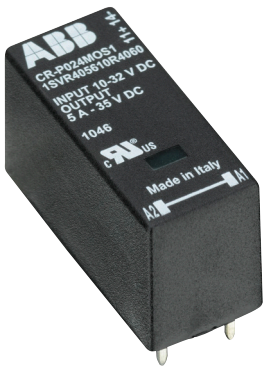
Data sheet

Pluggable interface relays and optocouplers CR-P
Pcb relays, optocouplers and accessories

Pluggable interface relays and optocouplers are used for electrical isolation, amplification and signal matching between the electronic controlling, e.g. PLC (programmable logic controller), PC or field bus systems and the sensor / actuator level. They don't use additional internal protective circuits and thus are overload-proof against short-time variations like current or voltage peaks.

2CDC 291 045 F0004



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Characteristics

- Standard Pcb relays and optocouplers
- 9 different rated control supply voltages U_s:
  DC versions: 12 V, 24 V, 48 V, 110 V
  AC versions: 24 V, 48 V, 110 V, 120 V, 230 V
- Output relay: 1 c/o (SPDT) contact (16 A) or 2 c/o (SPDT) contacts (8 A), 2 c/o (SPDT) contact version optionally equipped with gold contacts
  Output optocoupler: MOS-FET 5 A - 35 V DC, Triac 3 A - 275 V AC
- Cadmium-free contact material
- Suited for logical and standard sockets
- Width on socket: 15.8 mm
- Pluggable function modules: reverse polarity protection/ free wheeling diode, LED indication, RC elements, overvoltage protection

Approvals

	ANSI/UL 508	
	CAN/CSA C22.2 No.14	
	CAN/CSA C22.2 No.14	((only relays and sockets, except versions with gold contacts)
	VDE	(only relays and sockets)
	EAC	(only relays and sockets)
	CCC	(only relays and sockets)
	RMRS	(only relays and sockets)

Order data

Packing unit = 10 pieces

Pluggable interface relays, 1 c/o (SPDT) contact: 250 V, 16 A

Type	Rated control supply voltage U_s	Order code
CR-P012DC1	12 V DC	1SVR 405 600 R4000
CR-P024DC1	24 V DC	1SVR 405 600 R1000
CR-P048DC1	48 V DC	1SVR 405 600 R6000
CR-P110DC1	110 V DC	1SVR 405 600 R8000
CR-P024AC1	24 V AC	1SVR 405 600 R0000
CR-P048AC1	48 V AC	1SVR 405 600 R5000
CR-P110AC1	110 V AC	1SVR 405 600 R7000
CR-P120AC1	120 V AC	1SVR 405 600 R2000
CR-P230AC1	230 V AC	1SVR 405 600 R3000

Pluggable interface relays, 2 c/o (SPDT) contacts: 250 V, 8 A

CR-P012DC2	12 V DC	1SVR 405 601 R4000
CR-P024DC2	24 V DC	1SVR 405 601 R1000
CR-P048DC2	48 V DC	1SVR 405 601 R6000
CR-P110DC2	110 V DC	1SVR 405 601 R8000
CR-P024AC2	24 V AC	1SVR 405 601 R0000
CR-P048AC2	48 V AC	1SVR 405 601 R5000
CR-P110AC2	110 V AC	1SVR 405 601 R7000
CR-P120AC2	120 V AC	1SVR 405 601 R2000
CR-P230AC2	230 V AC	1SVR 405 601 R3000

Pluggable interface relays, 2 c/o (SPDT) with gold contacts: 250 V, 8 A

CR-P024DC2G	24 V DC	1SVR 405 606 R1000
CR-P024AC2G	24 V AC	1SVR 405 606 R0000
CR-P110AC2G	110 V AC	1SVR 405 606 R7000
CR-P230AC2G	230 V AC	1SVR 405 606 R3000

Pluggable optocouplers

Type	Rated control supply voltage U_s	Output	Order code
CR-P024MOS1	10-32 V DC	MOS-FET, 5 A - 35 V DC	1SVR 405 610 R4060
CR-P024TRI1		Triac, 3 A - 275 V AC	1SVR 405 610 R4070

