

INDUSTRIAL RELAYS

Industrial Electromagnetic Relays

Industrial electromagnetic relays are used mainly in industrial and power automation applications, in signaling controls, safety and protection systems and control and electric drives systems.



Features:

- DPDT, 3PDT and 4PDT contact configuration
- DC Coil voltages from 5VDC to 220V DC
- AC coil voltages from 6VAC to 240V AC 50/60 Hz
- Din Rail Plug in Socket are standard
- Rated load current: 5A/250V AC to 16A/250V AC rating
5A/24V DC to 16A/24VDC DC1 rating
- Test button with (K) or without block function (W)
- Built in LED light indicator (L)
- Surge suppression element with diode (D) or varistor (V)
- Approved for railroad applications (DE)
- Silver Nickel (AgNi) cadmium free contact material
- UL and CSA recognized relays
- ROHS2 and REACH compliance

Miniature Electromagnetic Relays

Miniature electromagnetic relays are used in many interface applications, standard automation projects, lighting control systems, emergency lighting applications, building application projects, food processing equipment control and many other electrical system applications.



Features:

- Standard SPDT, DPDT contact configuration
- DC Coil voltages from 3VDC to 110V DC
- AC coil voltages from 12VAC to 240V AC 50/60 Hz
- PCB mounting with socket or direct PCB solder
- Din Rail Plug in Socket are standard
- Rated load current: 8A/250V AC (DPDT) or 16A/250V AC (SPDT) rating;
8A/24V DC (DPDT) or 16A/24VDC (SPDT) DC1 rating
- Silver Nickel (AgNi) cadmium free contact material
- UL and CSA recognized relays
- ROHS2 and REACH compliance

Slimline Interface Relays

Slimline interface relays are used for PLC system and industrial automation applications, panel builders, machinery builders, time relays, office equipment and other applications that require a high switching capability in a small space.



Features:

- Standard SPDT contact configuration
- Standard 5 mm width
- DC Coil voltages from 5VDC to 60V DC
- Vertical or Horizontal configuration
- Sealed for Soldering and cleaning
- Can be used with Din rail socket or PCB mountable
- Rated load current
- 6A / 250V AC or 0.05A / 30V AC gold plated) rating
- 6A / 24V DC or 0.05A / 36V DC gold plated) rating
- 4A max for Solid state relays
- Silver Tin Oxide (AgSnO₂) cadmium free contact material
- Gold plated contact (AgSnO₂/Au 3μm) available
- UL recognized
- ROHS2 and REACH compliance

Subminiature Electromagnetic and Solid State Modules

Subminiature electromagnetic relays are used for PLC systems and industrial automation applications, panel builders, equipment builders and other applications that require a high switching capability in a small space. The Altech slim line interface relays can be used as a universal interface between the controller and the actuator to switch loads between 1 mA and 6A. They are available with electromechanical contacts or solid state configuration. Installation time is greatly reduced when a pre-assembled relays and sockets combination is used. Replacement relays and sockets are available from stock. Additional accessories include colored coded jumpers, spacers and markers (unmarked or marked based on the customer specification) for identification purposes.



Features:

- Standard SPDT contact configuration
- Space-saving 6.2 mm width
- Only 85 mm in height from DIN rail
- DC Coil voltages from 5VDC to 110V DC
- AC coil voltages from 6VAC to 240V AC 50/60 Hz
- Pre-assembled relay and DIN mount socket
- Screw clamp or Spring clamp terminals
- Universal AC/DC socket with built-in surge suppression and green LED
- Rated load current
- 6A / 250V AC or 0.05A / 30V AC gold plated) rating
- 6A / 24V DC or 0.05A / 36V DC gold plated) rating
- 4A max for Solid state relays
- Silver Tin Oxide (AgSnO₂) cadmium free contact material
- Gold plated contact (AgSnO₂/Au 3μm) available
- UL recognized
- ROHS2 and REACH compliance

Relays for Photovoltaic Systems

The Altech photovoltaic relays are suitable to be integrated in the solar converter to switch the DC voltage and current generated by the solar panels supplying the generated electricity to the electrical network. This requires an interface between the solar converter and the power grid. The circuit isolation gap between the converter and the power grid must have a contact gap of $\geq 1.5\text{mm}$ (according to safety standard DIN VDE 0126-1-1). Altech offers two different relays to meet this requirement.



