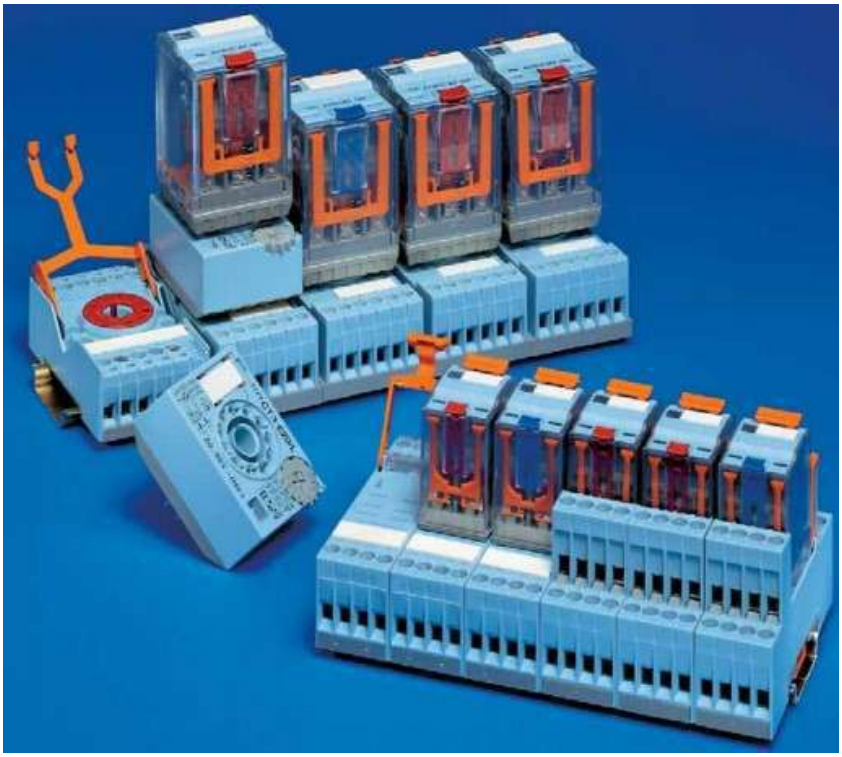

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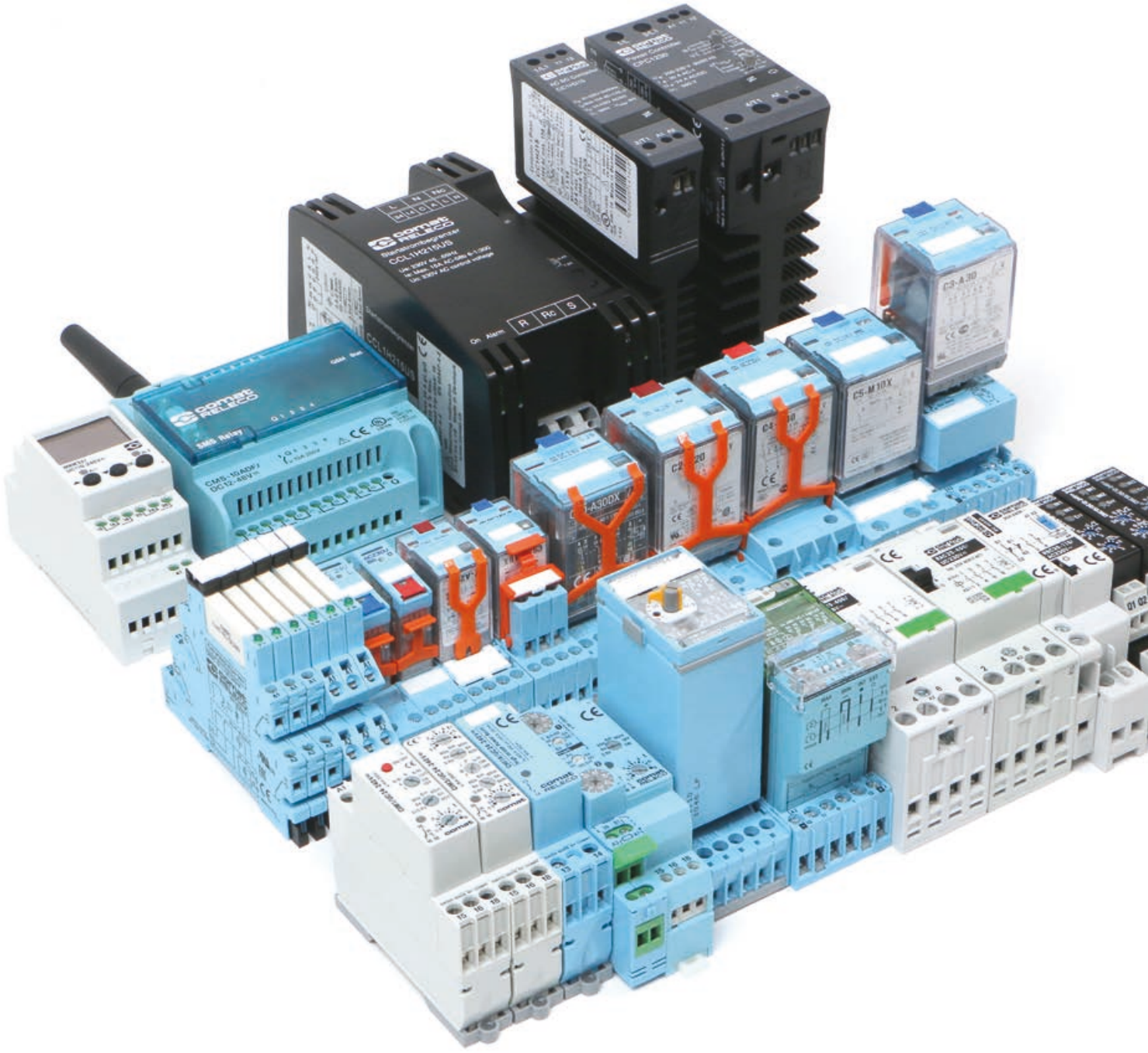
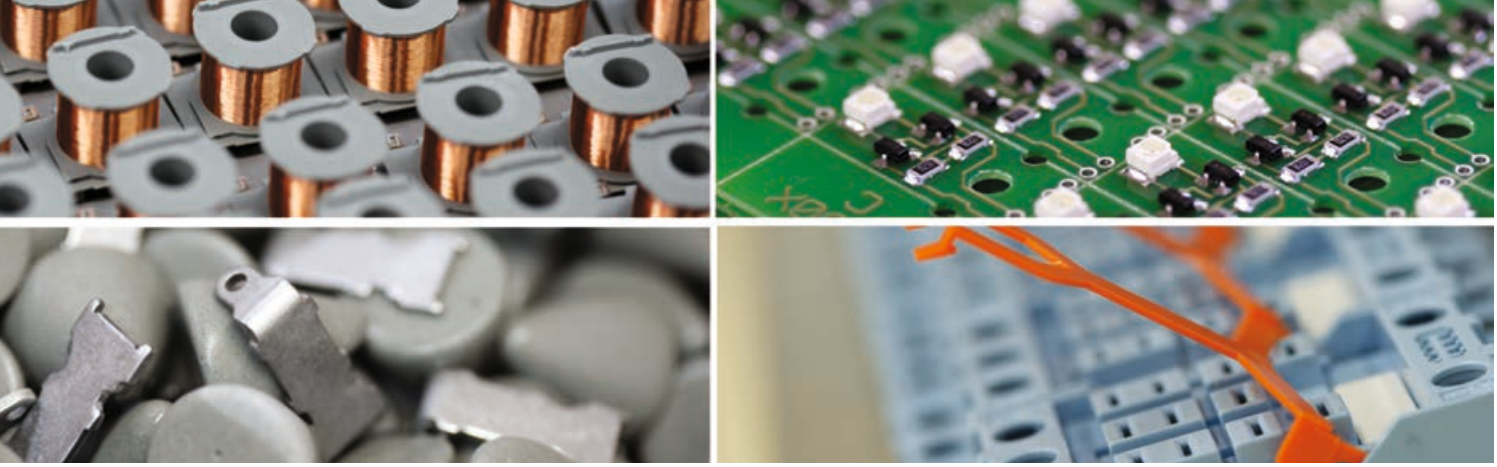
General Catalogue 2015/16





Comat Releco Group at a glance

The Comat Releco Group is a leading global supplier of high-quality components, systems and services in Industrial Automation, Electrical Installations and Railway and Transport Applications.

Our core competencies are Industrial, Time and Monitoring Relays. The product portfolio enjoys an outstanding world-wide reputation. Since 1996 our Quality Management System is certified according to ISO 9001.

Two strong brands www.comat.ch and www.releco.com

Comat and Releco are two well-established brands that have for decades enjoyed an outstanding reputation in their complementary segments of the market for Industrial, Time and Monitoring Relays.
Releco concentrates on high quality Industrial Relays and sets a focus on a high variety of features and functionalities to cover also specific customer requirements with customized solutions in low quantities.
Comat offers complete system solutions, including also software and services in the areas of Time and Monitoring Relays, SMS Relays, Miniature Contactors, Controllers as well as Power Electronics.

Customer focus and cutting-edge technology

The Group invests continuously in research and development, ensuring a sustained high rate of innovation. Due to our own qualified research and development teams, as well as the diversified production plants in Switzerland, Spain, India and China, the Group offers a complete range of standard as well as customized Industrial Automation, Electrical Installations and Railway and Transport Applications solutions.

Headquartered in Switzerland - Worldwide presence

Due to our distributor network the Group is present in all world markets. We maintain our own sales subsidiaries in Germany, France and Brazil. Since 2003 the Group is owned by the management.

Index

Index

comat RELECO
WORLD OF RELAYS

Relays 1

Time Relays 2

Monitoring Relays 3

Index

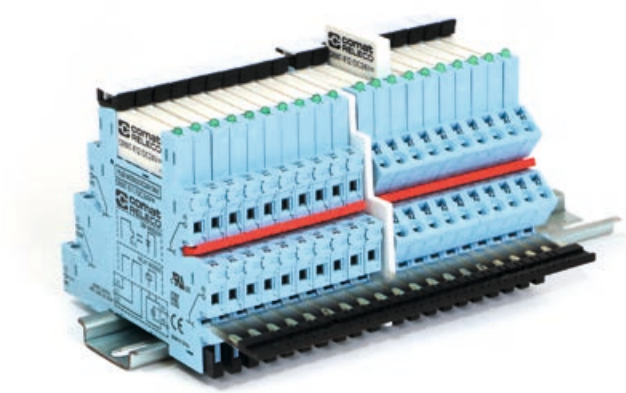
Notes

New in this catalogue

- CRINT
- CHI14
- CMD11
- Installation Contactors
- Solid State Contactors
- Softstarters

CRINT – Interface Relay

- Relay module up to 6 A 250 V, different contact materials
- Solid state modules for most loads DC and AC up to 2 A
- Coil UC = AC/DC, no protection circuit required
- LED status display
- Screw terminals or cage clamp terminals
- Jumper link
- Super small mounting: 6,2 mm



CHI14 – Power relay for high inrush currents

- For inrush currents up to 800 A: Switching of loads such as electronic control gears or switching power supplies for the latest generation of energy-saving lamps and LED
- Designed for fitting in electric switchboards due to the high nominal current of 16 A and the housing with 45 mm norm front
- Reduction of the inrush current and less wear thanks to switching while zero-crossing
- Suitable to use in living area: extremely low noise during operation

CMD11 – Mono Function Timing Relay

- 17 mm case system
- Relay contact 8 A
- On delay or off delay timing function
- 5 time ranges from 50 ms to 60 min
- Service function ON/OFF
- LED input and output status display

RAC, RBC – Installation Contactors

- Long lifetime due to double-break contacts
- Switching of different voltages with adjacent contacts
- Easily expandable by expansion module
- Hum-free operation
- Sample applications: light installations, heaters, motors, pumps, air conditioning, etc.
- With ON-OFF-AUTO-function
- With stepping function*
- With expansion module AUX

* RBC only

Solid State Contactors

- For frequent switching without contact bounce
- No wear and tear and silent operation thanks to semiconductor technology
- Non-hazardous switching of inductive loads
- Reduction of switch-on current thanks to zero voltage switching
- Clear LED status display
- Integrated overload protection
- DIN rack or screw assembly
- Space-saving: standard module width from 22.5 to 90 mm
- Integrated cooling element with optional thermal protector

Softstarters

- Reduces wear in the entire drive train through soft start-up
- Optimal starting torque through intelligent current control during start-up
- Protects the engine through integrated, adjustable motor protection with I2t-monitoring
- Minimises wiring effort and component costs: integrated bypass and motor protection
- Safe to use: comprehensive self-monitoring

Notes

Select the right relay for the right application

Reduction of contact erosion when switching DC loads

Increased contact gaps, double make contacts, and arc blow-out magnets to reduce contact erosion (burn offs).

Compared with standard contacts, the reliability can be remarkably increased when using customized contacts for switching DC loads with breakaway sparks.
Increased contact caps, double make contacts and blow out magnets are causing a longer distance for the electric arc. Electric arcs are extinguished quickly and increase significant the lifetime of the contacts.

Suitable relays for this application

Series	Type	Base	Contacts	Gap	Extras	DC-1 rating	
MRC	C2-G2x			1.7 mm		1.2 A	110 V DC
	C3-G3x			1.7 mm		1.2 A	110 V DC
	C3-M1x		Ma	2x 1.7 mm ≥ 3 mm	Double make contacts; Blow out magnet	10 A	220 V DC
	C3-X1x			2x 1.7 mm ≥ 3 mm	Double make contacts	7 A	110 V DC
	C4-X2x			2x 1.7 mm ≥ 3 mm	Double make contacts	7 A	110 V DC
	C5-G3x			1.7 mm		1.2 A	110 V DC
	C5-X1x			1.7 mm ≥ 3 mm	Double make contact	7 A	110 V DC
	C5-M1x		Ma	2x 1.7 mm ≥ 3 mm	Double make contacts; Blow out Mmagnet	10 A	220 V DC
	C5-M2x		Ma	2x 1.7 mm	Blow out magnet	7 A	110 V DC
QRC	C7-G2x			1.5 mm		0.8 A	110 V DC
	C7-X1x			2x 1.5 mm	Double make contacts	6 A	110 V DC
IRC	C10-G1x			1.0 mm		10 A	30 V DC
	C12-G2x			1.0 mm		5 A	30 V DC
DIN	CMC1	DIN 14 mm	2x		Adjustable start and breaking ramps	10 A	24 V DC

Contacts for high inrush current

Tungsten contacts have a higher melting point that help resist high power peaks and protect main contacts

High power peaks during switch-on of electrical loads, for example when switching power supplies and ballasts can lead to welding of the contacts. Early make tungsten contacts resist high inrush currents and avoid contact welding.

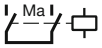
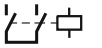
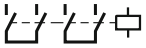
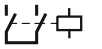
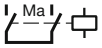
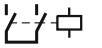
Suitable relays for this applicationn

Series	Type	Base	Contacts	Extras	AC-1 rating	
QRC	C7-W1x			Tungsten early make contact; Inrush current 2.5 ms 500 A	10 A	250 V AC
DIN	CHI14	DIN 17.5 mm		W / $AgSnO_2$ contact for high inrush currents up to 800 A	16 A	250 V AC
	CIM14	DIN 17.5 mm		W / $AgSnO_2$ contact for high inrush currents up to 800 A	16 A	250 V AC
	RIC...	DIN			20...63 A	400 V AC
	RAC...	DIN			20...25 A	400 V AC
	RBC...	DIN			20...32 A	400 V AC

Safe separation of power circuits

Relays with increased contact distance of at least 3 mm allow safe separations in power circuits of high voltage currents and increase the protection degree from potentially lethal currents.

Suitable relays for this application

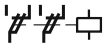
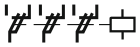
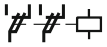
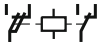
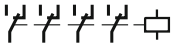
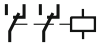
Serie	Type	Base	Contacts	Gap	Extras	AC-1 rating	
MRC	C3-M1x			2x 1.7 mm ≥ 3 mm	Double make contacts; Blow out magnet	10 A	250 V AC
	C3-X1x			2x 1.7 mm ≥ 3 mm	Double make contacts	10 A	250 V AC
	C4-X2x			2x 1.7 mm ≥ 3 mm	Double make contacts	10 A	250 V AC
	C5-X1x			≥ 3 mm	Double make contacts	16 A	400 V AC
	C5-M1x			≥ 3 mm	Double make contacts; Blow out magnet	16 A	400 V AC
QRC	C7-X1x			2x 1.5 mm ≥ 3 mm	Double make contacts	10 A	250 V AC

Reliable switching of low power signals

Twin contacts increase reliable switching by factors of 10 to 100 times. 10 µ hard gold plated contacts help to avoid contact oxidation. Together this allows reliable switching of very low level signals through the contacts.

Low level voltages in analogue circuits and signal voltages <10V/5 mA are not easily able to overcome contact resistances. Twin contacts increase contact reliability and gold contacts avoid contact oxidations and are especially suitable to switch low power signal loads.

Suitable relays for this application

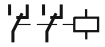
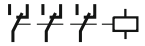
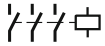
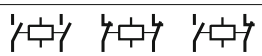
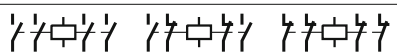
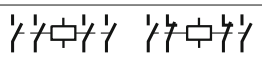
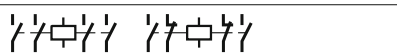
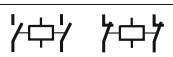
Serie	Type	Base	Contacts	Extras	Min. rating	
MRC	C2-T22x			Twin contacts, 10 µ gold plated	1 mA	5 V DC
	C3-T32x			Twin contacts, 10 µ gold plated	1 mA	5 V DC
QRC	C7-T22x			Twin contacts, 10 µ gold plated	1 mA	5 V DC
	C7-H23			1 power & 1 signal contact 2 µ gold plated	5 mA	5 V DC
	C9-A42x			Contacts, 10 µ gold plated	5 mA	5 V DC
IRC	C10-T13x			Twin contacts, 3 µ gold plated	1 mA	5 V DC
	C12-A22x			Contacts, 3 µ gold plated	5 mA	5 V DC
	CSS-N			NPN Solide state	1 mA	…48 V DC
	CSS-P			PNP Solide state	1 mA	…48 V DC

Efficient switching of high voltages high currents

Heavy duty relays are designed to switch high currents. Due to their relatively small dimensions and lower cost, these relays are more economical then contactors. Therefore control panels can be optimized for high power switching.

Heavy duty relays save space in the panel and cost less than contactors. They can be used for switching higher currents, for example electrical heaters up to 16 A at 400 V AC.

Suitable relays for this application

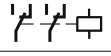
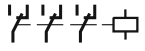
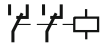
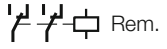
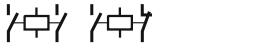
Series	Type	Base	Contacts	Gap	AC-1 rating	
MRC	C5-A2x				16 A	400 V AC
	C5-A3x				16 A	400 V AC
	C5-G3x			1.7 mm	16 A	400 V AC
	C5-X1x			> 3 mm	16 A	400 V AC
QRC	C7-A1x				16 A	250 V AC
RIC	RIC20	DIN 17.5 mm			20 A	400 V AC
	RIC25	DIN 35 mm			25 A	400 V DC
	RIC40	DIN 54.5 mm			40 A	400 V AC
	RIC63	DIN 54.5 mm			63 A	400 V AC
RAC	RAC20	DIN 17.5 mm			20 A	400 V AC
	RAC25	DIN 34 mm			25 A	400 V AC
RBC	RBC20	DIN 18 mm			20 A	400 V AC
	RBC32	DIN 35 mm			32 A	400 V AC

Switching with a pulse

Change the ON/OFF status of a latching relay (remanence relay) with a single pulse. The switching status remains stable also in the case of power failure.

The switching status of a latching relay is changed with a single input pulse although permanent connection is also possible. The contacts remain in position even after the “on” coil is de-energized. This guarantees that the relay status remains in position until such time that a control signal is applied to the “off” coil. A stepping relay provides an alternative for pulse switching and latching.
Latching relays help to save power dissipation, what is especially impontant when a hot environment is expected or when a high number of relays are mounted close with each other in a control cabinet.

Suitable relays for this application

Series	Type	Base	Contacts	Extras	Max. contact rating	
MRC	C3-R2x		 Rem.	Remanence (Latching) relay	10 A	250 V AC
	C4-R3x		 Rem.	Remanence (Latching) relay	10 A	250 V AC
	C5-R2x		 Rem.	Remanence (Latching) relay	10 A	400 V AC
QRC	C9-R2x		Rem.	Remanence (Latching) relay	5 A	120 V AC
DIN	RBC20	DIN 18 mm		Bistable installation contactor	20 A	400 V AC
DIN	RBC32	DIN 35 mm		Bistable installation contactor	32 A	400 V AC

Max. life time and highest number of switching cycles

Long Life relays are relays of robust mechanical structure with 5 times longer life cycles compared to standard relays. Unlimited switching cycles are reached with solid state relays.

The Long Life Relays with a more robust design provide a 5 times longer service life. Standard relays are designed for 10 to 20 million mechanical switching cycles. For periodical switching frequencies in the second or minute range, the standard relays reach their life cycle within a few months. The long life relays are specially designed for frequent switching applications.

Suitable relays for this application

Serie	Type	Base	Contacts/Outputs	Extras	Max. contact rating	
MRC C20 C30	C21			> 10^8 mechanical operations	10 A	250 V AC
	C22			> 10^8 mechanical operations, twin contacts	5 A	250 V AC
	C31			> 10^8 mechanical operations	10 A	250 V AC
	C31			> 10^8 mechanical operations, twin contacts	5 A	250 V AC
CSS	CSS-I			Solide state AC (unlimited ops.)	3 A	250 V AC
	CSS-Z			Solide state AC (unlimited ops.)	3 A	250 V AC
	CSS-N			Solide state DC (unlimited ops.) NPN	6 A	48 V DC
	CSS-P			Solide state DC (unlimited ops.) PNP	6 A	48 V DC
CRINT	CRINT-C1x5	DIN 6.2 mm		Solide state DC (unlimited ops.)	2 A	24 V DC
	CRINT-C1x8	DIN 6.2 mm		Solide state AC (unlimited ops.)	1 A	240 V AC
DIN	CMC1	DIN 14 mm	2x	Adjustable start and breaking ramps	16 A	24 V DC
	CMC15/16	DIN 14 mm	2x	Adjustable start and breaking ramps and speed	10 A	24 V DC

Blinking relays

Blinking relays with integrated solid state outputs have a virtually unlimited life time independent from the switching cycles. Specially appropriate for blinking functions in intervals of seconds or minutes.

Blinking in second or minute intervals with permanent repetitions wear standard mechanical relays in a short time. A standard relay will reach the limit of its designed life time within weeks or months. Special blinking relays with integrated semi conductor contacts provide the alternative for such applications.

Suitable relays for this application

Series	Type	Base	Contacts/Outputs	Extras	Max. contact rating	
CIM	CIM1	DIN 17.5 mm		Time range adjusttable 0.6 s - 60 h	16 A	250 V AC
	CIM2	DIN 17.5 mm		Time range adjusttable 0.6 s - 60 h	16 A	250 V AC
	CIM12	DIN 17.5 mm		Time range adjusttable 0.6 s - 60 h	2 A	250 V AC
	CIM22	DIN 17.5 mm		Time range adjusttable 0.6 s - 60 h	2 A	250 V AC
	CIM13	DIN 17.5 mm		Time range adjusttable 0.6 s - 60 h	5 A	30 V DC
	CIM23	DIN 17.5 mm		Time range adjusttable 0.6 s - 60 h	5 A	30 V DC
	CIM14	DIN 17.5 mm		Time range adjusttable 0.6 s - 60 h	16 A	250 V AC

Impulse shaping (Extending short pulses)

Pulse shaper of the series CPF extend or shorten input pulses for accurate further processing by PLC's.

PLC's or other control circuits are often not able to process fast and short pulses. The pulses are conditioned with CPF pulse formers for further processing by PLC's. Fast revolution speeds and distance measurements as well as "Namur" sensor signals are conditioned with the CPF type relays for further processing.

Suitable relays for this application

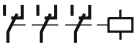
Series	Type	Base	Contacts	Trigger and Outputs times	Max. contact rating	
DIN	**CPF11**	DIN 17.5 mm		Input 1 - 5 ms; Output 5 - 60 ms	2 A	32 V DC
	CIM1x	DIN 17.5 mm		Input min. 20 ms; Output 50 ms - 60 h	16 A	250 V AC
	CIM2x	DIN 17.5 mm		Input min. 20 ms; Output 50 ms - 60 h	16 A	250 V AC
	CIM3x	DIN 17.5 mm		Input min. 20 ms; Output 50 ms - 60 h	16 A	250 V AC
	CM3	DIN 17.5 mm		Input min. 35 ms; Output 50 ms - 60 h	5 A	250 V AC
	CRV4	DIN 13 mm		Input min. 35 ms; Output 50 ms - 60 h	6 A	250 V AC
	CSV4	DIN 13 mm		Input min. 20 ms; Output 8 ms - 10 h	1.5 A	24 V DC
CS	**CS2**			Input min. 50 ms; Output 50 ms - 60 h	8 A	250 V AC
	CS3			Input min. 50 ms; Output 50 ms - 60 h	6 A	250 V AC

Energy saving with the same switching capacity

Relays with sensitive coils have considerably less power consumption than standard relays. This allows up to 90% energy saving with practically identical switching capcity

Relays with sensitive coils have improved and more effective magnetic circuits than coils of standard relays. The result is a considerably reduced coil current compared to a standard relay but with an almost identical switching capacity per contact. This means lower power consumption and therefore more economical operating and less heat. Under some circumstances, the user can provide a smaller power supply and save costs.

Suitable relays for this application

Series	Type	Base	Contacts	Sensitive coil	AC-1 contact rating	
MRC	**C3-N3x**			Nominal power 800 mW	6 A	250 V AC
QRC	**C9-E2x**			Nominal power 800 mW	5 A	250 V AC

Protection against aggressive environment

A 10 µ hard gold plating of the contacts is an effective way to protect the contacts against oxidation caused by aggressive gases.

Aggressive gases may develop in sewage plants, chemical plants, or in the steel production. Conducting failures may occur on relays with standard silver nickel contacts because of contact surface oxidation. 10 µ hard gold plated contacts are especially suitable in such environments and improve the contact reliability.

Suitable relays for this application

Series	Type	Base	Contacts	Extras	AC-1 contact rating	
MRC	C2-A28			Contacts 10 µ gold plated	10 A	250 V AC
	C2-T22			Twin contacts, 10 µ gold plated	6 A	250 V AC
	C3-A38			Contacts 10 µ gold plated	10 A	250 V AC
	C3-T32			Twin contacts, 10 µ gold plated	6 A	250 V AC
	C4-A48			Contacts 10 µ gold plated	10 A	250 V AC
QRC	C7-A28			Contacts 10 µ gold plated	10 A	250 V AC
	C7-T22			Twin contacts, 10 µ gold plated	6 A	250 V AC
	C9-A48			Contacts 10 µ gold plated	5 A	250 V AC
IRC	C10-A18			Contacts 3 µ gold plated	10 A	250 V AC
	C10-T13			Twin contacts, 3 µ gold plated	6 A	250 V AC
	C12-A22			Contacts 3 µ gold plated	5 A	250 V AC
	C12-G22			Twin contacts, 3 µ gold plated	5 A	250 V AC

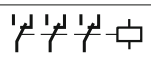
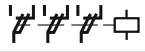
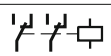
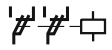
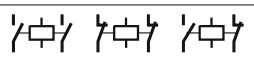
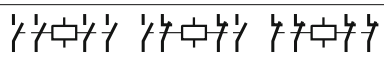
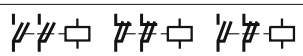
Relays according to Railway standard (increased shock and vibration resistance)

Relays as per Railway standard EN50155/EN60077/EN61373 are more suitable for applications with shock and vibration and have a higher degree of surge protection. Many of these railway relays also comply to additional fire protection standards, have lower inflammability and develop less toxic smoke and gases in case of fire.

Relays specially developed to comply with railway standards are designed for higher vibration, shock and surge values and allow higher tolerance in the voltage supply. Some of these relays additionally comply to special fire protection standards in regard to inflammability and the development of toxic smoke and gases in fire accidents.

Although specially designed for railway applications these relays are also suitable for other industrial applications where increased product safety is required.

Suitable relays for this application

Series	Type	Base	Contacts	Railway standard	Max. contact rating	
Long Life	C31			EN 50155, Fire protection NF F16-101/102	10 A	250 V AC
	C32			EN 50155, Fire protection NF F16-101/102	6 A	250 V AC
QRC	R7-A2x			EN 60077-1-2/99, EN 61373/99	10 A	250 V AC
	R7-T2x			EN 60077-1-2/99, EN 61373/99	6 A	250 V AC
CIM	CIM1R	DIN 17.5 mm		EN 50155, Fire protection NF F16-101/102	16 A	250 V AC
	CIM12R	DIN 17.5 mm		EN 50155, Fire protection NF F16-101/102	2 A	250 V AC
	CIM13R	DIN 17.5 mm		EN 50155, Fire protection NF F16-101/102	5 A	30 V DC
	CIM2R	DIN 17.5 mm		EN 50155, Fire protection NF F16-101/102	16 A	250 V AC
	CIM22R	DIN 17.5 mm		EN 50155, Fire protection NF F16-101/102	2 A	250 V AC
	CIM23R	DIN 17.5 mm		EN 50155, Fire protection NF F16-101/102	5 A	30 V DC
	CIM3R	DIN 17.5 mm		EN 50155, Fire protection NF F16-101/102	16 A	250 V AC
	CIM32R	DIN 17.5 mm		EN 50155, Fire protection NF F16-101/102	2 A	250 V AC
	CIM33R	DIN 17.5 mm		EN 50155, Fire protection NF F16-101/102	5 A	30 V DC
RIC	RIC20	DIN 17.5 mm		EN 50155	20 A	400 V AC
	RIC25	DIN 35 mm		EN 50155	25 A	400 V AC
	RIC-AUX	DIN 8 mm		EN 50155	6 A	400 V AC

1.0 Relays

Notes

Product range
Releco offers a wide range of relay types and versions and associated sockets and accessories.

Standard (general-purpose) relay, MRC series
35 x 35 mm round plug-in relay, 8- or 11-terminals multipole connector according to IEC 67 with 2 or 3 contacts up to 10 A and different contact types and contact materials.
Standard relay 35 x 35 mm with flat blade connectors with up to 4 contacts and up to 16 A with 3 contacts.

Miniature industrial relay, QRC series
22.5 mm series with up to 4 contacts and up to 10 A with 1 or 2 contacts.

Interface relay, IRC series
Overall width 13 mm with up to 2 electromechanical contacts, or fully electronic switches.

Special relays, remanence relays
While "normal" relays are monostable, i.e. they return to the idle state when the excitation is switched off, remanence relays are bistable, i.e. the current switching state is retained irrespective of the excitation. Relays of this type are available in different versions.

Electronic relay, CSS
In the IRC series different electronic DC or AC relays up to 6 A are available. For AC relays a distinction is made between synchronously (zero crossing) and asynchronously switching versions. For switching transformer loads we recommended using asynchronously switching semiconductor switches. For incandescent lamp loads etc. synchronously switching switches are ideal for avoiding high switch-on currents.

Accessories
Suitable sockets are available for the different relay series for DIN rail mounting or panel mounting. In addition, retaining clips are available for the relays, some of which are included in the scope of supply. Suitable bridges for cost-saving wiring in series are also available.

*** Special requirements**
H = Orange button. No lockable function
N = Black button. No function
P = Printing board pins

E = Lap transparent cover
Z = Close transparent cover
T = Close transparent cover (lamp)
M = Close transparent cover (lamp + button)

If other requeriments, please consult.

Basic identification principle (type designation code electromechanical relays)

C n(n) - T X y z(*)z /....V RF-nnnn

Ref. nnnn
Relays with a reference number are versions with special (e.g. customised) features. These features may relate to special test criteria, tolerances or other properties.
Availability of such relays may be limited to certain customers or applications.

Nominal coil voltage specification

AC ... V	AC 50/60 Hz, voltage 6 – 250 (400) V
AC ... V 60 Hz	AC 60 Hz, 120, 240 V
DC ... V	DC, voltage 5 – 220 V
UC ... V	AC/DC

X = Electric position indicating device with LED

Describes the options
D = Integrated freewheeling diode
F = Integrated freewheeling diode and series diode e.g. for common alarm circuits
R = RC connection for the coil
B = Bridge rectifier

Definition of contact material
This code may differ depending on type.
Examples:
0 in the standard range stands for AgNi
1–9 see contact material for each type

Number of contacts

Relay type
A = Standard (general-purpose) contact
E = Sensitive drive with 500 mW coil power
G = Refers to a NO contact
H = Single-point contact + twin contact load to signal current circuit for switching state feed back. Mixed contact configuration
M = Relay with highly effective neodimium blow magnet for fast quenching of the arc. This relay is particularly suitable for high DC loads.
N = Sensitive drive 800 mW coil power
R = Code for remanence relays, drive-specific ID
S = Sensitive drive with 250 mW exciter input
T = Twin contact for signal and control circuit
W = With tungsten contact for maximum switch-on currents
X = Relay high power, double make contact.

Basic type refers to the product line
Numbers between 2 and 12 and 20, 30 are used.

Normal industrial relay code
Relays with code R are used for railway series.

MRC – QRC

Protection against transients

When the coil is disconnected from an electromagnet, peaks of inverse voltage appear at the terminals which can reach very high values. These pulses can be transmitted down the line associated with the coil and could possibly affect other components.
In the case of a realy being operated by such devices as transistors, triacs, etc; it may be necessary to protect against transients.

Transients carried in the line

High voltage surges can be carried in the supply line to the relay coil. These may appear in the form of peaks or bursts and are generated by the connection and disconnection of electric motors, transformers, capacitors etc.
Normally a relay is unaffected by these pulses, but if a diode is connected in association with the coil, it must be capable of withstanding an inverse voltage higher than those of the incoming peaks.

Protection circuits

A protection circuit must efficiently cope with pulses generated by the coil as well as incoming line surges (surges $U_{1,2/50\mu s}$.)
Releco relays are available with integrated protection circuits or with modules plugged into sockets S3-MP or S3-MS.

X LED indication with rectifier.
For DC and AC relays up to 250 V
Surges of 1000 V up to 24 V
Surges of 2000 V from 25 to 60 V
Surges of 4000 V from 61 to 250 V
Note: LED connected, in series with the coil @ 220 VDC in QRC types.

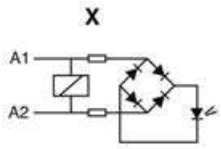
D Free-wheeling diode.
DX Free-wheeling diode + LED
Dampens transients caused by the relay coil on de-energisation.
Surges of 2000 V up to 60 VDC
Surges of 4000 V from 61 to 250 VDC (*)

F Polarity + free wheeling diode.
FX Polarity + free wheeling diode + LED
A diode in series with the coil protects the relay from reverse connection.
Surges of 1000 V up to 60 VDC
Surges of 4000 V from 61 to 250 VDC (*)

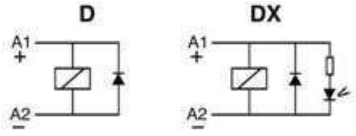
B Bridge rectifier incorporated
BX Bridge rectifier + LED indication
Allows the relay to operate in both AC or DC without any polarity inconvenience. Available only in voltages up to 60 V.
Surges of 1000 V

R Resistor and capacitor.
Suppressor for AC coils. Surges of 2000 V.
Available only in **MRC** types.

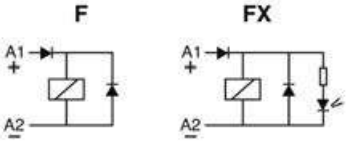
(*) Surges of 2000 V in **QRC** types.



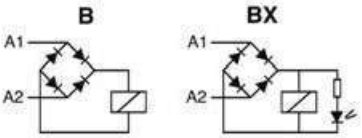
LED consumption: 1mA



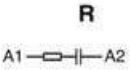
Increases release time approx. 4 times



Increase release time approx. 4 times



Increases release time approx. 3 times



IRC

LED and protection circuit connected to coil.

X LED with no polarity, (standard)
Coils ≤ 12 V CC y CA
LED rectifier bridge in parallel

X LED with no polarity, (standard)
Coils ≥ 24 V ... CC y CA
LED rectifier bridge in series

FX LED with polarity **A1+** (option)
Every DC coil voltage
Polarity and Free-wheeling diodes

BX LED with no polarity, (option)
Only 24 V and 48 V ADC coils
Rectifier bridge for AC/DC relays

R LED not available (option)
RC protection against pulses on AC

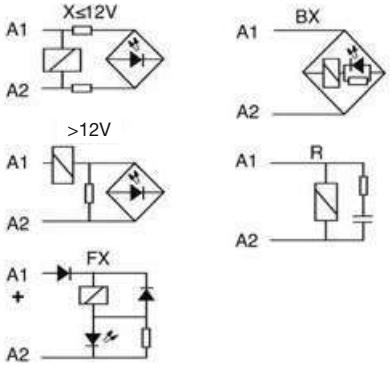
Protection against pulses

When a relay coil is disconnected, reverse voltage peaks may arise and reach very high values. Said peaks can transmit to the coil associated line and other relays or semiconductors can be affected.

If triac, transistor, etc. controls a relay, appropiate steps must be taken to avoid or decrease peaks down to a non risky level.

Both Polarity and Free-wheeling diodes (**FX**), must protect coils, to avoid malfunctions provided DC relays in battery are installed.

Making or breaking engines, transformers or contactors in an industrial environmental, may generate high voltage pulses, either isolated or burst, through the main line.
The voltage level of those pulse may be high enough to affect the isolation of the coil.



Contacts

There are different contact types. The main distinction is between single contacts and twin contacts. While single contacts are more suitable for higher loads, twin contacts are significantly more reliable at small loads, i.e. < 24 V, < 100 mA.

Contact Material

There is no all-purpose contact!
AgNi is used as standard material for a wide range of applications. AgNi contacts with hard gold plating (up to 10 µm) are offered for applications in aggressive atmosphere.
Relays with gold contacts are approved for relatively high currents (e.g. 6 A, 250 V), but in practice values of 200 mA, 30 V should not be exceeded for operation with intact gold plating.
Relays with a tungsten pre-contact are available for very high switch-on currents (up to 500 A, 2.5 ms). For some applications AgNi contacts with gold flashing (0.2 µm) are available. The purpose is corrosion protection during storage. There is no other purpose.
Tin oxide is specially appropiated for load with high-inrush current.

Minimum load

The minimum load value is a recommended value under normal conditions such as regular switching, no special ambient conditions, etc. Under these conditions reliable switching behaviour can be expected.

Contact resistance

Initial values of resistance of contact can vary with the use, load and others conditions. Typical values when the relay is new is about 50 mΩ.

Contact spacing

Normally all contacts have an air gap between 0,5 ... 1.5 mm when they are open. They are referred to as µ contacts. According to the Low-Voltage Directive and the associated standards these contacts are not suitable for safe disconnection.
For switching of DC loads large contact clearances are beneficial for quenching the arc. See special relays: series connections with a gap of 3 mm.

Switching capacity

The contact switching capacity is the product of switching voltage and switching current. For AC the permitted switching capacity is generally high enough to handle the max. continuous AC1 current over the whole voltage range. For DC the load limit curve must never be exceeded, because this would lead to a remaining switch-off arc and immediate destruction of the relay. The order of magnitude of the DC switching capacity is a few 100 W (DC 1).

Drive (coil)

The drive of a relay refers to the coil plus connections.
The coil has special characteristics, depending on the rated voltage and the type of current.

Coil design

The coil consists of a plastic former (resistant up to about 130 °C) and doubly insulated high-purity copper wire, temperature class F. The winding must withstand threshold voltages (EN 61000-4-5) of more than 2000 V. This is ensured through forced separation of the start and end of the winding.