Accessories

Function modules

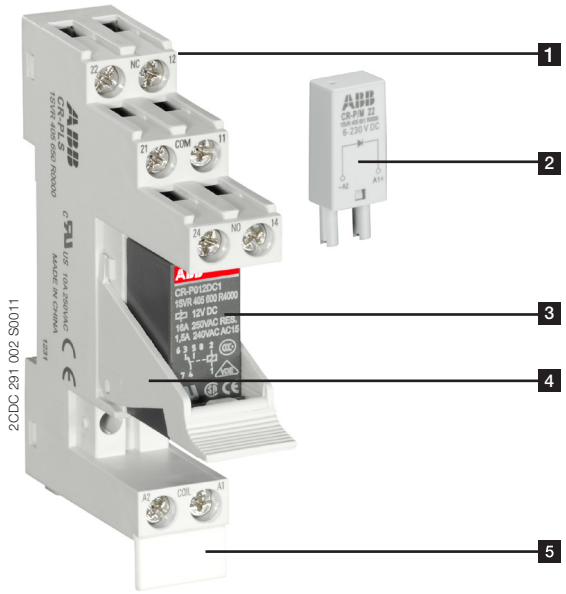
Type	Rated control supply voltage U_s	Version	Order code
Diode - Reverse polarity protection			
CR-P/M 22	6-220 V DC	A1+, A2-	1SVR 405 651 R0000
Diode and LED - Reverse polarity protection			
CR-P/M 42	6-24 V DC	red, A1+, A2-	1SVR 405 652 R0000
CR-P/M 42V	6-24 V DC	green, A1+, A2-	1SVR 405 652 R1000
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 V DC	red, A1+, A2-	1SVR 405 652 R9000
CR-P/M 42CV	110 V DC	green, A1+, A2-	1SVR 405 652 R9100
RC element - Arc elimination			
CR-P/M 52B	6-24 V AC/DC		1SVR 405 653 R0000
CR-P/M 52D	24-60 V AC/DC		1SVR 405 653 R4000
CR-P/M 52C	110-230 V AC/DC		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/ 110 V DC	red, for DC: A1+, A2-	1SVR 405 654 R0100
CR-P/M 92V	110-230 V AC/ 110 V 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/ 110 V DC	red, for DC: A1+, A2-	1SVR 405 655 R0100
CR-P/M 92CV	110-230 V AC/ 110 V 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

Sockets

Type	Version	Connection	Order code
Logical sockets			
CR-PLS	with protective separation	screw	1SVR 405 650 R0000
CR-PLSx		screw	1SVR 405 650 R0100
CR-PLC		spring	1SVR 405 650 R0200
Standard socket			
CR-PSS		screw	1SVR 405 650 R1000
Accessories for CR-P sockets			
CR-PH	Plastic holder		1SVR 405 659 R0000
CR-PJ	Jumper bar for sockets with screw connection		1SVR 405 658 R5000
Markers			
CR-PM	Marker		1SVR 405 658 R0000

Functions

Operating controls



1 **Socket**

2 **Pluggable function module**

3 **Interface relay**

4 **Holder**

5 **Marker label**

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.

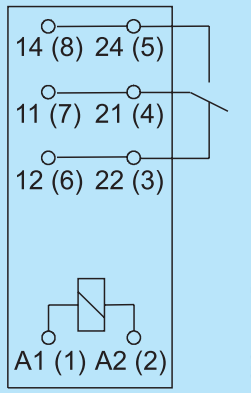
Optocouplers are mostly used where high switching frequency is necessary. They have no moving parts thus operate bounce-free and immune to vibrations.

Operating mode

When control supply voltage is applied, the output contacts of the interface relay get closed. When control supply voltage is switched off, the contacts fall back into their starting position.

