



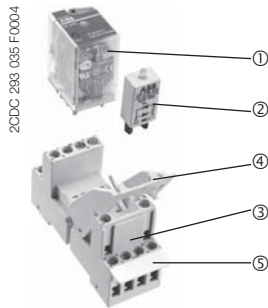
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Pluggable interface relays CR-M

Miniature relays

Data sheet



CR-M

- ① Interface relay
- ② Pluggable function module
- ③ Socket
- ④ Holder
- ⑤ Marker

Features

- Standard miniature relays with mechanical status indication
- 12 different supply voltages:
DC versions: 12 V, 24 V, 48 V, 60 V, 110 V, 125 V, 220 V
AC versions: 24 V, 48 V, 60 V, 110 V, 120 V, 230 V
- Output: 2 c/o (SPDT) contacts (12 A), 3 c/o (SPDT) contacts (10 A) or 4 c/o (SPDT) contacts (6 A)
- Available with or without LED
- 4-c/o (SPDT) version optionally equipped with gold contacts, LED and free wheeling diode
- Integrated test button for manual actuation and locking of output contacts (blue =DC, orange = AC) that can be removed if necessary
- Cadmium-free contact material
- Suited for logical and standard sockets
- Width on socket: 27 mm
- Pluggable function modules: reverse polarity protection/free wheeling diode, LED indication, RC elements, overvoltage protection, time modules

Approvals

	UL508	(except 60 V DC and 125 V DC devices with gold contacts)
	CAN/CSA C22.2 No.14	(except devices with gold contacts)
	CAN/CSA C22.2 No.14	(except 60 V DC and 125 V DC devices)
	VDE	(except 125 V DC devices)
	GOST	
	Lloyds Register	(only devices with 4 c/o (SPDT) contacts)
	CCC	
	RMRS	

Marks

CE CE

Order data

Type	Rated control supply voltage U_s	Order code
Interface relays without LED 2 c/o (SPDT) contacts: 250 V, 12 A		
CR-M012DC2	12 V DC	1SVR 405 611 R4000
CR-M024DC2	24 V DC	1SVR 405 611 R1000
CR-M048DC2	48 V DC	1SVR 405 611 R6000
CR-M060DC2	60 V DC	1SVR 405 611 R4200
CR-M110DC2	110 V DC	1SVR 405 611 R8000
CR-M125DC2	125 V DC	1SVR 405 611 R8200
CR-M220DC2	220 V DC	1SVR 405 611 R9000
CR-M024AC2	24 V AC	1SVR 405 611 R0000
CR-M048AC2	48 V AC	1SVR 405 611 R5000
CR-M110AC2	110 V AC	1SVR 405 611 R7000
CR-M120AC2	120 V AC	1SVR 405 611 R2000
CR-M230AC2	230 V AC	1SVR 405 611 R3000

Bold printed products = stocked products. Packing unit = 10 pieces.