Features:

- Standard DPST (2 NO) contact configuration
- DC Coil voltages from 5VDC to 110V DC
- Rated load current
- 35A / 250V AC or 48A / 250V AC
- 35A / 24V DC or 48A / 24V DC
- Contact gap $>1.75\text{ mm}$; Holding power 1W
- Silver Tin Oxide (AgSnO₂) cadmium free contact material
- Compact size, PCB mounting
- UL recognized
- ROHS2 and REACH compliance

MOUNTING OPTIONS					COIL			TYPE OF RELAY	NUMBER AND TYPE OF CONTACTS							RATED CURRENT [A]							
Direct PCB mounting	With plug-in socket PCB mounting	Panel mounting	35 mm rail mount acc. To PN-EN 60715	Others	AC	DC	AC/DC		SPDT	SPST(1NO)	SPST(1NC)	DPDT	DPST(2NO)	DPST(2NC)	3PDT	3PST(3NO)	4PDT	5	10	15	20	25	30

Industrial Electromagnetic Relays

								R2									12						
								R3									10						
								R4									6						
								RY2									12						
								R2M									5						
								RUC									16						
								R15 - DPDT									10						
								R15 - 3PDT									10						
								R15 - 4PDT									10						

Miniature Electromagnetic Relays

								RM40									5/8*						
								RM50									12						
								RM84									9						
								RM85									16						
								RM87									12						

Slimline Interface Relays

								RM699B									6						
								RSR30-...-D1-24-010-1									1						
								RSR30-...-A1-24-020-1									2						
								RSR30-...-D1-04-025-1									2.5						
								RSR30-...-D1-02-040-1									4						

Subminiature Electromagnetic and Solid State Modules

								PI6-1P									6						
								PI6-1T									1						
								PI6-1OC									1						
								PIR6W-1PS-...									max 6 ***						
								PIR6WB-1PS-...**									max 6 ***						

Relay Socket Combinations

								PI84 with socket GZT80									8						
								PI85 with socket GZT80									16						
								PI84 with socket GZM80									8						
								PI85 with socket GZM80									16						
								PIR2 with socket GZM2									12						
								PIR3 with socket GZM3									10						
								PIR4 with socket GZM4									6						
								PIR2M with socket GZ2									5						

* SPDT 5 A; SPST (1NO) 8A. **spring clamp socket. *** for more information see data sheet.

RSR30

Slimline Interface Relays



- Optically isolated
- Low on-state resistance
- Low input power consumption
- TTL and CMOS compatible
- RC networks (V AC)
- MOSFET output thyristor (V DC)

- Applications: household appliances, temperature control system, industrial automatic control, light system, office appliances, factory appliances
- Mounting: relays RSR30 are designed for direct PCB mounting, single in line package



AC Load - 2 A / 240 V

Input circuit

Part Number	Nominal voltage V DC	Control voltage range V DC	Max. control current mA	Release voltage V DC	Input resistance kΩ
▶ RSR30-D05-A1-24-020-1	5	3...10	12	1.0	0.32
▶ RSR30-D12-A1-24-020-1	12	7...20	10	1.0	1.07
▶ RSR30-D24-A1-24-020-1	24	18...32	7.7	1.0	3.0

Output circuit

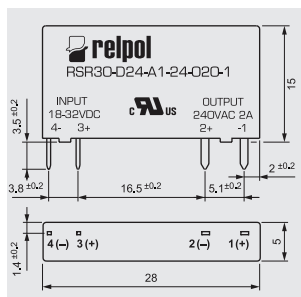
AC Load - 2 A / 240V

Nominal load current	1 A AC see Figure below
Max. load current	2 A AC see Figure below
Nominal load voltage	rest condition: 240 V AC
Load voltage range	12...280 V AC
Non-repetitive peak voltage	rest condition: 600 V AC
Non-repetitive surge current	operating state: 80 A
Max. off-state leakage current	rest condition: 1.5 mA
Max. on-state voltage drop	operating state: 1.2 V
Min. load current	operating state: 50 mA
Off-state dV/dt	max. allowable rate of voltage rise: 500 V/μs
Operating frequency range	47...400 Hz
RC snubber	10 nF, 100 Ω
Operation resistance	-
Peak power dissipation	-
Operating switching frequency	-
Transient voltage suppressor	-
Max voltage of suppressor operation	-