Coil resistance and other properties

Each coil has an ohmic coil resistance that can be verified with an ohmmeter. The specified coil resistance applies to a temperature of 20 °C. The tolerance is ± 10 %.
For AC operation the coil current will not match the ohmic value, because self-inductance plays a dominant role. At 230 V this may reach more than 90 H. When a relay is switched off, self-inductance results in a self-induced voltage that may affect the switching source (destruction of transistors, EMC problems).

Drive voltages

A distinction is made between the standardised voltages according to EN 60947 as guaranteed values, and typical values that can be expected with a high degree of probability.

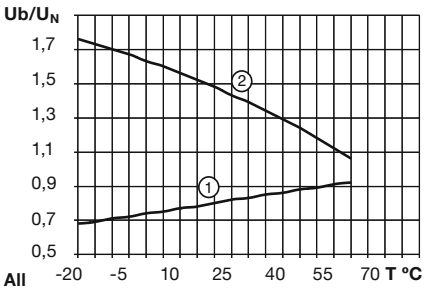
Pick-up voltage, Release voltage

The pick-up voltage is the voltage at which the relay engages safely. For DC the typical trip voltage is approx. 65 % of Unom, for AC approx. 75 %. The release voltage, on the other hand, is approx. 25 % or 60 % respectively.
For DC these voltages are strongly temperature-dependent, according to the temperature coefficient of Cu. This is not the case for AC, where the inductive resistance is the controlling factor, which is practically constant over a wide temperature range.
With AC, in a certain undervoltage range the relay may hum, and the armature may flutter. This voltage range must be avoided.

Operating voltage range

Unless specified otherwise, the following characteristic curve applies for the operating voltage range. The upper limit of the coil voltage is determined by self-heating and the ambient temperature. Self-heating through contacts under high load must not be underestimated. It may be higher than the power dissipation in the drive.

During intermittent operation significantly higher overvoltages temporary may occur for short periods. If in doubt please consult our specialists.



General design

RELECO relays are made from high-quality, carefully selected materials.
They comply with the latest environmental regulations such as RohS. Their meticulous design makes them particularly suitable for industrial applications and installation engineering.
They are particularly service-friendly through robust terminals, mechanical position indicating device a standard, manual operation, dynamic, permanent characteristics.
Colour coding for manual operation as a function of the coil voltage is another useful feature. Further options such as different coil connections, freewheeling diode, LED display, bridge rectifier for AC/DC drives etc., and short-term availability of special versions for practically any drive voltage up to DC 220 V / AC 400 V leave nothing to be desired.
Apart from a few special versions, the standard RELECO industrial relays feature manual operation (push/pull) and a mechanical position indicating device.
For safety reasons, manual operation may be replaced with a black button, if required.

Coil connections

Different coil connections can be integrated in the relay as an option.
For DC a cost-effective freewheeling diode is available. Please note that the stated release times are generally specified without the coil connection.
While an additional LED status indicator has practically no effect, a freewheeling diode (D) will lead to an increase in release time by a factor 2 to 5, or 10 ms to 30 ms. For AC VDRs or RC elements may be used. In this case resonance effects may have to be considered. VDRs and common RC elements may increase release times by less than 5 ms.

Standards, conformities
While CE marking of relays/sockets is controversial, since relays are sometimes regarded as components to which the marking requirement does not apply, all RELECO relays feature the CE mark to indicate that CE standards may also be applied to the relays, e.g. 2 kV surge resistance according to EN 61000-4-5.
A significant and not generally available characteristic is that the coils and in particular the connections are able to withstand the voltage spikes that may occur in practice.
In addition, the relays feature various technical approvals depending on the respective relay code, and they comply with further standards and guidelines. The main technical approvals include cURus, CSA, and CCC.
The associated information is provided in the respective data sheets.

Switching classes
EN 60947 defines different switching classes that specify the suitability of contacts for different load types.

Examples:
AC1 = Ohmic AC load
AC5b = AC incandescent lamp loads
AC15 = Power contactors, solenoid valves, solenoids
DC1 = Ohmic DC load
DC6 = DC incandescent lamps
DC13 = DC contactors, solenoids

UL508 contains different technical approval criteria such as general purpose, control application etc. Switching classes are defined based on the electrical switching capacity, e.g. B600 etc.

Main technical approvals and standards

Country	Technical approval
China	Authority: CQC Specification GB14048.5-2001
Canada	Authority: CSA Specification C 22,2; UL 508
Russia	Authority: KORPORATSIA STANDART Specification GOST R 50030.5.1
USA	Authority: UL Specification C 22,2; UL 508
United Kingdom	Authority: GB Lloyd´s Register of Shipping

Utilisation categories according to
EN 60947-4-1/-5-1

Pollution category
Cat. 1
Dry, non-conductive contamination without further effect

Cat. 2
Occasional conductive contamination, short duration due to moisture condensation

Cat. 3
Dry, non-conductive and conductive contamination with moisture condensation

Cat. 4
Contamination with persistent conductivity through conductive dust, rain

Protection class IP according to DIN 40050 and other standards. Industrial relays and their sockets can be classified as follows:
Socket IP20: Contact safety
Relay IP40/IP50: not watertight, but protected against ingress of coarse contaminants.

Further information and tips
The main operational criteria for relays such as number of cycles, switching frequency, ambient conditions, reliability requirements, load type, switch-on current, load switch-off energy must be clarified in order to ensure reliable operation and long service life.

Example
If the number of cycles is expected to exceed several 100,000 operations per year (e.g. clock generators, fast running machines), an electronic solution is no doubt more appropriate, although we also offer solutions for this type of application. In AC applications crosstalk caused by long control leads is often problem and can result in constant humming of the relay or even inadvertent triggering due to interference. Here, too, we offer solutions.

Various, apparently harmless loads may lead to very high switch-on currents or switch-off energy values, resulting in an unacceptable reduction in service life.
Particularly tricky are DC loads, particularly if they are inductive.
Circuits with relays and their connections often require a level of developer skill that is frequently no longer offered during standard education and training.
Your supplier will be very happy to provide expert advice

Characteristics of various loads:

Heating circuits
No higher switch-on currents, no higher switch-off loads.

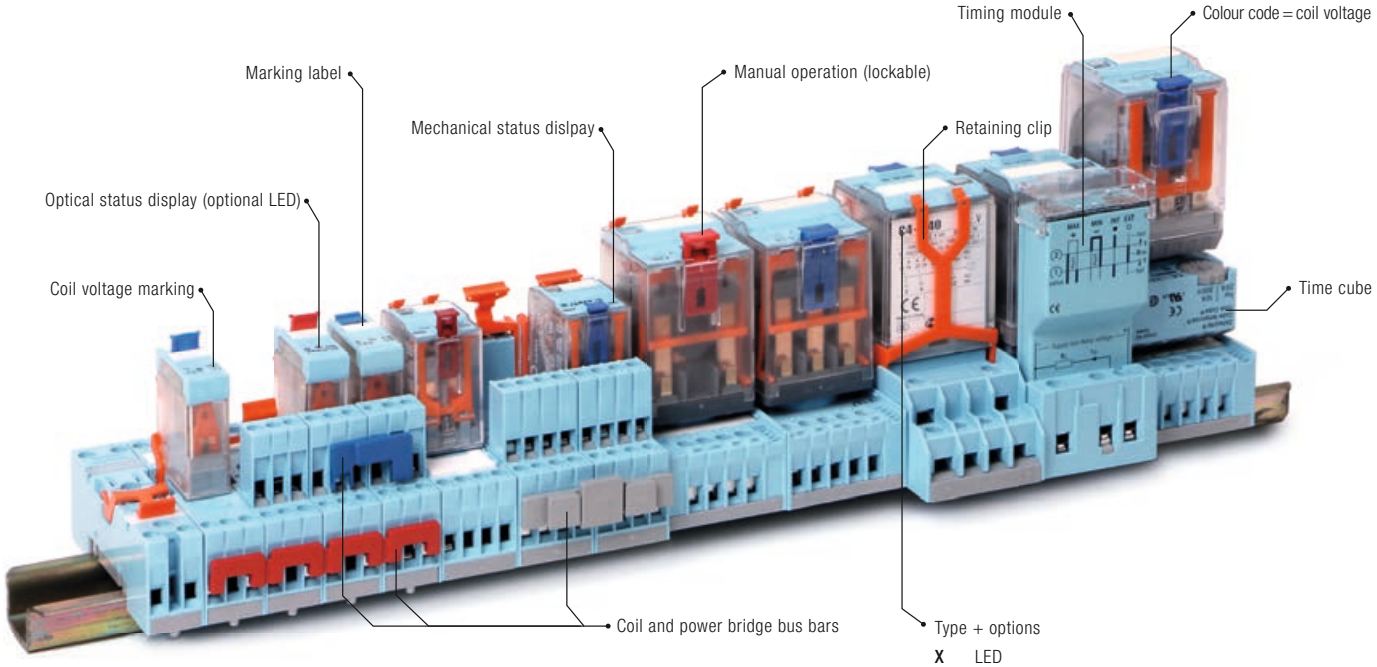
Incandescent lamps, halogen lamps
Switch-on currents during a few ms in the range 10 ... 18 x rated. Switch-off at rated load.

Low-energy lamps
Very high, but very short switch-on currents due to built-in decoupling capacitors.

Contacts have a tendency to fuse.

Transformers, AC contactors
Switching on during zero-transition may lead to switch-on currents of 8 ... 15 x rated.
High inductive switch-off energy is possible.
The load must be connected, not least due to EMC problems.

Full Features System



Five colours for an easier identification of coil voltage

AC red: 230 VAC (North America 120 VAC)

AC dark red: others VAC

UC grey: VAC/DC

DC blue: 24 VDC

DC dark blue: others VDC

If you don´t want to have the lockable function, you can use the orange “orange - push button”. SO - OP for MRC - C and S9 - OP for QRC (5 pieces bag)

Orange - push button

A black blanking plug is available if you don´t want a test button.
S= - NP for MR - C and S9 - NP for QRC (5 pieces bag)

Blanking plug

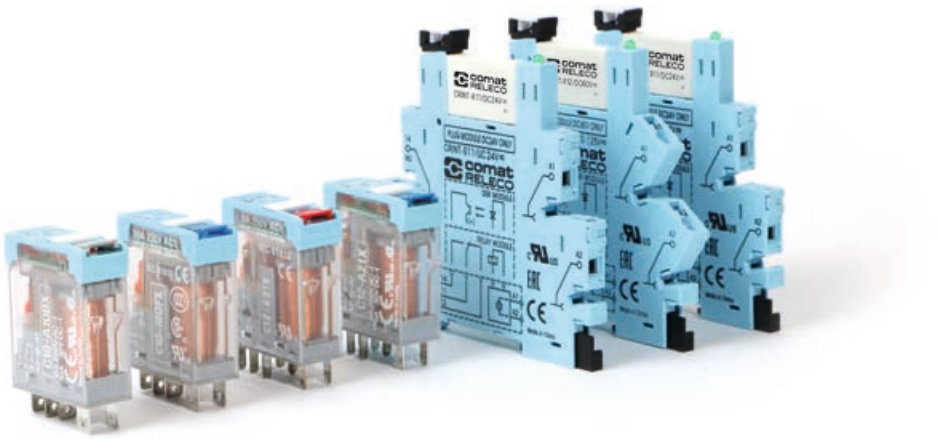
Comprehensive technical label

Part number
Coil details
Aditional circuit diagram for coil
Electric diagram showing all additions to the coil
Wiring diagram with sequential and DIN numbers
Maximum switching capacity
according to EN 60947 (IEC 947)
Approvals

Country	Approval		Country	Approval	
Canada		Authority: CSA Specification: C 22,2: UL 508	**United Kingdom**		Authority: Loyd's Register of Shipping
China		Authority: CQC Specification: GB14048.5-2001	**USA**		Authority: UL Specification: C 22,2; UL 508
Russia		Authority: KORPORATSIA STANDART Specification: GOST R 50030.5.1			

Notes

1.1 Interface Relays – IRC & CRINT



Application	Types	Pins	Contacts	AC ratings	DC ratings	Socket
IRC – C10 Series						
Interface standard relay	C10-A1x			10 A / 250 V	10 A / 30 V	S10
DC load switching	C10-G1x			10 A / 250 V	10 A / 30 V	S10
Low switching load	C10-T1xx			6 A / 250 V	6 A / 30 V	S10
Low switching load	C10-GTxx			6 A / 250 V	6 A / 30 V	S10
IRC – C12 Series						
Interface relay	C12-A2x			5 A / 250 V	5 A / 30 V	S12
Interface DC relay	C12-G2x			5 A / 250 V	5 A / 30 V	S12
CRINT Series						
High power contact $AgSnO_2$	CRINT-C1x1			6 A / 250 V	6 A / 30 V	
Low power contact $AgSnO_2$ + 3µ Au	CRINT-C1x2			6 A / 250 V	6 A / 30 V	
DC solid state switch	CRINT-C1x5				2 A / 24 V	
AC solid state switch	CRINT-C1x8			1 A / 240 V		

IRC series

C10-A1x

5-pin, Interface relays, 1-pole, plug-in, faston

Type			**C10-A1x/ ... V**			
			Standard relay, 1 change-over contact			
			Contact Ag Sn O2 to high inrush			
Maximum contact load			**10 A/250 V**	**AC-1**	**0,5 A/110 V**	**DC-1**
			10 A/30 V	**DC-1**	**0,2 A/220 V**	**DC-1**
			13 A/250 V	**AC-1** cULus		
Recommended minimum contact load			**10 mA/10 V**	**Code 0,5**		
			5 mA/5 V	**Code 8**		
Contacts						
Material	Standard	Code 0	AgNi			
	Optional	Code 8	AgNi + 5 µ Au			
	Optional	Code 5	Ag Sn O2			
Rated current			10 A			
Switch-on current max. (20 ms)			30 A (120 A for code 5)			
Switching voltage max.			250 V			
AC load (Fig 1)			2,5 kVA			
DC load			see fig. 2			
Coil						
Coil resistance			see table; tolerance ± 10 %			
Pick-up voltage			≤ 0,8 x U_N			
Release voltage			≥ 0,1 x U_N			
Nominal power			1,1 VA (AC)/0,7 W (DC)			

Coil table

VAC	Ω	mA	VDC	Ω	mA
24	290	45	12	224	53
48	1200	23	24	742	32
115	7.300	9,5	48	3.500	13,7
230	28.800	4,7	110	19.900	5,5

Insulation	Volt rms, 1 min
Contact open	1000 V
Contact/coil	5 kV
Insulation resistance at 500 V	≥1 GΩ
Insulation, IEC 61810-1	4 kV/3
Specifications	
Ambient temperature operation/storage	-40 (no ice)….70 °C /-40 ... 80 °C
Pick-up time/bounce time	10 ms/ ≤ 1 ms
Release time/bounce time	5 ms/ ≤ 3 ms
Mechanical life ops	AC: 10 Mill./DC: 20 Mill.
DC voltage endurance at rated load	≥100000 switching cycles
Switching frequency at rated load	≤ 1200/h
Protection class	IP40
Weight	21 g

Standard types			
VAC 50 Hz/60 Hz: 24, 48, 115 (120), 230 (240)	**C10-A10/AC ... V**	**C10-A18/AC ... V**	**C10-A15/AC ... V**
LED	**C10-A10X/AC ... V**	**C10-A18X/AC ... V**	**C10-A15X/AC ... V**
RC suppressor	**C10-A10R/AC ... V**	**C10-A18R/AC ... V**	**C10-A15R/AC ... V**
VDC 12, 24, 48, 110	**C10-A10/DC ... V**	**C10-A18/DC ... V**	**C10-A15/DC ... V**
LED	**C10-A10X/DC ... V**	**C10-A18X/DC ... V**	**C10-A15X/DC ... V**
Polarity and free wheeling diode	**C10-A10FX/DC ... V**	**C10-A18FX/DC ... V**	**C10-A15FX/DC ... V**
VAC/DC bridge rectifier 24 V, 48 V	**C10-A10BX/UC ... V**	**C10-A18BX/UC ... V**	**C10-A15BX/UC ... V**

"..." Enter the voltage for full type designation

Accessories	
Socket:	**S10, S10-M, S10-P**

Connection diagram

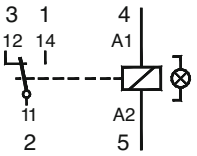


Fig. 1 AC voltage endurance

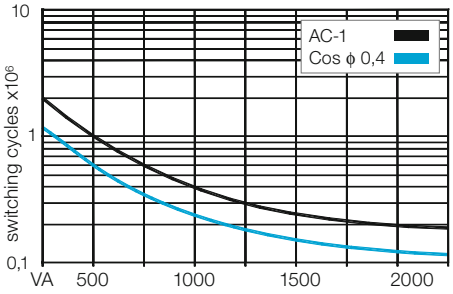
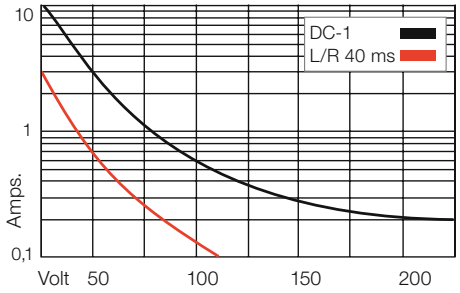
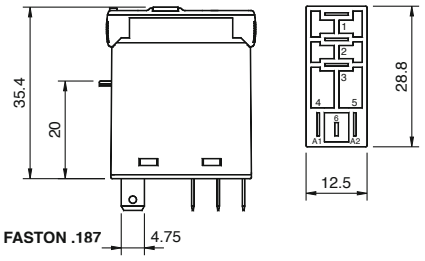


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

IEC 61810; EN 60947

C10-G1x

4-pin, Interface relays, 1-pole, normally open plug-in, faston

Type			**C10-G1X/ ... V** Standard relay 1 open contact for high DC load Contact Ag Sn O2 to high inrush
Maximum contact load			**10 A/250 V AC-1 0,8 A/110 V DC-1** **10 A/30 V DC-1 0,4 A/220 V DC-1**
Recommended minimum contact load			**10 mA/10 V Code 0,5** **5 mA/5 V Code 8**
Contacts			
Material	Standard	Code 0	AgNi
	Optional	Code 8	AgNi + 5 µ Au
	Optional	Code 5	Ag SnO2
Rated current			10 A
Switch-on current max. (20 ms)			30 A (120 A for code 5)
Switching voltage max.			250 V
AC load (Fig 1)			2,5 kVA
DC load			see Fig. 2

Coil

Coil resistance	see table; tolerance ± 10 %
Pick-up voltage	≤ 0,8 x U_N
Release voltage	≥ 0,1 x U_N
Nominal power	1,1 VA (AC)/0,7 W (DC)

Coil table

VAC	Ω	mA	VDC	Ω	mA
24	290	45	12	224	53
48	1200	23	24	742	32
115	7.300	9,5	48	3.500	13,7
230	28.800	4,7	110	19.900	5,5

Insulation	Volt rms, 1 min
Contact open	2000 V
Contact/coil	5 kV
Insulation resistance at 500 V	≥1 GΩ
Insulation, IEC 61810-1	4 kV/3

Specifications

Ambient temperature operation/storage	-40 (no ice)....70 °C /-40 ... 80 °C
Pick-up time/bounce time	10 ms/≤ 1 ms
Release time/bounce time	8 ms
Mechanical life ops	AC: 10 Mill./DC: 20 Mill.
DC voltage endurance at rated load	≥100000 switching cycles
Switching frequency at rated load	≤ 1200/h
Protection class	IP40
Weight	21 g

Standard types

VAC 50 Hz/60 Hz: 24, 48, 115 (120), 230 (240)	**C10-G10/AC ... V**	**C10-G15/AC ... V**
LED	**C10-G10X/AC ... V**	**C10-G15X/AC ... V**
RC suppressor	**C10-G10R/AC...V**	**C10-G15R/AC...V**
VDC 12, 24, 48, 110	**C10-G10/DC ... V**	**C10-G15/DC ... V**
LED	**C10-G10X/DC ... V**	**C10-G15X/DC ... V**
Polarity and free wheeling diode	**C10-G10FX/DC ... V**	**C10-G15FX/DC... V**
AC/DC bridge rectifier 24 V, 48 V	**C10-G10BX/DC ... V**	**C10-G15BX/UC... V**

"..." Enter the voltage for full type designation

Accessories

Socket: **S10, S10-M, S10-P**

Connection diagram

Gap: 1 mm

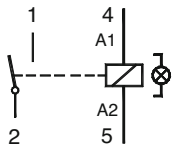


Fig. 1 AC voltage endurance

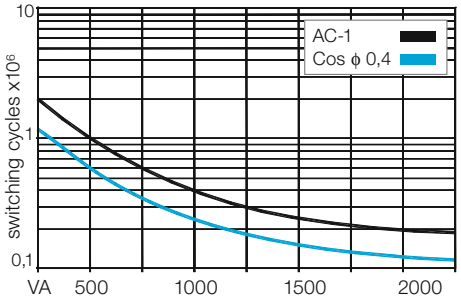
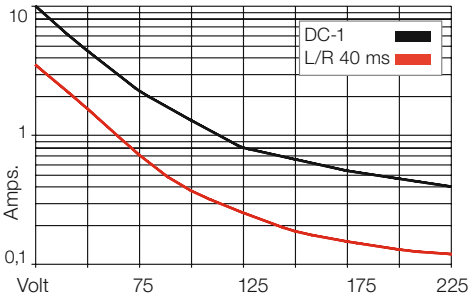
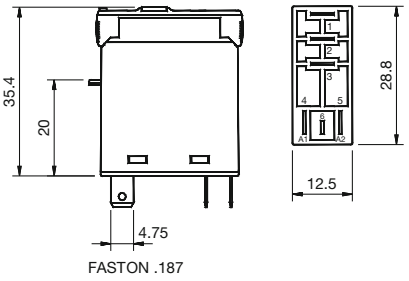


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

IEC 61810; EN 60947

IRC series

C10-T1x

5-pin, Interface relays, 1-pole, twin contact, plug-in faston

Type			**C10-T1x/ ... V**			
			Standard relay for low power application			
Maximum contact load			**6 A/250 V**	**AC-1**	**0,5 A/110 V**	**DC-1**
			6 A/30 V	**DC-1**	**0,2 A/220 V**	**DC-1**
Recommended minimum contact load			**5 mA/5 V**	**Code 1**		
			1 mA/5 V	**Code 3**		
Contacts						
Material	Standard	Code 1	AgNi + 0,2 µ Au			
	Optional	Code 3	AgNi + 3 µ Au			
Rated current			6 A			
Switch-on current max. (20 ms)			15 A			
Switching voltage max			250 V			
AC load (Fig 1)			1,5 kVA			
DC load			see fig. 2			
Coil						
Coil resistance			see table; tolerance ± 10 %			
Pick-up voltage			≤ 0,8 x U_N			
Release voltage			≥ 0,1 x U_N			
Nominal power			1,1 VA (AC)/0,7 W (DC)			

Coil table

VAC	Ω	mA	VDC	Ω	mA
24	290	45	12	224	53
48	1200	23	24	742	32
115	7.300	9,5	48	3.500	13,7
230	28.800	4,7	110	19.900	5,5

Insulation	Volt rms, 1 min
Contact open	1000 V
Contact/coil	5 kV
Insulation resistance at 500 V	≥1 GΩ
Insulation, IEC 61810-1	4 kV/3
Specifications	
Ambient temperature operation/storage	-40 (no ice)…70 °C /-40 ... 80 °C
Pick-up time/bounce time	10 ms/≤ 1 ms
Release time/bounce time	5 ms/≤ 3 ms
Mechanical life ops	AC: 10 Mill./DC: 20 Mill.
DC voltage endurance at rated load	≥100000 switching cycles
Switching frequency at rated load	1200/h
Protection class	IP40
Weight	21 g

Standard types

VAC 50 Hz/60 Hz: 24, 48, 115 (120), 230 (240)	**C10-T11/AC ... V**	**C10-T13/AC ... V**
LED	**C10-T11X/AC ... V**	**C10-T13X/AC ... V**
RC suppressor	**C10-T11R/AC...V**	**C10-T13R/AC...V**
VDC12, 24, 48, 110	**C10-T11/DC ... V**	**C10-T13/DC ... V**
LED	**C10-T11X/DC ... V**	**C10-T13X/DC ... V**
Polarity and free wheeling diode	**C10-T11FX/DC ... V**	**C10-T13FX/DC ... V**
AC/DC bridge rectifier 24 V, 48 V	**C10-T11BX/UC ... V**	**C10-T13BX/UC ... V**

"..." Enter the voltage for full type designation

Accessories

Socket: **S10, S10-P**

Connection diagram

Gap: 0,5 mm

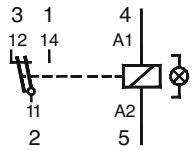


Fig. 1 AC voltage endurance

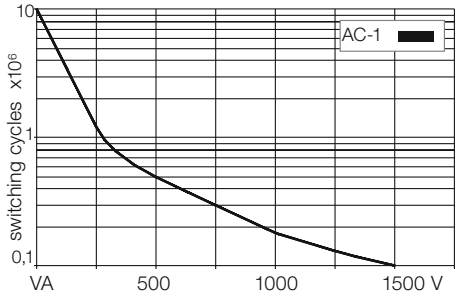
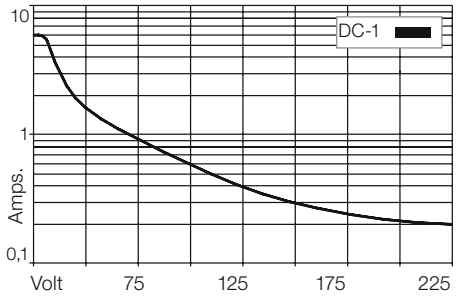
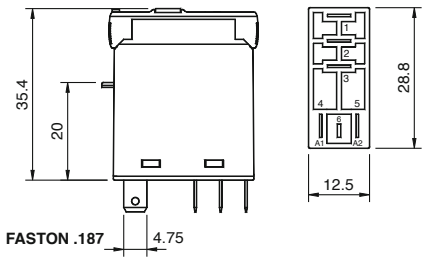


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

IEC 61810; EN 60947

C12-A2x

8-pin, Interface relays, 2-pole, plug-in faston

Type			**C12-A2x/ ... V** Standard relay 2 change-over contact
Maximum contact load			**5 A/250 V AC-1 0,5 A/110 V DC-1** **5 A/30 V DC-1 0,2 A/220 V DC-1**
Recommended minimum contact load			**10 mA/10 V Code 1** **5 mA/5 V Code 2**
Contacts			
Material	Standard	Code 1	AgNi + 0,2 µ Au
	Optional	Code 2	AgNi + 5 µ Au
Rated current			5 A
Switch-on current max. (20 ms)			15 A
Switching voltage max.			250 V
AC load (Fig 1)			1,2 kVA
DC load			see fig. 2

Coil

Coil resistance	see table; tolerance ± 10 %
Pick-up voltage	≤ 0,8 x U_N
Release voltage	≥ 0,1 x U_N
Nominal power	1,1 VA (AC)/0,7 W (DC)

Coil table

VAC	Ω	mA	VDC	Ω	mA
24	290	45	12	224	53
48	1200	23	24	742	32
115	7.300	9,5	48	3.500	13,7
230	28.800	4,7	110	19.900	5,5

Insulation	Volt rms, 1 min
Contact open	1000 V
Contact/contact	3000 V
Contact/coil	5 kV
Insulation resistance at 500 V	≥1 GΩ
Insulation, IEC 61810-1	4 kV/3
Specifications	
Ambient temperature operation/storage	-40 (no ice)….60 °C /-40 ... 80 °C
Pick-up time/bounce time	10 ms/≤ 1 ms
Release time/bounce time	5 ms/≤ 3 ms
Mechanical life ops	AC: 10 Mill./DC: 20 Mill.
DC voltage endurance at rated load	≥100000 switching cycles
Switching frequency at rated load	≤ 1200/h
Protection class	IP40
Weight	21 g

Standard types		
VAC 50 Hz/60 Hz: 24, 48, 115 (120), 230 (240)	**C12-A21/AC ... V**	**C12-A22/AC ... V**
LED	**C12-A21X/AC ... V**	**C12-A22X/AC ... V**
RC suppressor	**C12-A21R/AC ... V**	**C12-A22R/AC ... V**
VDC 12, 24, 48, 110	**C12-A21/DC ... V**	**C12-A22/DC ... V**
LED	**C12-A21X/DC ... V**	**C12-A22X/DC ... V**
Polarity and free wheeling diode	**C12-A21FX/DC ... V**	**C12-A22FX/DC ... V**
AC/DC bridge rectifier 24 V, 48 V	**C12-A21BX/UC ... V**	**C12-A22BX/UC ... V**

"..." Enter the voltage for full type designation

Accessories

Socket: **S12, S12-P**

Connection diagram

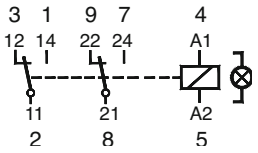


Fig. 1 AC voltage endurance

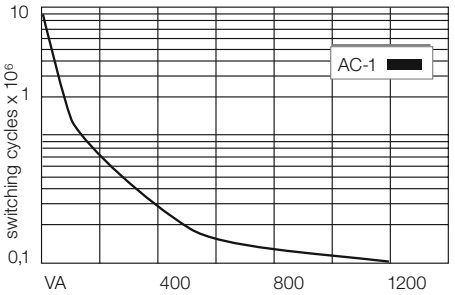
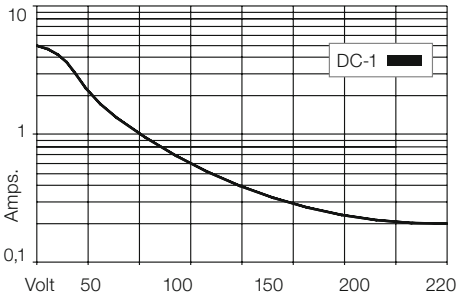


Fig. 2 DC load limit curve



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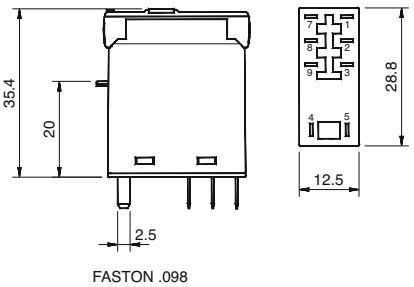


Technical approvals, conformities

IEC 61810; EN 60947

IRC series

C12-G2x

6-pin, Interface relays, 2-pole, plug-in faston

Type			**C12-G2x/ ... V** Standard relay 2 open contacts			
Maximum contact load			**5 A/250 V**	**AC-1**	**0,8 A/110 V**	**DC-1**
			5 A/30 V	**DC-1**	**0,4 A/220 V**	**DC-1**
Recommended minimum contact load			**10 mA/10 V**	**Code 1**		
			5 mA/5 V	**Code 2**		
Contacts						
Material	Standard	Code 1	AgNi + 0,2 µ Au			
	Optional	Code 2	AgNi + 5 µ Au			
Rated current			5 A			
Switch-on current max. (20 ms)			15 A			
Switching voltage max.			250 V			
AC load (Flg 1)			1,2 kVA			
DC load			see Fig. 2			

Coil

Coil resistance	see table; tolerance ± 10 %
Pick-up voltage	≥ 0,8 x U_N
Release voltage	≥ 0,1 x U_N
Nominal power	1,1 VA (AC)/0,7 W (DC)

Coil table

VAC	Ω	mA	VDC	Ω	mA
24	290	45	12	224	53
48	1200	23	24	742	32
115	7.300	9,5	48	3.500	13,7
230	28.800	4,7	110	19.900	5,5

Insulation

	Volt rms, 1 min
Contact open	2000 V
Contact/contact	3000 V
Contact/coil	5 kV
Insulation resistance at 500 V	≥1 GΩ
Insulation, IEC 61810-1	4 kV/3

Specifications

Ambient temperature operation/storage	-40 (no ice)….60 °C /-40 ... 80 °C
Pick-up time/bounce time	10 ms/≤ 1 ms
Release time/bounce time	5 ms/≤ 3 ms
Mechanical life ops	AC: 10 Mill./DC: 20 Mill.
DC voltage endurance at rated load	≥100000 switching cycles
Switching frequency at rated load	≤ 1200/h
Protection class	IP40
Weight	21 g

Standard types

VAC 50 Hz/60 Hz: 24, 48, 115, (120), 230, (240)	**C12-G21/AC ... V**	**C12-G22/AC ... V**
LED	**C12-G21X/AC ... V**	**C12-G22X/AC ... V**
RC suppressor	**C12-G21R/AC ... V**	**C12-G22R/AC ... V**
VDC 12, 24, 48, 110	**C12-G21/DC ... V**	**C12-G22/DC ... V**
LED	**C12G21X/DC ... V**	**C12-G22X/DC ... V**
Polarity and free wheeling diode	**C12-G21FX/DC ... V**	**C12-G22FX/DC ... V**
AC/DC bridge rectifier 24 V, 48 V	**C12-G21BX/UC ... V**	**C12-G22BX/UC ... V**

"..." Enter the voltage for full type designation

Accessories

Socket:	**S12, S12-P**

Connection diagram

Gap: 1 mm

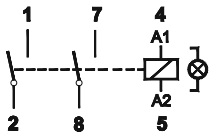


Fig. 1 AC voltage endurance

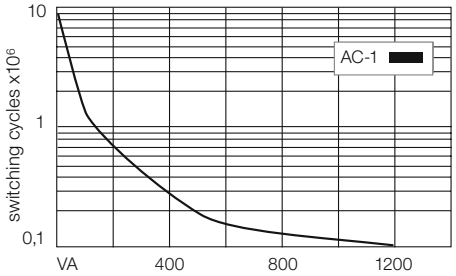
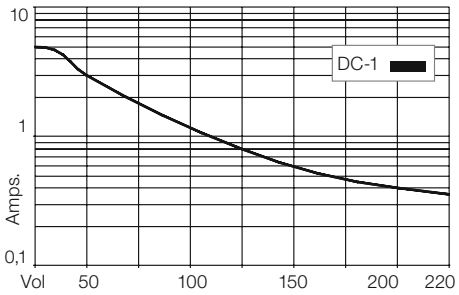
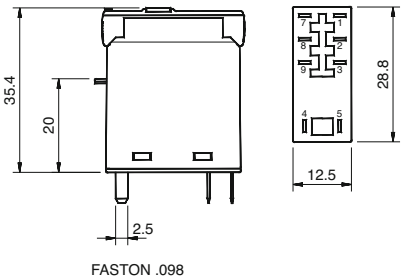


Fig. 2 DC load limit curve



Dimensions [mm]



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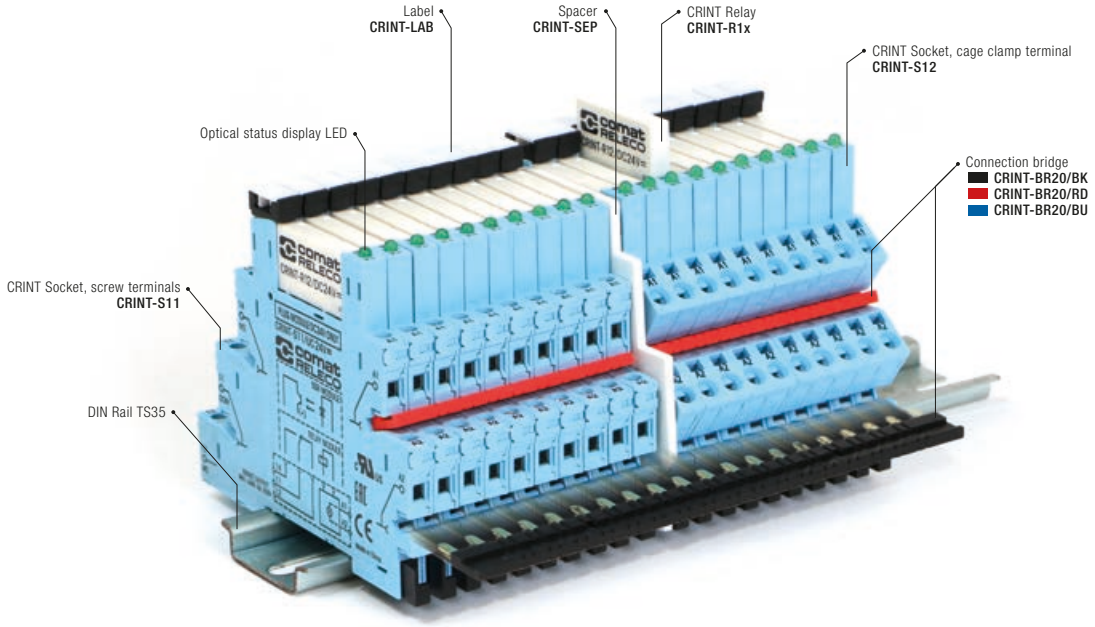
Technical approvals, conformities

IEC 61810; EN 60947



CRINT RELAY CODIFICATION AND ACCESSORIES

CRINT INTERFACE RELAY CONSISTS OF TWO COMPONENTS.

- RELAY
- SOCKET

CODIFICATION FOR COMPLETE RELAY MODULE RELAY AND SOCKET 6,2 MM

1		2	3	4	5	6		7	8
CRINT	-	C	1	1	1	R	/	UC	24V

1. Product family
CRINT

2. Type
C = Combined version (Socket and Relay)

3. Contact
1 = One change-over contact

4. Connection type
1 = Screw terminal
2 = Cage clamp terminal

5. Output
1 = $AgSnO_2$
2 = $AgSnO_2$ + 3µ Au
5 = NO / Solid-state DC
8 = NO / Solid-state AC

6. Options
– = Standard version
R = Railway version

7. Supply voltage
UC = AC/DC
DC = Only for C1x5 and C1x8

8. Nominal voltage
12V, 24V, 48V, 60V, 110-125V, 220-240V

RELAY CODIFICATION

1		2	3	4	5
CRINT	-	R	11	DC	12V

1. Product family
CRINT

2. Type
R = Relay

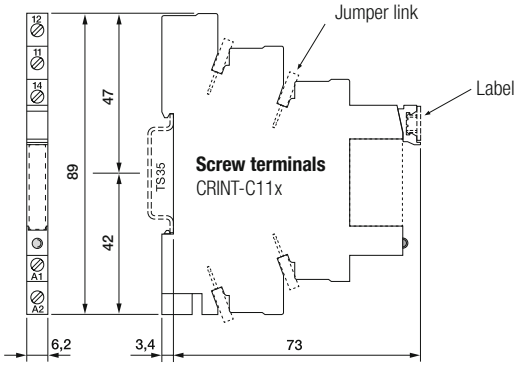
3. Contact
11 = $AgSnO_2$
12 = $AgSnO_2$ + 3µ Au
15 = NO / Solid-state DC
18 = NO / Solid-state AC

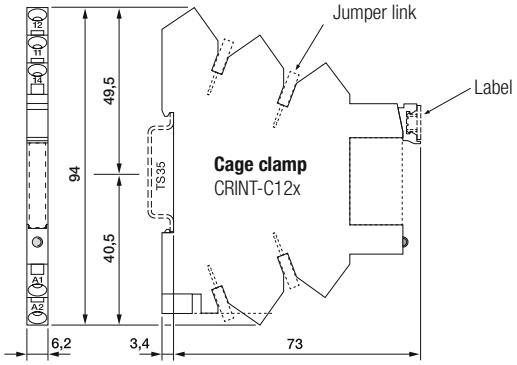
4. Supply voltage
DC

5. Nominal voltage
12V, 24V, 48V, 60V*

*60V Relay used for all sockets with a nominal voltage higher or equal 60V

Dimensions [mm]





CRINT 1x1 series

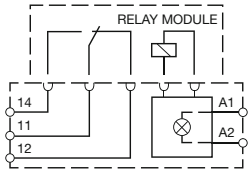
Interface module with mechanical CO output contact

DIN Rail mounting

Types: CRINT-C111, CRINT-C121 / ...V
For PLC's and process control. High power contact $AgSnO_2$.
With screw terminals (CRINT-S11) or cage clamp terminals (CRINT-S12).
Recommended max. load 250 V 6 A resistive.