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Type	Rated control supply voltage U _s	Order code
Interface relays without LED 3 c/o (SPDT) contacts: 250 V, 10 A		
CR-M012DC3	12 V DC	1SVR 405 612 R4000
CR-M024DC3	24 V DC	1SVR 405 612 R1000
CR-M048DC3	48 V DC	1SVR 405 612 R6000
CR-M060DC3	60 V DC	1SVR 405 612 R4200
CR-M110DC3	110 V DC	1SVR 405 612 R8000
CR-M125DC3	125 V DC	1SVR 405 612 R8200
CR-M220DC3	220 V DC	1SVR 405 612 R9000
CR-M024AC3	24 V AC	1SVR 405 612 R0000
CR-M048AC3	48 V AC	1SVR 405 612 R5000
CR-M060AC3	60 V AC	1SVR 405 612 R5200
CR-M110AC3	110 V AC	1SVR 405 612 R7000
CR-M120AC3	120 V AC	1SVR 405 612 R2000
CR-M230AC3	230 V AC	1SVR 405 612 R3000
Interface relays without LED 4 c/o (SPDT) contacts: 250 V, 6 A		
CR-M012DC4	12 V DC	1SVR 405 613 R4000
CR-M024DC4	24 V DC	1SVR 405 613 R1000
CR-M048DC4	48 V DC	1SVR 405 613 R6000
CR-M060DC4	60 V DC	1SVR 405 613 R4200
CR-M110DC4	110 V DC	1SVR 405 613 R8000
CR-M125DC4	125 V DC	1SVR 405 613 R8200
CR-M220DC4	220 V DC	1SVR 405 613 R9000
CR-M024AC4	24 V AC	1SVR 405 613 R0000
CR-M048AC4	48 V AC	1SVR 405 613 R5000
CR-M110AC4	110 V AC	1SVR 405 613 R7000
CR-M120AC4	120 V AC	1SVR 405 613 R2000
CR-M230AC4	230 V AC	1SVR 405 613 R3000
Interface relays with LED 2 c/o (SPDT) contacts: 250 V, 12 A		
CR-M012DC2L	12 V DC	1SVR 405 611 R4100
CR-M024DC2L	24 V DC	1SVR 405 611 R1100
CR-M048DC2L	48 V DC	1SVR 405 611 R6100
CR-M060DC2L	60 V DC	1SVR 405 611 R4300
CR-M110DC2L	110 V DC	1SVR 405 611 R8100
CR-M125DC2L	125 V DC	1SVR 405 611 R8300
CR-M220DC2L	220 V DC	1SVR 405 611 R9100
CR-M024AC2L	24 V AC	1SVR 405 611 R0100
CR-M048AC2L	48 V AC	1SVR 405 611 R5100
CR-M110AC2L	110 V AC	1SVR 405 611 R7100
CR-M120AC2L	120 V AC	1SVR 405 611 R2100
CR-M230AC2L	230 V AC	1SVR 405 611 R3100

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Type	Rated control supply voltage U_s	Order code
Interface relays with LED, 3 c/o (SPDT) contacts: 250 V, 10 A		
CR-M012DC3L	12 V DC	1SVR 405 612 R4100
CR-M024DC3L	24 V DC	1SVR 405 612 R1100
CR-M048DC3L	48 V DC	1SVR 405 612 R6100
CR-M060DC3L	60 V DC	1SVR 405 612 R4300
CR-M110DC3L	110 V DC	1SVR 405 612 R8100
CR-M125DC3L	125 V DC	1SVR 405 612 R8300
CR-M220DC3L	220 V DC	1SVR 405 612 R9100
CR-M024AC3L	24 V AC	1SVR 405 612 R0100
CR-M048AC3L	48 V AC	1SVR 405 612 R5100
CR-M110AC3L	110 V AC	1SVR 405 612 R7100
CR-M120AC3L	120 V AC	1SVR 405 612 R2100
CR-M230AC3L	230 V AC	1SVR 405 612 R3100
Interface relays with LED, 4 c/o (SPDT) contacts: 250 V, 6 A		
CR-M012DC4L	12 V DC	1SVR 405 613 R4100
CR-M024DC4L	24 V DC	1SVR 405 613 R1100
CR-M048DC4L	48 V DC	1SVR 405 613 R6100
CR-M060DC4L	60 V DC	1SVR 405 613 R4300
CR-M110DC4L	110 V DC	1SVR 405 613 R8100
CR-M125DC4L	125 V DC	1SVR 405 613 R8300
CR-M220DC4L	220 V DC	1SVR 405 613 R9100
CR-M024AC4L	24 V AC	1SVR 405 613 R0100
CR-M048AC4L	48 V AC	1SVR 405 613 R5100
CR-M110AC4L	110 V AC	1SVR 405 613 R7100
CR-M120AC4L	120 V AC	1SVR 405 613 R2100
CR-M230AC4L	230 V AC	1SVR 405 613 R3100
Interface relays with LED and free wheeling diode, 4 c/o (SPDT) contacts: 250 V, 6 A		
CR-M024DC4LD	24 V DC	1SVR 405 614 R1100
Interface relays with gold contacts, 4 c/o (SPDT) contacts: 250 V, 6 A		
CR-M024DC4G	24 V DC	1SVR 405 618 R1000
CR-M024AC4G	24 V AC	1SVR 405 618 R0000
CR-M110AC4G	110 V AC	1SVR 405 618 R7000
CR-M230AC4G	230 V AC	1SVR 405 618 R3000
Interface relays with LED and gold contacts, 4 c/o (SPDT) contacts: 250 V, 6 A		
CR-M012DC4LG	12 V DC	1SVR 405 618 R4100
CR-M024DC4LG	24 V DC	1SVR 405 618 R1100
CR-M048DC4LG	48 V DC	1SVR 405 618 R6100
CR-M060DC4LG	60 V DC	1SVR 405 618 R4300
CR-M110DC4LG	110 V DC	1SVR 405 618 R8100
CR-M125DC4LG	125 V DC	1SVR 405 618 R8300
CR-M220DC4LG	220 V DC	1SVR 405 618 R9100
CR-M024AC4LG	24 V AC	1SVR 405 618 R0100
CR-M048AC4LG	48 V AC	1SVR 405 618 R5100
CR-M110AC4LG	110 V AC	1SVR 405 618 R7100
CR-M120AC4LG	120 V AC	1SVR 405 618 R2100
CR-M230AC4LG	230 V AC	1SVR 405 618 R3100