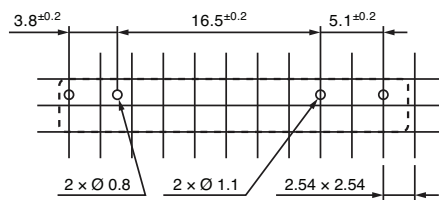
General data

Output circuit switching moment	R - instantaneous switching of the output circuit
Max. turn-on time	100 μs at rated voltage
Max. turn-off time	1/2 cycle + 1 ms at rated voltage
Insulation dielectric strength	between input and output: 4 000 V AC 1 minute
Dimensions (L x W x H)	28 x 5 x 15 mm
Weight	4 g
Storage temperature	-40...+100°C
Operating temperature	-20...+80 °C rated value: +55 °C see Figure below
Max. solder bath temperature	220 °C 10 s

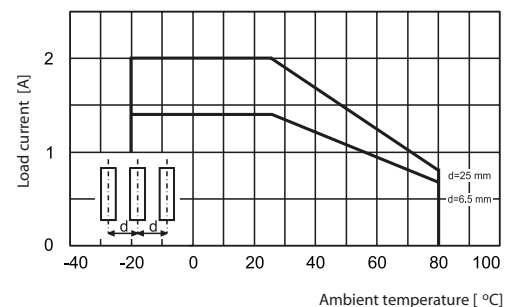
DIMENSIONS



PIN OUTS



Load current in the function of the ambient temperature and distances between relays



▶ **BOLD** - Regular stocked items.

RSR30

Slimline Interface Relays



- Optically isolated
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- Low input power consumption
- TTL and CMOS compatible
- RC networks (V AC)
- MOSFET output thyristor (V DC)

- Applications: household appliances, temperature control system, industrial automatic control, light system, office appliances, factory appliances
- Mounting: relays RSR30 are designed for direct PCB mounting, single in line package



DC Load - 2,5 A / 48 V

Input circuit

Part Number	Nominal voltage V DC	Control voltage range V DC	Max. control current mA	Release voltage V DC	Input resistance kΩ
▶ RSR30-D05-D1-04-025-1	5	3...10	12	1.8	0.32
▶ RSR30-D12-D1-04-025-1	12	7...20	10	3.6	1.07
▶ RSR30-D24-D1-04-025-1	24	18...32	7.7	8.3	3.0
▶ RSR30-D48-D1-04-025-1	48	38...58	4.4	8.3	10.8

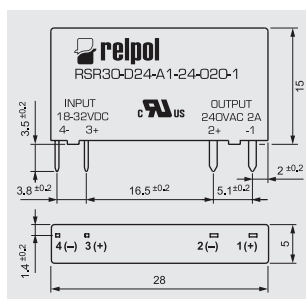
Output circuit

Nominal load current	1 A DC see Figure below
Max. load current	2.5 A DC see Figure below
Nominal load voltage	rest condition: 48 V DC
Load voltage range	0...60 V DC
Non-repetitive peak voltage	rest condition: 100 V DC
Non-repetitive surge current	operating state: 6 A
Max. off-state leakage current	rest condition: 1 mA
Max. on-state voltage drop	operating state: 0.4 V
Min. load current	operating state: 1 mA
Off-state dV/dt	-
Operating frequency range	-
RC snubber	-
Operation resistance	operating state: 160 mΩ at rated current
Peak power dissipation	600 W
Operating switching frequency	10 Hz
Transient voltage suppressor	Yes
Max voltage of suppressor operation	60 V DC

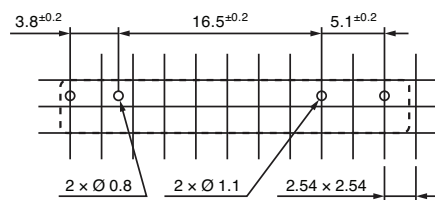
General data

Output circuit switching moment	R - instantaneous switching of the output circuit
Max. turn-on time	50 μs at rated voltage
Max. turn-off time	600 μs at rated voltage
Insulation dielectric strength	between input and output: 3 750 V AC 1 minute
Dimensions (L x W x H)	28 x 5 x 15 mm
Weight	4 g
Storage temperature	-25...+100°C
Operating temperature	-20...+80 °C rated value: +55 °C see Figure below
Max. solder bath temperature	220 °C 10 s