Electrical connection

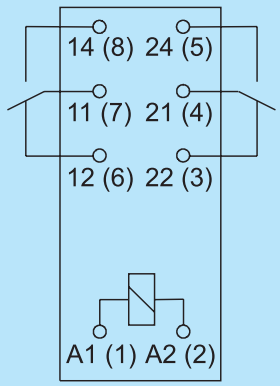
CR-P with 1 c/o (SPDT) contact



A1-A2	Control supply voltage
11(21)-12(22)/14(24)	Relay output

Connection diagram

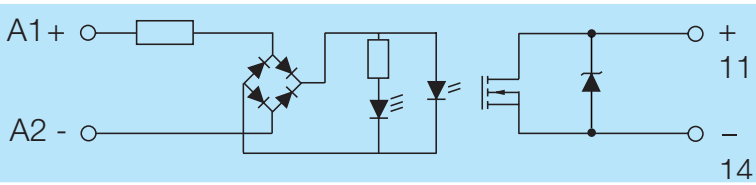
CR-P with 2 c/o (SPDT) contacts



A1-A2	Control supply voltage
11-12/14, 21-22/24	Relay outputs

Connection diagram

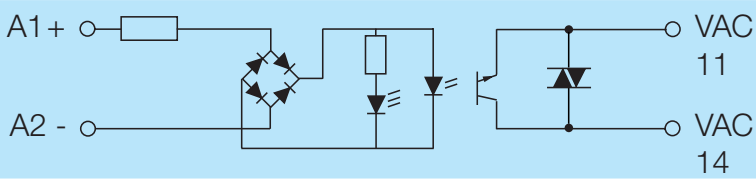
CR-P024MOS1



A1-A2	Control supply voltage
11-14	Output contacts

Connection diagram

CR-P024TRI1



A1-A2	Control supply voltage
11-14	Output contacts

Connection diagram

Technical data - CR-P interface relays

Input circuit - Supply circuit 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	-	8.4 V DC	30.6 V DC	0.1 U_s	0.4-0.48 W	360 Ω	10 %
	24 V DC	-	16.8 V DC	61.2 V DC	0.1 U_s	0.4-0.48 W	1440 Ω	10 %
	48 V DC	-	33.6 V DC	122.4 V DC	0.1 U_s	0.4-0.48 W	5700 Ω	10 %
	110 V DC	-	77.0 V DC	280.0 V DC	0.1 U_s	0.4-0.48 W	25200 Ω	10 %
AC Coils	24 V AC	50/60 Hz	19.2 V AC	28.8 V AC	0.15 U_s	0.75 VA	400 Ω	10 %
	48 V AC	50/60 Hz	38.4 V AC	57.6 V AC	0.15 U_s	0.75 VA	1550 Ω	10 %
	110 V AC	50/60 Hz	88.0 V AC	132.0 V AC	0.15 U_s	0.75 VA	8900 Ω	10 %
	120 V AC	50/60 Hz	96.0 V AC	144.0 V AC	0.15 U_s	0.75 VA	10200 Ω	10 %
	230 V AC	50/60 Hz	184.0 V AC	276.0 V AC	0.15 U_s	0.75 VA	38500 Ω	10 %

Output circuits

Type			CR-P...1	CR-P...2
Output circuit(s) - Relay contact(s)			11-12/14	11-12/14, 21-22/24
Kind of output			Relay, 1 c/o (SPDT) contact	Relay, 2 c/o (SPDT) contacts
Contact material			AgNi	AgNi AgNi/Au 5 µm
Rated operational voltage U_e (IEC/EN 60947-1)			250 V	
Minimum switching voltage			5 V	
Maximum switching voltage			300 V DC / 440 V AC	
Minimum switching current			5 mA (AgNi), 2 mA (AgNi/Au)	
Rated free air thermal current I_{th}			16 A	8 A
Rated operational current (IEC/EN 60947-5-1)	AC-12 (resistive)	230 V	16 A	8 A
	AC-15 (inductive)	230 V	1.5 A	1.5 A
	AC-15 (inductive)	120 V	3 A	3 A
	DC-12 (resistive)	24 V	16 A	8 A
	DC-13 (inductive)	24 V	2.5 A	2 A
	DC-13 (inductive)	120 V	0.22 A	0.22 A
	DC-13 (inductive)	250 V	0.1 A	0.1 A
AC rating * (UL 508; NEMA ICS-5)	Utilization category (pilot duty) (Contact rating code designation)		B300	
	Max. rated operational voltage		300 V AC	
	Max. continuous thermal current at utilization category		5 A	
	Max. making / breaking apparent power at utilization category		3600 / 360 VA	
	Utilization category (resistive) (CSA22.2 No.14....)		16 A, 250 V AC	8 A, 250 V AC
DC rating * (UL 508; NEMA ICS-5)	Utilization category (pilot duty) (Contact rating code designation)		R300	
	Max. rated operational voltage		300 V DC	
	Max. continuous thermal current at utilization category		1 A	
	Max. making / breaking apparent power at utilization category		28 VA	
	Utilization category (resistive) (CSA22.2 No.14....)		-	10 A, 24 V DC
Maximum making (inrush) current			30 A	15 A
Minimum switching power			0.3 W (AgNi), 0.05 W (AgNi/Au)	