Max. contact load	**6 A, 250 V AC-1**	**6 A, 30 V DC-1**
Contact		
Type	1 CO	
Material	$AgSnO_2$	
Switching current | $_{TH}$	6 A 250 V AC	
Recommended minimal load	100 mA / 12 V	
Switching power DC-1 30 V	180 W	
Switching power AC-1 230 V	1500 VA	
Switching power AC-15 230 V	300 VA	
Peak inrush current	15 A/2.5 ms	
Coil		
Operation voltage AC 50/60 Hz / DC	0.8 ... 1.25 U_N	
Nominal power DC/AC	408 / 900 mW	
Insulation		
Test voltage I / O	6 kVrms 1 minute	
Pollution degree	3	
Over voltage category	III	
Open contact	1000 Vrms dielectric strength 1 min	
Standard	EN61810-5	
General Specifications		
Ambient temperature: operation / storage	-40 … +70 °C / -40 … +85 °C	
Typical response time @ V_n	7 ms	
Typical release time @ V_n	15 ms	
Switching cycles: mech./elec.	10 x 10^6 / 3 x 10^4	
Cond. cross section screw terminal	2.5 mm^2	
Cond. cross section spring cage	0.75 … 2.5 mm^2	
Ingress protection	IP 20	
Mounting position	any	
Housing material	Polyamide PA6	

Connection diagram



Relay
- AgSnO2
- AgSnO2 + 3µ Au

Socket
-Screw terminal
-Cage clamp terminal

Fig.1 AC voltage endurance

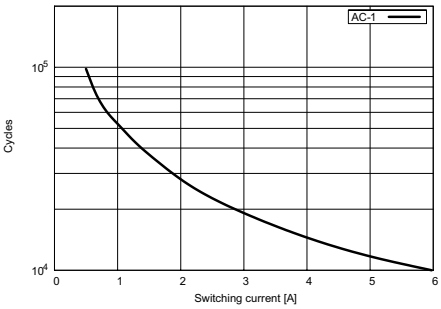
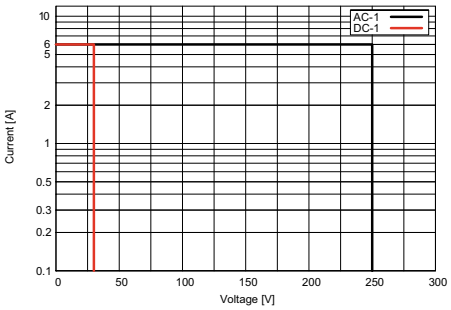


Fig. 2 DC load limit curve



Dimensions p.32

Order information

Screw terminal:	**CRINT-C111/UC...V**	**UC12V**
		UC24V
		UC48V
Cage clamp terminal:	**CRINT-C121/UC...V**	**UC60V**
		UC110-125V
„ …“ enter the voltage for full type designation		**UC220-240V**

Accessories

Jumper link (5 pcs):	blue:	**CRINT-BR20-BU/5**
	red:	**CRINT-BR20-RD/5**
	black:	**CRINT-BR20-BK/5**
Label plate (64 pcs):		**CRINT-LAB/64**
Spacer (5 pcs):		**CRINT-SEP/5**

Replacement relays:
CRINT-R11/DC...V
„ …“ enter the voltage for full type designation

DC12V
DC24V
DC48V
DC60V*

*60V Relay used for all sockets with
a nominal voltage higher or equal 60V

Technical approvals, conformities

(in progress)

CRINT 1x2 series

Interface module with mechanical CO output contact

DIN Rail mounting

Types: CRINT-C112, CRINT-C122 / ...V

Specially for PLC, process controls with DC currents. Contact $AgSnO_2$ + 3µ Au. For low power application. With screw terminals (CRINT-S11) or cage clamp terminals (CRINT-S12). No external freewheeling circuit required.

Max. contact load	**6 A, 250 V AC-1**	**6 A, 30 V DC-1**
Contact		
Type	1 CO	
Material	$AgSnO_2$ + 3µ Au	
Switching current I_{TH}	6 A 250 V AC	
Recommended minimal load	10 mA / 6 V	
Switching power DC-1 30 V	180 W	
Switching power AC-1 230 V	1500 VA	
Switching power AC-15 230 V	300 VA	
Peak inrush current	15 A/2.5 ms	
Coil		
Operation voltage AC 50/60 Hz / DC	0.8 ... 1.25 U_N	
Nominal power DC/AC	408 / 900 mW	
Insulation		
Test voltage I / O	6 kVrms 1 minute	
Pollution degree	3	
Over voltage category	III	
Open contact	1000 Vrms dielectric strength 1 min	
Standard	EN61810-5	
General Specifications		
Ambient temperature: operation / storage	-40 … +70 °C / -40 … +85 °C	
Typical response time @ V_n	7 ms	
Typical release time @ V_n	15 ms	
Switching cycles: mech./elec.	10 x 10^6 / 3 x 10^4	
Cond. cross section screw terminal	2.5 mm^2	
Cond. cross section spring cage	0.75 … 2.5 mm^2	
Ingress protection	IP 20	
Mounting position	any	
Housing material	Polyamide PA6	

Order information

Screw terminal:	**CRINT-C112/UC...V**	**UC12V** **UC24V** **UC48V**
Cage clamp terminal:	**CRINT-C122/UC...V**	**UC60V** **UC110-125V**
„ …“ enter the voltage for full type designation		**UC220-240V**

Accessories

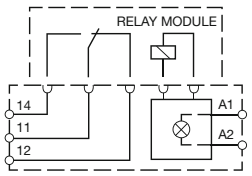
Jumper link (5 pcs):	blue:	**CRINT-BR20-BU/5**
	red:	**CRINT-BR20-RD/5**
	black:	**CRINT-BR20-BK/5**
Label plate (64 pcs):		**CRINT-LAB/64**
Spacer (5 pcs):		**CRINT-SEP/5**

Replacement relays:
CRINT-R12/DC...V
„ …“ enter the voltage for full type designation

DC12V
DC24V
DC48V
DC60V*

*60V Relay used for all sockets with a nominal voltage higher or equal 60V

Connection diagram



Relay
- AgSnO2
- AgSnO2 + 3µ Au

Socket
-Screw terminal
-Cage clamp terminal

Fig.1 AC voltage endurance

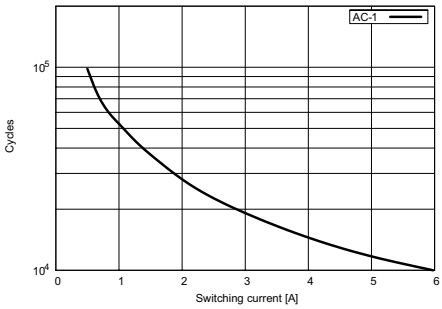
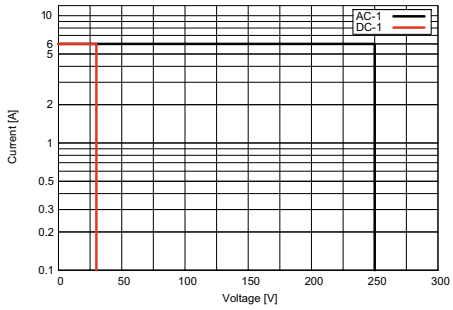


Fig. 2 DC load limit curve



Dimensions p.32

Technical approvals, conformities

(in progress)

CRINT 1x5 series

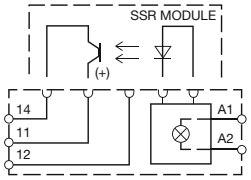
Solid state interface module with NO output contact

DIN Rail mounting

Types: CRINT-C115, CRINT-C125 / ...V
For PLC's and process control. DC solid state switch, type NO.
For fast and high frequent switching. With screw terminals (CRINT-S11) or cage clamp terminals (CRINT-S12).

Max. contact load	**2 A, 24 V DC-1**
Contact	
Type	1 NO (Solid state DC)
Material	MOSFET
Switching current I_{TH}	2 A 24 V DC
Recommended minimal load	20 mA / 5 V
Peak inrush current	48 A/10 ms
Coil	
Operation voltage AC 50/60 Hz / DC	0.8 ... 1.25 U_N
Nominal power DC/AC	160 / — mW
Insulation	
Test voltage I / O	2.5 kVrms 1 minute
Pollution degree	3
Over voltage category	III
Open contact	1000 Vrms dielectric strength 1 min
Standard	EN61810-5
General Specifications	
Ambient temperature: operation / storage	-30 … +70 °C / -40 … +85 °C
Typical response time @ V_n	1 ms
Typical release time @ V_n	1 ms
Cond. cross section screw terminal	2.5 mm^2
Cond. cross section spring cage	0.75 … 2.5 mm^2
Ingress protection	IP 20
Mounting position	any
Housing material	Polyamide PA6

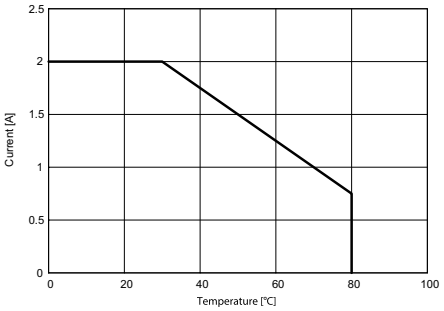
Connection diagram



Relay
- NO / Solid-state DC
- NO / Solid-state AC

Socket
-Screw terminal
-Cage clamp terminal

Output derating curve



Dimensions p.32

Order information

Screw terminal:	**CRINT-C115/UC...V**	**UC12V**
		UC24V
		UC48V
Cage clamp terminal:	**CRINT-C125/UC...V**	**UC60V**
		UC110-125V
„ …“ enter the voltage for full type designation		**UC220-240V**

Accessories

Jumper link (5 pcs):	blue:	**CRINT-BR20-BU/5**
	red:	**CRINT-BR20-RD/5**
	black:	**CRINT-BR20-BK/5**
Label plate (64 pcs):		**CRINT-LAB/64**
Spacer (5 pcs):		**CRINT-SEP/5**

Replacement relays:
CRINT-R15/DC...V
„ …“ enter the voltage for full type designation

DC12V
DC24V
DC48V
DC60V*

*60V Relay used for all sockets with a nominal voltage higher or equal 60V

Technical approvals, conformities

(in progress)

CRINT 1x8 series

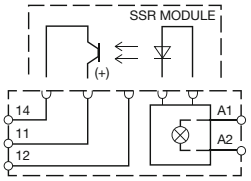
Solid state interface module with NO output contact

DIN Rail mounting

Types: CRINT-C118, CRINT-C128 / ...V
For PLC's and process control.
AC output interface zero synchronous switching NO for resistive or similar load. (No transformator rec.) With screw terminals (CRINT-S11) or cage clamp terminals (CRINT-S12).

Max. contact load	**1 A, 240 V AC-1**
Contact	
Type	1 NO (Solid state AC)
Material	TRIAC
Switching current I_{TH}	1 A 240 V AC
Recommended minimal load	22 mA / 12 V
Peak inrush current	80 A/10 ms
Coil	
Operation voltage AC 50/60 Hz / DC	0.8 ... 1.25 U_N
Nominal power DC/AC	150 / — mW
Insulation	
Test voltage I / O	2.5 kVrms 1 minute
Pollution degree	3
Over voltage category	III
Open contact	1000 Vrms dielectric strength 1 min
Standard	EN61810-5
General Specifications	
Ambient temperature: operation / storage	-30 … +70 °C / -40 … +85 °C
Typical response time @ V_n	1 ms
Typical release time @ V_n	1 ms
Cond. cross section screw terminal	2.5 mm^2
Cond. cross section spring cage	0.75 … 2.5 mm^2
Ingress protection	IP 20
Mounting position	any
Housing material	Polyamide PA6

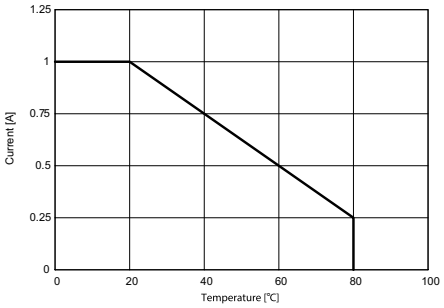
Connection diagram



Relay
- NO / Solid-state DC
- NO / Solid-state AC

Socket
-Screw terminal
-Cage clamp terminal

Output derating curve



Dimensions p.32

Order information

Screw terminal:	**CRINT-C118/UC...V**	**UC12V**
		UC24V
		UC48V
Cage clamp terminal:	**CRINT-C128/UC...V**	**UC60V**
		UC110-125V
„ ...“ enter the voltage for full type designation		**UC220-240V**

Accessories

Jumper link (5 pcs):	blue:	**CRINT-BR20-BU/5**
	red:	**CRINT-BR20-RD/5**
	black:	**CRINT-BR20-BK/5**
Label plate (64 pcs):		**CRINT-LAB/64**
Spacer (5 pcs):		**CRINT-SEP/5**

Replacement relays:
CRINT-R18/DC...V
„ ...“ enter the voltage for full type designation

DC12V
DC24V
DC60V*

*60V Relay used for all sockets with
a nominal voltage higher or equal 60V

Technical approvals, conformities

(in progress)

Notes

Notes

1.2 Miniature Industrial Relays – QRC

Application	Types	Pins	Contacts	AC ratings	DC ratings	Socket
C7 Series						
Miniature power relay	C7-A1x			16 A / 250 V	0.5 A / 110 V	S7
General purpose	C7-A2x			10 A / 250 V	0.5 A / 110 V	S7
Low switching load	C7-T2x			6 A / 250 V	6 A / 30 V	S7
DC load switching	C7-G2x			10 A / 250 V	0.8 A / 110 V	S7
DC load switching double make	C7-X1x		>3mm	10 A / 250 V	6 A / 110 V	S7
1 power and 1 signal contact	C7-H23			10 A / 250 V	6 A / 30 V	S7
Power relay for high inrush current	C7-W1x			10 A / 250 V 500 A / 2.5 ms inrush		S7
Railway application	R7-A2x			10 A / 250 V	10 A / 30 V	S7
Railway application	R7-T2x			6 A / 250 V	6 A / 30 V	S7
C9 Series						
Miniature relay	C9-A4x			5 A / 250 V	5 A / 30 V	S9
Sensitive Coil 500mW … 800mW	C9-E2x			5 A / 250 V	5 mA / 30 V	S9
Latching relay	C9-R2x			5 A / 120 V	5 A / 30 V	S9

C7-A1x

5-pin, miniature relay, 1-pole, faston

Type	**C7-A1x/ ... V** Standard relay 1 change-over contact
Maximum contact load	**16 A/250 V AC-1** **0,5 A/110 V DC-1** **16 A/24 V DC-1** **0,2 A/220 V DC-1**

Contacts

Material	Standard	Code 0	AgNi
Rated current			16 A
Switch-on current max. (20 ms)			40 A (120 A for code 5)
Switching voltage max.			250 V
AC load (Fig 1)			4 kVA
DC load			see Fig. 2
Relay compatible with socket S7-C			

Coil

Coil resistance	see table; tolerance ± 10 %
Pick-up voltage	≤ 0,8 x U_N
Release voltage	≥ 0,1 x U_N
Nominal power	1,2 VA (AC)/1,3 W (DC)

Coil table

VAC	Ω	mA	VDC	Ω	mA
24	174	50	12	111	108
48	686	25	24	432	55
115	4K3	10,4	48	1K7	28
230	18K6	5,2	110	9K2	12

Insulation

	Volt rms, 1 min
Contact open	1000 V
Contact/coil	2,5 kV
Insulation resistance at 500 V	≥1 GΩ
Insulation, IEC 61810-1	2,5 kV/3

Specifications

Ambient temperature operation/storage	-40 (no ice)….60 °C /-40 ... 80 °C
Pick-up time/bounce time	16 ms/≤ 3 ms
Release time/bounce time	8 ms/≤ 1 ms
Mechanical life ops	AC: 10 Mill./DC: 20 Mill.
AC/DC voltage endurance at rated load	≥100'000 switching cycles
Switching frequency at rated load	≤ 1200/h
Protection class	IP40
Weight	43 g

Standard types

VAC 50 Hz/60 Hz: 24, 48, 115 (120), 230 (240)	**C7-A10/AC ... V**
LED	**C7-A10X/AC ... V**
VDC 12, 24, 48, 110	**C7-A10/DC ... V**
LED	**C7-A10X/DC ... V**
Free wheeling diode	**C7-A10DX/DC ... V**
Polarity and free wheeling diode	**C7-A10FX/DC ... V**
AC/DC bridge rectifier 24 V, 48 V, 60 V	**C7-A10BX/UC ... V**

"..." Enter the voltage for full type designation

Accessories

Socket:	**S7-C**

Connection diagram

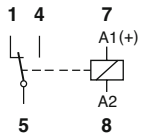


Fig. 1 AC voltage endurance

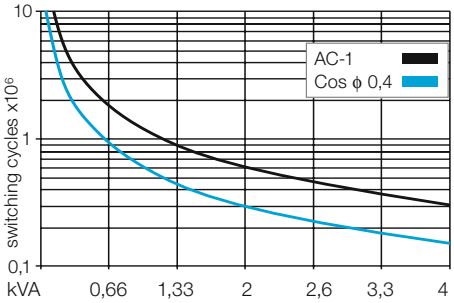
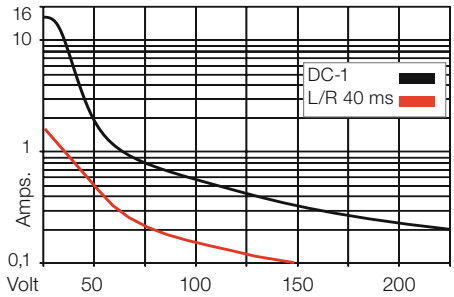
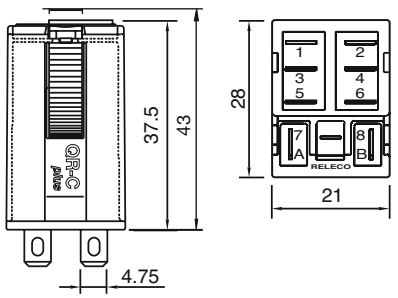


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

IEC 61810; EN 60947

QRC series

C7-A2x

8-pin, miniature relay, 2-poles, faston

Type	**C7-A2x/ ... V** Standard relay 2 change-over contact
Maximum contact load	**10 A/250 V AC-1 0,5 A/110 V DC-1** **10 A/30 V DC-1 0,2 A/220 V DC-1**
Recommended minimum contact load	**10 mA/10 V Code 0, 9** **5 mA/5 V Code 8**

Contacts

Material	Standard	Code 0	AgNi
	Optional	Code 8	AgNi + 5 µ Au
	Optional	Code 9	AgNi + 0,2 µ Au
Rated current			10 A
Switch-on current max. (20 ms)			30 A
Switching voltage max.			250 V
AC load (Fig 1)			2,5 kVA
DC load			see Fig. 2

Coil

Coil resistance	see table; tolerance ± 10 %
Pick-up voltage	≤ 0,8 x U_N
Release voltage	≥ 0,1 x U_N
Nominal power	1,2 VA (AC)/1 W (DC)

Coil table

VAC	Ω	mA	VDC	Ω	mA
24	174	50	12	148	85
48	686	25	24	594	43
115	4K3	10,4	48	2K3	21
230	18K6	5,2	110	11K4	10

Insulation

	Volt rms, 1 min
Contact open	1000 V
Contact/contact	2,5 kV
Contact/coil	2,5 kV
Insulation resistance at 500 V	≥1 GΩ
Insulation, IEC 61810-1	2,5 kV/3

Specifications

Ambient temperature operation/storage	-40 (no ice)….60 °C /-40 ... 80 °C
Pick-up time/bounce time	16 ms/≤ 3 ms
Release time/bounce time	8 ms/≤ 1 ms
Mechanical life ops	AC: 10 Mill./DC: 20 Mill.
DC voltage endurance at rated load	≥100000 switching cycles
Switching frequency at rated load	≤ 1200/h
Protection class	IP40
Weight	43 g

Standard types

VAC 50 Hz/60 Hz: 24, 48, 115 (120), 230 (240)	**C7-A20/AC ... V**	**C7-A28/AC ... V**	**C7-A29/AC ... V**
LED	**C7-A20X/AC ... V**	**C7-A28X/AC ... V**	**C7-A29X/AC ...V**
VDC 12, 24, 48, 110	**C7-A20/DC ... V**	**C7-A28/DC ... V**	**C7-A29/DC ... V**
LED	**C7-A20X/DC ... V**	**C7-A28X/DC ... V**	**C7-A29X/DC ... V**
Free wheeling diode	**C7-A20DX/DC ... V**	**C7-A28DX/DC ...V**	**C7-A29DX/DC .V**
Polarity and free wheeling diode	**C7-A20FX/DC ... V**	**C7-A28FX/DC ... V**	**C7-A29FX/DC ...V**
AC/DC bridge rectifier 24 V, 48 V, 60 V	**C7-A20BX/UC ... V**	**C7-A28BX/UC ... V**	**C7-A29BX/UC ... V**

"..." Enter the voltage for full type designation

Accessories

Socket:	**S7-C, S7-I/O, S7-L, S7-P, S7-P0**

Connection diagram

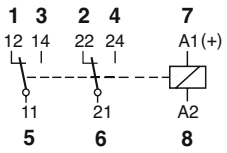


Fig. 1 AC voltage endurance

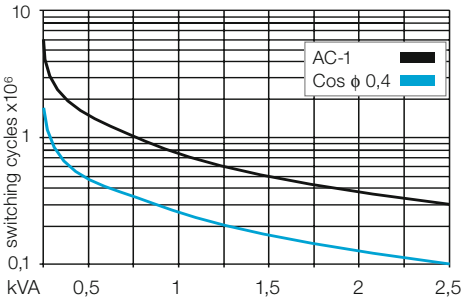
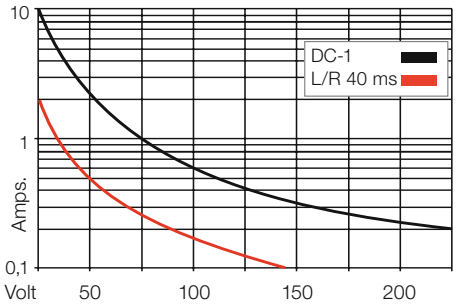
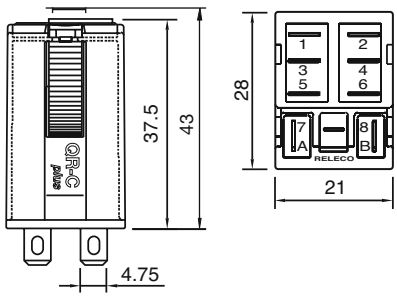


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

Lloyd´s

IEC 61810;
EN 60947

C7-T2x

8-pin, miniature relay, 2-poles, twin contact, faston

Type			**C7-T2x/ ... V** Standard relays for low level 2 change-over bifurcated contacts			
Maximum contact load			**6 A/250 V**	**AC-1**	**6 A/30 V**	**DC-1**
Recommended minimum contact load			**5 mA/5 V** **1 mA/5 V**	**Code 1** **Code 2**		
Contacts						
Material	Standard	Code 1	AgNi + 0,2 µ Au			
	Optional	Code 2	AgNi + 5 µ Au			
Rated current			6 A			
Switch-on current max. (20 ms)			15 A			
Switching voltage max.			250 V			
AC load (Fig 1)			1,2 kVA			
DC load			see fig. 2			

Coil

Coil resistance	see table; tolerance ± 10 %
Pick-up voltage	≤ 0,8 x U_N
Release voltage	≥ 0,1 x U_N
Nominal power	1,2 VA (AC)/1 W (DC)

Coil table

VAC	Ω	mA	VDC	Ω	mA
24	174	50	12	148	85
48	686	25	24	594	43
115	4K3	10,4	48	2K3	21
230	18K6	5,2	110	11K4	10

Insulation	Volt rms, 1 min
Contact open	1000 V
Contact/contact	2,5 kV
Contact/coil	2,5 kV
Insulation resistance at 500 V	≥1 GΩ
Insulation, IEC 61810-1	2,5 kV/3

Specifications	
Ambient temperature operation/storage	-40 (no ice)….60 °C /-40 ... 80 °C
Pick-up time/bounce time	16 ms/≤ 3 ms
Release time/bounce time	8 ms/≤ 1 ms
Mechanical life ops	AC: 10 Mill./DC: 20 Mill.
DC voltage endurance at rated load	≥100000 switching cycles
Switching frequency at rated load	≤ 1200/h
Protection class	IP40
Weight	43 g

Standard types		
VAC 50 Hz/60 Hz: 24, 48, 115 (120), 230 (240)	**C7-T21/AC ... V**	**C7-T22/AC ... V**
LED	**C7-T21X/AC ... V**	**C7-T22X/AC ... V**
VDC 12, 24, 48, 110	**C7-T21/DC ... V**	**C7-T22/DC ... V**
LED	**C7-T21X/DC ... V**	**C7-T22X/DC ... V**
Free wheeling diode	**C7-T21DX/DC ... V**	**C7-T22DX/DC ...V**
Polarity and free wheeling diode	**C7-T21FX/DC ... V**	**C7-T22FX/DC ... V**
AC/DC bridge rectifier 24 V, 48 V, 60 V	**C7-T21BX/UC ... V**	**C7-T22BX/UC ... V**

"..." Enter the voltage for full type designation

Accessories

Socket: **S7-C, S7-I/O, S7-L, S7-P, S7-P0**

Connection diagram

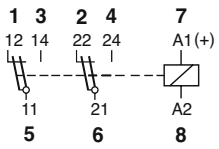


Fig. 1 AC voltage endurance

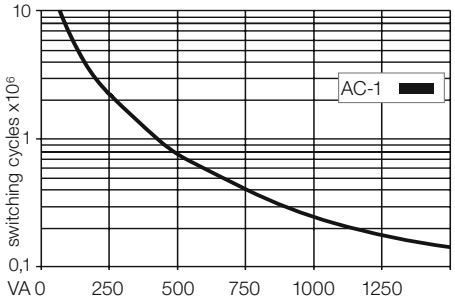
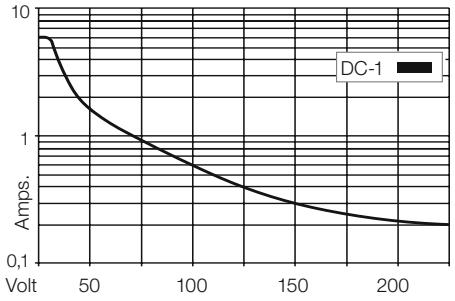
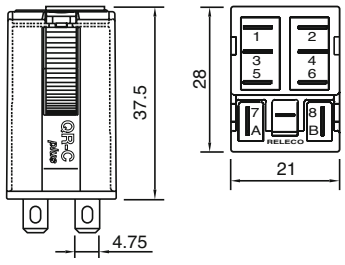


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

IEC 61810; EN 60947

QRC series

C7-G2x

6-pin, miniature power relay, 2-poles, faston

Type	**C7-G2x/ ... V** Power relay, DC application 2 open contacts, gap 1,5mm
Maximum contact load	**10 A/250 V AC-1 0,8 A/110 V DC-1** **10 A/30 V DC-1 0,4 A/220 V DC-1**

Contacts

Material	Standard	Code 0	AgNi
Rated current			10 A
Switch-on current max. (20 ms)			30 A
Switching voltage max			250 V
AC load (Fig 1)			2,5 kVA
DC load			see fig. 2

Coil

Coil resistance	see table; tolerance ± 10 %
Pick-up voltage	≤ 0,8 x U_N
Release voltage	≥ 0,1 x U_N
Nominal power	1,5 VA (AC)/1,5 W (DC)

Coil table

VAC	Ω	mA	VDC	Ω	mA
24	153	62	12	99	121
48	611	31	24	388	61
115	3K6	13	48	1K5	32
230	14K6	6,5	110	8K	14

Insulation Volt rms, 1 min

Contact open	2000 V
Contact/contact	2,5 kV
Contact/coil	2,5 kV
Insulation resistance at 500 V	≥1 GΩ
Insulation, IEC 61810-1	2,5 kV/3

Specifications

Ambient temperature operation/storage	-40 (no ice)….60 °C /-40 ... 80 °C
Pick-up time/bounce time	20 ms/≤ 3 ms
Release time/bounce time	10 ms/≤ 1 ms
Mechanical life ops	AC: 10 Mill./DC: 20 Mill.
DC voltage endurance at rated load	≥100000 switching cycles
Switching frequency at rated load	≤ 1200/h
Protection class	IP40
Weight	43 g

Standard types

VAC 50 Hz/60 Hz: 24, 48, 115 (120), 230 (240)	**C7-G20/AC ... V**
LED	**C7-G20X/AC ... V**
VDC 12, 24, 48, 110	**C7-G20/DC ... V**
LED	**C7-G20X/DC ... V**
Free wheeling diode	**C7-G20DX/DC ... V**
Polarity and free wheeling diode	**C7-G20FX/DC ... V**
AC/DC bridge rectifier 24 V, 48 V, 60 V	**C7-G20BX/UC ... V**

"..." Enter the voltage for full type designation

Accessories

Socket: **S7-C, S7-I/O, S7-L, S7-P, S7-P0**

Connection diagram

Gap: 1,5 mm

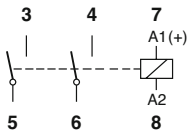


Fig. 1 AC voltage endurance

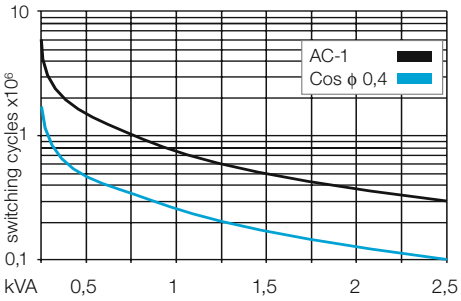
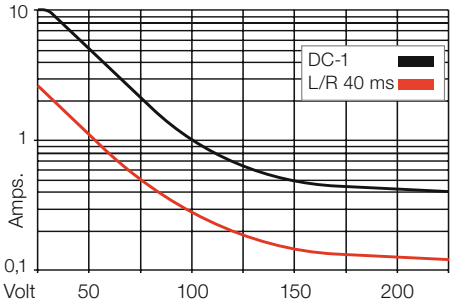
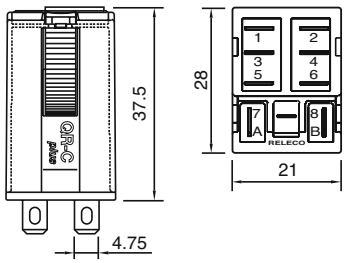


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

Lloyd´s

IEC 61810; EN 60947

C7-X1x

4-pin, miniature power relay, 1-pole, double make contact, faston

Type	**C7-X1x/ ... V** Power relay, DC application 1 pole, NO, double make
Maximum contact load	**10 A/250 V AC-1 6 A/110 V DC-1** **10 A/30 V DC-1 1 A/220 V DC-1**

Contacts

Material	Standard	Code 0	AgNi
Rated current			10 A
Switch-on current max. (20 ms)			30 A
Switching voltage max.			250 V
AC load			2,5 kVA
DC load			see Fig. 2

Coil

Coil resistance	see table; tolerance ± 10 %
Pick-up voltage	≤ 0,8 x U_N
Release voltage	≥ 0,1 x U_N
Nominal power	1,5 VA (AC)/1,3 W (DC)

Coil table

VAC	Ω	mA	VDC	Ω	mA
24	153	62	12	111	108
48	611	31	24	432	55
115	3K6	13	48	1K7	27
230	14K6	6,5	110	9K2	12

Insulation

	Volt rms, 1 min
Contact open	2,5 kV
Contact/coil	2,5 kV
Insulation resistance at 500 V	≥1 GΩ
Insulation, IEC 61810-1	2,5 kV/3

Specifications

Ambient temperature operation/storage	-40 (no ice)….60 °C /-40 ... 80 °C
Pick-up time/bounce time	20 ms/≤ 3 ms
Release time/bounce time	10 ms/≤ 1 ms
Mechanical life ops	AC: 10 Mill./DC: 20 Mill.
DC voltage endurance at rated load	≥100000 switching cycles
Switching frequency at rated load	≤ 1200/h
Protection class	IP40
Weight	43 g

Standard types

VAC 50 Hz/60 Hz: 24, 48, 115 (120), 230 (240)	**C7-X10/AC ... V**
LED	**C7-X10X/AC ... V**
VDC 12, 24, 48, 110	**C7-X10/DC ... V**
LED	**C7-X10X/DC ... V**
Free wheeling diode	**C7-X10DX/DC ... V**
Polarity and free wheeling diode	**C7-X10FX/DC ... V**
AC/DC bridge rectifier 24 V, 48 V, 60 V	**C7-X10BX/UC ... V**

"..." Enter the voltage for full type designation

Accessories

Socket:	**S7-C, S7-I/O, S7-L, S7-P, S7-P0**

Connection diagram

Gap:
3 mm (1,5 + 1,5)

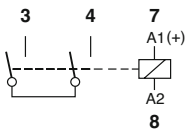


Fig. 1 AC voltage endurance

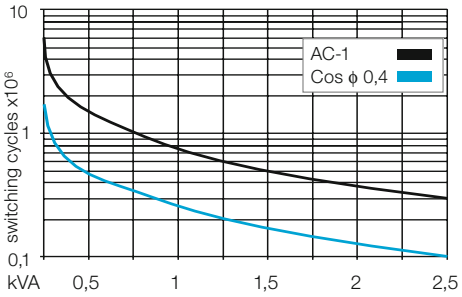
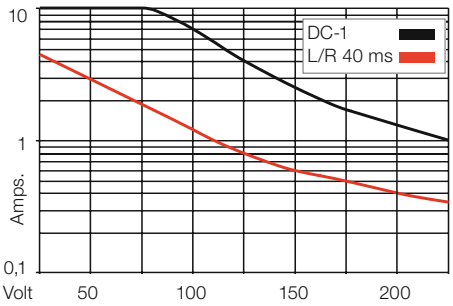
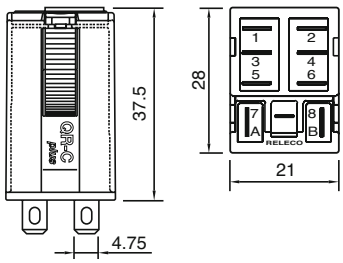


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

Lloyd´s

IEC 61810; EN 60947

QRC series

C7-H23

8-pin, miniature relay, 2-pole, faston

Type	**C7-H23/ ... V** Special relays 1 x CO power contact 1 x CO twin contact
Maximum contact load	**10 A / 250 V AC-1 6 A / 250 V AC-1** **10 A / 30 V DC-1 6 A / 30 V DC-1**
Recommended minimum contact load	**10 mA/10 V (Power contacts)** **5 mA/5V (twin contacts)**

Contacts

Power contact

Standard material	AgNi
Rated current	10 A
Switch-on current max. (20 ms)	30 A
Switching voltage max.	2,5 kV
AC load (Fig 1)	2,5 VA
DC load	see fig. 2

*Power contact only

Twin contact

Standard material	AgNi + 0,2 µ Au
Rated current	6 A
Switch-on current max. (20 ms)	15 A
Switching voltage max.	250 V

Coil

Coil resistance	see table; tolerance ± 10 %
Pick-up voltage	≤ 0,8 x U_N
Release voltage	≥ 0,1 x U_N
Nominal power	1,2 VA (AC) /1 W (DC)

Coil table

VAC	Ω ± 10%	mA	VDC	Ω ± 10%	mA
24	174	50	12	148	81
48	686	25	24	594	40
115	4K3	10.4	48	2K3	21
230	18K6	5.2	110	11K4	10

Insulation Volt rms, 1 min

Contact open	1000 V
Contact/contact	2,5 kV
Contact/coil	2,5 kV
Insulation, IEC 61810-1:	2,5 kV/3

Specifications

Ambient temperature operation/storage	40 (no ice)….60 °C /-40 ... 80 °C
Mechanical life ops	AC: 10 Mill./DC: 20 Mill.
Protection class	IP40
Weight	43 g

Standard types

VAC 50 Hz/60 Hz: 24, 48, 115 (120), 230 (240)	**C7-H23/AC ... V**
LED	**C7-H23X/AC ... V**
VDC 12,24, 48, 110	**C7-H23/DC ... V**
LED	**C7-H23X/DC ... V**
Free wheeling diode	**C7-H23DX/DC ... V**
Polarity and free wheeling diode	**C7-H23FX/DC ... V**
UC 24 V, 48 V, 60 V	**C7-H23BX/UC ... V**

"..." Enter the voltage for full type designation

Accessories

Socket: **S7-C, S7-I/O, S7-L, S7-P, S7-P0**

Connection diagram

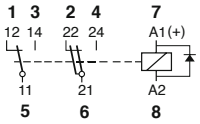


*Fig. 1 AC voltage endurance

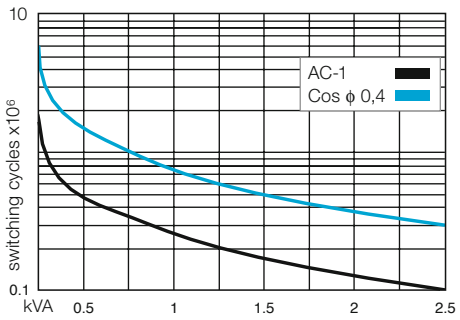
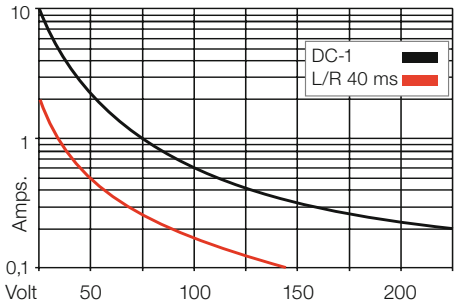
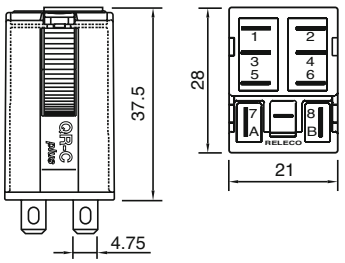


*Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

IEC 61810; EN 60947

C7-W1x

4-pin, miniature relay, 1-pole, tungsten contact, faston

Type:	**C7-W1x/ ... V** Power relay for high inrush current 1 pole normally open
Maximum contact load:	**10 A/250 V AC-1 6 A/250 V AC-5a/b**
Recommended minimum contact load:	**10 mA/10 V**

Contacts

Material	Standard	Code 0	AgNi/W
Rated current			10 A
Switch-on current max. (2,5 ms)			500 A
Switching voltage max.			250 V
AC load (Fig 1)			2,5 kVA
DC load			see fig. 2

Coil

Coil resistance	see table; tolerance ± 10 %
Pick-up voltage	≤ 0,8 x U_N
Release voltage	≥ 0,1 x U_N
Nominal power	1,5 VA (AC)/1,5 W (DC)

Coil table

VAC	Ω	mA	VDC	Ω	mA
24	153	62	12	99	121
48	611	31	24	388	61
115	3K6	13	48	1K5	32
230	14K5	6,5	110	8K	14

Insulation

	Volt rms, 1 min
Contact open	1000 V
Contact/coil	2,5 kV
Insulation resistance at 500 V	≥1 GΩ
Insulation, IEC 61810-1	2,5 kV

Specifications

Ambient temperature operation/storage	-40 (no ice)….60 ºC /-40 ... 80 °C
Pick-up time/bounce time	20 ms/≤ 3 ms
Release time/bounce time	10 ms/≤ 1 ms
Mechanical life ops	AC: 10 Mill./DC: 20 Mill.
DC voltage endurance at rated load	≥100000 switching cycles
Switching frequency at rated load	≤ 1200/h
Protection class	IP40
Weight	43 g

Standard types

VAC 50 Hz/60 Hz: 24, 48, 115 (120), 230 (240)	**C7-W10/AC ... V**
LED	**C7-W10X/AC ... V**
VDC 12, 24, 48, 110	**C7-W10/DC ... V**
LED	**C7-W10X/DC ... V**
Free wheeling diode	**C7-W10DX/DC ... V**
Polarity and free wheeling diode	**C7-W10FX/DC ... V**
AC/DC bridge rectifier 24 V, 48 V, 60 V	**C7-W10BX/UC ... V**