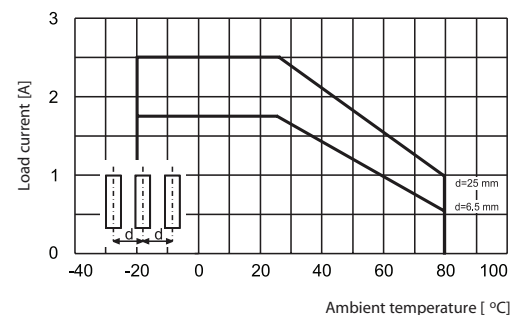
DIMENSIONS



PIN OUTS



Load current in the function of the ambient temperature and distances between relays



▶ **BOLD** - Regular stocked items.

RSR30

Slimline Interface Relays



PIR6W-1PS

- Optically isolated
- Low on-state resistance
- Low input power consumption
- TTL and CMOS compatible
- RC networks (V AC)
- MOSFET output thyristor (V DC)

- Applications: household appliances, temperature control system, industrial automatic control, light system, office appliances, factory appliances
- Mounting: relays RSR30 are designed for direct PCB mounting, single in line package



DC Load - 4 A / 24V Version

Input circuit

Part Number	Nominal voltage V DC	Control voltage range V DC	Max. control current mA	Release voltage V DC	Input resistance kΩ
▶ RSR30-D05-D1-02-040-1	5	3...10	12	1.8	0.32
▶ RSR30-D12-D1-02-040-1	12	7...20	10	3.6	1.07
▶ RSR30-D24-D1-02-040-1	24	18...32	7.7	8.3	3.0
▶ RSR30-D48-D1-02-040-1	48	38...58	4.4	8.3	10.8

Output circuit

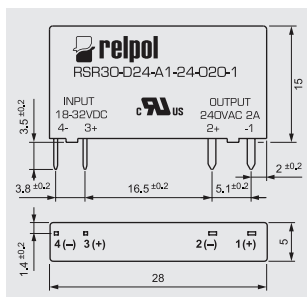
DC Load - 4 A / 24V

Nominal load current	2 A DC see Figure below
Max. load current	4 A DC see Figure below
Nominal load voltage	rest condition: 24 V DC
Load voltage range	0...32 V DC
Non-repetitive peak voltage	rest condition: 60 V DC
Non-repetitive surge current	operating state: 6 A
Max. off-state leakage current	rest condition: 1 mA
Max. on-state voltage drop	operating state: 0.24 V
Min. load current	operating state: 1 mA
Off-state dV/dt	-
Operating frequency range	-
RC snubber	-
Operation resistance	operating state: 120 mΩ
Peak power dissipation	600 W
Operating switching frequency	10 Hz
Transient voltage suppressor	Yes
Max voltage of suppressor operation	36 V DC

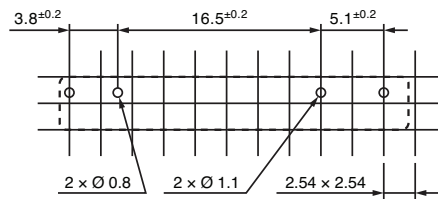
General data

Output circuit switching moment	R - instantaneous switching of the output circuit
Max. turn-on time	50 μs at rated voltage
Max. turn-off time	600 μs at rated voltage
Insulation dielectric strength	between input and output: 3 750 V AC 1 minute
Dimensions (L x W x H)	28 x 5 x 15 mm
Weight	4 g
Storage temperature	-25...+100 °C
Operating temperature	-20...+80 °C rated value: +55 °C see Figure below
Max. solder bath temperature	220 °C 10 s

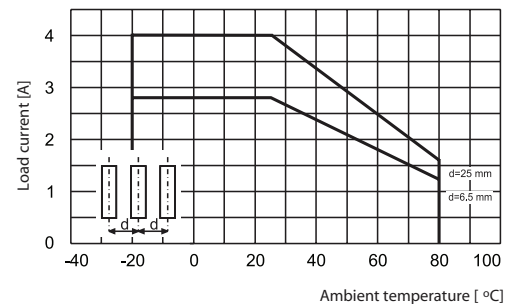
DIMENSIONS



PIN OUTS



Load current in the function of the ambient temperature and distances between relays



▶ **BOLD** - Regular stocked items.