Type		CR-P...1	CR-P...2
Maximum switching (breaking) power	AC-1 (resistive)	4000 VA	2000 VA
Contact resistance		≤ 100 mΩ	
Maximum operating frequency	rated load AC-1	600 switching cycles/h	
	without load	72000 switching cycles/h	
Mechanical lifetime		> 3 x 10^7 switching cycles	
Electrical lifetime	AC-1 (resistive)	> 0.7 x 10^5 switching cycles (16 A, 250 V)	> 10^5 switching cycles (8 A, 250 V)
	cos φ	see reduction factor F	
Response time		typ. 7 ms	
Release time		typ. 3 ms	

*) Those ratings are based on different type tests but they are not covered by the cULus or CSA approvals

Isolation data

Type		CR-P...1	CR-P...2
Rated insulation voltage		400 V AC	
Insulation class		C250 / B400	
Rated impulse withstand voltage U_{imp}	between coil and contacts	5 kV	
	between open contacts	1 kV	
	between c/o (SPDT) contacts	-	2.5 kV AC
Clearance	between coil and contacts	≥ 10 mm	
Creepage distance	between coil and contacts	≥ 10 mm	
Overvoltage category		III	
Pollution degree		3	

General data

Type	CR-P...1	CR-P...2
Dimensions	see 'Dimensional drawings'	
Weight	14 g (0.031 lb)	
Type of connection	by socket	
Mounting	on socket (see accessories)	
Mounting position	any	
Degree of protection	IP 67	

Environmental data

Type		CR-P...1	CR-P...2
Ambient temperature range	operation	DC: -40...+85 °C; AC: -40...+70 °C	
	storage	-40...+85 °C	
Vibration resistance (10-150 Hz)	n/o contact	10 g	
	n/c contact	10 g	5 g
Shock resistance	n/o contact	30 g	20 g
	n/c contact	30 g	20 g

Standards / Directives

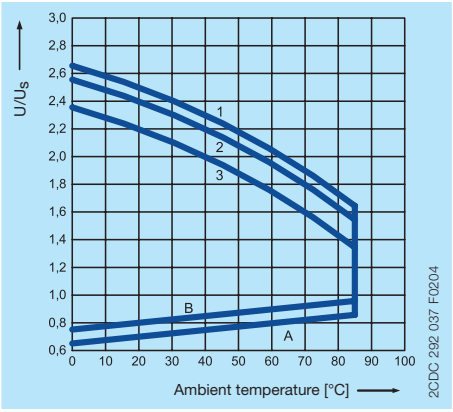
Type	CR-P...1	CR-P...2
Standards	IEC/EN 61810-1	
RoHS Directive	2011/65/EU	

Technical data - CR-P optocouplers

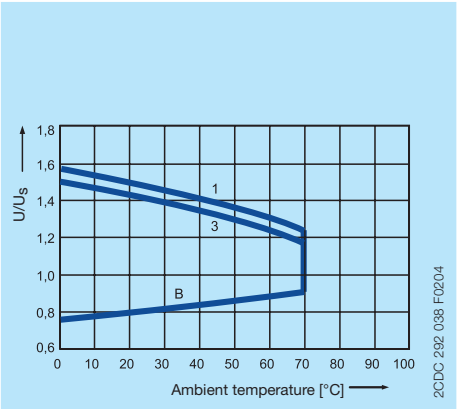
Input circuits		CR-P024MOS1	CR-P024TRI1
Input resistance		2200 Ω	1950 Ω
Rated control voltage		24 V DC	24 V DC
Pull-in voltage		10 V DC	10 V DC
Maximum input voltage		32 V DC	32 V DC
Nominal input current		10 mA	12 mA
Input power		260 mW	295 mW
Typical switching-on time		50 ms	< 1/2 cycle
Typical switch-off time		250 ms	< 1/2 cycle
Output			
Output circuits		11 (13+) - 14	11 (13+) - 14
Kind of output		MOS-FET	Triac
Rated operational voltage		24 V DC	240 V AC
Maximum switching voltage		35 V DC	275 V AC
Minimum switching current		1 mA	50 mA
Maximum switching current continously		5 A	3,5 A
Leakage current at maximum switching voltage		10 uA	1 mA
Voltage drop at rated current		300 mV	1,1 V
Isolation data			
Rated insulation voltage	input/output	2,5 kV	2,5 kV
Insulation class		2	2
Clearance	input/output	19 mm	19 mm
Creepage distance	input/output	19 mm	19 mm
Overvoltage category		III	III
Polution degree		2	2
General data			
Dimensions		see 'Dimensional drawings'	
Weight		11 g (0.618 lbs)	11 g (0.618 lbs)
Mounting		on socket	on socket
Enviromental data			
Ambient temperature	operational	-20…+80 °C	-20…+80 °C
	storage	-40…+100 °C	-40…+100 °C
Standards / Directives			
Standards		IEC/EN 62314	IEC/EN 62314
EMC Directive		2014/30/EU	2014/30/EU
RoHS Directive		2011/65/EU	2011/65/EU