"..." Enter the voltage for full type designation

Accessories

Socket:	**S7-C, S7-I/O, S7-L, S7-P, S7-P0**
Optional accessories (blanking plug):	**S9-NP, S9-OP**

Connection diagram

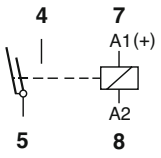


Fig. 1 AC voltage endurance

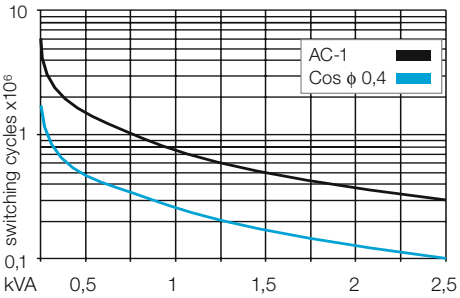
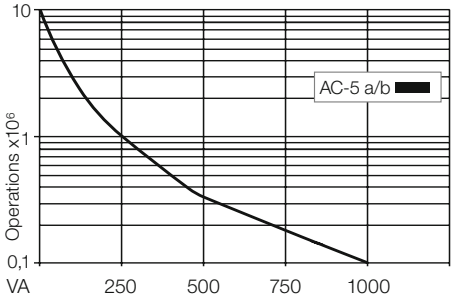
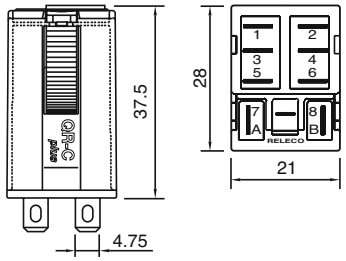


Fig. 2 AC voltage endurance



Dimensions [mm]



Technical approvals, conformities

Lloyd´s

IEC 61810; EN 60947

QRC series

R7-A2x

8-pin, miniature standard relay, 2-pole, plug-in
Relay approval: EN 60077-1-2/99 - EN 61373/99 for Railway application

Type	**R7-A2x/DC ... V** Railway application Sensitive, 2 change-over contacts
Maximum contact load:	**10 A/250 V AC-1 10A/30V DC-1**
Recommended minimum contact load	**10 mA/10 V Code 0, 4** **5 mA/5 V Code 8**

Contacts

Material	Standard	Code 0	AgNi
	Optional	Code 4	AgNi + 0,2 µ Au
	Optional	Code 8	AgNi + 5 µ Au
Rated current			10 A
Switch-on current max. (20 ms)			30 A
Switching voltage max.			250 V
AC load			see fig. 1
DC load			see fig. 2

Coil

Coil resistance	see table; tolerance ± 10 %
Operating range	0,7 U_N ... 1,25 U_N
Pick-up voltage	≥ 0,1 x U_N
Nominal power	1,07 W

Coil table

Voltage	Ω ± 10%	mA
24	535	45
48	2004	24
72	4750	15
110	11337	10

Insulation

	Volt rms, 1 min
Pollution grade	PD3
Pulse (1,2 /50µs) Dielectric strenght (1Minute/V rms)	
Contact/coil	4KV / 2200V
Between different poles	4KV / 2200V
Between contact and the same pole	1550 / 850V

Specifications

Ambient temperature operation/storage	-25 (no ice)....70 °C /-40 ... 80 °C
Number of mechanical operations	>20millions
Thermic class	B (130° C)
Vibration : category / class	1 / B Body mounted
Vibration	5-150Hz (3 axes)
Shock	5g (3 axes)
Operation (UN) / release time	10 ms/ 15 ms
Weight	35 g
Weight avg. Relay + Socket (S7-M)	75g
Protection class	IP40

Standard types

VDC 24, 48, 72, 110	**R7-A20/DC ... V**	**R7-A24/DC ... V**	**R7-A28/DC ... V**
LED	**R7-A20X/DC ... V**	**R7-A24X/DC ... V**	**R7-A28X/DC ... V**
Free wheeling diode	**R7-A20D/DC ... V**	**R7-A24D/DC ... V**	**R7-A28D/DC ... V**
LED + free wheeling diode	**R7-A20DX/DC ... V**	**R7-A24DX/DC ... V**	**R7-A28DX/DC ... V**

"..." Enter the voltage for full type designation

Accessories

Socket: **S7-C, S7-I/O, S7-L, S7-P, S7-P0**

Connection diagram

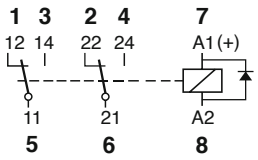


Fig. 1 AC voltage endurance

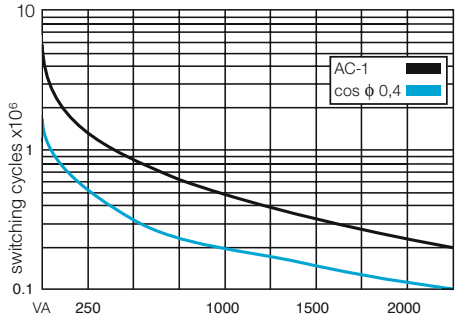
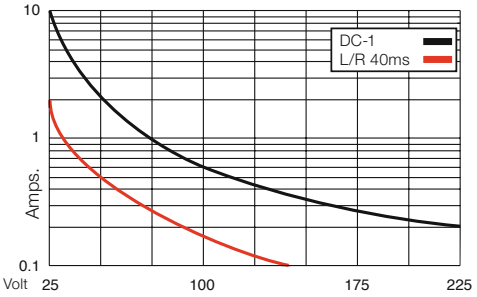
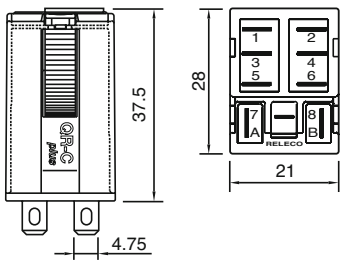


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

EN 60077-1-2/99; EN 61373/99

R7-T2x

8-pin, miniature industrial relay, 2-pole, change-over contact, faston
Relay approval: EN 60077-1-2/99 - EN 61373/99 for Railway application

Type			**R7-T2x/DC ... V** Railway application Sensitive, 2 change-over contact	
Maximum contact load			**6 A/250 V** **AC-1**	**6 A /30 V DC-1**
Recommended minimum contact load			**5 mA/5 V** **Code 1** **1 mA/5 V** **Code 2**	
Contacts				
Material	Standard	Code 1	AgNi + 0,2 µ Au	
	Optional	Code 2	AgNi + 5 µ Au	
Rated current			6 A	
Switch-on current max. (20 ms)			15 A	
Switching voltage max.			250 V	
AC load			see fig. 1	
DC load			see fig. 2	
Coil				
Coil resistance			see table; tolerance ± 10 %	
Operation range			0,7 U_N ... 1,25 U_N	
Contact open			≥ 0,1 x U_N	
Nominal power			1,07 W	

Coil table

Voltage	Ω ± 10%	mA
24	535	45
48	2004	24
72	4750	15
110	11337	10

Insulation	Volt rms, 1 min
Pollution grade	PD3
Pulse (1,2 /50µs) Dielectric strenght (1Minute/V rms)	
Contact/coil	4KV / 2200V
Between different poles	4KV / 2200V
Between contact and the same pole	1550 / 850V
Specifications	
Ambient temperature operation/storage	-25 (no ice)....70 °C /-40 ... 80 °C
Number of mechanical operations	≥ 20 millions
Thermic class	B (130° C)
Vibration : category / class	1 / B Body mounted
Vibration	5-150Hz (3 axes)
Shock	5g (3 axes)
Operation (UN) / release time	10 ms/ 15 ms
Weight	35 g
Weight avg. Relay + Socket (S7-M)	75g
Protection class	IP40

Standard types

VDC 24, 48, 72, 110	**R7-T21/DC ... V**	**R7-T22/DC ... V**
LED	**R7-T21X/DC ... V**	**R7-T22X/DC ... V**
Free wheeling diode	**R7-T21D/DC ... V**	**R7-T22D/DC ... V**
LED + free wheeling diode	**R7-T21DX/DC ... V**	**R7-T22DX/DC ... V**

"..." Enter the voltage for full type designation

Accessories

Socket: **S7-C, S7-I/O, S7-L, S7-P, S7-P0**

Connection diagram

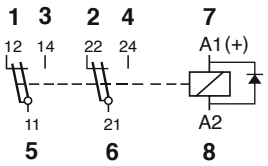


Fig. 1 AC voltage endurance

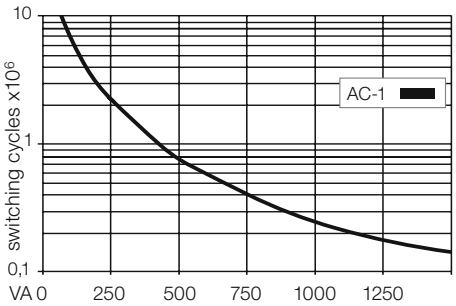
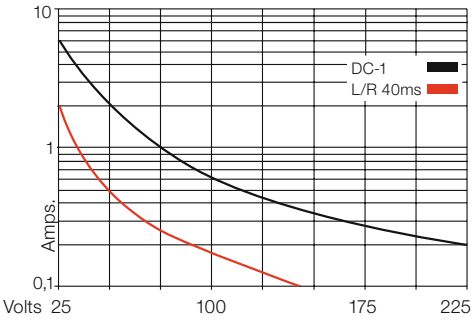
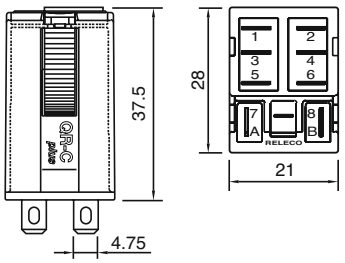


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

IEC 60077; EN 60077-1-2/99; EN 61373/99

QRC series

C9-A4x

14-pin, miniature relay, 4-pole, plug-in, faston

Type	**C9-A4x/ ... V** Standard relays 4 change-over contacts
Maximum contact load	**5 A/250 V AC-1 5 A/30 V DC-1**
Recommended minimum contact load	**10 mA/10 V Code 1** **5 mA/5 V Code 2**

Contacts

Material	Standard	Code 1	AgNi + 0,2 µ Au
	Optional	Code 2	AgNi + 5 µ Au
Rated current			5 A
Switch-on current max. (20 ms)			15 A
Switching voltage max (same polarity)			250 V
AC load (Fig 1)			1,250 kVA
DC load			see Fig. 2

Coil

Coil resistance	see table; tolerance ± 10 %
Pick-up voltage	≤ 0,8 x U_N
Release voltage	≥ 0,1 x U_N
Nominal power	1,2 VA (AC)/1 W (DC)

Coil table

VAC	Ω	mA	VDC	Ω	mA
24	174	50	12	148	81
48	686	25	24	594	40
115	4K3	10,4	48	2K3	21
230	18K6	5,2	110	11K4	11

Insulation

	Volt rms, 1 min
Contact open	1000 V
Contact/contact	2 kV
Contact/coil	2,5 kV
Insulation resistance at 500 V	≥1 GΩ
Insulation, IEC 61810-1	2,5 kV/3

Specifications

Ambient temperature operation/storage	-40 (no ice)….60 °C /-40 ... 80 °C
Pick-up time/bounce time	10 ms/≤ 3 ms
Release time/bounce time	6 ms/≤ 1 ms
Mechanical life ops	AC: 10 Mill./DC: 20 Mill.
DC voltage endurance at rated load	≥100000 switching cycles
Switching frequency at rated load	≤ 1200/h
Protection class	IP40
Weight	43 g

Standard types

VAC 50 Hz/60 Hz: 24, 48, 115, 230 (240)	**C9-A41/AC ... V**	**C9-A42/AC ... V**
LED	**C9-A41X/AC ... V**	**C9-A42X/AC ... V**
VDC 12, 24, 48, 110	**C9-A41/DC ... V**	**C9-A42/DC ... V**
LED	**C9-A41X/DC ... V**	**C9-A42X/DC ... V**
Free wheeling diode	**C9-A41DX/DC ... V**	**C9-A42DX/DC ... V**
Polarity and free wheeling diode	**C9-A41FX/DC ... V**	**C9-A42FX/DC ... V**
AC/DC bridge rectifier 24 V, 48 V, 60 V	**C9-A41BX/UC ... V**	**C9-A42BX/UC ... V**

"..." Enter the voltage for full type designation

Accessories

Socket:	**S9-M, S9-L, S9-P, S9-P0**
Optional accessories (blanking plug):	**S9-NP, S9-OP**

Connection diagram

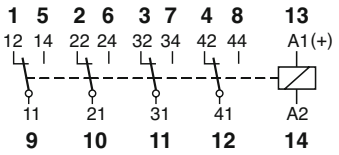


Fig. 1 AC voltage endurance

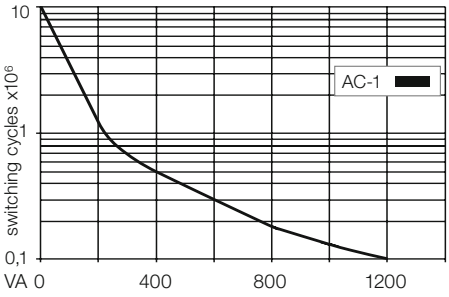
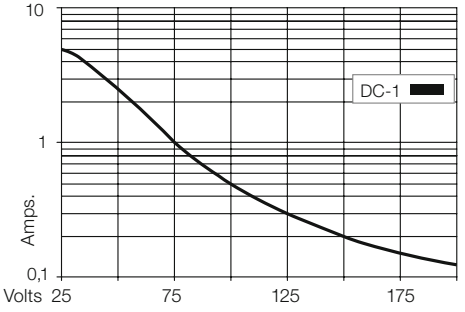
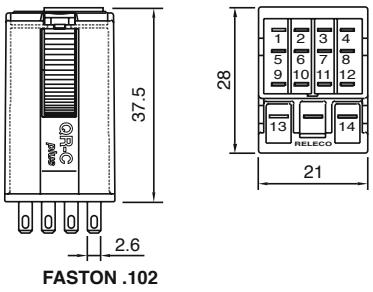


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

IEC 61810; EN 60947

C9-E2x

8-pin, miniature relay, 2-pole, plug-in, faston

Type	**C9-E2x/ ... V** Sensitive relay, 500 mW 2 change-over contacts
DC operating range	**0,8 ...1,7 x U_N**
Maximum contact load	**5 A/250 V AC-1 5 A/30 V DC-1**
Recommended minimum contact load	**10 mA/10 V Code 1** **5 mA/5 V Code 2**

Contacts

Material	Standard	Code 1	AgNi + 0,2 µ Au
	Optional,	Code 2	AgNi + 5 µ Au
Rated current			5 A
Switch-on current max. (20 ms)			15 A
Switching voltage max.			250 V
AC load (Fig 1)			1200 VA
DC load			see fig. 2

Coil

Coil resistance	see table; tolerance ± 10 %
Pick-up voltage	≤ 0,8 x U_N
Release voltage	≥ 0,1 x U_N
Nominal power	0,8 VA (AC)/0,5 W (DC)

Coil table

VAC	Ω	mA	VDC	Ω	mA
24	238	33	12	288	42
48	1K	17	24	1K1	21
115	5K9	7	48	4K6	10
230	23K9	3,5	110	24K2	4,5

Insulation

	Volt rms, 1 min
Contact open	1000 V
Contact/contact	2,5 kV
Contact/coil	2,5 kV
Insulation resistance at 500 V	≥1 GΩ
Insulation, IEC 61810-1	2,5 kV/3

Specifications

Ambient temperature operation/storage	-40 (no ice)....60 °C /-40 ... 80 °C
Pick-up time/bounce time	10 ms/≤ 3 ms
Release time/bounce time	6 ms/≤ 1 ms
Mechanical life	AC: 10 Mill./DC: 20 Mill.
DC voltage endurance at rated load	≥100000 switching cycles
Switching frequency at rated load	≤ 1200/h
Protection class	IP40
Weight	40 g

Standard types

VAC 50 Hz/60 Hz: 24, 48, 115, 230 (240)	**C9-E21/AC ... V**	**C9-E22/AC ... V**
LED	**C9-E21X/AC ... V**	**C9-E22X/AC ... V**
VDC 12, 24, 48, 110, 220	**C9-E21/DC ... V**	**C9-E22/DC ... V**
LED	**C9-E21X/DC ... V**	**C9-E22X/DC ... V**
Free wheeling diode	**C9-E21DX/DC ... V**	**C9-E22DX/DC ... V**
Polarity and free wheeling diode	**C9-E21FX/DC ... V**	**C9-E22FX/DC ... V**
AC/DC bridge rectifier 24 V, 48 V, 60 V	**C9-E21BX/UC ... V**	**C9-E22BX/UC ... V**

"..." Enter the voltage for full type designation

Accessories

Socket:	**S9-M, S9-L, S9-P, S9-P0**
Optional accessories (blanking plug):	**S9-NP, S9-OP**

Connection diagram

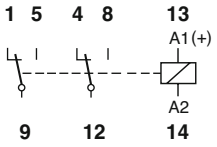


Fig. 1 AC voltage endurance

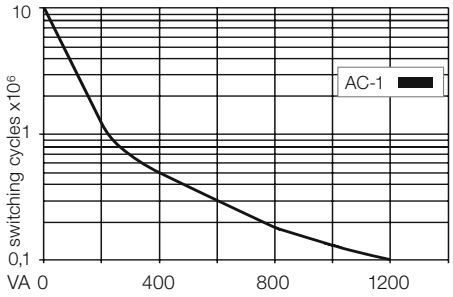
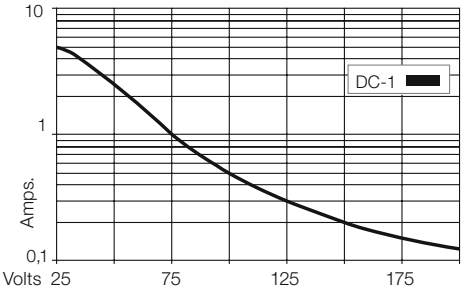
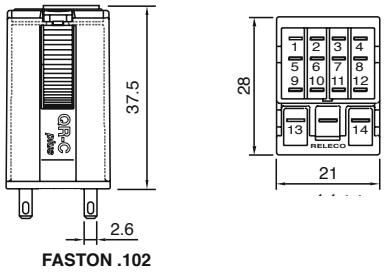


Fig. 2 DC load limit curve



Dimensions [mm]



FASTON .102

Technical approvals, conformities

IEC 61810; EN 60947

QRC series

C9-R2x

9-pin, miniature remanence relay, 2-pole, plug-in, faston

Type	**C9-R2x/ ... V** Magnetic latching relay 2 change-over contacts
Maximum contact load	**5 A/120V AC-1 5 A/30 V DC-1**
Recommended minimum contact load	**10 mA/10 V**

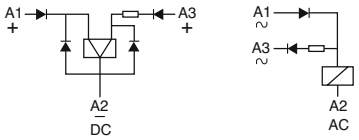
Contacts

Material	Standard	Code 1	AgNi + 0,2 µ Au
Rated current			5 A
Switch-on current max. (20 ms)			15 A
Switching voltage max.			120V
AC load			600 VA
DC load			see Fig. 2

Coil

Coil resistance	see table; tolerance ± 10 %
ON pulse power	1,2 VA/W
OFF pulse power	0,3 VA/W
1 winding for AC, 2 winding for DC	

Internal Diagram:



Coil table

VAC	mA ON	mA OFF	VDC	mA ON	mA OFF
24	50	8	12	100	25
48	25	4	24	50	12
115	10	2	48	25	6
230	5	1	60	20	5

Insulation

	Volt rms, 1 min
Contact open	1000 V
Contact/contact	2 kV
Contact/coil	2 kV
Insulation resistance at 500 V	≥1 GΩ
Insulation, IEC 61810-1	2,5 kV/2

Specifications

Ambient temperature operation/storage	-40 (no ice)….60 °C /-40 ... 80 °C
Minimum pulse ON/OFF	50 ms
Mechanical life	AC: 10 Mill./DC: 20 Mill.
DC voltage endurance at rated load	≥100000 switching cycles
Switching frequency at rated load	≤ 1200/h
Protection class	IP40
Weight	43 g

Standard types

AC 50 Hz/60 Hz: 24, 48, 115, 230	**C9-R21/AC ... V**
DC 12, 24, 48, 60	**C9-R21/DC ... V**

"..." Enter the voltage for full type designation

Accessories

Socket:	**S9-M, S9-L, S9-P, S9-P0**
Optional accessories (blanking plug):	**S9-NP, S9-OP**

Connection diagram

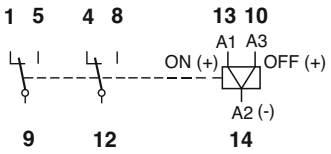


Fig. 1 AC voltage endurance

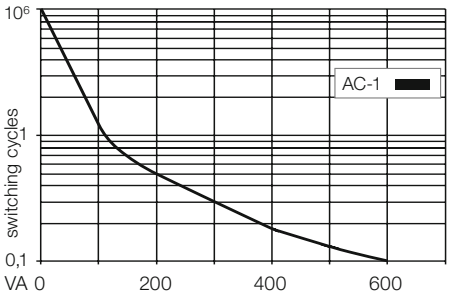
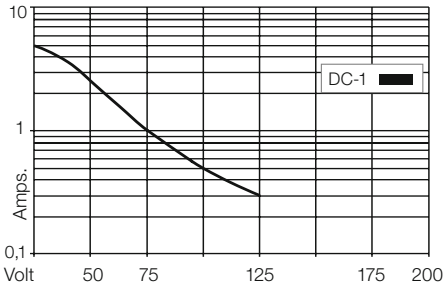
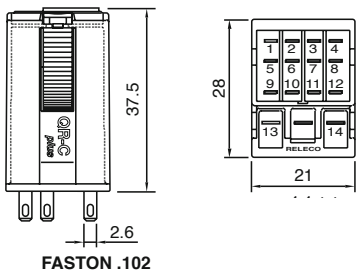


Fig. 2 DC load limit curve



Dimensions [mm]



FASTON .102

Technical approvals, conformities

Lloyd´s

IEC 61810; EN 60947

Notes

1.3 Industrial Relays – MRC

Application	Types	Pins	Contacts	AC ratings	DC ratings	Socket
C2 Series						
General purpose	C2-A2x			10 A / 250 V	0.5 A / 110 V	S2
Low switching load	C2-T2x			6 A / 250 V	6 A / 30 V	S2
DC load switching	C2-G2x		1.7mm	10 A / 250 V	1.2 A / 110 V	S2
C3 Series						
General purpose	C3-A3x			10 A / 250 V	0.5 A / 110 V	S3
Low switching load	C3-T3x			6 A / 250 V	6 A / 30 V	S3
DC load switching	C3-G3x		1.7mm	10 A / 250 V	1.2 A / 110 V	S3
DC load switching with magnetic blow out	C3-M1x		>3mm Ma.	10 A / 250 V	10 A / 220 V	S3
DC load switching double make	C3-X1x		>3mm	10 A / 250V	7 A / 110 V	S3
Latching relay	C3-R2x		Rem.	10 A /250 V	0.5 A / 110 V	S3
C4 Series						
General purpose	C4-A4x			10 A / 250 V	0.5 A / 110 V	S4
DC load switching double make	C4-X2x		2x >3mm	10 A / 250 V	7 A / 110 V	S4
Latching relay	C4-R3x		Rem.	10 A / 250 V	0.5 A / 110 V	S4
C5 Series						
Power relay	C5-A2x			16 A / 400 V	0.5 A / 110 V	S5
Power relay	C5-A3x			16 A / 400 V	0.5 A / 110 V	S5
DC load switching	C5-G3x		1.7mm	16 A / 400 V	1.2 A / 110 V	S5
DC load switching double make	C5-X1x		>3mm	16 A / 400 V	7 A / 110 V	S5
DC load switching with magnetic blow out	C5-M1x		>3mm Ma.	16 A / 400 V	10 A / 220 V	S5
DC load switching with magnetic blow out	C5-M2x		>3mm Ma.	16 A / 250 V	7 A / 110 V	S5
Latching relay	C5-R2x		Rem.	10 A / 400 V	10 A / 30 V	S5

MRC Serie

C2-A2x

8-pin standard relay, 2-pole, plug-in, IEC 61810

Type	**C2-A2x/ ... V** Standard relay, 2 change-over contacts
Maximum contact load	**10 A/250 V AC-1 0,5 A/110 V DC-1** **10 A/30 V DC-1 0,2 A/220 V DC-1**
Recommended minimum contact load	**10 mA/10 V Code 0, 9** **5 mA/5 V Code 8**

Contacts

Material	Standard	Code 0	AgNi
	Optional	Code 8	AgNi + 5 µ Au
	Optional	Code 9	AgNi + 0,2 µ Au
Max. switching current			10 A
Max. peak inrush current (20 ms.)			30 A
Max. switching voltage			250 V
Max. AC load (Fig 1 1)			2,5 kVA
Max. DC load			See Fig 2

Coils

Coil resistance	see table; tolerance ± 10 %
Pull-in voltage	≤ 0,8 x U_N
Pull-in voltage	≥ 0,1 x U_N
Nominal power	2,2 VA (AC)/1,3 W (DC)

Table

VAC	Ω	mA	VDC	Ω	mA
24	67	92	24	443	54
48	296	46	48	1K8	27
115	1K7	19	110	9K	12
230	7K1	9,5	220	36K1	6

Insulation

Insulation	Volt rms, 1 min
Open contact	1000 V
Between adjacent poles	2,5 kV
Between contacts and coil	2,5 kV
Insulation resistance at 500 V	≥1 GΩ
Insulation, IEC 61810-1	2,5 kV/3

Specifications

Ambient temperature operation/storage	-40 (no ice)….60 °C /-40 ... 80 °C
Pick-up time + bounce time	16 ms/≤ 3 ms
Release time + bounce time	8 ms/≤ 1 ms
Mechanical life ops	AC: 10 Mill./DC: 20 Mill.
DC voltage endurance at rated load	≥100000 ops. switching cycles
Operating frequency at nominal load	≤1200/ops/h
Protection degree	IP40
Weight	79 g

Standard types

VAC 50 Hz/60 Hz: 24, 48, 115 (120), 230 (240)	**C2-A20/AC ... V**	**C2-A28/AC ... V**	**C2-A29AC ... V**
LED	**C2-A20X/AC ... V**	**C2-A28X/AC ... V**	**C2-A29X/AC ... V**
VDC 24, 48, 110, 220	**C2-A20/DC ... V**	**C2-A28/DC ... V**	**C2-A29/DC ... V**
LED	**C2-A20X/DC ... V**	**C2-A28X/DC ... V**	**C2-A29X/DC ... V**
Free wheeling diode	**C2-A20DX/DC ... V**	**C2-A28DX/DC ... V**	**C2-A29DX/DC ...V**
Polarity and free wheeling diode	**C2-A20FX/DC ... V**	**C2-A28FX/DC ... V**	**C2-A29FX/DC ... V**
AC/DC bridge rectifier 24 V, 48 V, 60 V	**C2-A20BX/UC ... V**	**C2-A28BX/UC ... V**	**C2-A29BX/UC ... V**

"..." Enter the voltage for full type designation

Accessories

Socket:	**S2-B, S2-S, S2-L, S2-P, S2-P0**
Optional accessories (blanking plug):	**SO-NP, SO-OP**
Retaining clip, plastic:	**S30-CM**

Connection diagram

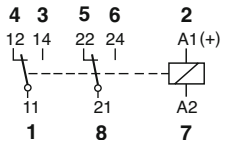


Fig. 1 AC voltage endurance

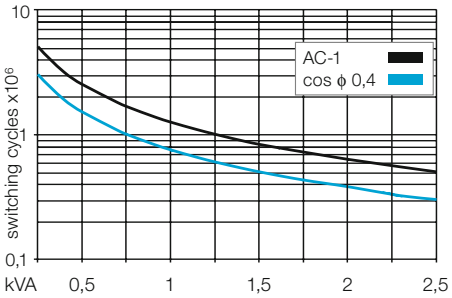
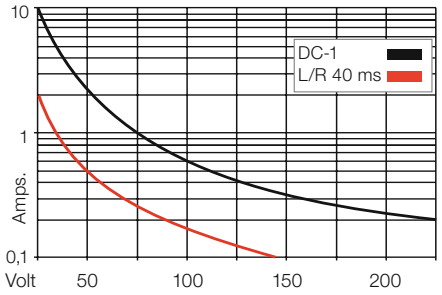
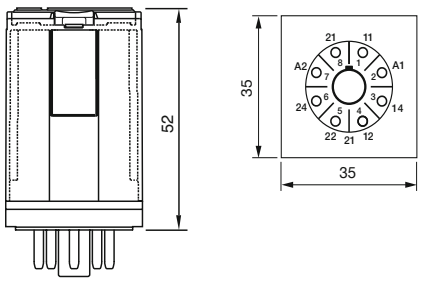


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

Lloyd´s

IEC 61810; EN 60947

C2-T2x

8-pin standard relay, 2-pole, twin contact, plug-in, IEC 61810

Type			**C2-T2x/ ... V** Standard relay for low level 2 Change-over contacts			
Maximum contact load			**6 A/250 V**	**AC-1**	**6 A/30 V**	**DC-1**
Recommended minimum contact load			**5 mA/5 V** **1 mA/5 V**	**Code 1** **Code 2**		
Contacts						
Material	Standard	Code 1	AgNi + 0,2 µ Au			
	Optional	Code 2	AgNi + 5 µ Au			
Rated current			6 A			
Switch-on current max. (20 ms)			15 A			
Switching voltage max.			250 V			
AC load (Fig 1)			1,2 kVA			
DC load			see Fig. 2			
Coil						
Coil resistance			see table; tolerance ± 10 %			
Pick-up voltage			≤ 0,8 x U_N			
Release voltage			≥ 0,1 x U_N			
Nominal power			2,2 VA (AC)/1,3 W (DC)			

Coil table

VAC	Ω	mA	VDC	Ω	mA
24	67	92	24	443	54
48	296	46	48	1K8	27
115	1K7	19	110	9K	12
230	7K1	9,5	220	36K1	6

Insulation	Volt rms, 1 min
Contact open	1000 V
Contact/contact	2,5 kV
Contact/coil	2,5 kV
Insulation resistance at 500 V	≥1 GΩ
Insulation, IEC 61810-1	2,5 kV/3
Specifications	
Ambient temperature operation/storage	-40 (no ice)….60 °C /-40 ... 80 °C
Pick-up time/bounce time	16 ms/≤ 3 ms
Release time/bounce time	8 ms/≤ 1 ms
Mechanical life ops	AC: 10 Mill./DC: 20 Mill.
DC voltage endurance at rated load	≥100000 switching cycles
Switching frequency at rated load	≤ 1200/ops/h
Protection class	IP40
Weight	79 g

Standard types		
VAC 50 Hz/60 Hz: 24, 48, 115 (120), 230 (240)	**C2-T21/AC ... V**	**C2-T22/AC ... V**
LED	**C2-T21X/AC ... V**	**C2-T22X/AC ... V**
VDC 24, 48, 110, 220	**C2-T21/DC ... V**	**C2-T22/DC ... V**
LED	**C2-T21X/DC ... V**	**C2-T22X/DC ... V**
Free wheeling diode	**C2-T21DX/DC ... V**	**C2-T22DX/DC ... V**
Polarity and free wheeling diode	**C2-T21FX/DC ... V**	**C2-T22FX/DC ... V**
AC/DC bridge rectifier 24 V, 48 V, 60 V	**C2-T21BX/UC ... V**	**C2-T22BX/UC ... V**

"..." Enter the voltage for full type designation

Accessories	
Socket:	**S2-B, S2-S, S2-L, S2-P, S2-P0**
Optional accessories (blanking plug):	**SO-NP, SO-OP**
Retaining clip, plastic:	**S30-CM**

Connection diagram

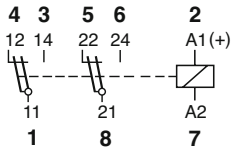


Fig. 1 AC voltage endurance

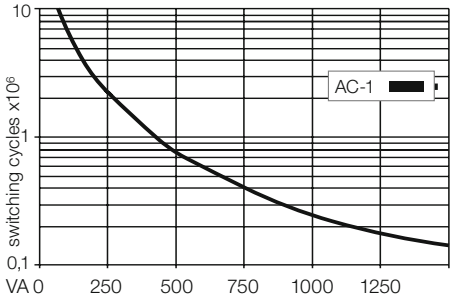
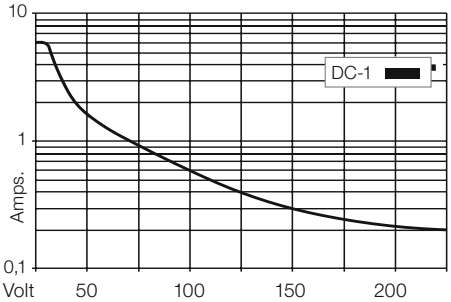
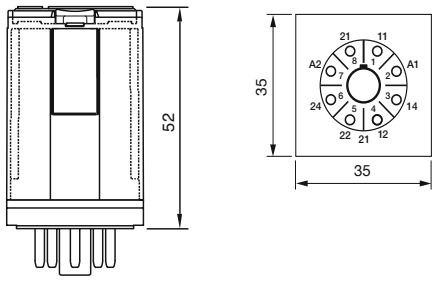


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

Lloyd´s

IEC 61810; EN 60947

MRC series

C2-G2x

8-pin standard relay, 2-pole, plug-in, IEC 61810

Type	**C2-G2x/ ... V** Standard relays, DC application 2 open contacts
Maximum contact load	**10 A/250 V AC-1 1,2 A/110 V DC-1** **10 A/30 V DC-1 0,4 A/220 V DC-1**

Contacts

Material	Standard	Code 0	AgNi
Rated current			10 A
Switch-on current max. (20 ms)			30 A
Switching voltage max.			250 V
AC load (Fig 1)			2,5 kVA
DC load			see Fig. 2

Coil

Coil resistance	see table; tolerance ± 10 %
Pick-up voltage	≤ 0,8 x U_N
Release voltage	≥ 0,1 x U_N
Nominal power	2,4 VA (AC)/1,6 W (DC)

Coil table

VAC	Ω	mA	VDC	Ω	mA
24	65	100	24	360	66
48	286	50	48	1K4	34
115	1K7	21	110	7K6	15
230	6K8	10	220	30K3	7,5

Insulation

	Volt rms, 1 min
Contact open	2000 V
Contact/contact	2,5 kV
Contact/coil	2,5 kV
Insulation resistance at 500 V	≥1 GΩ
Insulation, EN 61810-1	2,5 kV/3

Specifications

Ambient temperature operation/storage	-40 (no ice)….60 °C /-40 ... 80 °C
Pick-up time/bounce time	20 ms/≤ 3 ms
Release time/bounce time	8 ms/≤ 1 ms
Mechanical life ops	AC: 10 Mill./DC: 20 Mill.
DC voltage endurance at rated load	≥100000 switching cycles
Switching frequency at rated load	≤ 1200/ops/h
Protection class	IP40
Weight	79 g

Standard types

VAC 50 Hz/60 Hz: 24, 48, 115 (120), 230 (240)	**C2-G20/AC ... V**
LED	**C2-G20X/AC ... V**
VDC 24, 48, 110, 220	**C2-G20/DC ... V**
LED	**C2-G20X/DC ... V**
Free wheeling diode	**C2-G20DX/DC ... V**
Polarity and free wheeling diode	**C2-G20FX/DC ... V**
AC/DC bridge rectifier 24 V, 48 V, 60 V	**C2-G20BX/UC ... V**

"..." Enter the voltage for full type designation

Accessories

Socket:	**S2-B, S2-S, S2-L, S2-P, S2-P0**
Optional accessories (blanking plug):	**SO-NP, SO-OP**
Retaining clip, plastic:	**S30-CM**

Connection diagram

Gap: 1,7 mm

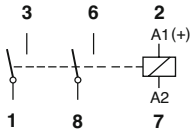


Fig. 1 AC voltage endurance

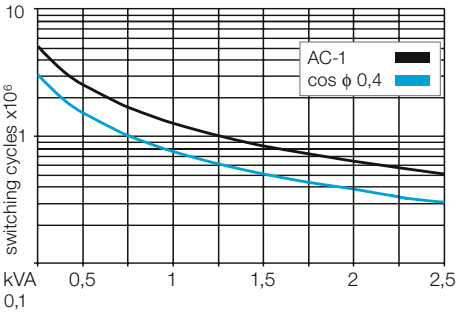
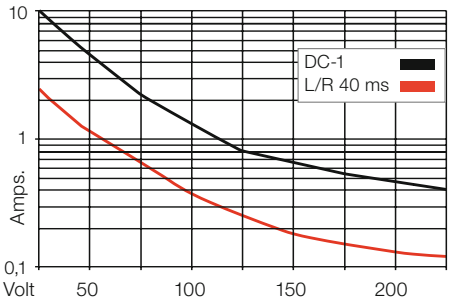
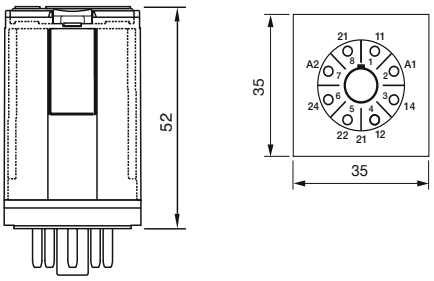


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

Lloyd´s

IEC 61810; EN 60947

C3-A3x

11-pin standard relays, 3-pole, plug-in, IEC 61810

Type	**C3-A3x/ ... V** Standard relays, 3 change-over contacts
Maximum contact load	**10 A/250 AC-1 0,5 A/110 V DC-1** **10 A/30 DC-1 0,2 A/220 V DC-1**
Recommended minimum contact load	**10 mA/10 V Code 0, 9** **5 mA/5 V Code 8**

Contacts

Material	Standard	Code 0	AgNi
	Optional	Code 8	AgNi + 5 µ Au
	Optional	Code 9	AgNi + 0,2 µ Au
Rated current			10 A
Switch-on current max. (20 ms)			30 A
Switching voltage max.			250 V
AC load (Fig 1)			2,5 kVA
DC load			see Fig. 2

Coil

Coil resistance	see table; tolerance ± 10 %
Pick-up voltage	≤ 0,8 x U_N
Release voltage	≥ 0,1 x U_N
Nominal power	2,2 VA (AC)/1,3 W (DC)

Coil table

VAC	Ω	mA	VDC	Ω	mA
24	67	92	24	480	50
48	296	46	48	1K8	26
115	1K7	19	110	9K	12
230	7K1	9,5	220	36K1	6

Insulation

	Volt rms, 1 min
Contact open	1000 V
Contact/contact	2,5 kV
Contact/coil	2,5 kV
Insulation resistance at 500 V	≥1 GΩ
Insulation, IEC 61810-1	2,5 kV/3

Specifications

Ambient temperature operation/storage	-40 (no ice)….60 °C /-40 ... 80 °C
Pick-up time/bounce time	16 ms/≤ 3 ms
Release time/bounce time	8 ms/≤ 1 ms
Mechanical life ops	AC: 10 Mill./DC: 20 Mill.
DC voltage endurance at rated load	≥ 100000 switching cycles
Switching frequency at rated load	≤ 1200/ops/h
Protection class	IP40
Weight	81 g

Standard types

VAC 50 Hz/60 Hz: 24, 48, 115 (120), 230 (240)	**C3-A30/AC ... V**	**C3-A38/AC ... V**	**C3-A39/AC ... V**
LED	**C3-A30X/AC ... V**	**C3-A38X/AC ... V**	**C3-A39X/AC ... V**
VDC 24, 48, 110, 220	**C3-A30/DC ... V**	**C3-A38/DC ... V**	**C3-A39/DC ... V**
LED	**C3-A30X/DC ... V**	**C3-A38X/DC ... V**	**C3-A39X/DC ... V**
Free wheeling diode	**C3-A30DX/DC ... V**	**C3-A38DX/DC ... V**	**C3-A39DX/DC ... V**
Polarity and free wheeling diode	**C3-A30FX/DC ... V**	**C3-A38FX/DC ... V**	**C3-A39FX/DC ... V**
AC/DC bridge rectifier 24 V, 48 V, 60 V	**C3-A30BX/UC ... V**	**C3-A38BX/UC ... V**	**C3-A39BX/UC ... V**