RSR30

Slimline Interface Relays



PIR6W-1PS

- Optically isolated
- Low on-state resistance
- Low input power consumption
- TTL and CMOS compatible
- RC networks (V AC)
- MOSFET output thyristor (V DC)

- Applications: household appliances, temperature control system, industrial automatic control, light system, office appliances, factory appliances
- Mounting: relays RSR30 are designed for direct PCB mounting, single in line package



DC Load - 1 A / 100V Version

Input circuit

Part Number	Nominal voltage V DC	Control voltage range V DC	Max. control current mA	Release voltage V DC	Input resistance kΩ
▶ RSR30-D05-D1-24-010-1	5	3...10	12	1.8	0.32
▶ RSR30-D12-D1-24-010-1	12	7...20	10	3.6	1.07
▶ RSR30-D24-D1-24-010-1	24	18...32	7.7	8.3	3.0
▶ RSR30-D48-D1-24-010-1	48	38...58	4.4	8.3	10.8

Output circuit

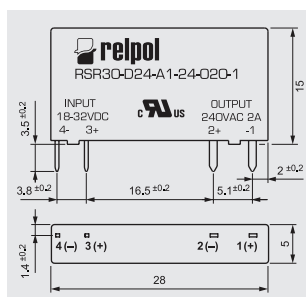
DC Load - 1 A / 100V

Nominal load current	0.4 A DC see Figure below
Max. load current	1 A DC see Figure below
Nominal load voltage	rest condition: 100 V DC
Load voltage range	0...180 V DC
Non-repetitive peak voltage	rest condition: 180 V DC
Non-repetitive surge current	operating state: 6 A
Max. off-state leakage current	rest condition: 1 mA
Max. on-state voltage drop	operating state: 0.6 V
Min. load current	operating state: 1 mA
Off-state dV/dt	-
Operating frequency range	-
RC snubber	-
Operation resistance	operating state: 1.5 Ω maximum value
Peak power dissipation	600 W
Operating switching frequency	10 Hz
Transient voltage suppressor	Yes
Max voltage of suppressor operation	180 V DC

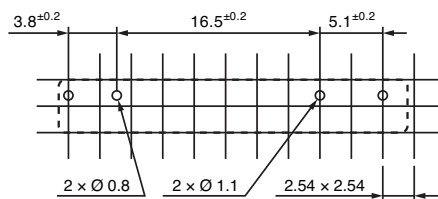
General data

Output circuit switching moment	R - instantaneous switching of the output circuit
Max. turn-on time	50 μs at rated voltage
Max. turn-off time	600 μs at rated voltage
Insulation dielectric strength	between input and output: 2 500 V AC 1 minute
Dimensions (L x W x H)	28 x 5 x 15 mm
Weight	4 g
Storage temperature	-25...+100 °C
Operating temperature	-20...+80 °C rated value: +55 °C see Figure below
Max. solder bath temperature	220 °C 10 s

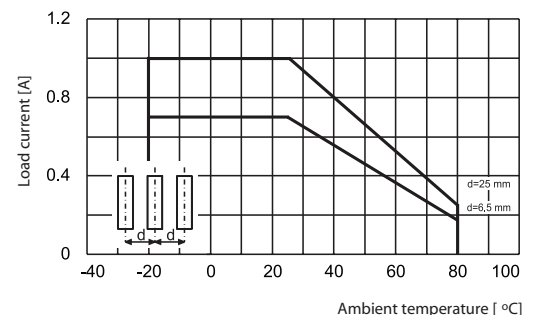
DIMENSIONS



PIN OUTS



Load current in the function of the ambient temperature and distances between relays



▶ **BOLD** - Regular stocked items.

RM699B

Slimline Interface Relays



RM699B
for PCB mounting
or plug-in sockets

- Cover width only 5,0 mm
- Sealed for soldering and cleaning
- Applications: for PLC's, industrial machinery, time relays, counters, temperature adjusters, measurement instruments, office equipment, etc.