Technical diagrams - CR-P interface relays

Operating range of coils



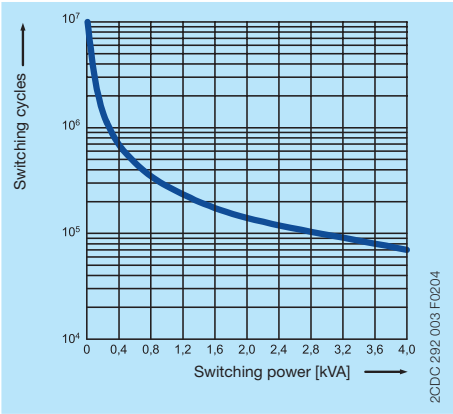
Operating range of DC coil



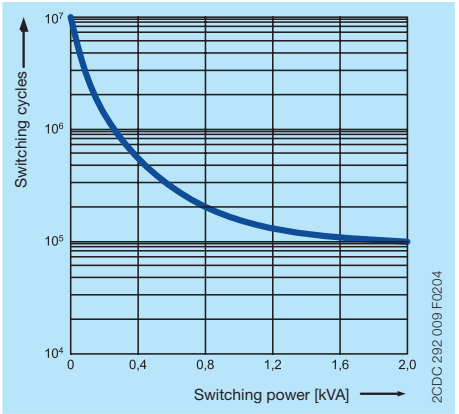
Operating range of AC coil

A	unloaded contacts, coil temperature = ambient temperature
B	continued with I_{th} (16 A at CR-P ... 1 and 8 A at CR-P ... 2) loaded contacts coil heated with 1,1 x U_s
1	at unloaded contacts
2	at 50 % rated load
3	at rated load

Load limit curves - Electrical lifetime at resistive AC load

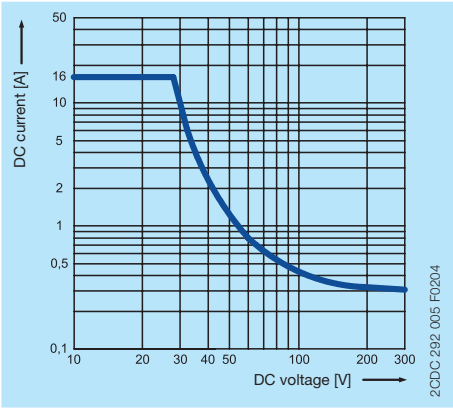


Versions with 1 c/o (SPDT) contact (CR-P ... 1)

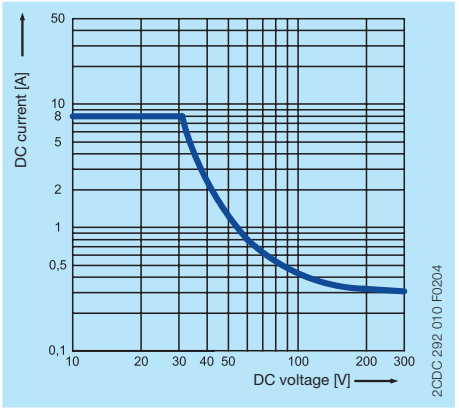


Versions with 2 c/o (SPDT) contacts (CR-P ... 2)