"..." Enter the voltage for full type designation

Accessories

Socket:	**S3-B, S3-S, S3-L, S3-P, S3-P0**
Optional accessories (blanking plug):	**SO-NP, SO-OP**
Retaining clip, plastic:	**S30-CM**

Connection diagram

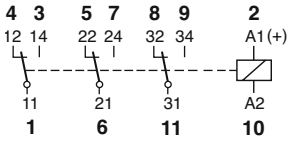


Fig. 1 AC voltage endurance

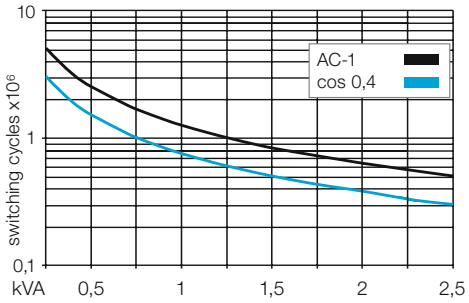
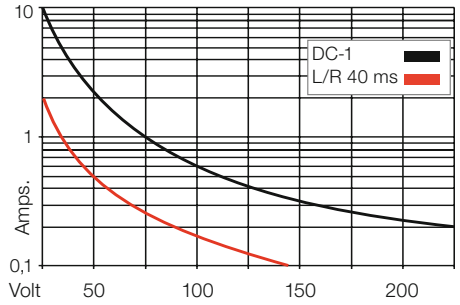
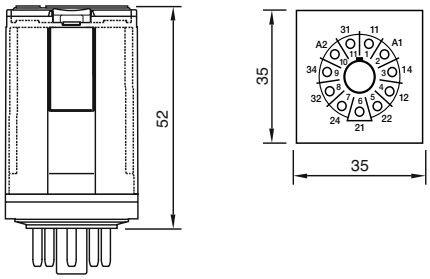


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

Lloyd´s

IEC 61810; EN 60947

C3-T3x

11-pin standard relay, 3-pole, twin contact, plug-in, IEC 61810

Type			**C3-T3x/ ... V** Standard relays for low level 3 change-over twin contacts		
Maximum contact load			**6 A/250 V**	**AC-1**	**6 A/30 V** **DC-1**
Recommended minimum contact load			**5 mA/5 V** **1 mA/5 V**	**Code 1** **Code 2**	
Contacts					
Material	Standard	Code 1	AgNi + 0,2 µ Au		
	Optional	Code 2	AgNi + 5 µ Au		
Rated current			6 A		
Switch-on current max. (20 ms)			15 A		
Switching voltage max.			250 V		
AC load (Fig 1)			1,2 kVA		
DC load			see Fig. 2		
Coil					
Coil resistance			see table; tolerance ± 10 %		
Pick-up voltage			≤ 0,8 x U_N		
Release voltage			≥ 0,1 x U_N		
Nominal power			2,2 VA (AC)/1,3 W (DC)		

Coil table

VAC	Ω	mA	VDC	Ω	mA
24	67	92	24	480	50
48	296	46	48	1K8	26
115	1K7	19	110	9K	12
230	7K1	9,5	220	36K1	6

Insulation	Volt rms, 1 min
Contact open	1000 V
Contact/contact	2,5 kV
Contact/coil	2,5 kV
Insulation resistance at 500 V	≥1 GΩ
Insulation, EN 61810-1	2,5 kV/3
Specifications	
Ambient temperature operation/storage	-40 … 70 °C /-40 … 80 °C
Pick-up time/bounce time	8 ms/≤ 3 ms
Release time/bounce time	18 ms/≤ 1 ms
Mechanical life ops	AC: 10 Mill./DC: 20 Mill.
DC voltage endurance at rated load	≥100000 switching cycles
Switching frequency at rated load	≤ 1200/ops/h
Protection class	IP40
Weight	81 g

Standard types

VAC 50 Hz/60 Hz: 24, 48, 115 (120), 230 (240)	**C3-T31/AC ... V**	**C3-T32/AC ... V**
LED	**C3-T31X/AC ... V**	**C3-T32X/AC ... V**
VDC 24, 48, 110, 220	**C3-T31/DC ... V**	**C3-T32/DC ... V**
LED	**C3-T31X/DC ... V**	**C3-T32X/DC ... V**
Free wheeling diode	**C3-T31DX/DC ... V**	**C3-T32DX/DC ... V**
Polarity and free wheeling diode	**C3-T31FX/DC ... V**	**C3-T32FX/DC ... V**
AC/DC bridge rectifier 24 V, 48 V, 60 V	**C3-T31BX/UC ... V**	**C3-T32BX/UC ... V**

"..." Enter the voltage for full type designation

Accessories

Socket:	**S3-B, S3-S, S3-L, S3-P, S3-P0**
Optional accessories (blanking plug):	**SO-NP, SO-OP**
Retaining clip, plastic:	**S30-CM**

Connection diagram

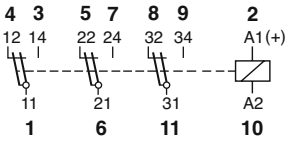


Fig. 1 AC voltage endurance

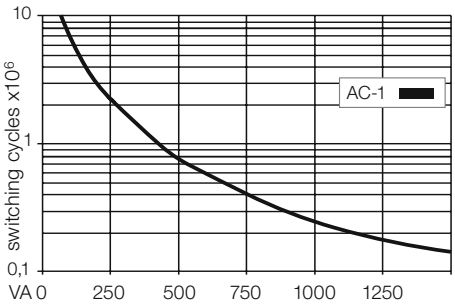
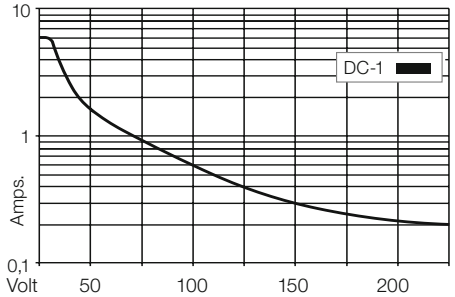
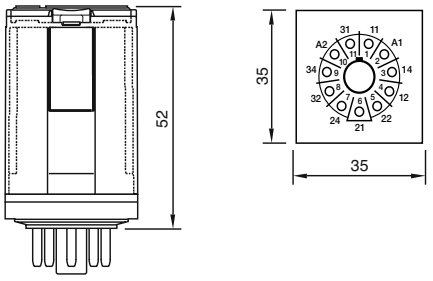


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

Lloyd´s

IEC 61810; EN 60947

C3-G3x

11-pin standard relay, 3-pole, open contact, IEC 61810

Type	**C3-G3x/ ... V** Standard relays, DC application 3 open contacts
Maximum contact load	**10 A 250 V AC-1 1,2 A/110 V DC-1** **10 A 30 V DC-1 0,4 A/220 V DC-1**

Contacts

Material	Standard	Code 0	AgNi
Rated current			10 A
Switch-on current max. (20 ms)			30 A
Switching voltage max.			250 V
AC load (Fig 1)			2,5 kVA
DC load			see Fig. 2

Coil

Coil resistance	see table; tolerance ± 10 %
Pick-up voltage	≤ 0,8 x U_N
Release voltage	≥ 0,1 x U_N
Nominal power	2,4 VA (AC)/1,6 W (DC)

Coil table

VAC	Ω	mA	VDC	Ω	mA
24	65	100	24	360	66
48	286	50	48	1K4	34
115	1K7	21	110	7K6	15
230	6K8	10	220	30K3	7,5

Insulation

	Volt rms, 1 min
Contact open	2000 V
Contact/contact	2,5 kV
Contact/coil	2,5 kV
Insulation resistance at 500 V	≥1 GΩ
Insulation, IEC 61810-1	2,5 kV/3

Specifications

Ambient temperature operation/storage	-40 (no ice)….60 °C /-40 ... 80 °C
Pick-up time/bounce time	20 ms/≤ 3 ms
Release time/bounce time	8 ms/≤ 1 ms
Mechanical life ops	AC: 10 Mill./DC: 20 Mill.
DC voltage endurance at rated load	≥100000 switching cycles
Switching frequency at rated load	≤ 1200/ops/ h
Protection class	IP40
Weight	81 g

Standard types

VAC 50 Hz/60 Hz: 24, 48, 115 (120), 230 (240)	**C3-G30/AC ... V**
LED	**C3-G30X/AC ... V**
VDC 24, 48, 110, 220	**C3-G30/DC ... V**
LED	**C3-G30X/DC ... V**
Free wheeling diode	**C3-G30DX/DC... V**
Polarity and free wheeling diode	**C3-G30FX/DC ... V**
AC/DC bridge rectifier 24 V, 48 V, 60 V	**C3-G30BX/UC ... V**

"..." Enter the voltage for full type designation

Accessories

Socket:	**S3-B, S3-S, S3-L, S3-P, S3-P0**
Optional accessories (blanking plug):	**SO-NP, SO-OP**
Retaining clip, plastic:	**S30-CM**

Connection diagram

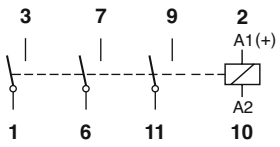


Fig. 1 AC voltage endurance

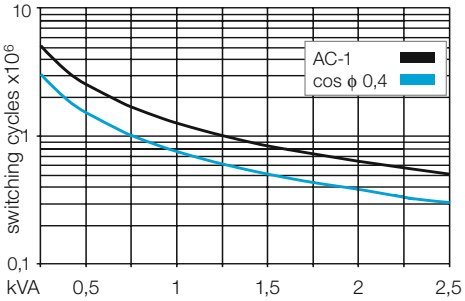
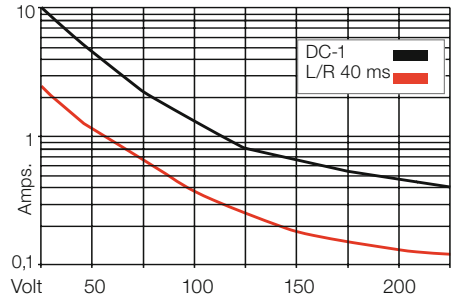
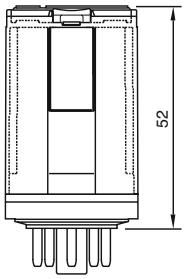
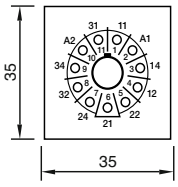


Fig. 2 DC load limit curve



Dimensions [mm]





Technical approvals, conformities

Lloyd´s

IEC 61810; EN 60947

MRC series

C3-M1x

11-pin power relay, 1-pole, magnetic blow out, IEC 61810

Type	**C3-M1x/ ... V** Power relays, DC, application 1 pole, magnetic blow out
Maximum contact load	**10 A 250 V AC-1 10 A 220 V DC-1**

Contacts

Material	Standard	Code 0	AgNi
Rated current			10 A
Switch-on current max. (20 ms)			30 A
Switching voltage max.			250 V
AC load (Fig 1)			2,5 kVA
DC load			see Fig. 2

Coil

Coil resistance	see table; tolerance ± 10 %
Pick-up voltage	≤ 0,8 x U_N
Release voltage	≥ 0,1 x U_N
Nominal power	2,4 VA (AC) / 1,3 W (DC)

Coil table

VAC	Ω	mA	VDC	Ω	mA
24	65	100	24	480	50
48	286	50	48	1K8	26
115	1K7	21	110	9K	12
230	6K8	10	220	29K	7,5

Insulation

	Volt rms, 1 min
Contact open	2500 V
Contact/contact	2,5 kV
Contact/coil	2,5 kV
Insulation resistance at 500 V	≥1 GΩ
Insulation, IEC 61810-1:	2,5 KV / 3

Specifications

Ambient temperature operation/storage	-40 … 70 °C (55° C AC) /-40 ... 80 °C
Nominal coil power	2,4 VA (AC), 1,3 W (DC)
Pick-up time/bounce time	20 ms/≤ 3 ms
Release time/bounce time	10 ms/≤ 1 ms
Isolation: EN 60947, pollution rate 3, Gr C	250 V
Dielectric strength, Contact/Coil	2,5 KV

Standard types

VAC 50 Hz/60 Hz: 24, 48, 115 (120), 230 (240)	**C3-M10/AC ... V**
LED	**C3-M10X/AC ... V**
VDC 24, 48, 110, 220	**C3-M10/DC ... V**
LED	**C3-M10X/DC ... V**
Free wheeling diode	**C3-M10DX/DC ... V**
Polarity and free wheeling diode	**C3-M10FX/DC ... V**
AC/DC bridge rectifier 24 V, 48 V, 60 V	**C3-M10BX/UC ... V**

"..." Enter the voltage for full type designation

Accessories

Socket:	**S3-B, S3-S, S3-L, S3-P, S3-P0**
Optional accessories (blanking plug):	**SO-NP, SO-OP**
Retaining clip, plastic:	**S30-CM**

Connection diagram

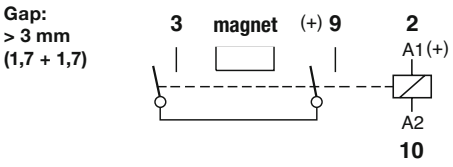


Fig. 1 AC voltage endurance

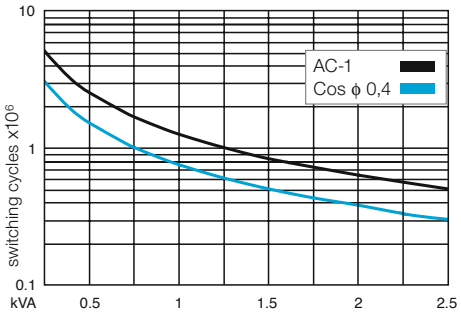
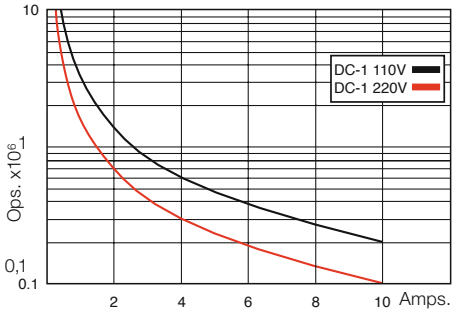
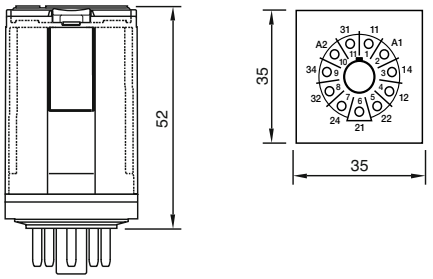


Fig. 2 DC voltage endurance



Dimensions [mm]



Technical approvals, conformities

Lloyd´s

IEC 61810; EN 60947

C3-X1x

11-pin power relay, 1-pole, double make, IEC 61810

Type			**C3-X1x/ ... V** Power relays for DC application 1 pole, NO, double make
Maximum contact load			**10 A/250 V AC-1 7 A/110 V DC-1** **10 A/30 V DC-1 1,2 A/220 V DC-1**
Contacts			
Material	Standard	Code 0	AgNi
Rated current			10 A
Switch-on current max. (20 ms)			30 A
Switching voltage max.			250 V
AC load (Fig 1)			2,5 kVA
DC load			see Fig. 2

Coil

Coil resistance	see table; tolerance ± 10 %
Pick-up voltage	≤ 0,8 x U_N
Release voltage	≥ 0,1 x U_N
Nominal power	2,4 VA (AC)/1,3 W (DC)

Coil table

VAC	Ω	mA	VDC	Ω	mA
24	65	100	24	480	54
48	286	50	48	1K8	26
115	1K7	21	110	9K	12
230	6K8	10	220	29K	7,5

Insulation	Volt rms, 1 min
Contact open	2500 V
Contact/contact	2,5 kV
Contact/coil	2,5 kV
Insulation resistance at 500 V	≥1 GΩ
Insulation, IEC 61810-1	2,5 kV/3

Specifications	
Ambient temperature operation/storage	-40 (no ice)….60 °C /-40 ... 80 °C
Pick-up time/bounce time	18 ms/≤ 3 ms
Release time/bounce time	8 ms/≤ 1 ms
Mechanical life ops	AC: 10 Mill./DC: 20 Mill.
DC voltage endurance at rated load	≥100000 switching cycles
Switching frequency at rated load	≤ 1200/ops/h
Protection class	IP40
Weight	83 g

Standard types

VAC 50 Hz/60 Hz: 24, 48, 115 (120), 230 (240)	**C3-X10/AC ... V**
LED	**C3-X10X/AC ... V**
VDC 24, 48, 110, 220	**C3-X10/DC ... V**
LED	**C3-X10X/DC ... V**
Free wheeling diode	**C3-X10DX/DC ... V**
Polarity and free wheeling diode	**C3-X10FX/DC ... V**
AC/DC bridge rectifier 24 V, 48 V, 60 V	**C3-X10BX/UC ... V**

"..." Enter the voltage for full type designation

Accessories

Socket:	**S3-B, S3-S, S3-L, S3-P, S3-P0**
Optional accessories (blanking plug):	**SO-NP, SO-OP**
Retaining clip, plastic:	**S30-CM**

Connection diagram

Gap:
> 3 mm
(1,7 + 1,7)

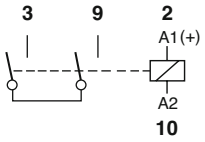


Fig. 1 AC voltage endurance

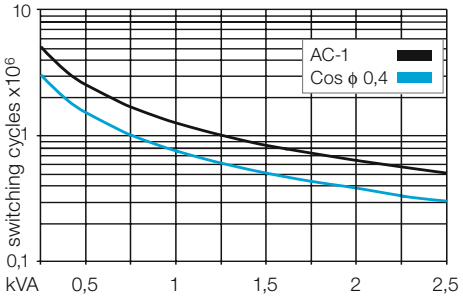
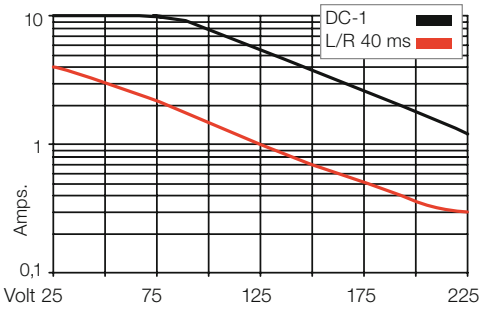
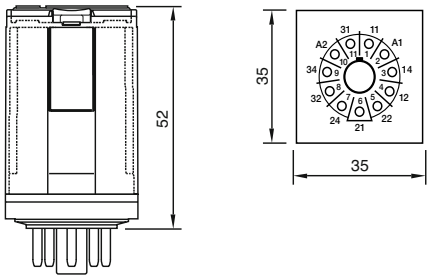


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

Lloyd´s

IEC 61810; EN 60947

MRC series

C3-R2x

11-pin remanence relays, 2-pole, IEC 61810

Type	**C3-R2x/ ... V** Remanence plug-in relays, 2 change-over contacts
Maximum contact load	**10 A/250 V AC-1 0,5 A/110 V DC-1** **10 A/30 V DC-1 0,2 A/220 V DC-1**
Recommended minimum contact load	**10 mA/10 V Code 0, 9** **5 mA/5 V Code 8**

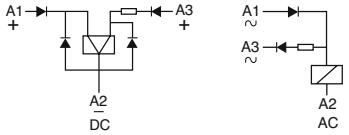
Contacts

Material	Standard	Code 0	AgNi
	Optional	Code 8	AgNi + 5 µ Au
	Optional	Code 9	AgNi + 0,2 µ Au
Rated current			10 A
Switch-on current max. (20 ms)			30 A
Switching voltage max.			250 V
AC load (Fig 1)			2,5 kVA
DC load			see Fig. 2

Coil

Coil resistance	see table; tolerance ± 10 %
ON pulse power	1,5 VA/W
OFF pulse power	0,5 VA/W
Pull-in ON/OFF	≤ 0,8 x U_N

Internal Diagram:



Coil table

VAC	mA ON	mA OFF	VDC	mA ON	mA OFF
24	75	12	12	125	41
48	38	6	24	63	21
115	16	2,5	48	31	10
230	8	1,3	110	14	4,5

Insulation

Insulation	Volt rms, 1 min
Contact open	1000 V
Contact/contact	2,5 kV
Contact/coil	2,5 kV
Insulation resistance at 500 V	≥1 GΩ
Insulation, IEC 61810-1	2,5 kV/3

Specifications

Ambient temperature operation/storage	-40 (no ice)….60 °C /-40 ... 80 °C
Minimum pulse length for ON/OFF	50 ms
Mechanical life ops	10 Mill.
DC voltage endurance at rated load	≥100000 switching cycles
Switching frequency at rated load	≤ 1200/ops/h
Protection class	IP40
Weight	81 g

Standard types

VAC 50 Hz/60 Hz: 24, 48, 115, 230	**C3-R20/AC ... V**	**C3-R28/AC ... V**	**C3-R29/AC ... V**
VDC 12, 24, 48, 110	**C3-R20/DC ... V**	**C3-R28/DC ... V**	**C3-R29/DC ... V**

"..." Enter the voltage for full type designation

Accessories

Socket:	**S3-B, S3-S, S3-L, S3-P, S3-P0**
Retaining clip, plastic:	**S30-CM**

Connection diagram

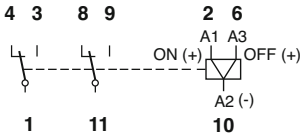


Fig. 1 AC voltage endurance

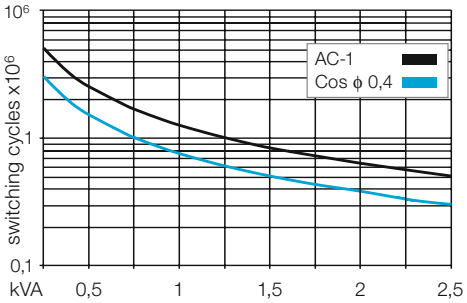
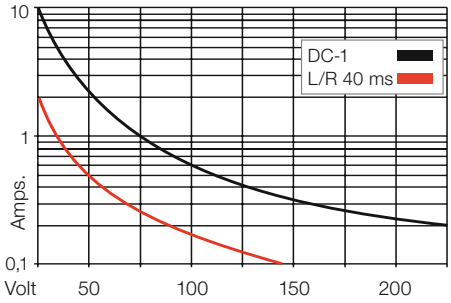
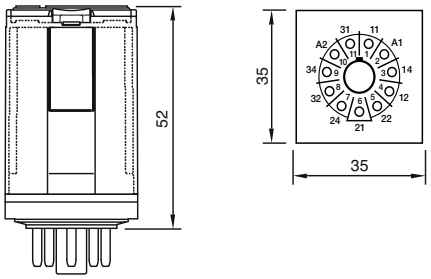


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

Lloyd´s

IEC 61810; EN 60947

C4-A4x

14-pin, standard relay, 4-pole, plug-in, faston

Type			**C4-A4x/ ... V** Standard relays, 4 change-over contacts
Maximum contact load			**10 A/250 V AC-1 0,5 A/110 V DC-1** **10 A/30 V DC-1 0,2 A/220 V DC-1**
Recommended minimum contact load			**10 mA/10 V Code 0, 9** **5 mA/5 V Code 8**
Contacts			
Material	Standard	Code 0	AgNi
	Optional	Code 8	AgNi + 5 µ Au
	Optional	Code 9	AgNi + 0,2 µ Au
Rated current			10 A
Switch-on current max. (20 ms)			30 A
Switching voltage max.			250 V
AC load (Fig 1)			2,5 kVA
DC load			see Fig. 2

Coil

Coil resistance	see table; tolerance ± 10 %
Pick-up voltage	≤ 0,8 x U_N
Release voltage	≥ 0,1 x U_N
Nominal power	2,4 VA (AC)/1,4 W (DC)

Coil table

VAC	Ω	mA	VDC	Ω	mA
24	65	100	24	414	58
48	286	50	48	1K6	30
115	1K7	21	110	8K1	13
230	6K8	10	220	35K7	6,2

Insulation	Volt rms, 1 min
Contact open	1000 V
Contact/contact	2,5 kV
Contact/coil	2,5 kV
Insulation resistance at 500 V	≥1 GΩ
Insulation, IEC 61810-1	2,5 kV/3
Specifications	
Ambient temperature operation/storage	-40 (no ice)….60 °C /-40 ... 80 °C
Pick-up time/bounce time	20 ms/≤ 3 ms
Release time/bounce time	8 ms/≤ 1 ms
Mechanical life ops	AC: 10 Mill./DC: 20 Mill.
DC voltage endurance at rated load	≥100000 switching cycles
Switching frequency at rated load	≤ 1200/ops/h
Protection class	IP40
Weight	90 g

Standard types		
VAC 50 Hz/60 Hz: 24, 48, 115, (120), 230, (240)	**C4-A40/AC ... V**	**C4-A48/AC ... V**
LED	**C4-A40X/AC ... V**	**C4-A48X/AC ... V**
RC suppressor	**C4-A40R/AC ... V**	**C4-A48R/AC ... V**
VDC 24, 48, 110, 220	**C4-A40/DC ... V**	**C4-A48/DC ... V**
LED	**C4-A40X/DC ... V**	**C4-A48X/DC ... V**
Free wheeling diode	**C4-A40DX/DC ... V**	**C4-A48DX/DC ... V**
Polarity and free wheeling diode	**C4-A40FX/DC ... V**	**C4-A48FX/DC ... V**
AC/DC bridge rectifier 24 V, 48 V, 60 V	**C4-A40BX/UC ... V**	**C4-A48BX/UC ... V**

"..." Enter the voltage for full type designation

Accessories	
Socket:	**S4-J, S4-L, S4-P, S4-P0**
Optional accessories (blanking plug):	**SO-NP, SO-OP**

Connection diagram

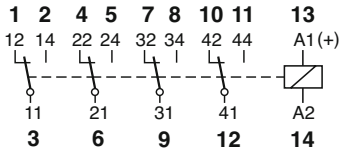


Fig. 1 AC voltage endurance

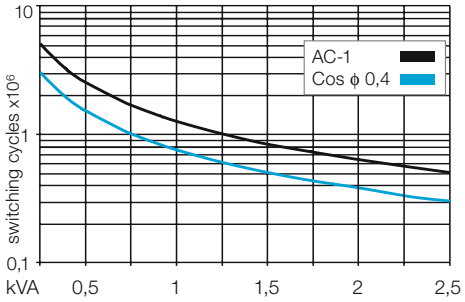
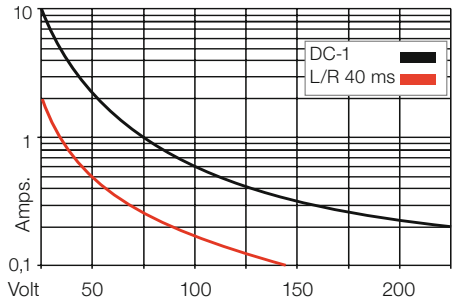
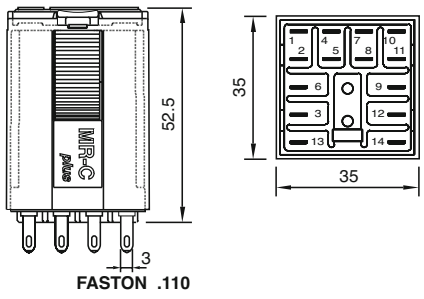


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

Lloyd's

IEC 61810; EN 60947

MRC series

C4-X2x

14-pin, power relay, double-make, faston

Type	**C4-X2x/ ... V** Power relays, DC application 2-pole, NO, double make
Maximum contact load	**10 A/250 V AC-1 7 A/110 V DC-1** **10 A/30 V DC-1 1,2 A/220 V DC-1**

Contacts

Material	Standard	Code 0	AgNi
Rated current			10 A
Switch-on current max. (20 ms)			30 A
Switching voltage max			250 V
AC load (Fig 1)			2,5 kVA
DC load			see Fig. 2

Coil

Coil resistance	see table; tolerance ± 10 %
Pick-up voltage	≤ 0,8 x U_N
Release voltage	≥ 0,1 x U_N
Nominal power	2,4 VA (AC)/1,3 W (DC)

Coil table

VAC	Ω	mA	VDC	Ω	mA
24	65	100	24	443	54
48	286	50	48	1K8	27
115	1K7	21	110	9K2	12
230	6k8	10	220	36K1	6

Insulation

	Volt rms, 1 min
Contact open	2500 V
Contact/contact	2,5 kV
Contact/coil	2,5 kV
Insulation resistance at 500 V	≥1 GΩ
Insulation, IEC 61810-1	2,5 kV/3

Specifications

Ambient temperature operation/storage	-40 (no ice)….60 °C /-40 ... 80 °C
Pick-up time/bounce time	20 ms/≤ 3 ms
Release time/bounce time	8 ms/≤ 1 ms
Mechanical life ops	AC: 10 Mill./DC: 20 Mill.
DC voltage endurance at rated load	≥100000 switching cycles
Switching frequency at rated load	≤ 1200/ops/h
Protection class	IP40
Weight	90 g

Standard types

VAC 50 Hz/60 Hz: 24, 48, 115, (120), 230, (240)	**C4-X20/AC ... V**
LED	**C4-X20X/AC ... V**
RC suppressor	**C4-X20R/AC ... V**
VDC 24, 48, 110, 220	**C4-X20/DC ... V**
LED	**C4-X20X/DC ... V**
Free wheeling diode	**C4-X20DX/DC ... V**
Polarity and free wheeling diode	**C4-X20FX/DC ... V**
AC/DC bridge rectifier 24 V, 48 V, 60 V	**C4-X20BX/UC ... V**

"..." Enter the voltage for full type designation

Accessories

Socket:	**S4-S, S4-L, S4-P, S4-P0**
Optional accessories (blanking plug):	**SO-NP, SO-OP**

Connection diagram

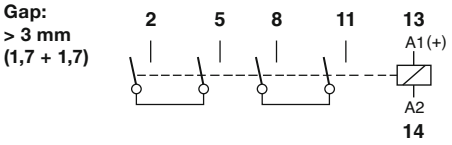


Fig. 1 AC voltage endurance

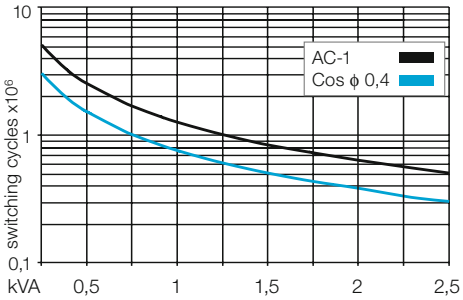
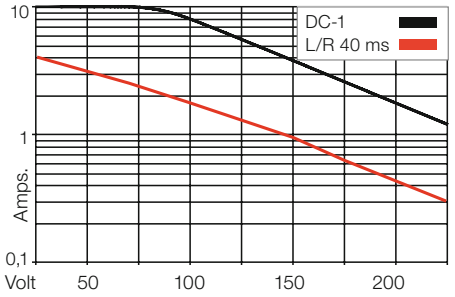
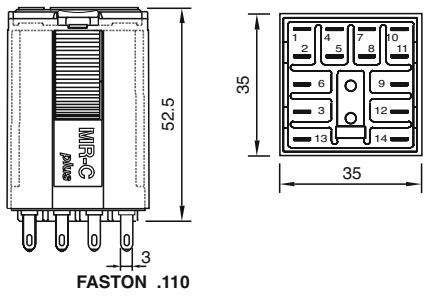


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

IEC 61810; EN 60947

C4-R3x

14-pin, remanence relay, 3-pole, faston

Type	**C4-R3x/ ... V** Magnetic remanence relay 3 change-over contact
Maximum contact load	**10 A/250 V AC-1 0,5 A/110 V DC-1** **10 A/10 V DC-1 0,2 A/220 V DC-1**
Recommended minimum contact load	**10 mA/10 V Code 0, 9** **5 mA/5 V Code 8**

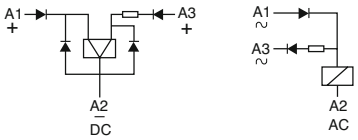
Contacts

Material	Standard	Code 0	AgNi
	Optional	Code 8	AgNi + 5 µ Au
	Optional	Code 9	AgNi + 0,2 µ Au
Rated current			10 A
Switch-on current max. (20 ms)			30 A
Switching voltage max.			250 V
AC load			2,5 kVA
DC load			see Fig. 2

Coil

Coil resistance	see table; tolerance ± 10 %
ON pulse power	1,5 VA/W
OFF pulse power	0,5 VA/W
	1 Winding for AC, 2 Windings for DC
Pull-in ON/OFF	≤ 0,8 x U_N

Internal Diagram:



Coil table

VAC	mA ON	mA OFF	VDC	mA ON	mA OFF
24	75	12	12	125	41
48	38	6	24	63	21
115	16	2,5	48	31	10
230	8	1,3	110	14	4,5

Insulation

	Volt rms, 1 min
Contact open	1000 V
Contact/contact	2,5 kV
Contact/coil	2,5 kV
Insulation resistance at 500 V	≥1 GΩ
Insulation, IEC 61810-1	2,5 kV/3

Specifications

Ambient temperature operation/storage	-40 (no ice)….60 °C /-40 ... 80 °C
Minimum pulse length for ON/OFF	50 ms
Mechanical life ops	AC: 10 Mill./DC: 20 Mill. switching cycles
DC voltage endurance at rated load	≥100000 switching cycles
Switching frequency at rated load	≤ 1200/h
Protection class	IP40
Weight	95 g

Standard types

VAC 50 Hz/60 Hz: 24, 48, 115, 230

VDC 12, 24, 48, 110

C4-R30/AC ... V	**C4-R38/AC ... V**	**C4-R39/AC ... V**
C4-R30/DC ... V	**C4-R38/DC ... V**	**C4-R39/DC ... V**

"..." Enter the voltage for full type designation

Accessories

Socket:	**S4-J, S4-L, S4-P, S4-P0**
Optional accessories (blanking plug):	**SO-NP, SO-OP**

Connection diagram

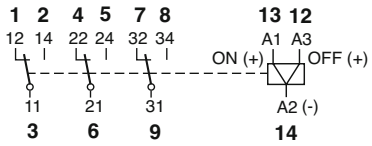


Fig. 1 AC voltage endurance

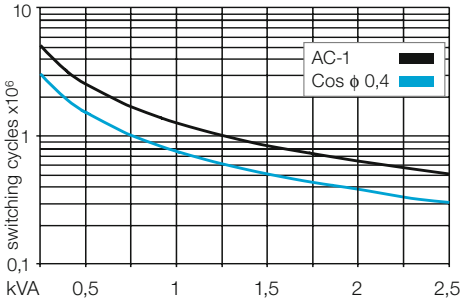
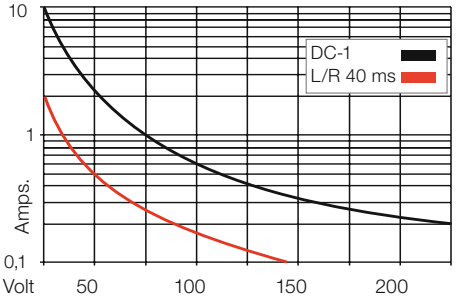
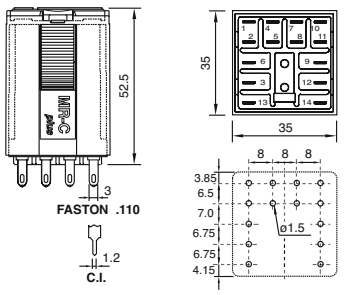


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

IEC 61810; EN 60947

C5-A2x

8-pin, power relay, 2-pole, plug-in, faston

Type	**C5-A2x/ ... V** Power relays, 2 change-over contacts
Maximum contact load	**16 A/400 V AC-1 0,5 A/110 V DC-1** **16 A/30 V DC-1 0,2 A/220 V DC-1**

Contacts

Material	Standard	Code 0	AgNi
Rated current			16 A
Switch-on current max. (20 ms)			40 A
Switching voltage max.			400 V
AC load (Fig 1)			4 kVA
DC load			see Fig. 2

Coil

Coil resistance	see table; tolerance ± 10 %
Pick-up voltage	≤ 0,8 x U_N
Release voltage	≥ 0,1 x U_N
Nominal power	2,4 VA (AC)/1,4 W (DC)

Coil table

VAC	Ω	mA	VDC	Ω	mA
24	65	100	24	414	58
48	286	50	48	1K6	30
115	1K7	21	110	8K1	13
230	6K8	10	220	35K6	6
400	18K8	6			

Insulation

	Volt rms, 1 min
Contact open	1000 V
Contact/contact	4 kV
Contact/coil	4 kV
Insulation resistance at 500 V	≥3 GΩ
Insulation, IEC 61810-1	4 kV/3

Specifications

Ambient temperature operation/storage	-40 (no ice)….60 °C /-40 ... 80 °C
Pick-up time/bounce time	20 ms/≤ 3 ms
Release time/bounce time	10 ms/≤ 1 ms
Mechanical life ops	AC: 10 Mill./DC: 20 Mill.
DC voltage endurance at rated load	≥100000 switching cycles
Switching frequency at rated load	≤ 1200/ops/h
Protection class	IP40
Weight	90 g

Standard types

VAC 50 Hz/60 Hz: 24, 48, 115 (120), 230 (240)	**C5-A20/AC ... V**
LED	**C5-A20X/AC ... V**
RC suppressor (max 250 V)	**C5-A20R/AC ... V**
VDC 24, 48, 110, 220	**C5-A20/DC ... V**
LED	**C5-A20X/DC ... V**
Free wheeling diode	**C5-A20DX/DC ... V**
Polarity and free wheeling diode	**C5-A20FX/DC ... V**
AC/DC bridge rectifier 24 V, 48 V, 60 V	**C5-A20BX/UC ... V**

"..." Enter the voltage for full type designation

Accessories

Socket:	**S5-S, S5-L, S5-P, S5-P0, S5-M**
Optional accessories (blanking plug):	**SO-NP, SO-OP**

Connection diagram

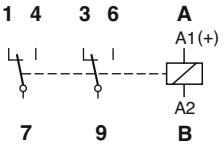


Fig. 1 AC voltage endurance

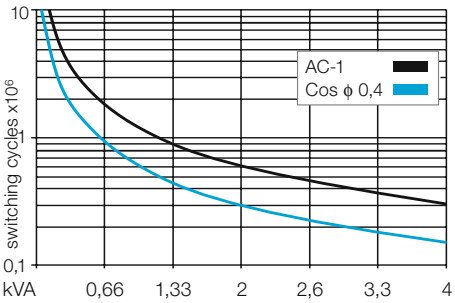
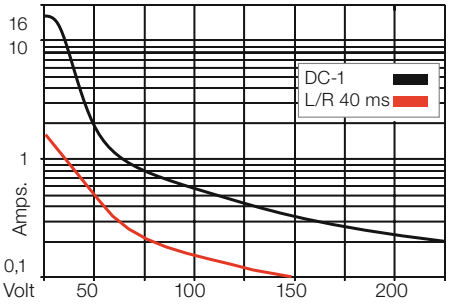
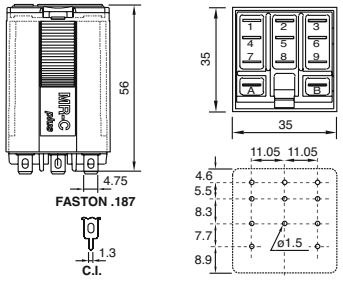


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

IEC 61810; EN 60947

C5-A3x

11-pin, power relay, 3-pole, plug-in, faston

Type	**C5-A3x/ ... V** Power relays, 3 change-over contacts
Maximum contact load	**16 A/400 V AC-1 0,5 A/110 V DC-1** **16 A/30 V DC-1 0,2 A/220 V DC-1**