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Type	Rated control supply voltage U_s	Order code
Interface-relays with gold contacts, LED and free wheeling diode, 4 c/o (SPDT) contacts: 250 V, 6 A		
CR-M012DC4LDG	12 V DC	1SVR 405 618 R4400
CR-M024DC4LDG	24 V DC	1SVR 405 618 R1400

Ordering data - Accessories

Function modules

Type	Rated control supply voltage U_s	Version	Order code
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Diode - Reverse polarity protection

CR-P/M 22	6-230 V DC	A1+, A2-	1SVR 405 651 R0000
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Diode and LED - Reverse polarity protection

CR-P/M 42	6-24 V DC	red, A1+, A2-	1SVR 405 652 R0000
CR-P/M 42V	6-24 V DC	green, A1+, A2-	1SVR 405 652 R1000
CR-P/M 42B	24-60 V DC	red, A1+, A2-	1SVR 405 652 R4000
CR-P/M 42BV	24-60 V DC	green, A1+, A2-	1SVR 405 652 R4100
CR-P/M 42C	110-230 V DC	red, A1+, A2-	1SVR 405 652 R9000
CR-P/M 42CV	110-230 V DC	green, A1+, A2-	1SVR 405 652 R9100

RC element - Arc elimination

CR-P/M 52B	6-24 V AC		1SVR 405 653 R0000
CR-P/M 52D	24-60 V AC		1SVR 405 653 R4000
CR-P/M 52C	110-230 V AC		1SVR 405 653 R1000

Diode and LED

CR-P/M 62	6-24 V AC/DC	red, for DC: A1+, A2-	1SVR 405 654 R0000
CR-P/M 62V	6-24 V AC/DC	green, for DC: A1+, A2-	1SVR 405 654 R1000
CR-P/M 62E	24-60 V AC/DC	red, for DC: A1+, A2-	1SVR 405 654 R4000
CR-P/M 62EV	24-60 V AC/DC	green, for DC: A1+, A2-	1SVR 405 654 R4100
CR-P/M 92	110-230 V AC/DC	red, for DC: A1+, A2-	1SVR 405 654 R0100
CR-P/M 92V	110-230 V AC/DC	green, for DC: A1+, A2-	1SVR 405 654 R1100

Varistor and LED - Overvoltage protection

CR-P/M 62C	6-24 V AC/DC	red, for DC: A1+, A2-	1SVR 405 655 R0000
CR-P/M 62CV	6-24 V AC/DC	green, for DC: A1+, A2-	1SVR 405 655 R1000
CR-P/M 62D	24-60 V AC/DC	red, for DC: A1+, A2-	1SVR 405 655 R4000
CR-P/M 62DV	24-60 V AC/DC	green, for DC: A1+, A2-	1SVR 405 655 R4100
CR-P/M 92C	110-230 V AC/DC	red, for DC: A1+, A2-	1SVR 405 655 R0100
CR-P/M 92CV	110-230 V AC/DC	green, for DC: A1+, A2-	1SVR 405 655 R1100