Load limit curves - Maximum switching power at resistive DC load

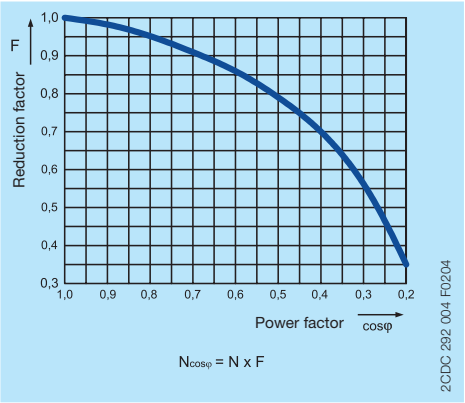


Versions with 1 c/o (SPDT) contact (CR-P ... 1)



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

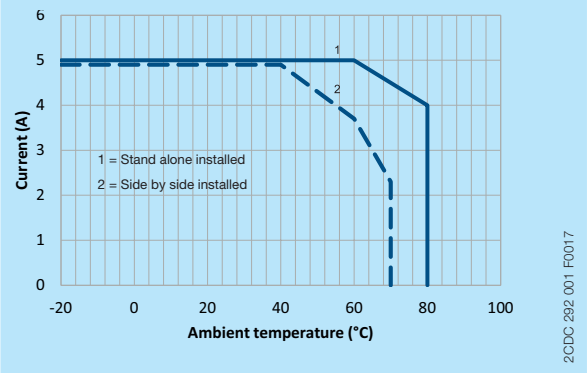
Reduction factor F at inductive AC load



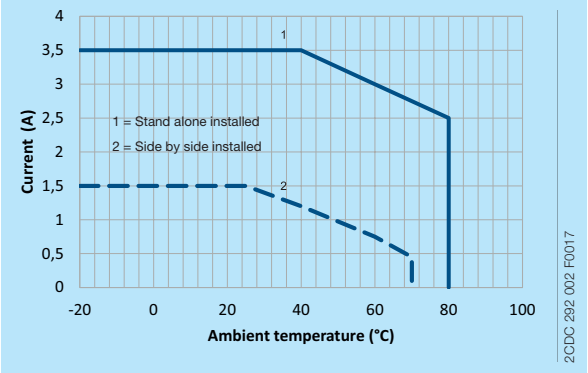
Versions with 1 or 2 c/o (SPDT) contacts (CR-P ... 1 and CR-P ... 2)

Technical diagrams - CR-P optocouplers

Derating curves



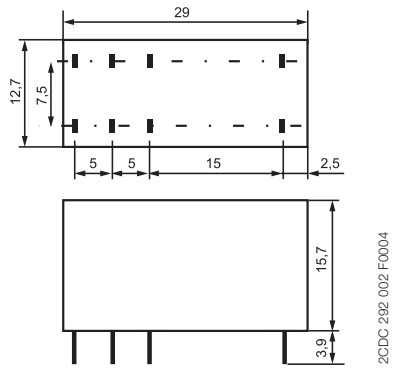
MOS-FET output



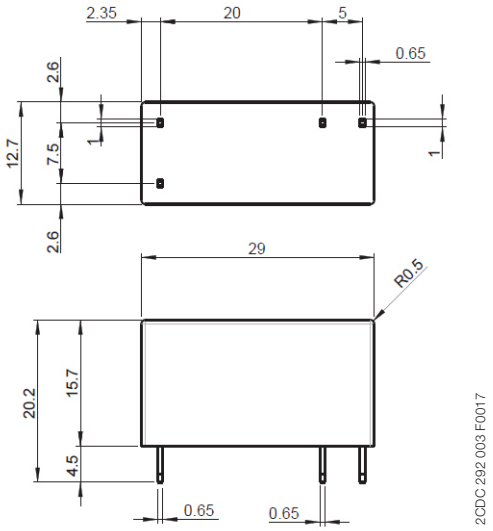
Triac output

Dimensions

in **mm**



CR-P relays



CR-P optocouplers

Further documentation

Document title	Document type	Document number
Electronic relays and controls	Catalog	2CDC 110 004 C02xx
Sockets CR-P	Data sheet	2CDC 117 004 D020x
Jumper bar CR-PJ	Data sheet	2CDC 117 015 D020x
Pluggable function modules CR-P/M	Data sheet	2CDC 117 007 D020x

You can find the documentation on the internet at www.abb.com/lowvoltage
-> Automation, control and protection -> Electronic relays and controls
-> Interface relays and optocouplers.

CAD system files

You can find the CAD files for CAD systems at http://abb-control-products.partcommunity.com
-> Low Voltage Products & Systems -> Control Products -> Electronic Relays and Controls.

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