Contacts

Material	Standard	Code 0	AgNi
Rated current			16 A
Switch-on current max. (20 ms)			40 A
Switching voltage max.			400 V
AC load (Fig 1)			4 kVA
DC load			see Fig. 2

Coil

Coil resistance	see table; tolerance ± 10 %
Pick-up voltage	≤ 0,8 x U_N
Release voltage	≥ 0,1 x U_N
Nominal power	2,4 VA (AC)/1,4 W (DC)

Coil table

VAC	Ω	mA	VDC	Ω	mA
24	65	100	24	414	58
48	286	50	48	1K6	30
115	1K7	21	110	8K1	13
230	6K8	10	220	35K6	6,2
400	18K8	6			

Insulation

	Volt rms, 1 min
Contact open	1000 V
Contact/contact	4 kV
Contact/coil	4 kV
Insulation resistance at 500 V	≥3 GΩ
Insulation, IEC 61810-1	4 kV/3

Specifications

Ambient temperature operation/storage	-40 (no ice)….60 °C /-40 ... 80 °C
Pick-up time/bounce time	20 ms/≤ 3 ms
Release time/bounce time	10 ms/≤ 1 ms
Mechanical life ops	AC: 10 Mill./DC: 20 Mill.
DC voltage endurance at rated load	≥100000 switching cycles
Switching frequency at rated load	≤ 1200/h
Protection class	IP40
Weight	95 g

Standard types

VAC 50 Hz/60 Hz: 24, 48, 115, (120), 230, (240)	**C5-A30/AC ... V**
LED	**C5-A30X/AC ... V**
RC suppressor (max 250 V)	**C5-A30R/AC ... V**
VDC 24, 48, 110, 220	**C5-A30/DC ... V**
LED	**C5-A30X/DC ... V**
Free wheeling diode	**C5-A30DX/DC ... V**
Polarity and free wheeling diode	**C5-A30FX/DC ... V**
AC/DC bridge rectifier 24 V, 48 V, 60 V	**C5-A30BX/UC ... V**

"..." Enter the voltage for full type designation

Accessories

Socket:	**S5-S, S5-L, S5-P, S5-P0, S5-M**
Optional accessories (blanking plug):	**SO-NP, SO-OP**

Connection diagram

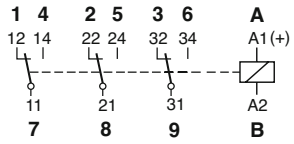


Fig. 1 AC voltage endurance

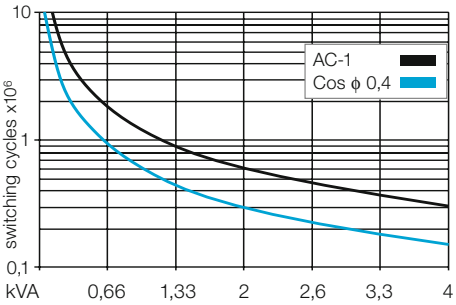
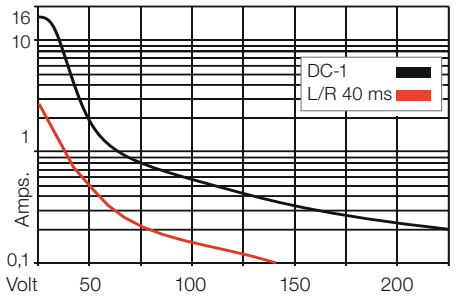
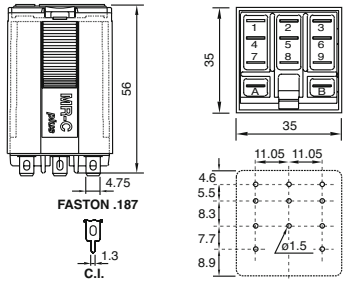


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

EN 60947; IEC 61810

MRC series

C5-G3x

8-pin, power relay, 3-pole, open contact plug-in, faston

Type	**C5-G3x/ ... V** Power relays, DC application. 3 open contacts
Maximum contact load	**16 A/400 V AC-1 1,2 A/110 V DC-1** **16 A/30 V DC-1 0,4 A/220 V DC-1**

Contacts

Material	Standard	Code 0	AgNi
Rated current			16 A
Switch-on current max. (20 ms)			40 A
Switching voltage max.			400 V
AC load (Fig 1)			4 kVA
DC load			see Fig. 2

Coil

Coil resistance	see table; tolerance ± 10 %
Pick-up voltage	≤ 0,8 x U_N
Release voltage	≥ 0,1 x U_N
Nominal power	2,4 VA (AC)/1,6 W (DC)

Coil table

VAC	Ω	mA	VDC	Ω	mA
24	65	100	12	90	133
48	286	50	24	373	66
115	1K7	21	48	1K4	34
230	6K8	10	110	7K6	15
400	18K8	6	220	30K3	7,5

Insulation

	Volt rms, 1 min
Contact open	2000 V
Contact/contact	4 kV
Contact/coil	4 kV
Insulation resistance at 500 V	≥ 3 GΩ
Insulation, IEC 61810-1	4 kV/3

Specifications

Ambient temperature operation/storage	-40 (no ice)….60 °C /-40 ... 80 °C
Pick-up time/bounce time	20 ms/≤ 3 ms
Release time/bounce time	10 ms/≤ 1 ms
Mechanical life ops	AC: 10 Mill./DC: 20 Mill.
DC voltage endurance at rated load	≥100000 switching cycles
Switching frequency at rated load	≤ 1200/h
Protection class	IP40
Weight	95 g

Standard types

VAC 50 Hz/60 Hz: 24, 48, 115, (120), 230, (240)	**C5-G30/AC ... V**
LED	**C5-G30X/AC ... V**
RC suppressor (max 250 V)	**C5-G30R/AC ... V**
VDC 12, 24, 48, 110, 220	**C5-G30/DC ... V**
LED	**C5-G30X/DC ... V**
Free wheeling diode	**C5-G30DX/DC ... V**
Polarity and free wheeling diode	**C5-G30FX/DC ... V**
AC/DC bridge rectifier 24 V, 48 V, 60 V	**C5-G30BX/UC ... V**

"..." Enter the voltage for full type designation

Accessories

Socket:	**S5-S, S5-L, S5-P, S5-P0, S5-M**
Optional accessories (blanking plug):	**SO-NP, SO-OP**

Connection diagram

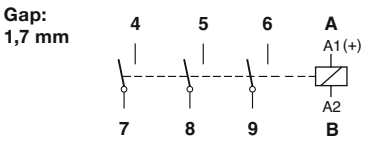


Fig. 1 AC voltage endurance

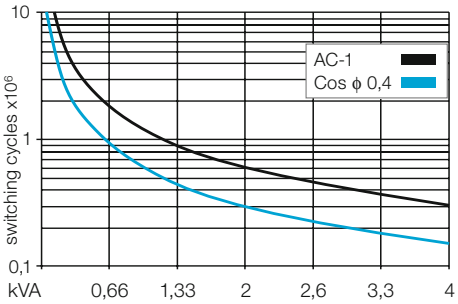
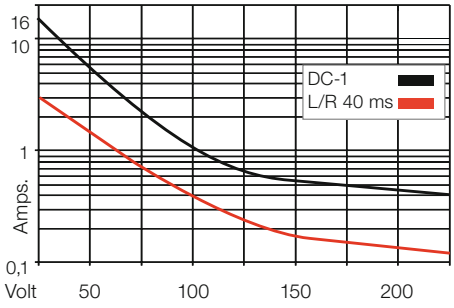
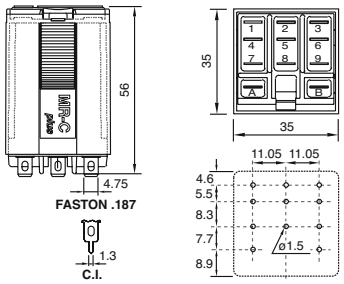


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

EN 60947; IEC 61810

C5-X1x

4-pin, power relay, 1-pole, double make, faston

Type	**C5-X1x/ ... V** Power relays, DC application 1 pole, NO, double make
Maximum contact load	**16 A/400 V AC-1 7 A/110 V DC-1** **16 A/30 V DC-1 1,2 A/220V DC-13**

Contacts

Material	Standard	Code 0	AgNi
Rated current			16 A
Switch-on current max. (20 ms)			40 A
Switching voltage max.			400 V
AC load (Fig 1)			4 kVA
DC load			see Fig. 2

Coil

Coil resistance	see table; tolerance ± 10 %
Pick-up voltage	≤ 0,8 x U_N
Release voltage	≥ 0,1 x U_N
Nominal power	2,4 VA (AC)/1,3 W (DC))

Coil table

VAC	Ω	mA	VDC	Ω	mA
24	65	100	12	110	108
48	286	50	24	443	54
115	1K7	21	48	1K7	27
230	6K8	10	110	9K2	12
400	18K8	6	220	34K5	6,2

Insulation

	Volt rms, 1 min
Contact open	4 kV
Contact/contact	4 kV
Contact/coil	4 kV
Insulation resistance at 500 V	≥ 3 GΩ
Insulation, IEC 61810-1	4 kV/3

Specifications

Ambient temperature operation/storage	-40 (no ice)….60 °C /-40 ... 80 °C
Pick-up time/bounce time	20 ms/≤ 3 ms
Release time/bounce time	10 ms/≤ 1 ms
Mechanical life ops	AC: 10 Mill./DC: 20 Mill.
DC voltage endurance at rated load	≥100000 switching cycles
Switching frequency at rated load	≤ 1200/h
Protection class	IP40
Weight	90 g

Standard types

VAC 50 Hz/60 Hz: 24, 48, 115 (120), 230 (240)	**C5-X10/AC ... V**
LED	**C5-X10X/AC ... V**
RC suppressor (max 250 V)	**C5-X10R/AC ... V**
VDC 12, 24, 48, 110, 220	**C5-X10/DC ... V**
LED	**C5-X10X/DC ... V**
Free wheeling diode	**C5-X10DX/DC ... V**
Polarity and free wheeling diode	**C5-X10FX/DC ... V**
AC/DC bridge rectifier 24 V, 48 V, 60 V	**C5-X10BX/UC ... V**

"..." Enter the voltage for full type designation

Accessories

Socket:	**S5-S, S5-L, S5-P, S5-P0, S5-M**
Optional accessories (blanking plug):	**SO-NP, SO-OP**

Connection diagram

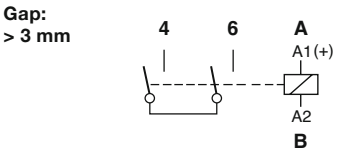


Fig. 1 AC voltage endurance

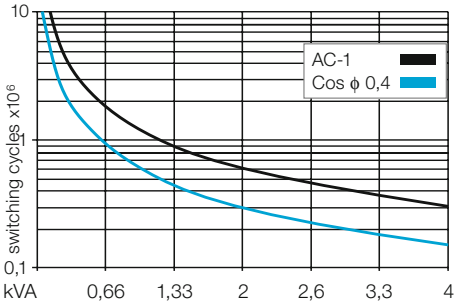
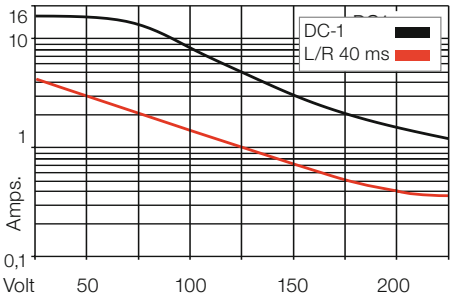
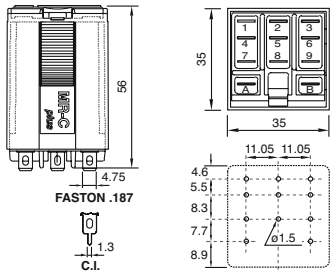


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

IEC 61810; EN 60947

MRC series

C5-M1x

4-pin, power relay, 1-pole double make, magnetic blow out, faston

Type	**C5-M1x/ ... V** Power relays, DC application 1 pole, NO, magnetic blow out
Maximum contact load	**16 A/400 V AC-1 10 A/220 V DC-1** **3,6 A/110 V DC-13 2 A/220 V DC-13**

Contacts

Material	Standard	Code 0	AgNi
Rated current			16 A
Switch-on current max. (20 ms)			40 A
Switching voltage max.			400 V
AC load (Fig 1)			4 kVA
DC load			see Fig. 2

Coil

Coil resistance	see table; tolerance ± 10 %
Pick-up voltage	≤ 0,8 x U_N
Release voltage	≥ 0,1 x U_N
Nominal power	2,4 VA (AC)/1,3 W (DC)

Coil table

VAC	Ω	mA	VDC	Ω	mA
24	65	100	12	110	108
48	286	50	24	443	54
115	1K7	21	48	1K7	27
230	6K8	10	110	9K2	12
400	18K8	6	220	34K5	6,2

Insulation

	Volt rms, 1 min
Contact open	4000 V
Contact/contact	4 kV
Contact/coil	4 kV
Insulation resistance at 500 V	≥3 GΩ
Insulation, IEC 61810-1	4 kV/3

Specifications

Ambient temperature operation/storage	-40 (no ice)….60 °C /-40 ... 80 °C
Pick-up time/bounce time	20 ms/≤ 3 ms
Release time/bounce time	10 ms/≤ 1 ms
Mechanical life ops	AC: 10 Mill./DC: 20 Mill.
DC voltage endurance	see fig. 2
Switching frequency at rated load	≤ 1200/h
Protection class	IP40
Weight	90 g

Standard types

VAC 50 Hz/60 Hz: 24, 48, 115 (120), 230 (240)	**C5-M10/AC ... V**
LED	**C5-M10X/AC ... V**
RC suppressor (max 250 V)	**C5-M10R/AC ... V**
VDC 12, 24, 48, 110, 220	**C5-M10/DC ... V**
LED	**C5-M10X/DC ... V**
Free wheeling diode	**C5-M10DX/DC ... V**
Polarity and free wheeling diode	**C5-M10FX/DC ... V**
AC/DC bridge rectifier 24 V, 48 V, 60 V	**C5-M10BX/UC ... V**

"..." Enter the voltage for full type designation

Accessories

Socket:	**S5-S, S5-L, S5-P, S5-P0, S5-M**
Optional accessories (blanking plug):	**SO-NP, SO-OP**

Connection diagram

Gap:
> 3 mm
(1,7 + 1,7)

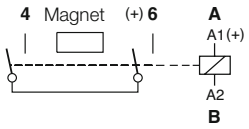


Fig. 1 AC voltage endurance

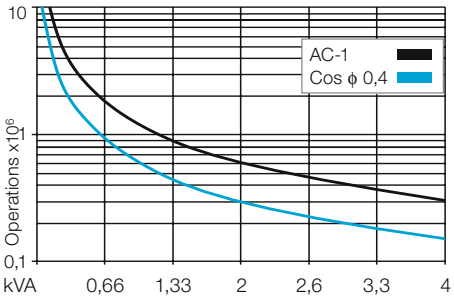
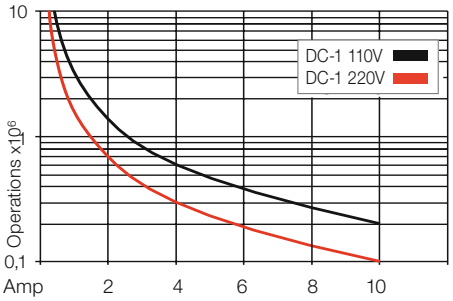
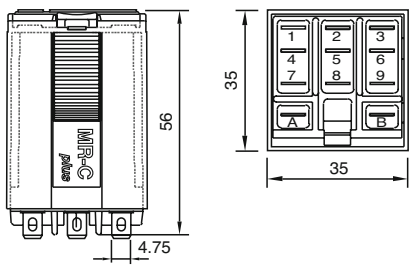


Fig. 2 DC voltage endurance



Dimensions [mm]



Technical approvals, conformities

IEC 61810; EN 60947

C5-M2x

6-pin, power relay, 2-pole normally open, magnetic blow out, faston

Type	**C5-M2x/ ... V** Power relays, DC application double pole, NO, magnetic blow out
Maximum contact load	**16 A / 250 V AC-1** **7 A / 110 V DC-1** **3 A / 220 V DC-1**

Contacts

Material	Standard	Code 0	AgNi
Rated current			16 A
Switch-on current max. (20 ms)			40 A
Switching voltage max.			250 V
AC load (Fig 1)			4 kVA
DC load			see Fig. 2

Coil

Coil resistance	see table; tolerance ± 10 %
Pick-up voltage	≥ 0,8 x U_N
Release voltage	≥ 0,1 x U_N
Nominal power	2,4 VA (AC) / 1,6 W (DC)

Coil table

VAC	Ω	mA	VDC	Ω	mA
24	65	100	12	90	133
48	286	50	24	373	66
115	1K7	21	48	1K4	33
230	6K8	10.4	110	7K6	15

Insulation

	Volt rms, 1 min
Contact open	2 kV
Contact/contact	4 kV
Contact/coil	3 kV
Insulation resistance at 500 V	≥ 3 GΩ
Insulation, EN 60947/IEC 61810-1:	4 KV/3

Specifications

Ambient temperature operation/storage	-40 (no ice)….60 °C /-40 ... 80 °C
Pick-up time/bounce time	20 ms/≤ 3 ms
Release time/bounce time	10 ms/≤ 1 ms
Mechanical life ops	AC: 10 Mill./DC: 20 Mill. switching cycles
DC Rated load	≥ 75.000 switching cycles
Switching frequency at rated load	≤ 1200/h
Protection class	IP40
Weight	90 g

Standard types

VAC 50 Hz/60 Hz: 24, 48, 115 (120), 230 (240)	**C5-M20/AC ... V**
LED	**C5-M20X/AC ... V**
RC suppressor (max 250 V)	**C5-M20R/AC ... V**
VDC 12, 24, 48, 110, 220	**C5-M20/DC ... V**
LED	**C5-M20X/DC ... V**
Free wheeling diode	**C5-M20DX/DC ... V**
Polarity and free wheeling diode	**C5-M20FX/DC ... V**
AC/DC bridge rectifier 24 V, 48 V, 60 V	**C5-M20BX/UC ... V**

"..." Enter the voltage for full type designation

Accessories

Socket:	**S5-S, S5-L, S5-P, S5-P0, S5-M**
Optional accessories (blanking plug):	**SO-NP, SO-OP**

Connection diagram

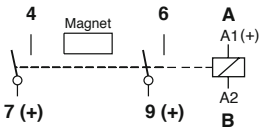


Fig. 1 AC voltage endurance

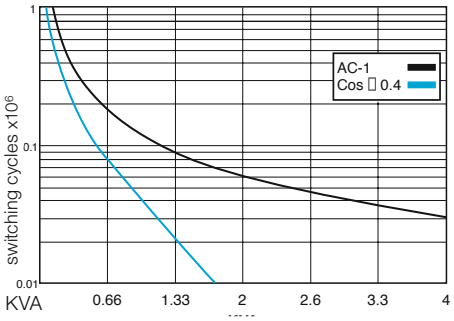
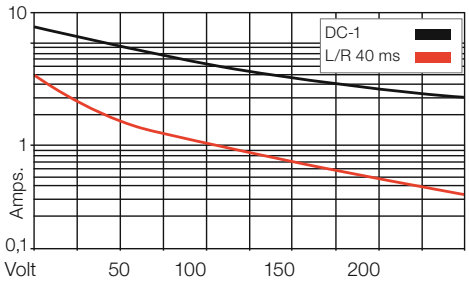
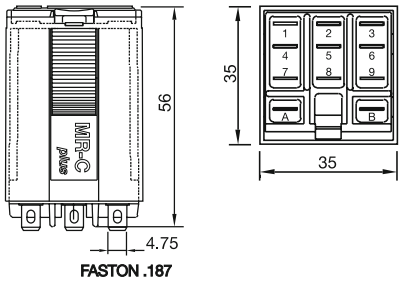


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

IEC 61810; EN 60947

MRC series

C5-R2x

9-pin, remanence relay, 2-pole, faston

Type	**C5-R2x/ ... V** Magnetic latching – Remanence relays 2 change-over contact, 10A
Maximum contact load	**10 A/400 V AC-1 10 A/30 V DC-1** **0,2 A/250 V DC-1 0,5 A/110 V DC-1**

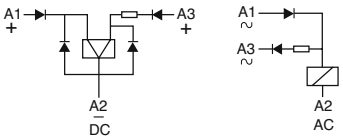
Contacts

Material	Standard	Code 0	AgNi
Rated current			10 A
Switch-on current max. (20 ms)			30 A
Switching voltage max.			400 V
AC load (Fig 1)			4 kVA
DC load			see Fig. 2

Coil

Coil resistance	see table; tolerance ± 10 %
ON pulse power	1,5 VA/W
OFF pulse power	0,5 VA/W
1 winding for AC, 2 winding for DC	
Pull-in ON/OFF	< 0,8 x U_N

Internal Diagram:



Coil table

VAC	mA ON	mA OFF	VDC	mA ON	mA OFF
24	75	12	12	125	41
48	38	6	24	63	21
115	16	2,5	48	31	10
230	8	1,3	110	14	4,5

Insulation

	Volt rms, 1 min
Contact open	1000 V
Contact/contact	4 kV
Contact/coil	4 kV
Insulation resistance at 500 V	≥3 GΩ
Insulation, EN 60947/IEC 61810-1	4 kV/3

Specifications

Ambient temperature operation/storage	-40 (no ice)….60 °C /-40 ... 80 °C
Minimum pulse ON/OFF	50 ms
Mechanical life ops	AC: 10 Mill./DC: 20 Mill.
DC voltage endurance at rated load	≥100000 switching cycles
Switching frequency at rated load	≤ 1200/h
Protection class	IP40
Weight	95 g

Standard types

VAC 50 Hz/60 Hz: 24, 48, 115, 230	**C5-R20/AC ... V**
VDC : 12, 24, 48, 110,	**C5-R20/DC ... V**

"..." Enter the voltage for full type designation

Accessories

Socket:	**S5-S, S5-L, S5-P, S5-P0, S5-M**
Optional accessories (blanking plug):	**SO-NP, SO-OP**

Connection diagram

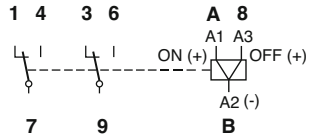


Fig. 1 AC voltage endurance

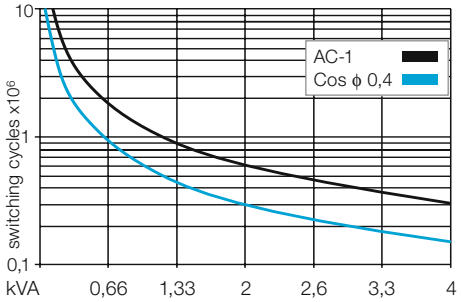
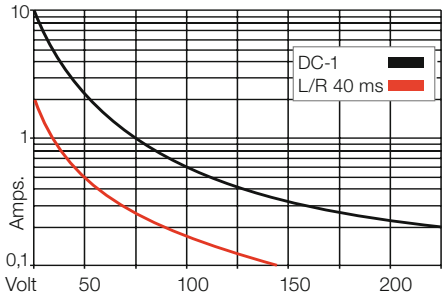
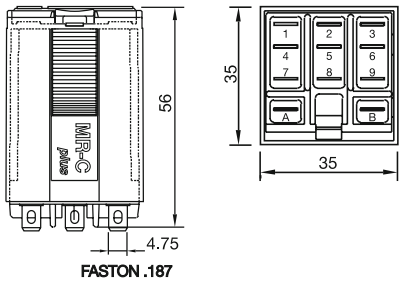


Fig. 2 DC load limit curves



Dimensions [mm]



Technical approvals, conformities

IEC 61810, EN 60947

Notes

Notes

1.4 Long Life Relays (Railway)

Long Life Series

Application	Types	Pins	Contacts	Contact ratings	Socket
C20 Series					
Long Life standard	C21	8		10 A / 250 V	S2
Long Life, reliable switching of lower loads	C22	8		5 A / 250 V	S2
C30 Series					
Long Life, Railway	C31	11		10 A / 250 V	S3
Long Life, reliable switching of lower loads, Railway	C32	11		5 A / 250 V	S3

Long life series

C21 with single contacts

8 pin plug-in relay, 2-pole, according to IEC 67-I-5a

Type	**C21/...V** Long Life Relay 2 change over contacts Types with LED status indicator Types with free wheeling diode Manual actuator and mech. status indicator
Maximum contact load	**10 A / 250 V AC-1,** **10 A / 30 V DC-1**
Recommended minimum contact load	**50 mA / 10 V**

Contacts

Type	single contact micro disconnection
Material	AgCuNi
Rated operational current	10 A
Max. inrush current (20 ms)	40 A
Rated switching voltage AC-1	250 V
Max. AC load	2500 VA AC-1
Max. DC load 30 V / 230 V DC-1 (Fig. 2)	300 W / 90 W

Coils (Values are valid at 20 °C)

Pick-up voltage	≤ 0.8 x V_N
Release voltage AC / DC	> 0.15 x V_N / > 0.05 x V_N
Nominal power AC / DC	2.5 VA / 1.2 W

Coil Table

V_N AC	Ω	mA	V_N DC	Ω	mA
24	52	104	**12**	115	104
48	240	55	**24**	480	50
115	1350	23	**48**	1850	26
230	5600	11.5	**110**	9000	12
			220	29000	7.6

Types with LED indicator take additional 5 … 10 mA @ < 80 V

Insulation

Test voltage open contact	1.5 kVrms, 1 minute
Test voltage between adjacent poles	1.5 kVrms, 1 minute
Test voltage between contacts and coil	2 kVrms, 1 minute

General Specifications

Ambient temperature operation, storage	-40 … +70 °C
Pickup time AC / DC	3 … 10 ms / ≤ 12 ms
Release time AC / DC	2 … 15 ms / ≤ 3.5 ms
Bounce time NO contact AC / DC	3 … 6 ms / approx. 3.5 ms
Mechanical life	≥ 10^8 operations
Operating frequency at nominal load	≤ 360 operations / h
Ingress Protection degree	IP 40
Weight	80 g

Standard types

AC 50 Hz / 60 Hz: 24, 48, 115, 230	**C21/AC...V**
LED	**C21L/AC...V**
DC: 12, 24, 48, 110, 220	**C21/DC...V**
Free wheeling diode	**C21D/DC...V**
LED + Free wheeling diode	**C21DL/DC...V**

"..." enter the voltage for full type designation

Accessories

Socket: **EC-8, S2-B, S2-S, S2-L, S2-P, S2-PO**

Connection diagram

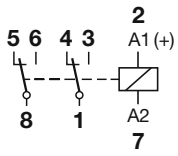


Fig.1 AC voltage endurance

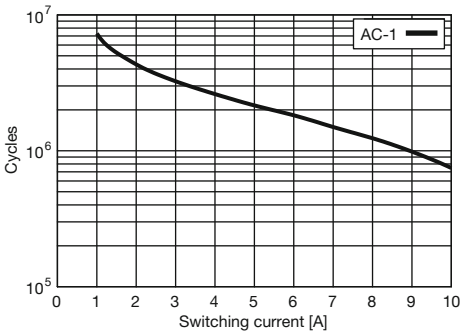
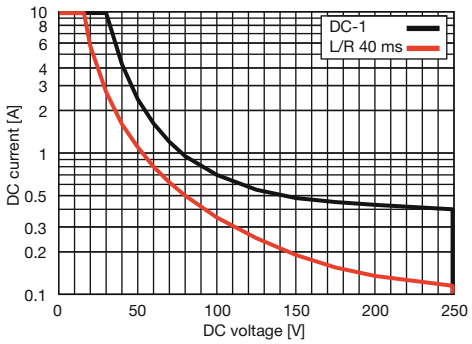
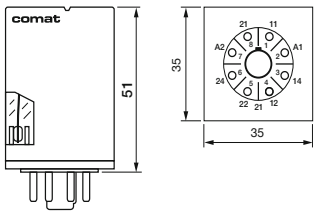


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

Long life series

C22 with double contacts

8 pin plug-in relay, 2-pole, according to IEC 67-I-5a

Type	**C22/...V** Long Life Relay 2 change over double contacts Types with LED status indicator Types with free wheeling diode Manual actuator and mech. status indicator
Maximum contact load	**6 A / 250 V AC-1** **6 A / 30 V DC-1**
Recommended minimum contact load	**10 mA / 5 V**

Contacts

Type	double contact micro disconnection
Material	AgCuNi
Rated operational current	6 A
Max. inrush current (20 ms)	15 A
Rated switching voltage AC-1	250 V
Max. AC load	1500 VA AC-1
Max. DC load 30V / 230V DC-1 (Fig. 2)	200 W / 90 W

Coils (Values are valid at 20 °C)

Pick-up voltage	≤ 0.8 x V_N
Release voltage AC / DC	> 0.15 x V_N / > 0.05 x V_N
Nominal power AC / DC	2.5 VA / 1.2 W

Coil Table

V_N AC	Ω	mA	V_N DC	Ω	mA
24	52	104	**12**	115	104
48	240	55	**24**	480	50
115	1350	23	**48**	1850	26
230	5600	11.5	**110**	9000	12
			220	29000	7.6

Types with LED indicator take additional 5 ... 10 mA @ < 80 V

Insulation

Test voltage open contact	1.5 kVrms, 1 minute
Test voltage between adjacent poles	1.5 kVrms, 1minute
Test voltage between contacts and coil	2 kVrms, 1minute

General Specifications

Ambient temperature operation, storage	-40 ... +70 °C
Pickup time AC / DC	3 ... 10 ms / ≤ 12 ms
Release time AC / DC	2 ... 15 ms / ≤ 3.5 ms
Bounce time NO contact AC / DC	3 ... 6 ms / approx. 3.5 ms
Mechanical life	≥ 10^8 operations
Operating frequency at nominal load	≤ 360 operations / h
Ingress Protection degree	IP 40
Weight	80 g

Standard types

AC 50 Hz / 60 Hz: 24, 48, 115, 230	**C22/AC...V**
LED	**C22L/AC...V**
DC: 12, 24, 48, 110, 220	**C22/DC...V**
Free wheeling diode	**C22D/DC...V**
LED + Free wheeling diode	**C22DL/DC...V**

"..." enter the voltage for full type designation

Accessories

Socket:	**EC-8, S2-B, S2-S, S2-L, S2-P, S2-PO**

Connection diagram

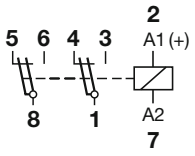


Fig.1 AC voltage endurance

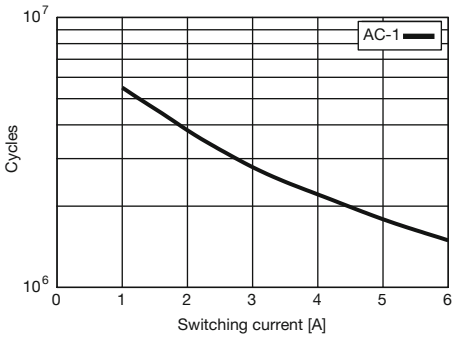
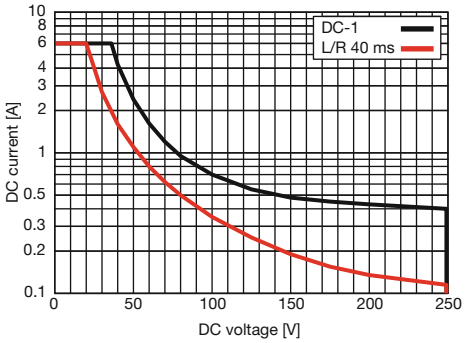
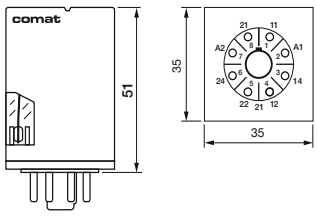


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

Long life series (Railway) EN 50155

C31 with single contacts

11 pin plug-in relay, 3-pole, according to IEC 67-I-18a

Type	**C31/...V**
	Long Life Relay, according to EN 50 155 Railway
	3 change over contacts
	Types with LED status indicator
	Types with free wheeling diode
	Manual actuator and mech. status indicator
Maximum contact load	**10 A / 250 V AC-1**
	10 A / 30 V DC-1
Recommended minimum contact load	**50 mA / 10 V**

Contacts

Type	single contact micro disconnection
Material	AgCuNi
Rated operational current	10 A
Max. inrush current (20 ms)	40 A
Rated switching voltage	250 V
Max. AC load	2500 VA AC-1
Max. DC load 30V / 230V DC-1 (Fig. 2)	300W / 90 W

Coils (Values are valid at 20 °C)

Pick-up voltage	≤ 0.8 x V_N
Release voltage AC / DC	> 0.15 x V_N / > 0.05 x V_N
Nominal power AC / DC	2.5 VA / 1.2 W

Coil Table

V_N AC	Ω	mA	V_N DC	Ω	mA
24	52	104	**12**	115	104
48	240	55	**24**	480	50
115	1350	23	**48**	1850	26
230	5600	11.5	**110**	9000	12
			220	29000	7.6

Types with LED indicator take additional 5 … 10 mA @ < 80 V

Insulation

Test voltage open contact	1.5 kVrms, 1 minute
Test voltage between adjacent poles	1.5 kVrms, 1minute
Test voltage between contacts and coil	2 kVrms,1minute

General Specifications

Ambient temperature operation, storage	-40 … +70 °C
Pickup time AC / DC	3 … 10 ms / ≤ 12 ms
Release time AC / DC	2 … 15 ms / ≤ 3.5 ms
Bounce time NO contact AC / DC	3 … 6 ms / approx. 3.5 ms
Mechanical life	≥ 10^8 operations
Operating frequency at nominal load	≤ 360 operations / h
Ingress Protection degree	IP 40
Weight	80 g

Standard types

AC 50 Hz / 60 Hz: 24, 48, 115, 230 (240)	**C31/AC...V**
LED	**C31L/AC...V**
DC: 12, 24, 48, 110, 220	**C31/DC...V**
Free wheeling diode	**C31D/DC...V**
LED + Free wheeling diode	**C31DL/DC...V**
Railway EN 50155; NF F 16-101/102	**C31D/R DC...V**

"..." enter the voltage for full type designation

Accessories

Socket:	**EC-11, EC11A, S3-B, S3-S, S3-L, S3-P, S3-PO**

Connection diagram

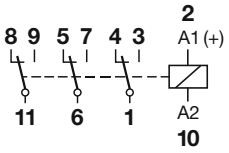


Fig.1 AC voltage endurance

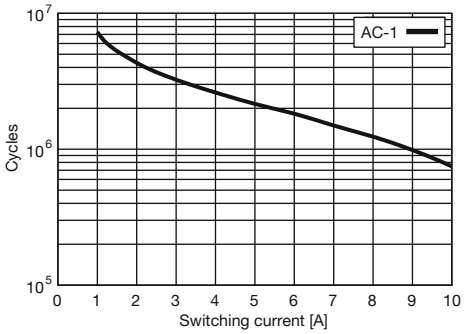
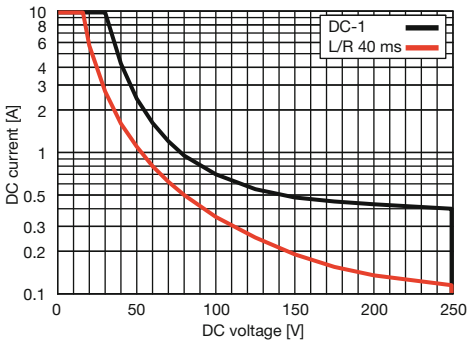
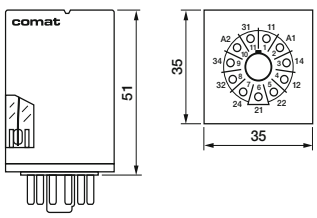


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

C32 with double contacts

11 pin plug-in relay, 3-pole, according to IEC 67-I-18a

Type	**C32/...V** Long Life Relay, according to EN 50 155 Railway 3 change over double contacts Types with LED status indicator Types with free wheeling diode Manual actuator and mech. status indicator
Maximum contact load	**6 A / 250 V AC-1** **6 A / 30 V DC-1**
Recommended minimum contact load	**10 mA / 5 V**

Contacts

Type	double contact micro disconnection
Rated operational current	6 A
Max. inrush current (20 ms)	15 A
Rated switching voltage AC-1	250 V
Max. AC load	1500 VA AC-1
Max. DC load 30V / 230V DC-1 (Fig. 2)	200 W / 90 W

Coils (Values are valid at 20 °C)

Pick-up voltage	≤ 0.8 x V_N
Release voltage AC / DC	> 0.15 x V_N / > 0.05 x V_N
Nominal power AC / DC	2.5 VA / 1.2 W

Coil Table

V_N AC	Ω	mA	V_N DC	Ω	mA
24	52	104	**12**	115	104
48	240	55	**24**	480	50
115	1350	23	**48**	1850	26
230	5600	11.5	**110**	9000	12
			220	29000	7.6

Types with LED indicator take additional 5 … 10 mA @ < 80 V

Insulation

Test voltage open contact	1.5 kVrms, 1 minute
Test voltage between adjacent poles	1.5 kVrms, 1 minute
Test voltage between contacts and coil	2 kVrms, 1 minute

General Specifications

Ambient temperature operation, storage	-40 … +70 °C
Pickup time AC / DC	3 … 10 ms / ≤ 12 ms
Release time AC / DC	2 … 15 ms / ≤ 3.5 ms
Bounce time NO contact AC / DC	3 … 6 ms / approx. 3.5 ms
Mechanical life	≥ 10^8 operations
Operating frequency at nominal load	≤ 360 operations / h
Ingress Protection degree	IP 40
Weight	80 g

Standard types

AC 50 Hz / 60 Hz: 24, 48, 115, 230 (240)	**C32/AC...V**
LED	**C32L/AC...V**
DC: 12, 24, 48, 110, 220	**C32/DC...V**
Free wheeling diode	**C32D/DC...V**
LED + Free wheeling diode	**C32DL/DC...V**
Railway EN 50155; NF F 16-101/102	**C32D/R DC...V**

" ..." enter the voltage for full type designation

Accessories

Socket:	**EC-11, EC11A, S3-B, S3-S, S3-L, S3-P, S3-PO**

Connection diagram

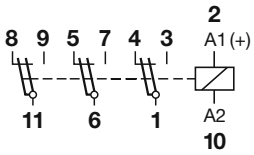


Fig.1 AC voltage endurance

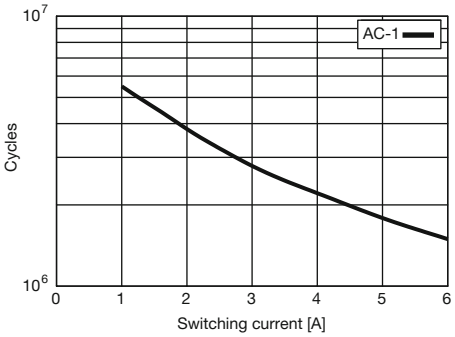
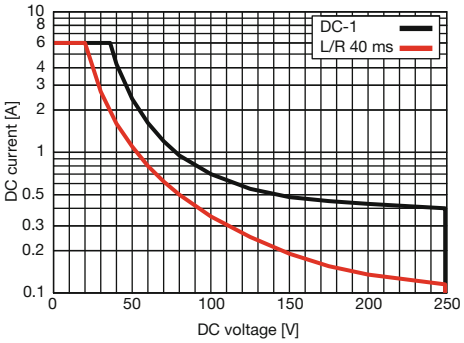
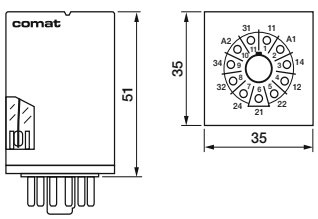


Fig. 2 DC load limit curve



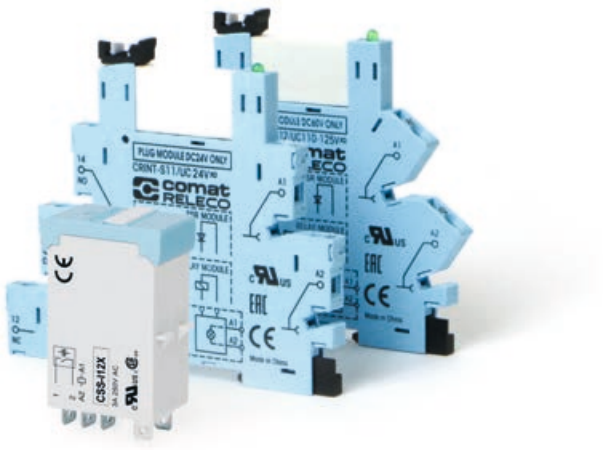
Dimensions [mm]



Technical approvals, conformities

Notes

1.5 Solid State Relays



Application	Types	Pins	Contacts	AC ratings	DC ratings	Socket
CSS Series						
AC Solid state relay, Instantaneous switching	CSS-I			3 A / 250 V		S10
AC Solid state relay synch. to zero crossing	CSS-Z			3 A / 250 V		S10
NPN Solid state relay	CSS-N				6 A / 48 V	S10
PNP Solid state relay	CSS-P				6 A / 48 V	S10
CRINT Series						
DC solid state switch	CRINT-C1x5				2 A / 24 V	
AC solid state switch	CRINT-C1x8			1 A / 240 V		

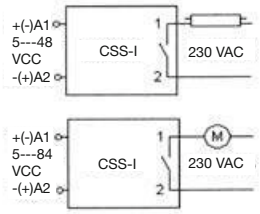
CSS-I

4-pin, Interface solid state relay, 1-pole, plug-in faston

Type	**CSS-I** Solid state relay For switching resistive and inductive AC loads Instantaneous
Output	**1 N/O contact**
Operating range	**3 A, 24 ... 250 VAC, 50/60 Hz**
Minimum contact load	**35 mA**
Control circuit	
Input voltage range	5 ... 48 VDC
Input current	10 mA
Output circuit	Instantaneous
Max. output current	3 A
Min. output current	35 mA
Output voltage range	24...250 VAC
Inrush current	150 A/10 ms
Residual current	1 mA
I^2t value	210 A^2s
Specifications	
Ambient temperature operation/storage	-40 ... 70 °C /-40 ... 85 °C
Pick-up time	0.06 ms
Release time	0.06 ms
Weight	28 g

Applications

It is specially suitable to switch inductive loads up to 3A/250 VAC.
For switching loads with a high inrush or overcurrent as transformers, motors or fluorescents, the maximum output current will limit to 2 A.