Varistor - Overvoltage protection

CR-P/M 72	24 V AC		1SVR 405 656 R0000
CR-P/M 72A	115 V AC		1SVR 405 656 R1000
CR-P/M 82	230 V AC		1SVR 405 656 R2000

Time modules

Type		Order code
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Time module

CR-P/M T1	12-24 V AC/DC	ON-delay	1SVR 405 657 R0000
CR-P/M T2	12-24 V AC/DC	Impulse-ON	1SVR 405 657 R0100

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All CR-P/M modules - except time modules CR-P/M T... - can be plugged onto all CR-P or CR-M sockets. The time modules CR-P/M T... can be plugged onto the following sockets only: CR-PLSx, CR-PLC and CR-M2LS, CR-M3LS, CR-M4LS, CR-M2LC, CR-M4LC.

Sockets

Type	Version	Connection	Order code
Logical sockets			
CR-M2LS	for 2 c/o (SPDT) contacts	screw	1SVR 405 651 R1100
CR-M3LS	for 3 c/o (SPDT) contacts	screw	1SVR 405 651 R2100
CR-M4LS	for 2 or 4 c/o (SPDT) contacts	screw	1SVR 405 651 R3100
CR-M2LC	for 2 c/o (SPDT) contacts	spring	1SVR 405 651 R1200
CR-M4LC	for 2 or 4 c/o (SPDT) contacts	spring	1SVR 405 651 R3200
Standard sockets			
CR-M2SS	for 2 c/o (SPDT) contacts	screw	1SVR 405 651 R1000
CR-M3SS	for 3 c/o (SPDT) contacts	screw	1SVR 405 651 R2000
CR-M4SS	for 2 or 4 c/o (SPDT) contacts	screw	1SVR 405 651 R3000
CR-M2SF	for 2 c/o (SPDT) contacts	fork type screw	1SVR 405 651 R1300
CR-M4SF	for 2 or 4 c/o (SPDT) contacts	fork type screw	1SVR 405 651 R3300
Accessories for CR-M sockets			
CR-MH	Plastic holder		1SVR 405 659 R1000
CR-MH1	Metall holder		1SVR 405 659 R1100
CR-MJ	Jumper bar for sockets with screw clamps		1SVR 405 658 R6000

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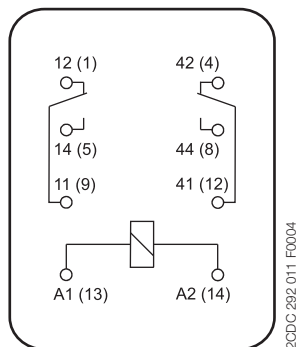
Application

Interface relays are electromechanic and electronic input and output modules for electrical isolation, levelling, noise suppression or signal amplification between control unit and process.

Operating mode

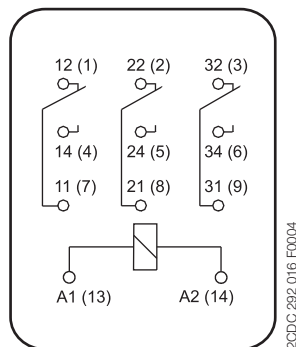
When power supply is applied, the output contacts get closed. When control supply voltage is switched off, the contacts fall back into their starting position. Manual operation and locking of the output relays is possible via the integrated test button.

