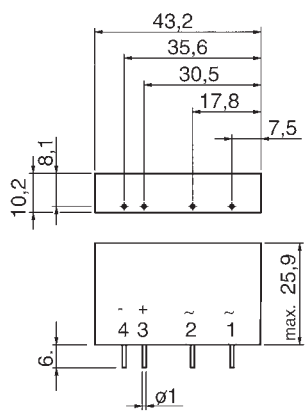


Output 200 V DC



Dimensions

OAC 3–32 V/24–280 V



interface