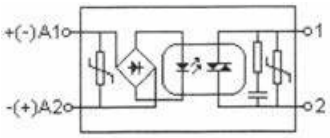
Standard types

VDC 5–48	**CSS-I12X/DC5–48V**

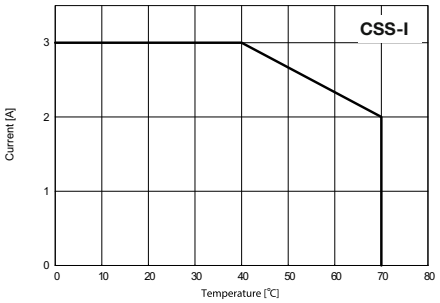
Accessories

Socket:	**S10, S10-M, S10-P**

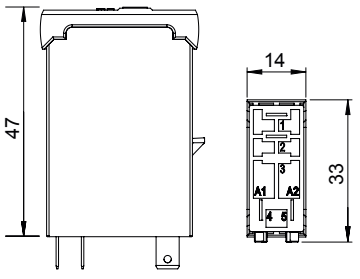
Fig. 1 CSS-I diagram



Tab. 2 AC derating curve



Dimensions [mm]



Technical approvals, conformities

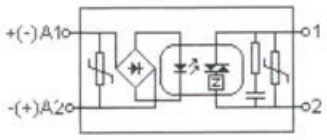
CE

CSS-Z

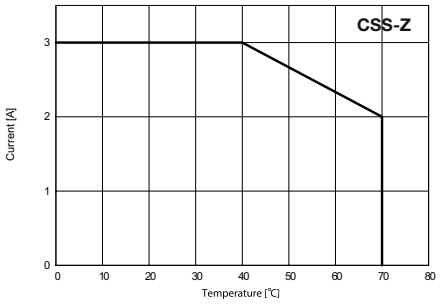
4-pin, Interface solid state relay, 1-pole, plug-in faston

Type	**CSS-Z** Solid state relay For switching resistive lamps and AC loads Synchronized to zero crossing
Output	**1 N/O contact**
Operating range	**3 A, 24 ... 250 VAC, 50/60 Hz**
Minimum contact load	**35 mA**
Control parameters	
Input voltage range	5 ... 48 VDC
Input current	10 mA
Output	Synchronized zero
Max. output current	3 A
Min. output current	35 mA
Output voltage range	24 ... 250 VAC
Inrush current	150 A/10 ms
Residual current	1 mA
I^2t value	210 A^2s
Specifications	
Ambient temperature operation/storage	-40....70 ºC /-40 ... 85 °C
Pick-up time	10 ms
Release time	10 ms
Weight	28 g

Fig. 1 CSS-Z diagram

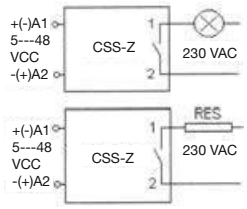


Tab. 2 AC derating curve



Applications

Switches ohmic AC loads up to 3 A/250 VAC in the zero-point of the tension and avoids any overcurrent peak in the connection.
Suitable for switching resistors, incandescent lamps, signalling equipment, etc. Not suitable for inductive loads



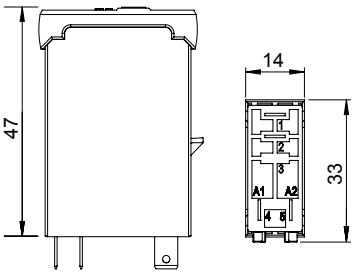
Standard types

VDC 5–48	**CSS-Z12X/DC5–48V**

Accessories

Socket:	**S10, S10-M, S10-P**

Dimensions [mm]



Technical approvals, conformities

CE

IRC series

CSS-N

4-pin, Interface solid state relay, 1-pole, plug-in faston

Type	**CSS-N** NPN solid state relay Terminal commun 2 negative (S10 socket)
Output	1 N/O contact
Operating range	**6 A, 5 ... 48 VDC**
Minimum contact load	**1 mA**

Control parameters	
Input voltage range	5 ... 48 VDC
Input current	4 mA

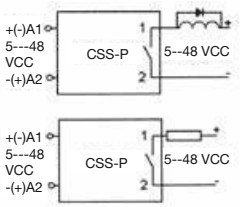
Output	
Type	NPN
Max. output current	6 A
Output voltage range	5 ... 48 VDC
Switch-on current max.	40 A / 10 ms
Max. voltage drop	≤ 0,14 VDC
Residual current	0,1 mA

Specifications	
Ambient temperature operation/storage	-40 ... 70 °C/-40 ... 85 °C
Test voltage between input/output	4 kV rms/1 min.
Turn-on delay	0,06 ms
Release delay	0,06 ms
Weight	28 g

Applications

For switching heating elements, electro valves, motors, PLC input/output signals, solenoids, incandescent and fluorescent lamps, etc. (up to 48 VDC).

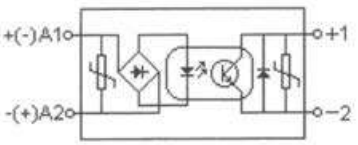
Inductive loads must be shunted with an antiparallel diode.



Standard types	
VDC 5–48	**CSS-N13X/DC5–48V**

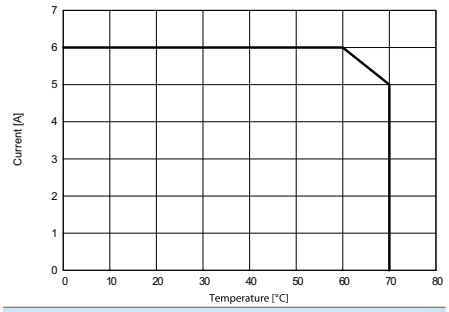
Accessories	
Socket:	**S10, S10-M, S10-P**

Fig. 1 CSS-N diagram

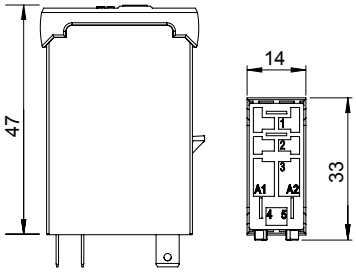


Negative common

Tab. 2 DC derating curve



Dimensions [mm]



Technical approvals, conformities

CE

CSS-P

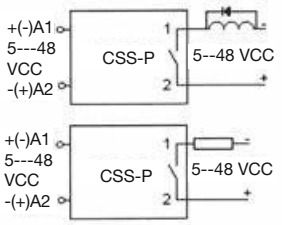
4-pin, Interface solid state relay, 1-pole, plug-in faston

Type	**CSS-P** PNP solid state relay Terminal commun 2 positive (S10 socket)
Output	1 N/O contact
Operating range	**6 A, 5 ... 48 VDC**
Minimum contact load	**1 mA**
Control parameters	
Input voltage range	5 ... 48 VDC
Input current	4 mA
Output	
Type	PNP
Max. output current	6 A
Output voltage range	5 ... 48 VDC
Max. switch-on current	40 A / 10 ms
Max. voltage drop	**0,14** VDC
Residual current	0,1 mA
Specifications	
Ambient temperature operation/storage	-40…70 °C /-40 ... 85 °C
Turn-on delay	0,06 ms
Release delay	0,06 ms
Weight	28 g

Applications

For switching heating elements, electro valves, motors, PLC input/output signals, solenoids, incandescent and fluorescent lamps, etc. (up to 48 VDC).

Inductive loads must be shunted with an antiparallel diode.



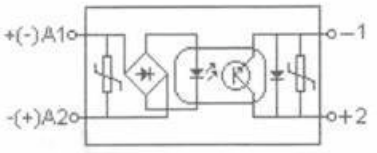
Standard types

VDC 5–48	**CSS-P13X/DC5–48V**

Accessories

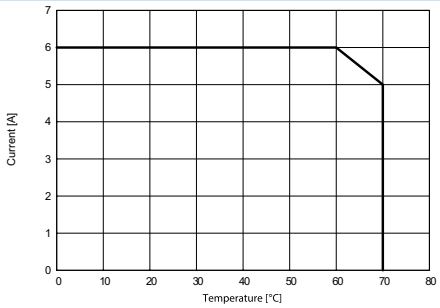
Socket:	**S10, S10-M, S10-P**

Fig. 1 CSS-P diagram

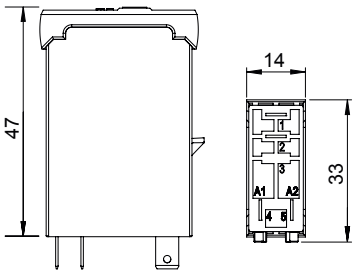


Positive common

Tab. 2 DC derating curve



Dimensions [mm]



Technical approvals, conformities

CE

CRINT 1x5 series

Solid state interface module with mechanical NO output contact

DIN Rail mounting according to DIN 43 880

Types: CRINT-C115, CRINT-C125 / ...V
For PLC's and process control. DC solid state switch, type NO.
For fast and high frequent switching. With screw terminals (CRINT-S11) or cage clamp terminals (CRINT-S12).

Max. contact load	**2 A, 24 V DC-1**
Contact	
Type	1 NO (Solid state DC)
Material	MOSFET
Switching current I_{TH}	2 A 24 V DC
Recommended minimal load	20 mA / 5 V
Peak inrush current	48 A/10 ms
Coil	
Operation voltage AC 50/60 Hz / DC	0.8 ... 1.25 U_N
Nominal power DC/AC	160 / — mW
Insulation	
Test voltage I / O	2.5 kVrms 1 minute
Pollution degree	3
Over voltage category	III
Open contact	1000 Vrms dielectric strength 1 min
Standard	EN61810-5
General Specifications	
Ambient temperature: operation / storage	-30 ... +70 °C / -40 ... +85 °C
Typical response time @ V_n	1 ms
Typical release time @ V_n	1 ms
Cond. cross section screw terminal	2.5 mm^2
Cond. cross section spring cage	0.75 ... 2.5 mm^2
Ingress protection	IP 20
Mounting position	any
Housing material	Polyamide PA6

Order information

Screw terminal: **CRINT-C115/UC...V**	**UC12V**
	UC24V
	UC48V
Cage clamp terminal: **CRINT-C125/UC...V**	**UC60V**
	UC110-125V
„ ...“ enter the voltage for full type designation	**UC220-240V**

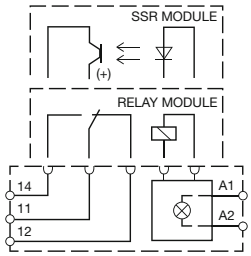
Accessories

Jumper link (5 pcs):	blue:	**CRINT-BR20-BU/5**
	red:	**CRINT-BR20-RD/5**
	black:	**CRINT-BR20-BK/5**
Label plate (64 pcs):		**CRINT-LAB/64**
Spacer (5 pcs):		**CRINT-SEP/5**

Replacement relays: **CRINT-R15/DC...V**	**DC12V**
„ ...“ enter the voltage for full type designation	**DC24V**
	DC48V
	DC60V*

*60V Relay used for all sockets with a nominal voltage higher or equal 60V

Connection diagram



Relay
- NO / Solid-state DC
- NO / Solid-state AC

Relay
- AgSnO2
- AgSnO2 + 3µ Au

Socket
-Screw terminal
-Cage clamp terminal

Fig.1 AC voltage endurance

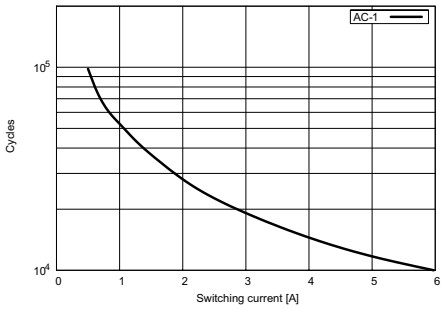
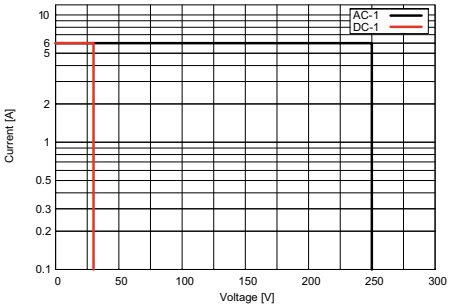
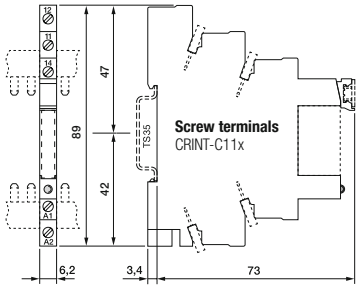


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

CRINT 1x8 series

Solid state interface module with mechanical NO output contact

DIN Rail mounting according to DIN 43 880

Types: CRINT-C118, CRINT-C128 / ...V
For PLC's and process control.
AC output interface zero synchronous switching NO for resistive or similar load. (No transformator rec.) With screw terminals (CRINT-S11) or cage clamp terminals (CRINT-S12).

Max. contact load	**1 A, 240 V AC-1**
Contact	
Type	1 NO (Solid state AC)
Material	TRIAC
Switching current I_{TH}	1 A 240 V AC
Recommended minimal load	22 mA / 12 V
Peak inrush current	80 A/10 ms
Coil	
Operation voltage AC 50/60 Hz / DC	0.8 ... 1.25 U_N
Nominal power DC/AC	150 / — mW
Insulation	
Test voltage I / O	2.5 kVrms 1 minute
Pollution degree	3
Over voltage category	III
Open contact	1000 Vrms dielectric strength 1 min
Standard	EN61810-5
General Specifications	
Ambient temperature: operation / storage	-30 … +70 °C / -40 … +85 °C
Typical response time @ V_n	1 ms
Typical release time @ V_n	1 ms
Cond. cross section screw terminal	2.5 mm^2
Cond. cross section spring cage	0.75 … 2.5 mm^2
Ingress protection	IP 20
Mounting position	any
Housing material	Polyamide PA6

Order information

Screw terminal: **CRINT-C118/UC...V**	**UC12V**
	UC24V
	UC48V
Cage clamp terminal: **CRINT-C128/UC...V**	**UC60V**
	UC110-125V
„ …“ enter the voltage for full type designation	**UC220-240V**

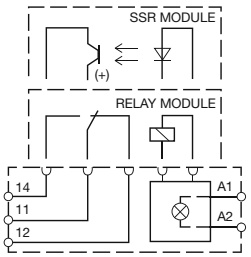
Accessories

Jumper link (5 pcs):	blue:	**CRINT-BR20-BU/5**
	red:	**CRINT-BR20-RD/5**
	black:	**CRINT-BR20-BK/5**
Label plate (64 pcs):		**CRINT-LAB/64**
Spacer (5 pcs):		**CRINT-SEP/5**

Replacement relays: **CRINT-R18/DC...V**	**DC12V**
	DC24V
„ …“ enter the voltage for full type designation	**DC60V***

*60V Relay used for all sockets with a nominal voltage higher or equal 60V

Connection diagram



Relay
- NO / Solid-state DC
- NO / Solid-state AC

Relay
- AgSnO2
- AgSnO2 + 3µ Au

Socket
-Screw terminal
-Cage clamp terminal

Fig.1 AC voltage endurance

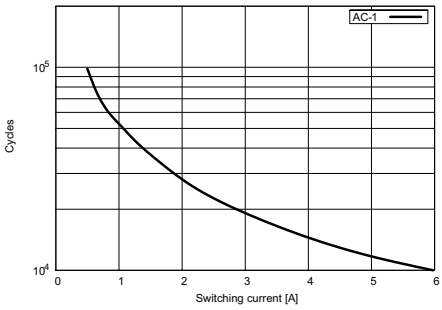
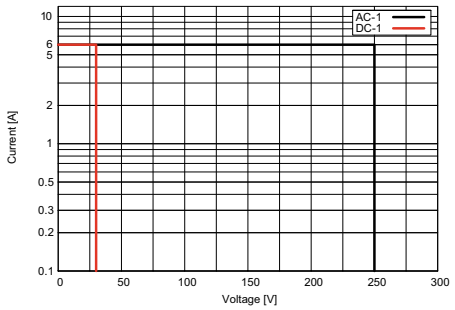
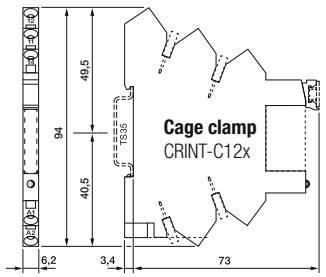


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

In combination with I/O sockets and the plug-in jumpers, the IRC relay series permits low-cost, clearly arranged and reliable realisation of interface circuits for the input and output ends of PLC and control systems.

S10-M and S12 sockets with one and two contacts, with inputs in series and identical arrangement of the contacts.

Identical order of coil and contacts on both sockets.

Coil terminal at level 1:
(A2, A2, A1)

Power terminals at level 1:
(12, 11, 14)

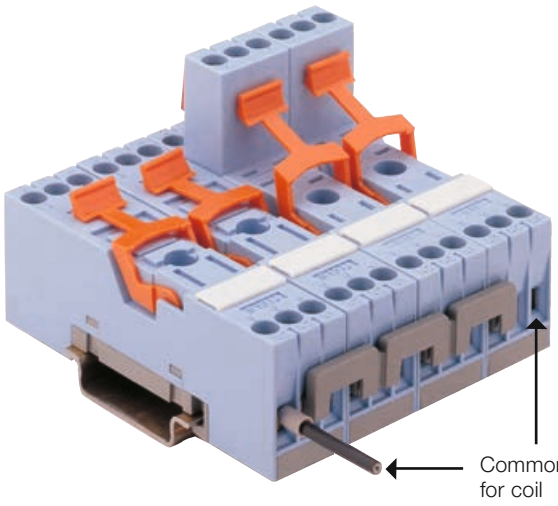
Power terminals at level 2:
(22, 21, 24)

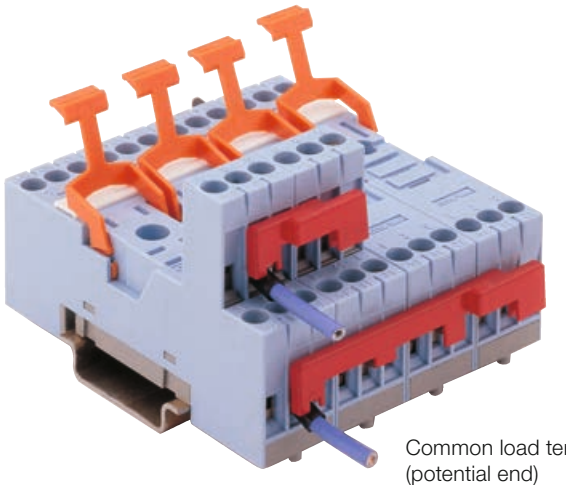
General

All plug-in jumpers are insulated. The plug-in jumpers at the drive end (coil) can be split manually to the required length, thus enabling the creation of any required interface groups.

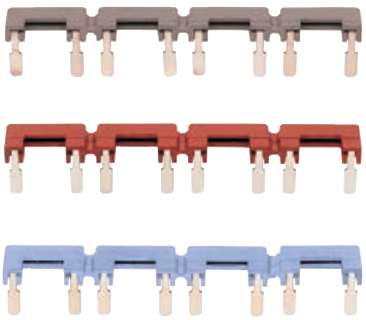
The jumpers are available in the colours grey, blue and red. .

Options:
Colours used by RELECO in the relays' test buttons:
- Blue for DC circuits
- Red for AC circuits

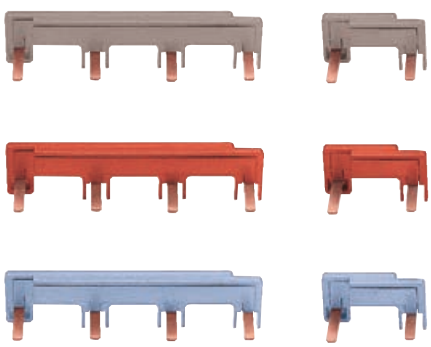




B20 plug-in jumpers for the control end



V40 and V10 plug-in jumpers for the power end



V40, V10

Power bridge bars for sockets S10-M and S12

V40 bridges join four similar points in four aside adjacent sockets. They can join up either among themselves or to V10 units, to bridge an unlimited number of sockets S10-M and S12 in any combination.

V10 bridges are units to connect a single socket to the next one, so you bridge less or more than 4 sockets.
Made of copper with a current capacity of 40 A.

B20

Coil bridge bars for sockets S10-M and S12

B20 bridges points A2, internally connected, of every aside adjacent socket S10-M or S12.

Each element connects point 6 of the first socket to point 5 of the next one, always leaving free the point 5 of the first socket and the point 6 of the last one, to connect the common polarity cable.

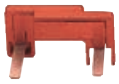
V40-G

V10-G

B20-G

V40-R

V10-R



B20-R

V40-A

V10-A

B20-A

Jumper connection on S1O-M and S12 sockets

The S10-M and S12 sockets and the new connection jumpers B20, V10 and V40 enable easy and fast wiring of rows of relays. The jumpers can be used in a mixed configuration of S10-M and S12 sockets.

Different jumper colours allow clear identification. This results in fewer errors, lower assembly costs and easier inspection and maintenance work. Available in grey (standard), red (AC) and blue (DC), in conformity with the colour coding used by RELECO for test buttons for relay identification.

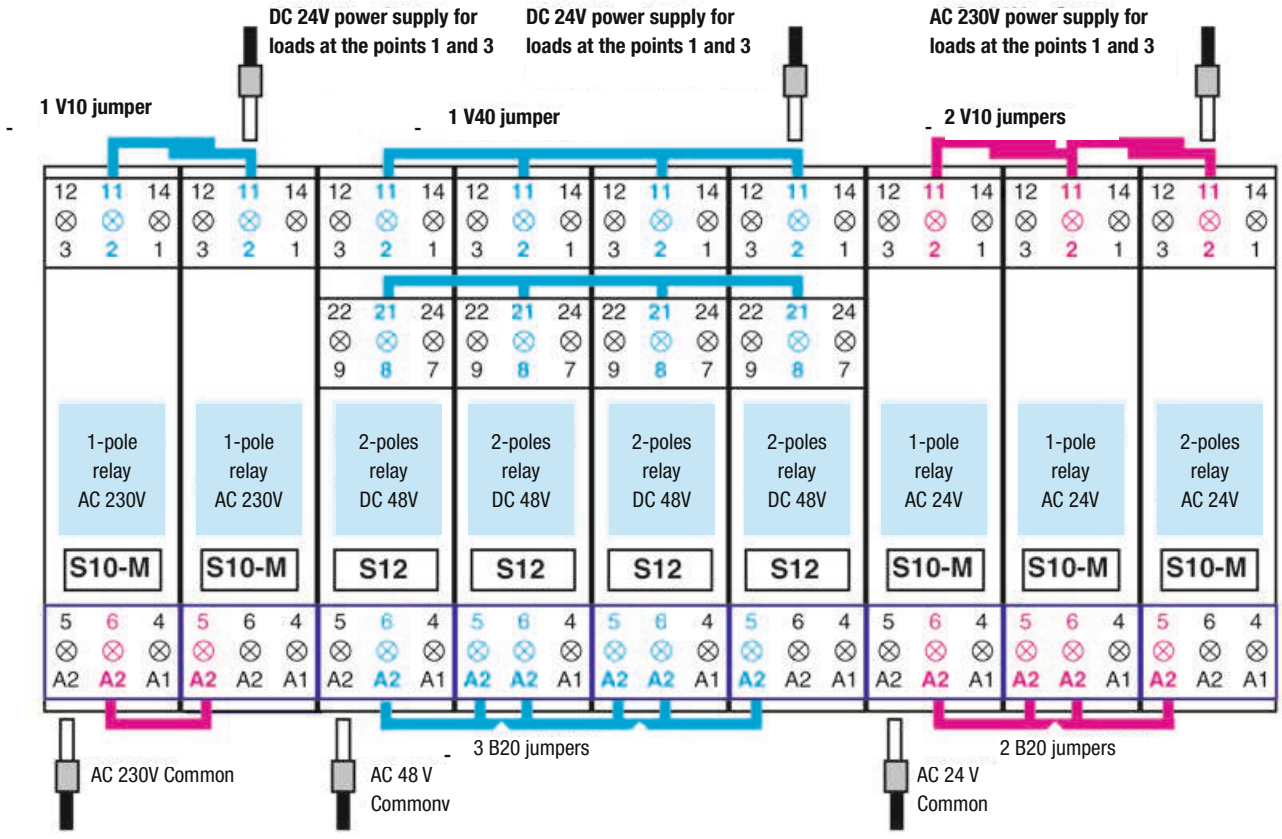
Attention needs to be paid only to the total current. At higher currents and also for safety reasons, a current supply at the start and end of a jumpered connection is recommended.

V40 plug-in jumpers for the power end

Contacts can be linked to the power ends with the aid of these jumpers. Normally, these are the changeover contacts, terminal 11 or 21. The jumpers can also be used to jumper NC or NO plug-in terminals. V40 jumpers link four identical contacts of four neighbouring sockets. They can either be linked to one another or to V10 jumpers to jumper a number of sockets in any combination.

V10 plug-in jumpers for the power end

V10 jumpers can be used to link individual sockets to one another in groups. A combination of V40 and V10 jumpers is possible, depending on the number of sockets.



B20 plug-in jumpers for the control end

The sockets S10-M and S12 are accessible via the plug-in terminals 5 and 6 for A2 (internal connection). Each element links terminal 6 of the first socket to 5 of the next socket, and 5 of the first socket and 6 of the last socket are always left free to connect the cable. The jumper B20 consists of four coherent parts, which can be separated, however.

Semiconductor relays as an interface to PLC and control systems

Input

Application

The CSS semiconductor switches have a useful life that is practically unlimited in terms of switching cycles. They operate without bounce and permit a high switching frequency

Drive

All versions feature an electrically isolated input for 5 to 32 V DC. The inputs are characterised by a minimum delay with a simultaneously high interference immunity.

DC semiconductor switches

There are two versions with identical performance data.

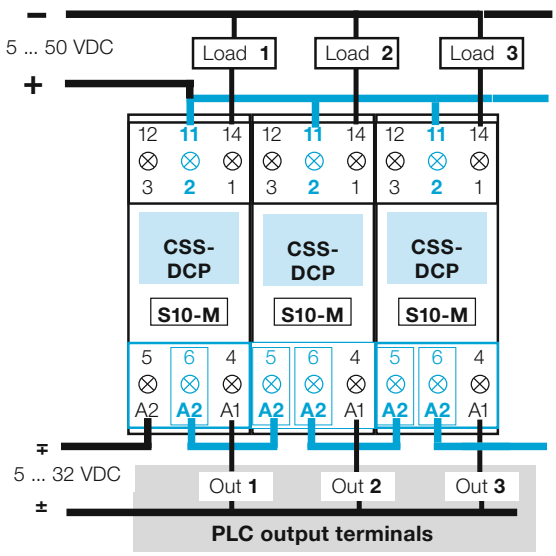
The CSS-DCN version has the common negative terminal 2, and the load is connected to terminal 1. The CSS-DCP has the common positive terminal at terminal 2. The load is connected to terminal 1. This corresponds to an NPN or PNP switch.

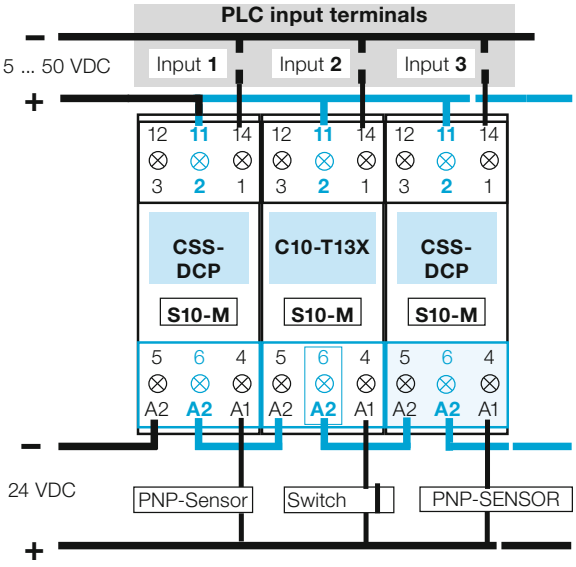
AC switches

The CSS-AZ version switches synchronously, i.e. it switches during the passage through zero. The CSS-AC version switches asynchronously, i.e. the semiconductor switch switches through, independently of the phase, at the moment of detected triggering.

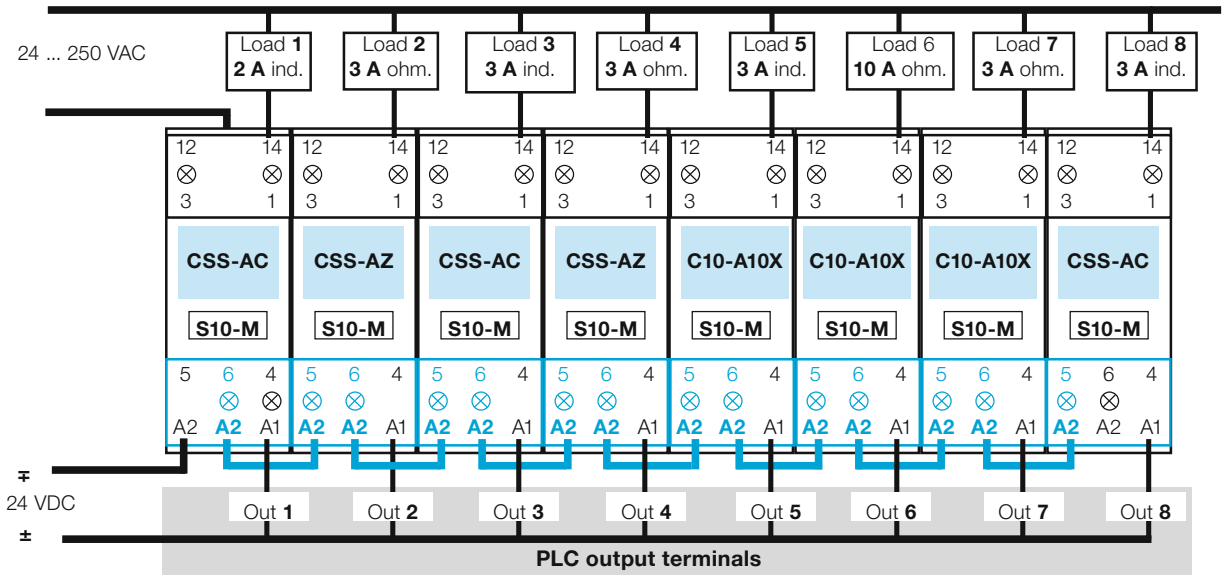
DC applications with mixed components

DC applications with mixed components





AC applications with mixed components



Notes

1.6 High Inrush Relays

Application	Types	Contacts	AC ratings	Socket
Power relay for high inrush current	C7-W1x		10 A / 250 V	S7
Hum-free installation contactor	RIC20		20 A / 400 V	DIN
Universal time relay for high inrush currents	CIM14		16 A / 250 V	DIN
Power relay for high inrush currents	CHI14		16 A / 250 V	DIN

OFTEN UNDERESTIMATED: HIGH INRUSH CURRENTS IN LIGHTING TECHNOLOGY

Lighting technology has been changing for some years now. Traditional light bulbs are rapidly being replaced with energy-efficient light sources such as fluorescent lamps and LEDs. All of these lamps have one thing in common: they require electronic control gear (ECG). The contacts on conventional relays wear out very quickly if used for triggering these devices.

Pre-devices such as relays and contactors are placed under an increased strain when switching ECGs and energy-saving lamps with integrated ECGs. This has to be taken into consideration when planning a new system. Even when refitting the lighting technology in an existing system, the new features have to be accounted for by adapting switching components to suit the new consumers. Be aware, however, that this issue affects more than just light sources. The structure of modern switching power supplies in many devices means that this problem is also found in other areas of electronics and installation. Modern devices require a low operating current but a very high inrush current, which has to be taken into account when designing switching devices.

ECG inrush processes

ECGs and switching power supplies allow for the inrush current to peak at the exact point the device is switched on. High inrush currents are created by the capacitors used in ECGs after the rectifier for smoothing out the current and as an energy store. If a capacitor is entirely discharged, a charging current, similar to an electrical short, may occur during the first micro-seconds of the inrush process.

Our example of an ECG for 2 × 24 W T5 fluorescent lamps shows that peak currents of more than 22 A – measured during the phase maximum – and a half-life of 305 µs may easily occur. During normal operation, this ECG absorbs a current of merely 220 mA. The inrush current is therefore 100 times higher than the nominal current in this example. The data sheets of renowned ECG manufacturers show, however, that inrush currents as high as 60 A may occur – with a lamp output of just 100 W. In daily life, complete lighting groups are most commonly switched on together, thus cumulating the effect of the high inrush current even further.

Great demand placed on relay performance

Common relay types use silver alloys such as silver-nickel (AgNi) for their contacts. They are not designed for inrush currents that are much higher than the nominal current. The thermic loads could weld the contacts shut after just a few switching-cycles. The result: the consumer can no longer be switched off.

An arc is created at the point the contact blades of a relay near each other during the switching process. The contact bounce found in mechanical contacts increases this arc even further. This effect is primarily influenced by the level and half-life of the inrush current. The temperatures created during the process can easily exceed the melting point of the contact alloy, thus leading to the contact blades being welded together.

The information provided in the data sheets of relay and consumer manufacturers is a first point of reference when calculating the correct specifications of a relay. They often disclose the inrush currents and peak times.

Disproportionately high inrush currents create an exceptionally high risk of welding, which is the reason why the contact material must be able to meet increased demands.

Relays for high inrush currents up to 800 A

Comat developed the high power relay CHI14 especially for inrush currents up to 800 A.

The CHI14 has a tungsten (W/$AgSnO_2$) pre-contact with a higher melting point than ordinary silver alloys. This facilitates the switching of currents up to 800 A for 200 µs and 165 A for 20 ms. The switching during zero flow is another special feature of this high-tech product.

This significantly reduces the inrush current. The 2 × 24 W T5 ECG is an impressive example: Fig. 1 shows a inrush current without zero flow switching of 22 A. Thanks to the zero flow switching at almost 3.5 A, the inrush current is 85 % lower in Fig. 2.

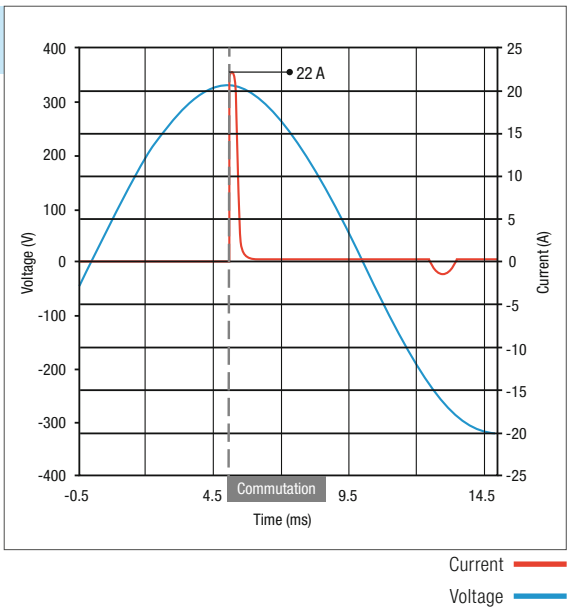
With a 16 A nominal current and a DIN housing with one module width, the CHI14 is suitable for installation in distributors and upgrading existing installations. It is also ideal for use in living areas as its switching process is almost entirely noiseless.

The multi-function time relay CIM14 of similar build features an additional 10 time functions such as stepping switches and automatic light switches in hallways.

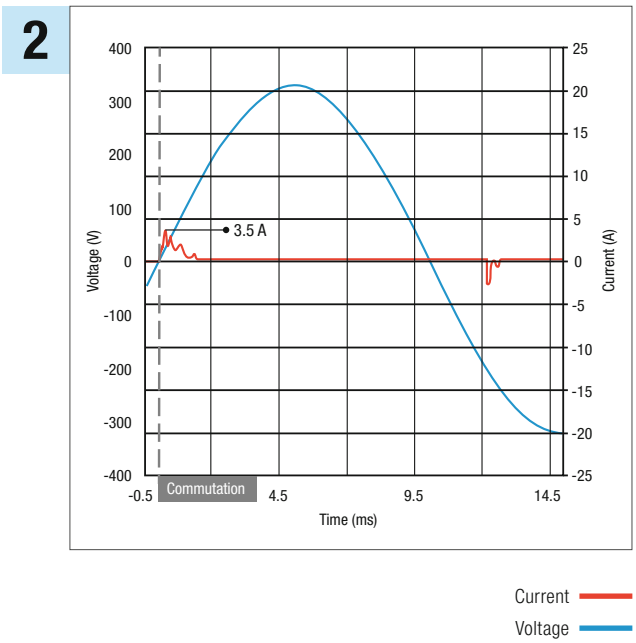
The RIC series contactors have large-surface contacts that disconnect twice. Thanks to $AgSnO_2$ contacts, the RIC 40 and RIC63 types can switch currents up to 150 A for 100 ms. The RAC versions with on-off function and the RBC stepping switches are also interesting options for installation.

The movable relay C7-W10 is ideal for industrial applications. The tungsten (W/$AgSnO_2$) pre-contact makes it possible to handle inrush currents up to 500 A for 2.5 ms.