Connection diagrams



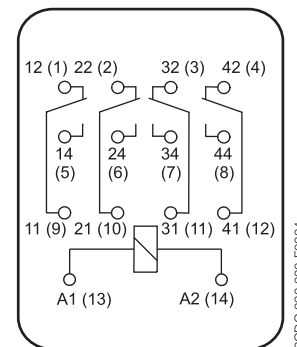
CR-M with 2 c/o (SPDT) contacts

A1-A2 Control supply voltage
11-12/14 Relay outputs
41-42/44



CR-M with 3 c/o (SPDT) contacts

A1-A2 Control supply voltage
11-12/14 Relay outputs
21-22/24
31-32/34



CR-M with 4 c/o (SPDT) contacts

A1-A2 Control supply voltage
11-12/14 Relay outputs
21-22/24
31-32/34
41-42/44

Pluggable interface relays CR-M

Miniature relays

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Technical data

Input circuit - Coil data A1-A2

	Rated control supply voltage U_s	Rated frequency	Make voltage (at 20 °C)	Maxium voltage (at 55 °C)	Break voltage	Rated power	Coil resistance (at 20 °C)	Tolerance of coil resistance
DC coils	12 V DC	-	9.6 V DC	13.2 V DC	$\geq 0.1 U_s$	0.9 W	160 Ω	$\pm 10 \%$
	24 V DC	-	19.2 V DC	26.4 V DC	$\geq 0.1 U_s$	0.9 W	640 Ω	$\pm 10 \%$
	48 V DC	-	38.4 V DC	52.8 V DC	$\geq 0.1 U_s$	0.9 W	2600 Ω	$\pm 10 \%$
	60 V DC	-	48.0 V DC	66.0 V DC	$\geq 0.1 U_s$	0.9 W	4000 Ω	$\pm 10 \%$
	110 V DC	-	88.0 V DC	121.0 V DC	$\geq 0.1 U_s$	0.9 W	13600 Ω	$\pm 10 \%$
	125 V DC	-	100.0 V DC	137.5 V DC	$\geq 0.1 U_s$	0.9 W	16000 Ω	$\pm 10 \%$
	220 V DC	-	176.0 V DC	242.0 V DC	$\geq 0.1 U_s$	0.9 W	54000 Ω	$\pm 10 \%$
AC coils	24 V AC	50 / 60 Hz	19.2 V AC	26.4 V AC	$\geq 0.2 U_s$	1.6 VA	158 Ω	$\pm 10 \%$
	48 V AC	50 / 60 Hz	38.4 V AC	52.8 V AC	$\geq 0.2 U_s$	1.6 VA	640 Ω	$\pm 10 \%$
	60 V AC	50 / 60 Hz	48.0 V AC	66.0 V AC	$\geq 0.2 U_s$	1.6 VA	930 Ω	$\pm 10 \%$
	110 V AC	50 / 60 Hz	88.0 V AC	121.0 V AC	$\geq 0.2 U_s$	1.6 VA	3450 Ω	$\pm 10 \%$
	120 V AC	50 / 60 Hz	96.0 V AC	132.0 V AC	$\geq 0.2 U_s$	1.6 VA	3770 Ω	$\pm 10 \%$
	230 V AC	50 / 60 Hz	184.0 V AC	253.0 V AC	$\geq 0.2 U_s$	1.6 VA	16100 Ω	$\pm 10 \%$

Type	CR-M...2		CR-M...3		CR-M...4	
Output circuits	11-12/14 21-22/24		11-12/14 21-22/24 31-32/34		11-12/14 21-22/24 31-32/34 41-42/44	
Kind of output	Relay, 2 c/o (SPDT)		Relay, 3 c/o (SPDT)		Relay, 4 c/o (SPDT)	
Contact material	AgNi		AgNi		AgNi AgNi/Au 5 µm	
Rated operational voltage U _a (VDE 0110, IEC 60947-1)	250 V					
Min. switching voltage	5 V					
Max. switching voltage	DC	250 V DC				
	AC	250 V AC				
Min. switching current	5 mA (AgNi), 2 mA (AgNi/Au)					
Conventional free-air thermal current I _{th}	12 A		10 A		6 A	
Rated operational current (IEC 60947-5-1)	AC12 (resistive)	230 V	12 A	10 A	6 A	
	AC15 (inductive)	230 V	1.5 A	1.5 A	1 A	
	DC12 (resistive)	24 V	12 A	10 A	6 A	
	DC13 (inductive)	24 V	8 A	8 A	6 A	
Min. switching power	0.3 W (AgNi), 0.1 W (AgNi/Au)					
Max. switching power	AC1	3000 VA	2500 VA		1500 VA	
Contact resistance	≤ 100 mΩ					
Max. switching capacity	rated load AC1	1200 switching cycles/h				
	without load	18000 switching cycles/h				
Lifetime	mechanical	> 2 x 10 ⁷ switching cycles				
	electrical AC1 (resistive)	> 10 ⁵ switching cycles				
		(12 A, 250 V)	(10 A, 250 V)		(6 A, 250 V)	
	cos φ	see Reduction factor F				
Response time	typ. 13 ms (DC), typ. 10 ms (AC)					
Release time	typ. 3 ms (DC), typ. 8 ms (AC)					