RM699B SPDT DC coil / 6A rated current

Part Number	Coil Voltage DC	Coil Type	Coil Resistance at 20°C in Ω	Coil Operating Range	
				min. (at 20°C)	max. (at 55°C)
▶ RM699BV-3011-85-1005	5	DC	147	3.75	7.5
▶ RM699BV-3011-85-1012	12	DC	848	9.0	18.0
▶ RM699BV-3011-85-1024	24	DC	3390	18.0	36.0
▶ RM699BV-3011-85-1048	48	DC	10600	36.0	72.0
▶ RM699BV-3011-85-1060	60	DC	20500	45.0	90.0

RM699B SPDT gold plated contacts DC coil / 0.05A rated current

Part Number	Coil Voltage DC	Coil Type	Coil Resistance at 20°C in Ω	Coil Operating Range	
				min. (at 20°C)	max. (at 55°C)
RM699BV-3211-85-1005	5	DC	147	3.75	7.5
RM699BV-3211-85-1012	12	DC	848	9.0	18.0
RM699BV-3211-85-1024	24	DC	3390	18.0	36.0
RM699BV-3211-85-1048	48	DC	10600	36.0	72.0
RM699BV-3211-85-1060	60	DC	20500	45.0	90.0

Contact Data

Number and type of contacts		RM699B	
		SPDT	SPDT
Contact material		AgSnO ₂	AgSnO ₂ / Au 3µm
Max. switching voltage		400 V AC / 250 V DC	30V AC / 36 V DC
Min. switching voltage		10 V	5V
Rated load	AC1	6 A / 250 V AC	0.05 A / 30V AC
	DC1	6 A / 24 V DC; 0.15 A / 250 V DC	0.05 A / 36 V DC
Min. switching current		100 mA	10mA
Max. inrush current		10 A 20 ms	0.1 A 20 ms
Rated current		6A	0.05 A
Max. breaking capacity		1500 VA	1.2 VA
Min. breaking capacity		1 W	0.05 W
Contact resistance		≤ 100 mΩ 100 mA, 24 V	≤ 30 mΩ 10 mA, 5 V
Max. operating frequency			
• at rated load		360 cycles/hour	360 cycles/hour
• no load		72000 cycles/hour	72000 cycles/hour

Coil Data

Rated voltage	DC	5 ... 60 V
Must release voltage		DC: ≥ 0.05 U _n
Operating range of supply voltage		see table above
Rated power consumption	DC	0.17 W 5 ... 24 V; 0.217 W 48, 60 V

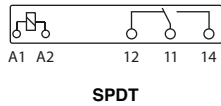
Insulation

Insulation rated voltage	250 V AC
Overvoltage category	III
Dielectric strength	4 000 V AC type of insulation: reinforced 1 000 V AC type of clearance: micro-disconnection
Contact - coil distance	
• clearance	≥ 6 mm
• creepage	≥ 8 mm

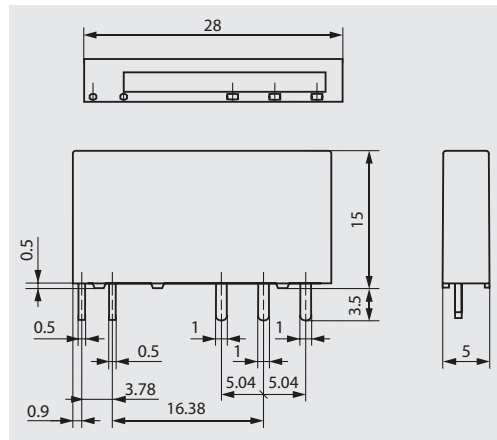
General data

Operating / release time (typical values)	8 ms / 4 ms
Electrical life (number of cycles)	
• resistive AC1	the SPST (1 NO) and SPST (1 NC) contact loaded (bilateral load): see Fig. 1 the SPST (1 NO) contact loaded: > 3 x 10 ⁷ ; 6 A, 250 V AC
Mechanical life (cycles)	> 10 ⁷
Dimensions (L x W x H)	28 x 5 x 15 mm
Weight	6 g
Ambient temperature	
• storage	-40...+85 °C
• operating	-40...+85 °C
Cover protection category	IP 64 PN-EN 60529
Environmental protection	RTIII PN-EN 116000-3
Shock resistance	5 g
Vibration resistance	5 g 10...55 Hz
Solder bath temperature	max. 260 °C
Soldering time	max. 5 s