Pluggable interface relays CR-M

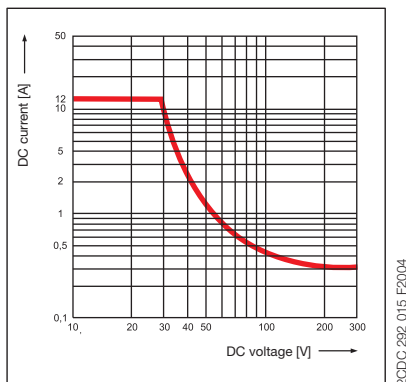
Miniature relays

Data sheet

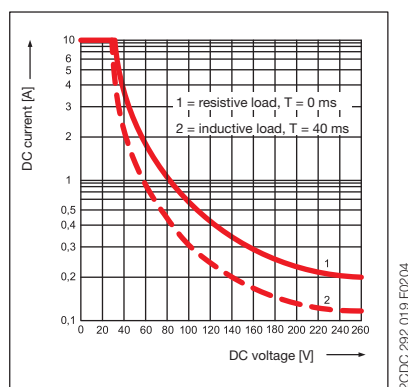
Type		CR-M...2	CR-M...3	CR-M...4
Isolation data				
Rated insulation voltage		250 V AC		
Insulation class		C250 / B250		
Rated impulse withstand voltage U _{imp} between	coil and contacts	2.5 kV AC		
	open contacts	1.5 kV AC		
	c/o (SPDT) contacts	2.5 kV AC	2 kV AC	
Clearance	betw. coil and contacts	≥ 2.5 mm		≥ 1.6 mm
Creepage distance	betw. coil and contacts	≥ 4 mm		≥ 3.2 mm
Overvoltage category		III		II
Pollution degree		3		2
General data				
Dimensions (W x H x D) when mounted		21.2 x 27.5 x 35.6 mm		
Weight		35 g (0.077 lb)		
Mounting		on socket (see accessories)		
Mounting position		any		
Degree of protection		IP 40		
Electrical data				
Connection		by socket		
Environmental data				
Ambient temperature range	operation	DC	-40...+70 °C	
		AC	-40...+55 °C	
	storage	-40...+85 °C		
Vibration resistance (10-150 Hz)	n/o contact	5 g		
	n/c contact	5 g		
Shock resistance	n/o contact	10 g		
	n/c contact	5 g		
Standards				
Product standard		EN 60810-1, EN 60255-23, IEC 61810-7		
Low Voltage Directive		73/23/EEC		

Technical diagrams

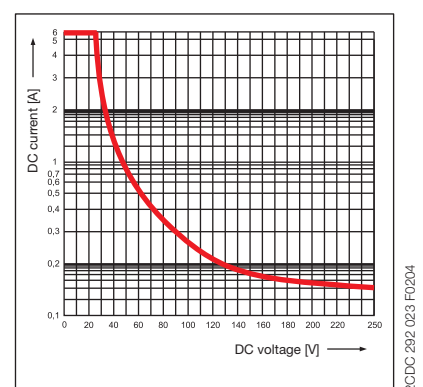
Load limit curves - Maximum switching power at resistive DC load



Versions with 2 c/o (SPDT) contacts (CR-M ... 2)



Versions with 3 c/o (SPDT) contacts (CR-M ... 3)



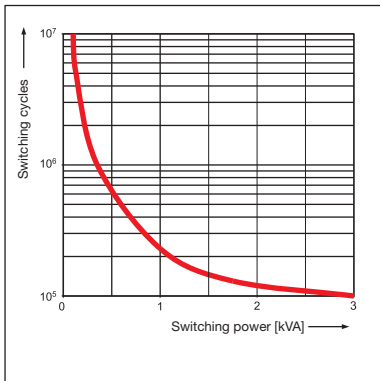
Versions with 4 c/o (SPDT) contacts (CR-M ... 4)

Pluggable interface relays CR-M

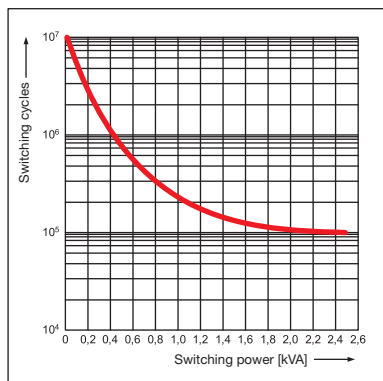
Miniature relays

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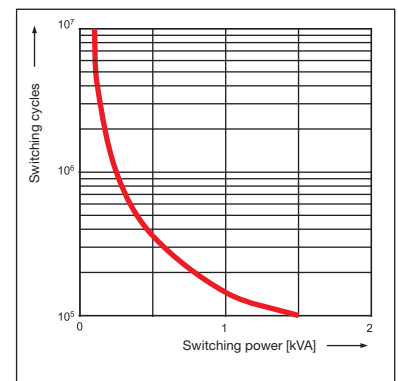
Load limit curves - Electrical lifetime at resistive AC load



Versions with 2 c/o (SPDT) contacts (CR-M ... 2)

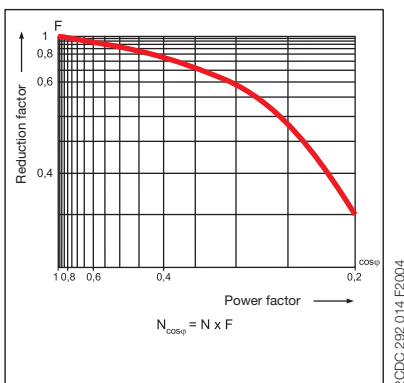


Versions with 3 c/o (SPDT) contacts (CR-M ... 3)

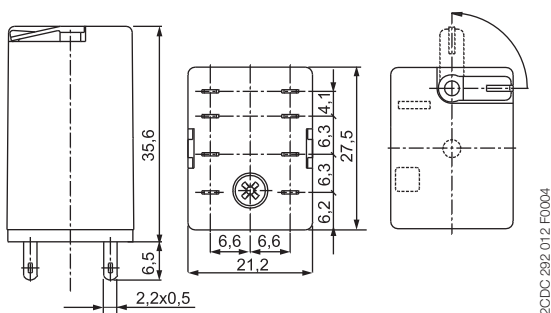


Versions with 4 c/o (SPDT) contacts (CR-M ... 4)

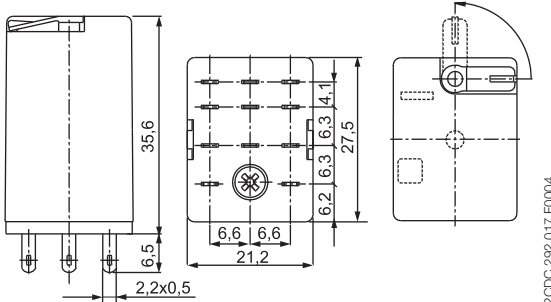
Reduction factor F at inductive AC load



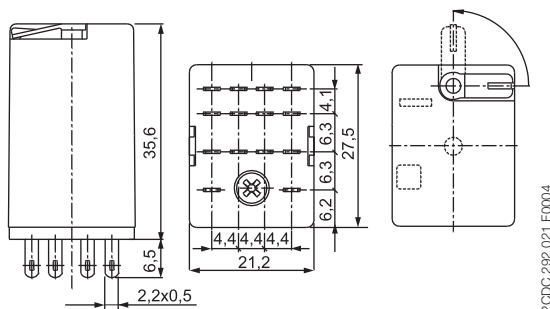
Dimensions in mm



Versions with 2 c/o (SPDT) contacts (CR-M ... 2)



Versions with 3 c/o (SPDT) contacts (CR-M ... 3)



Versions with 4 c/o (SPDT) contacts (CR-M ... 4)

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Data sheet

Further documentation

Document title	Document type	Document number
Sockets CR-M	Data sheet	2CDC 117 005 D020x
Jumper bar CR-MJ	Data sheet	2CDC 117 015 D020x
Pluggable function modules CR-P/M	Data sheet	2CDC 117 007 D020x
Pluggable time modules CR-PM T	Data sheet	2CDC 117 011 D020x



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DocId:34444444 (05/05/2004)

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