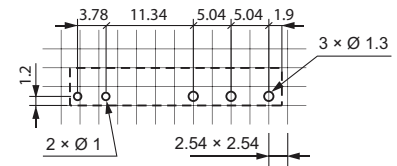
CONNECTION DIAGRAMS



DIMENSIONS



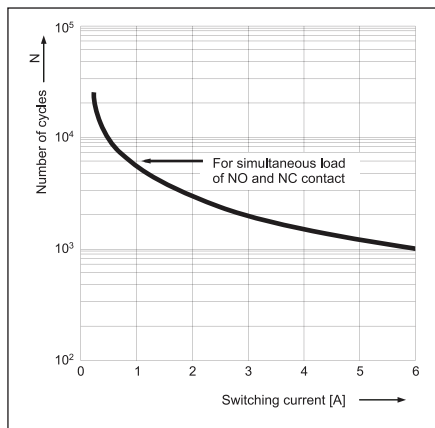
PIN OUTS



LOAD CHARTS

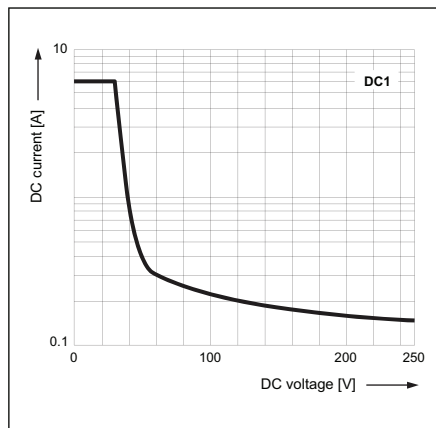
Electrical life at AC resistive current.
Switching frequency: 360 cycles/hour

Fig. 1



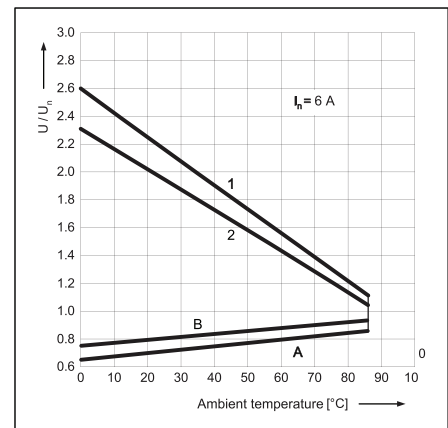
Max. DC resistive load breaking capacity

Fig. 2



Coil operating range - DC

Fig. 3



Description of Fig. 3

A - relations between make voltage and ambient temperature at no load on contacts. Coil temperature and ambient temperature are equal before coil energizing. Make voltage is not higher than the value read on Y axis (multiplication of rated voltage).

B - relations between make voltage and ambient temperature after initial coil heating up with $1.1 U_n$, at continues load of I_n on contacts. Make voltage is not higher than the value read on Y axis (multiplication of rated voltage).

1. 2 - values on Y axis represent allowed overvoltage on coil at certain ambient temperature and contact load: 1 - no load; 2 - rated load

Socket Ordering Codes

Part Number Screw Clamp Terminals	Part Number Spring Clamp Terminals	Rated input voltage U_n	Power of input circuit
PI6W-1PS-6VDC	PI6WB-1PS-6VDC	5 VDC	0.3 W
PI6W-1PS-12/24VDC	PI6WB-1PS-12/24VDC	12/24 VDC	0.2 W
PI6W-1PS-36VDC	PI6WB-1PS-36VDC	36 VDC	0.3 W
PI6W-1PS-48VDC	PI6WB-1PS-48VDC	48 VDC	0.4 W
PI6W-1PS-60VDC	PI6WB-1PS-60VDC	60 VDC	0.5 W
PI6W-1PS-24VAC/DC	PI6WB-1PS-24VAC/DC	24 VAC/DC	0.5VA / 0.4W
PI6W-1PS-42VAC/DC	PI6WB-1PS-42VAC/DC	42 VAC/DC	0.5VA / 0.4W
PI6W-1PS-115VAC/DC	PI6WB-1PS-115VAC/DC	115 VAC/DC	1.2VA / 1.2W
PI6W-1PS-230VAC/DC	PI6WB-1PS-230VAC/DC	230 VAC/DC	1.2VA / 1.2W



For relay socket combinations see pages 96-97 (screw clamp terminals) and pages 100-101 (spring clamp terminals).