1



2



QRC series

C7-W1x

4-pin, miniature relay, 1-pole, tungsten contact, faston

Type:	**C7-W1x/ ... V** Power relay for high inrush current 1 pole normally open
Maximum contact load:	**10 A/250 V AC** **6 A/250 V AC5a/b**
Recommended minimum contact load:	**10 mA/10 V**

Contacts

Material	Standard	Code 0	AgNi/W
Rated current			10 A
Switch-on current max. (2,5 ms)			500 A
Switching voltage max.			250 V
AC load (Fig 1)			2,5 kVA
DC load			see fig. 2

Coil

Coil resistance	see table; tolerance ± 10 %
Pick-up voltage	≤ 0,8 x U_N
Release voltage	≥ 0,1 x U_N
Nominal power	1,5 VA (AC)/1,5 W (DC)

Coil table

VAC	Ω	mA	VDC	Ω	mA
24	153	62	12	99	121
48	611	31	24	388	61
115	3K6	13	48	1K5	32
230	14K5	6,5	110	8K	14

Insulation

	Volt rms, 1 min
Contact open	1000 V
Contact/coil	2,5 kV
Insulation resistance at 500 V	≥1 GΩ
Insulation, IEC 61810-1	2,5 kV

Specifications

Ambient temperature operation/storage	-40 (no ice)….60 °C /-40 ... 80 °C
Pick-up time/bounce time	20 ms/≤ 3 ms
Release time/bounce time	10 ms/≤ 1 ms
Mechanical life ops	AC: 10 Mill./DC: 20 Mill.
DC voltage endurance at rated load	≥100000 switching cycles
Switching frequency at rated load	≤ 1200/h
Protection class	IP40
Weight	43 g

Standard types

VAC 50 Hz/60 Hz: 24, 48, 115 (120), 230 (240)	**C7-W10/AC ... V**
LED	**C7-W10X/AC ... V**
VDC 12, 24, 48, 110	**C7-W10/DC ... V**
LED	**C7-W10X/DC ... V**
Free wheeling diode	**C7-W10DX/DC ... V**
Polarity and free wheeling diode	**C7-W10FX/DC ... V**
AC/DC bridge rectifier 24 V, 48 V, 60 V	**C7-W10BX/UC ... V**

"..." Enter the voltage for full type designation

Accessories

Socket:	**S7-M, S7-I/O, S7-L, S7-P, S7-P0**
Optional accessories (blanking plug):	**S9-NP, S9-OP**

Connection diagram

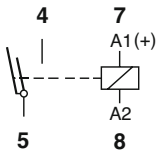


Fig. 1 AC voltage endurance

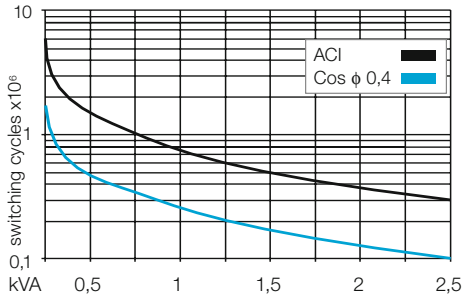
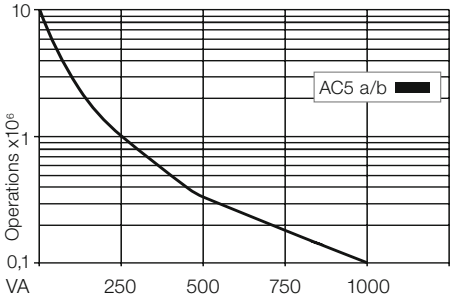
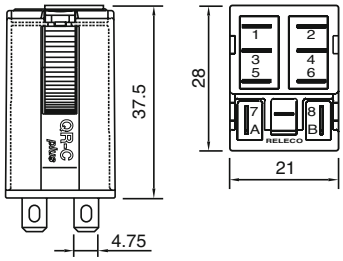


Fig. 2 AC voltage endurance



Dimensions [mm]



Technical approvals, conformities

Lloyd´s

IEC 61810; EN 60947

Installation Contactor

RIC20

20 A, AC/DC control voltage, silent operation
DIN rail mounting according to DIN 43 880

comat RELECO
WORLD OF RELAYS

Type: RIC20-xxx/ ...V
Hum-free installation contactor, 2 contacts, 2 NO, 1 NO-1 NC, 2 NC types available

Rated operational power	**4 kW / 230 V AC-1, 0.5 A / 220 V DC-1**
Recommended minimum contact load	**10 mA / 24 V**

Contacts

Material		AgNi
Rated operational current		20 A
Max. inrush current (100ms)		50 A
Max. switching voltage		400 V
Max. AC load	AC-1, AC-7a	4 kW / 230 V
	AC-3	1.3 kW /230 V (NO contact only)
Max. DC load 24 V / 220 V DC-1 (Fig. 1)		480 W / 130 W

Control input V_n =	**UC 24 V**	**UC 36 V**	**UC 230 V**
Operating voltage range [V]	20.4 … 26.4	30.6 … 39.6	195 … 253
Typ. pic up voltage [V]	17	25	160
Typ. release voltage [V]	7	11	70
Power consumption [W]	≤ 2.5	≤ 2.5	≤ 2.5
Inductive turn-off voltage	None	None	None
Surge immunity EN 6100-4-5	2 kV	2 kV	2 kV

Insulation

Rated insulation voltage	230 V
Rated impulse withstand voltage	4 kV
Min. clearance of open contact	3.6 mm

General Specifications

Ambient temperature	
storage	-30 … 80 °C
operation, Spacer after 2 contactors side by side	-5 … 55 °C
operation, Spacer after 3 contactors side by side	-5 … 40 °C
Pick-up time	15 … 45 ms
Release time	20 … 50 ms
Mechanical life	≥ 3 x 10^6 operations
AC voltage endurance at rated load AC-3, AC-7b	≥ 3 x 10^5 operations
DC voltage endurance at rated load DC-1	10^5 operations
Operating frequency at rated load DC-1	≤ 300 operations / h
Operating frequency at rated load AC-1	≤ 600 operations / h
Conductor cross section coil /contacts	Stranded wire 2.5 mm² / 6 mm²
Max. Screw torque coil /contacts	0.6 Nm / 1.2 Nm
Ingress protection degree	IP 20
Weight	140 g

Standard types

UC (AC / DC) 50 / 60 Hz, 24, 36, 230	**2NO**	**RIC20-200/UC ...V**
	1NO + 1NC	**RIC20-110/UC ...V**
"…" enter the voltage for full type designation	**2NC**	**RIC20-020/UC ...V**

Accessories

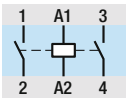
Sealing cover:	**RIC-SEAL 20**
Spacer:	**RIC-DIST**

Samples of lamp loads	**Number of lamps**
Incandescent lamps 230 V / 100 W	20
Fluorescent lamps not corrected 230 V / 36 W	17
Fluorescent lamps electronic ballast units 36 W	15

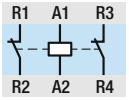
Find more information about RIC, RAC, RBC series on pages 117 – 127.

Mounting information
If multiple contactors are mounted side by side, spacers (RIC DIST) have to be inserted for the purpose of heat dissipation.
Example: Ambient temperature up to 40°C: 1 spacer after 3 RIC // 40…55°C: 1 spacer after 2 RIC.

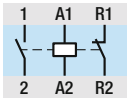
Connection diagram



2xNO
RIC20-200



2xNC
RIC20-020



1xNO + 1xNC
RIC20-110

Coil circuit

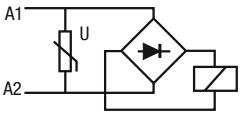
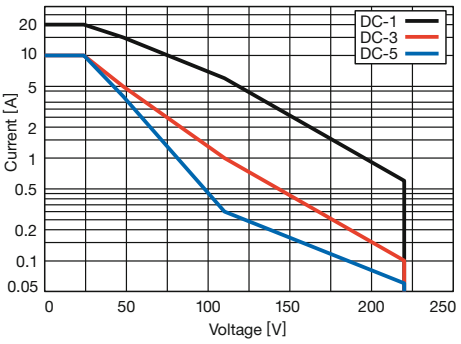
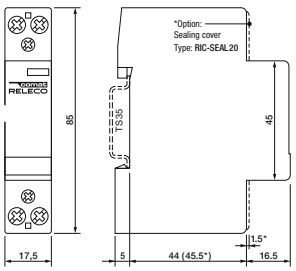


Fig. 1 DC load limit curve DC1



Dimensions [mm]



Technical approvals, conformities

IEC/EN 60947-4-1, VDE 0660
IEC/EN 60947-5-1
IEC/EN 61095, VDE 0637

CIM14

Time relay with NO contact for high inrush currents up to 800 A 8 time functions + stepping function, ON-OFF switch, 50 ms ... 60 h, DIN Rail mounting according to DIN 43 880

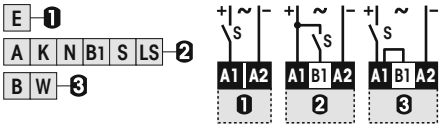
Type: CIM14/UC24-240V

Sophisticated multifunction time relay, 1 NO power contact for high inrush currents up to 800 A with zero crossing switching (50/60 Hz), 8 time functions, stepping function and service function ON/OFF, time ranges: 50 ms … 60 h, multifunction LED state indicator, suitable for any time-control application and also staircase lighting, Light-switch neon lamp current absorption on input B1, Manual switching function for maintenance, emergency, etc., 16.6 Hz power supply applications. Railway version available.

Maximum contact load	**16 A / 250 V AC-1 384 W DC-1**
Recommended minimum contact load	**100 mA / 12 V**

Time functions and related connection diagrams (Function diagrams: refer to page 152)

The functions are selectable by rotary switch



LED function table:

LED	Relay	Time run
OFF	OFF	NO
Continuous ON	ON	NO
Short blinking	OFF	YES
Long blinking	ON	YES

Time data

7 partial time ranges, t_{max} (rotary switch)	0.6, 6, 60 s / 6, 60 min / 6, 60 h
Fine adjustment range (rotary knob)	t_{min} … t_{max}, 0.5 … 6
Time range tolerance	t_{min}: -5 % … +0 % / t_{max}: -0 % … +5 %
Repetition accuracy	± 0.1 % or DC: 2 ms / AC: 10 ms
Response time, power on, on A1	≤ 45 ms
Min. trigger pulse on B1	20 ms (AC / DC)
Reset time B1 (AC/DC)	≤ 30 ms
Voltage failure buffering (50 / 60 Hz)	≥ 20 ms

Contacts

Material	W / $AgSnO_2$
Rated operational current at 40 °C / 60 °C	16 A / 13 A
Max. inrush current	165 A / 20 ms
	800 A / 200 µs
Max. switching voltage AC-1	250 V
Max. AC load AC-1 (Fig.1)	4 kVA
Max. DC load DC-1 24 V	384 W

Power supply- and control input

Nominal voltage (A1, B1)	**UC 24-240 V (UC = AC / DC)**
Operating voltage range	16.8 … 250 V
Power consumption	1.2 VA / 0.43 W
Frequency range	16 … 60 Hz
Allowed DC residual current into B1	≤ 0.5 mA
AC Neon lamp residual current into B1	≤ 10 mA
Trigger threshold voltage on B1, AC / DC	15 / 17 V

Insulation

Test voltage open contact	1 kVrms 1 minute
Test voltage between contacts and control input	2.5 kVrms 1 minute

General Specifications

Ambient temperature storage /operation	-40 … 85 °C / -40 …60 °C
Mechanical life of contact	5 x 10^6 operations
Conductor cross section	Stranded wire 2.5 mm^2, 2 x 1.5 mm^2
Ingress protection degree	IP 20
Max. Screw torque	0.4 Nm
Housing material / weight	Lexan / 70 g

Standard types

UC (AC/DC) 15...60 Hz	**CIM14/UC24-240V**

Connection diagram

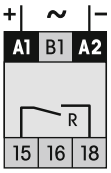


Fig.1 AC voltage endurance

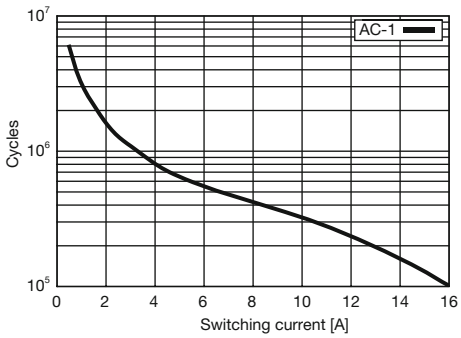
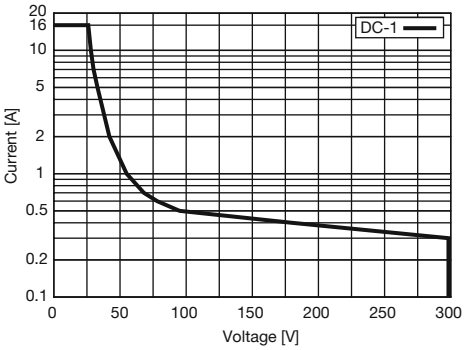
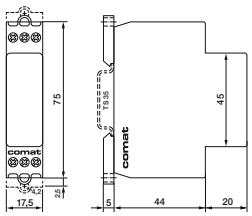


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

EN 50155, EN 60730

CHI14

Power relay for high inrush currents up to 800 A
DIN Rail mounting according to DIN 43 880

Type: CHI14/UC24-240V

The CHI14 is a power relay for all applications effecting high inrush currents up to 800 A such as electronic control gears of energy saving lamps, power supplies of the latest LED lights and switching supplies of industrial components. These loads show an inrush current up to 250 times of their nominal current.

The CHI14 is equipped with a low noise operating NO contact with a nominal current up to 16 A and complies with the applicable DIN standards 43880 with installation dimension of 17.5 mm (1 module width).

Maximum contact load	**16 A / 250 V AC-1 384 W DC-1**
Recommended minimum contact load	**100 mA / 12 V**

Contacts

Material	W / $AgSnO_2$
Rated operational current at 40 °C / 60 °C	16 A / 13 A
Max. inrush current	165 A / 20 ms
	800 A / 200 µs
Max. switching voltage AC-1	250 V
Max. AC load AC-1 (Fig.1)	4 kVA
Max. DC load DC-1 24 V /	384 W

Power supply- and control input

Nominal voltage (A1, B1)	**UC 24-240 V (UC = AC / DC)**
Operating voltage range	16.8 … 250 V
Power consumption	1.2 VA / 0.43 W
Frequency range	16 … 60 Hz

Insulation

Test voltage open contact	1 kVrms 1 minute
Test voltage between contacts and control input	2.5 kVrms 1 minute

General Specifications

Ambient temperature storage /operation	-40 … 85 °C / -40 …60 °C
Mechanical life of contact	5 x 10^6 operations
Conductor cross section	Stranded wire 2.5 mm^2, 2 x 1.5 mm^2
Ingress protection degree	IP 20
Max. Screw torque	0.4 Nm
Housing material / weight	Lexan / 70 g

Standard types

UC (AC/DC) 15…60 Hz	**CHI14/UC24-240V**

Connection diagram

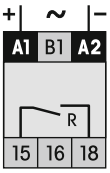


Fig.1 AC voltage endurance

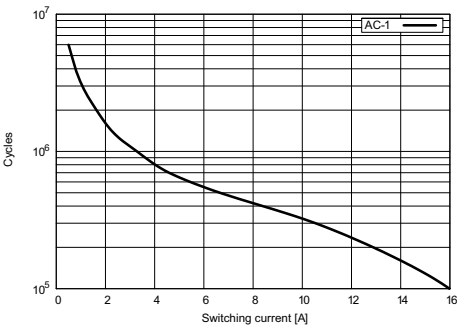
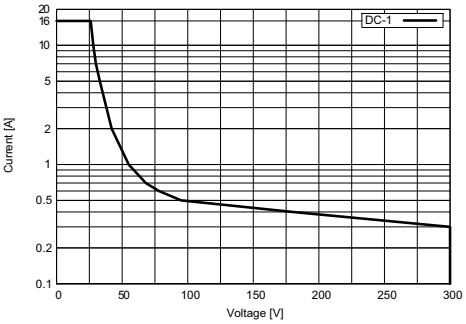
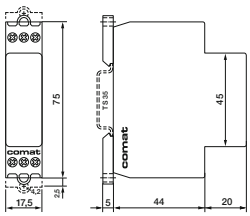


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

EN 50155, EN 60730

Notes

1.7 Motor Control Relays

Application	Types	Output	DC ratings	Mounting
DC Motor controller	CMC1	2x MOSFET	16 A (20 A) / 24 V	DIN
	CMC15	2x MOSFET H bridge	10 A (20 A) / 24 V	DIN
	CMC16	2x MOSFET H bridge	10 A (20 A) / 24 V	DIN
DC Motor control relay	KDM3-24	1x PNP & 1x NPN	3 A / 32 V	S7-C

CMC1

DC Motor controller with adjustable start and breaking ramps for DC motors up to 384W

Type: CMC1/DC12-24V

The CMC is a control device for DC motors and permits operation in both rotating directions, i. e. the rotating direction can be reversed with the input signal. Alternatively, two motors can be operated in the same direction.
The CMC1 allows also to control lamps or electromagnets. The start and breaking ramps of the connected loads can be adjusted by two potentiometers in the time range 0 - 4 seconds.

Maximum load	**16 A / 24 V**

Outputs	**Drive**
Type	MOSFET
Nominal switching current	16 A
Inrush current	20 A (short-term)
Nominal voltage	24 V
Switching power	384 W

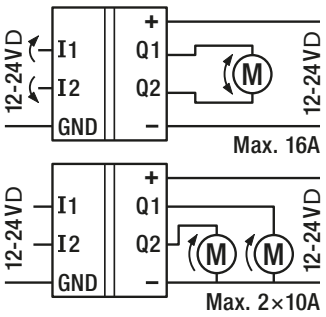
Control input V_n =	**12-24 V**
Nominal operating voltage range (DC)	12 – 24 V
Admissible voltage range (DC)	8 – 28 V
Current consumption	DC
12 V	3 mA
24 V	6 mA

Power supply	
Nominal operating voltage (DC)	12 – 24 V
Operating voltage (DC)	8 – 28 V
Max. current consumption without load	10 mA
Max. power consumption	DC
12 V	120 mW
24 V	240 mW

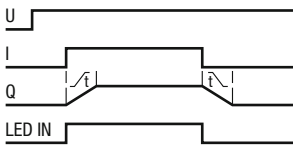
General Specifications	
Ambient temperature storage/operation	-40 – +85°C / -25 – +60°C
Connection terminals	Screw terminal 2.5 mm^2
DC voltage endurance at rated load	> 100 000 h (at 25 °C)
Ingress protection degree	IP 20
Mounting	DIN rail TS35
Housing material	Aluminium
Weight	80 g

Standard types	
DC 12-24	**CMC1/DC12-24V**

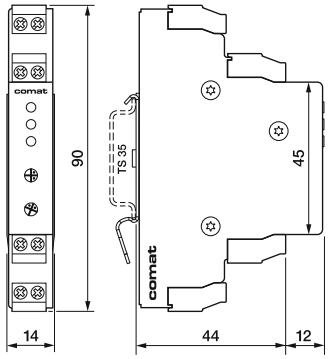
Connection diagram



Function diagramm



Dimensions [mm]



Technical approvals, conformities

CMC15

DC Motor controller with adjustable start and breaking ramps and speed control by 0 ... 10 V signal for DC motors up to 240W

Type: CMC15/DC12-24V

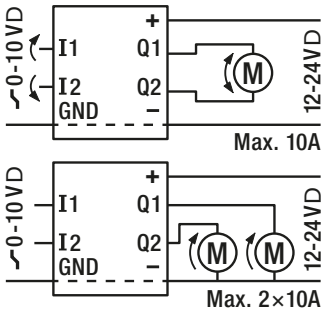
The CMC15 is a control device for DC motors and permits operation in both rotating directions, i. e. the rotating direction can be reversed with the input signal. Alternatively two motors can be operated in the same rotating direction. The motor speed is set by a 0 – 10 V signal.

Maximum load	**10 A / 24 V**
Outputs	**Drive**
Type	MOSFET H bridge
Nominal switching current	10 A
Inrush current	20 A / max. 3 s
Nominal voltage	24 V
Switching power	240 W
Analogue inputs	
Nominal operating voltage range (DC)	0 – 10 V
Resolution	8 Bit
Input impedance	55 kΩ
Power supply	
Nominal operating voltage (DC)	12 – 24 V
Operating voltage (DC)	8 – 28 V
Max. current consumption without load	10 mA
Max. power consumption	DC
12 V	120 mW
24 V	240 mW
Time response	
Start ramp	0 – 2 s
Breaking ramp	0 – 2 s
General Specifications	
Ambient temperature storage/operation	-40 – +85°C / -25 – +60°C
Connection terminals	Screw terminal 2.5 mm^2
DC voltage endurance at rated load	> 100 000 h (at 25 °C)
Ingress protection degree	IP 20
Mounting	DIN rail TS35
Housing material	Aluminium
Weight	80 g

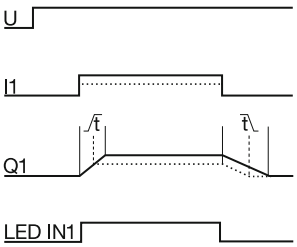
Standard types

DC 12-24	**CMC15/DC12-24V**

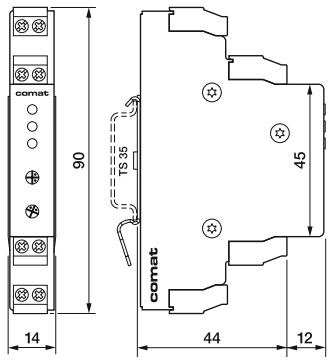
Connection diagram



Function diagramm



Dimensions [mm]



Technical approvals, conformities

CMC16

DC Motor controller with adjustable start and breaking ramps and speed control by 4 ... 20 mA signal for DC motors up to 240W

Type: CMC16/DC12-24V

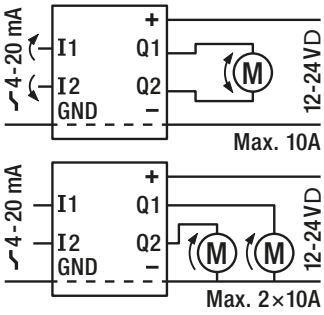
The CMC16 is a control device for DC motors and permits operation in both rotating directions, i. e. the rotating direction can be reversed with the input signal. Alternatively two motors can be operated in the same rotating direction. The motor speed is set by a 4 – 20 mA signal.

Maximum load	**10 A / 24 V**
Outputs	**Drive**
Type	MOSFET H bridge
Nominal switching current	10 A
Inrush current	20 A / max. 3 s
Nominal voltage	24 V
Switching power	240 W
Analogue inputs	
Nominal operating voltage range (DC)	4 – 20 mA
Resolution	8 Bit
Input impedance	190 Ω
Power supply	
Nominal operating voltage (DC)	12 – 24 V
Operating voltage (DC)	8 – 28 V
Max. current consumption without load	10 mA
Max. power consumption	DC
12 V	120 mW
24 V	240 mW
Time response	
Start ramp	0 – 2 s
Breaking ramp	0 – 2 s
General Specifications	
Ambient temperature storage/operation	-40 – +85°C / -25 – +60°C
Connection terminals	Screw terminal 2.5 mm^2
DC voltage endurance at rated load	> 100 000 h (at 25 °C)
Ingress protection degree	IP 20
Mounting	DIN rail TS35
Housing material	Aluminium
Weight	80 g

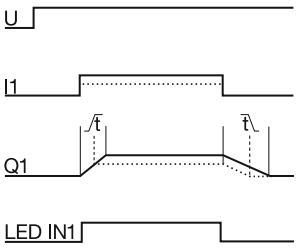
Standard types

DC 12-24	**CMC16/DC12-24V**

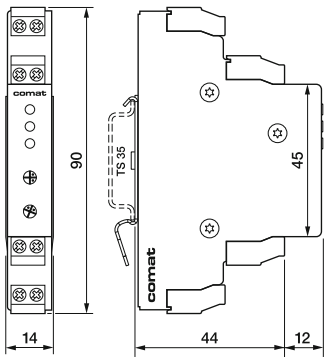
Connection diagram



Function diagramm



Dimensions [mm]



Technical approvals, conformities

Plug-in solid state relay

KDM 3-24

DC Motor control relay with brake function, DC 24 V
1 high side switch and 1 N-channel brake switch

Type: KDM 3-24/DC12-24V R
Solid state relay for DC-motor control
and similar applications
1 high side + 1 N channel transistor switch
All overload and short circuit protected
Adjustable or disabled brake function by
external resistor or jumper
LED status indicator
Pluggable module

Maximum load	**3 A / 32 V**	
Outputs	**Drive**	**Brake**
Type: Power MOS FET	High side	N-channel
Max. switching current	3 A	3 A, 10 sec
Max. continuous current	3 A (5 A) [1]	2 A
Max. inrush current, 1 sec [2]	20 A	7
Switching voltage range	10 … 32 V	10 … 32 V
Max. Load	100 W	65 W
Thermal overload protection [2]	self restoring	self restoring
Over current limiting [2]	typ. 35 A	7 … 14 A
Clamp voltage	typ. 58 V	60 … 70 V
Max. inductive switch-off energy [2]	1 Ws single pulse	0.4 Ws single pulse
ON resistance @ 25 °C	≤ 50 mΩ	≤ 100 mΩ
Leakage current	≤ 10 µA	

[1] Repetitive operation: When the ratio t_{pulse} / t_{cycle} is a low value then the current can be increased up to 5 A @ $T_A \leq 50$ °C.
[2] Not for continous repetitive operation

Control input V_N =	**DC 12-24 V**
Operating voltage range	9 … 28 V
Release voltage	≤ 2 V
Typical input current @ 12 / 24 V	2 / 6.5 mA
Power consumption @ 12 / 24 V	25 / 160 mW
Polarity reversal	protected

General Specifications	
Ambient temperature storage/operation	-40 … +85°C / -25 … +60°C
ON delay	1 ms
Release time	1 ms
Ingress protection degree	IP 40 when the device is plugged in
Housing material	Lexan
Weight	27 g

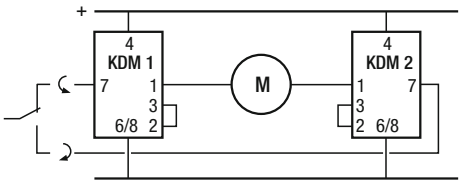
Standard types

DC 12-24	**KDM3-24/DC12-24V R**

Accessories

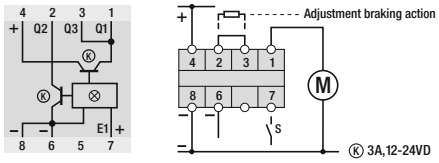
Socket:	**S7-C**

Application example
Four quadrant (forward / reversed) motor control

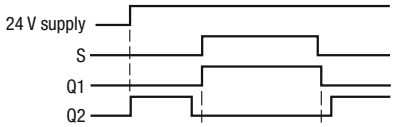


Operating with brake resistors (on 2–3) is not recommended in this application.

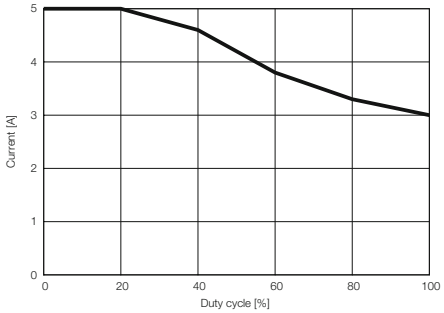
Connection diagram



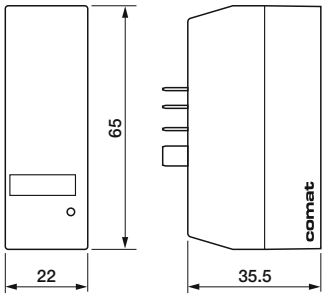
Function diagramm



Output current vs. duty cycle



Dimensions [mm]



Technical approvals, conformities

Notes

1.8 Installation Contactors

- Different versions NO; NC; NC + NO
- AC/DC Coil Hum free
- No EMC (free wheeling circuit included)
- Robust and compact
- Wide Range of application
- Mouting according DIN/EN 43880 on DIN Rail TS 35
- Sealing cover optional

Installation Contactor

RIC20

20 A, AC/DC control voltage, silent operation
DIN rail mounting according to DIN 43 880

Type: RIC20-xxx/ ...V

Hum-free installation contactor, 2 contacts, 2 NO, 1 NO-1 NC, 2 NC types available

Rated operational power	**4 kW / 230 V AC-1, 0.6 A / 220 V DC-1**
Recommended minimum contact load	**50 mA / 24 V**

Contacts

Material		AgNi
Rated operational current		20 A
Max. inrush current (100ms)		50 A
Max. switching voltage		230 V
Max. AC load	AC-1, AC-7a	4 kW / 230 V
	AC-3	1.3 kW / 230 V (NO) 0.75 kW / 230 V (NC)
Max. DC load 24 V / 220 V DC-1 (Fig. 1)		480 W / 130 W

Control input V_n =	**UC 24 V**	**UC 36 V**	**UC 230 V**
Operating voltage range [V]	20.4 ... 26.4	30.6 ... 39.6	195 ... 253
Typ. pic up voltage [V]	17	25	160
Typ. release voltage [V]	7	11	70
Power consumption [W]	2.1	2.1	2.1
Inductive turn-off voltage	None	None	None
Surge immunity EN 6100-4-5	2 kV	2 kV	2 kV

Insulation

Rated insulation voltage	230 V
Rated impulse withstand voltage	4 kV
Min. clearance of open contact	3.6 mm

General Specifications

Ambient temperature	
storage	-30 ... 80 °C
operation, Spacer after 2 contactors side by side	-5 ... 55 °C
operation, Spacer after 3 contactors side by side	-5 ... 40 °C
Pick-up time	15 ... 45 ms
Release time	20 ... 50 ms
Mechanical life	≥ 3 x 10^6 operations
AC voltage endurance at rated load AC-3, AC-7b	≥ 3 x 10^5 operations
DC voltage endurance at rated load DC-1	10^5 operations
Operating frequency at rated load DC-1	≤ 300 operations / h
Operating frequency at rated load AC-1	≤ 600 operations / h
Conductor cross section coil /contacts	Stranded wire 2.5 mm^2 / 6 mm^2
Max. Screw torque coil /contacts	0.6 Nm / 1.2 Nm
Ingress protection degree	IP 20
Weight	140 g

Standard types

UC (AC / DC) 50 / 60 Hz, 24, 36, 230	**2NO**	**RIC20-200/UC ...V**
	1NO + 1NC	**RIC20-110/UC ...V**
"..." enter the voltage for full type designation	**2NC**	**RIC20-020/UC ...V**

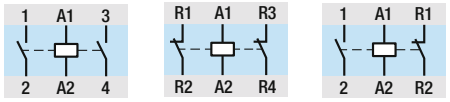
Accessories

Sealing cover:	**RIC-SEAL 20**
Spacer:	**RIC-DIST**

Samples of lamp loads	**Number of lamps**
Incandescent lamps 230 V / 100 W	20
Fluorescent lamps not corrected 230 V / 36 W	17
Fluorescent lamps electronic ballast units 36 W	10

Mounting information
If multiple contactors are mounted side by side, spacers (RIC DIST) have to be inserted for the purpose of heat dissipation.
Example: Ambient temperature up to 40°C: 1 spacer after 3 RIC // 40...55°C: 1 spacer after 2 RIC.

Connection diagram



2xNO RIC20-200 | 2xNC RIC20-020 | 1xNO + 1xNC RIC20-110

Coil circuit

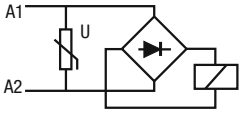
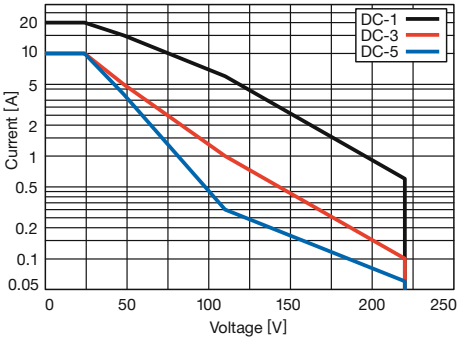
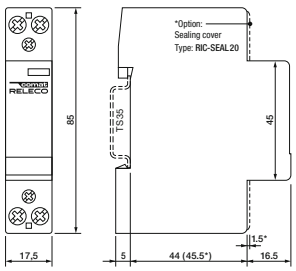


Fig. 1 DC load limit curve DC-1



Dimensions [mm]



Technical approvals, conformities

IEC/EN 60947-4-1, VDE 0660
IEC/EN 60947-5-1
IEC/EN 61095, VDE 0637

Installation Contactor

RIC25

25 A, AC/DC control voltage, silent operation
DIN Rail mounting according to DIN 43 880

Type: RIC25-xxx/ ...V

Hum-free installation contactor, 4 contacts, 4 NO, 4 NC, 2 NO-2 NC types available

Rated operational power AC-1	**Single phase: 5.4 kW/230 V, 0.6 A/220 V DC-1** **3 phase 230 V: 9 kW** **3 phase 400 V: 16 kW**
Recommended minimum contact load	**50 mA / 24 V**

Contacts

Material		AgNi
Rated operational current		25 A
Max. inrush current (100ms)		50 A
Max. switching voltage		400 V
Max. AC load 3 phase	AC-1, AC-7a	9 kW / 230 V, 16 kW / 400 V
	AC-3	2.2 kW /230 V, 4 kW / 400 V
Max. DC load 24V/220V DC-1 (Fig. 1)		600 W / 130 W

Control input V_n =	**UC 24 V**	**UC 36 V**	**UC 230 V**
Operating voltage range [V]	20.4 … 26.4	30.6 … 39.6	195 … 253
Typ. pic up voltage [V]	17	25	160
Typ. release voltage [V]	7	11	70
Power consumption [W]	2.6	2.6	2.6
Inductive turn-off voltage	None	None	None
Surge immunity EN 6100-4-5	2 kV	2 kV	2 kV

Insulation

Rated insulation voltage	440 V
Rated impulse withstand voltage	4 KV
Min. clearance of open contact	3.6 mm

General Specifications

Ambient temperature		
storage		-30 … 80 °C
operation, Spacer after 2 contactors side by side		-5 … 55 °C
operation, Spacer after 3 contactors side by side		-5 … 40 °C
Pick-up time		15 … 45 ms
Release time		20 … 70 ms
Mechanical life		≥ 3 x 10^6 operations
AC voltage endurance at rated load	AC-3, AC-7b	≥ 5 x 10^5 operations
DC voltage endurance at rated load	DC-1	10^5 operations
Operating frequency at rated load	DC-1	≤ 300 operations / h
Operating frequency at rated load	AC-1, AC-3	≤ 600 operations / h
Conductor cross section coil / contacts terminals		Stranded wire 2.5 mm² / 6 mm²
Max. Screw torque coil / contacts		0.6 Nm / 1.2 Nm
Ingress protection degree		IP 20
Weight		270 g

Standard types

UC (AC / DC) 50 / 60 Hz, 24, 36, 230	**4NO**	**RIC25-400/UC ...V**
	2NO + 2NC	**RIC25-220/UC ...V**
"..." enter the voltage for full type designation	**4NC**	**RIC25-040/UC ...V**

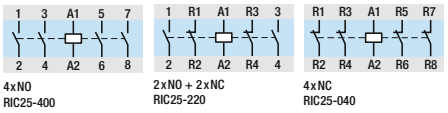
Accessories

Auxillary contact bloc:	**RIC-AUX..**
Sealing cover:	**RIC-SEAL 25**
Spacer:	**RIC-DIST**

Samples of lamp loads	**Number of lamps**
Incandescent lamps 230 V/ 100 W	20
Fluorescent lamps not corrected 230 V/ 36 W	20
Fluorescent lamps electronic ballast units 36 W	14

Mounting information
If multiple contactors are mounted side by side, spacers (RIC DIST) have to be inserted for the purpose of heat dissipation.
Example: Ambient temperature up to 40°C: 1 spacer after 3 RIC // 40…55°C: 1 spacer after 2 RIC.

Connection diagram



Coil circuit

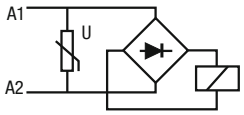
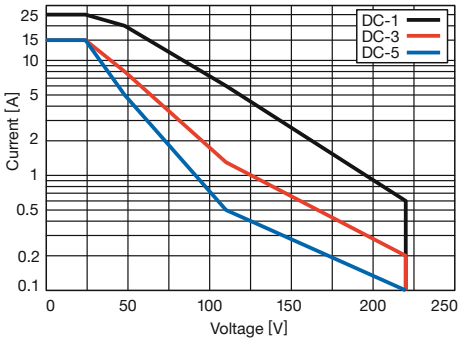
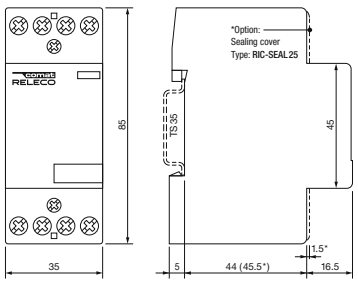


Fig. 1 DC load limit curve DC-1



Dimensions [mm]



Technical approvals, conformities

IEC/EN 60947-4-1
IEC/EN 60947-5-1
IEC/EN 61095

Installation Contactor

RIC40

40 A, AC/DC control voltage, silent operation
DIN rail mounting according to DIN 43 880

Type: RIC 40-xxx/…V

Hum-free installation contactor, 4 contacts, 4 NO, 2 NO-2 NC, 4 NC types available

Rated operational power AC-1	**Single phase: 8.7 kW/230 V, 1.2 A / 220 V DC-1** **3 phase 230 V: 16 kW** **3 phase 400 V: 26 kW**
Recommended minimum contact load	**50 mA / 24 V**

Contacts

Material		$AgSnO_2$
Rated operational current		40 A
Max. inrush current (100ms)		150 A
Max. switching voltage		400 V
Max. AC load 3 phase	AC-1, AC-7a	16 kW / 230 V, 26 kW / 400 V
	AC-3	3.7 kW / 230 V, 11 kW / 400 V
Max. DC load 24V/220V DC-1(Fig. 1)		960 W / 260 W

Control input V_N = AC 50 / 60 Hz / DC	**UC 24 V**	**UC 230 V**
Operating voltage range [V]	20.4 … 26.4	195 … 253
Typ. pic up voltage [V]	17	160
Typ. release voltage [V]	7	70
Power consumption [W]	6	5
Inductive turn-off voltage	None	None
Surge immunity EN 6100-4-5	2 kV	2 kV

Insulation

Rated insulation voltage	440 V
Rated impulse withstand voltage	4 kV
Min. clearance of open contact	3.6 mm

General Specifications

Ambient temperature		
storage		-30 … 80 °C
operation, Spacer after 2 contactors side by side		-5 … 55 °C
operation, Spacer after 3 contactors side by side		-5 … 40 °C
Pick-up time		15 … 20 ms
Release time		35 … 45 ms
Mechanical life		≥ 3 x 10^6 operations
AC voltage endurance at rated load	AC-3, AC-7b	≥ 1.5 x 10^5 operations
DC voltage endurance at rated load	DC-1	10^5 operations
Operating frequency at rated load	DC-1	≤ 300 operations / h
Operating frequency at rated load	AC-1, AC-3	≤ 600 operations / h
Conductor cross section coil /contacts terminals		Stranded wire 2.5 mm^2 / 16 mm^2
Max. Screw torque coil /contacts		0.6 Nm / 3.5 Nm
Ingress protection degree		IP 20
Weight		420 g

Standard types

UC (AC / DC) 50 / 60 Hz, 24, 230	**4NO**	**RIC40-400/UC …V**
	2NO + 2NC	**RIC40-220/UC …V**
"…" enter the voltage for full type designation	**4NC**	**RIC40-040/UC …V**

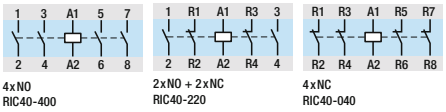
Accessories

Auxiliary contact bloc:	**RIC-AUX..**
Sealing cover:	**RIC-SEAL 40-63**
Spacer:	**RIC-DIST**

Samples of lamp loads	**Number of lamps**
Incandescent lamps 230 V / 100 W	40
Fluorescent lamps not corrected 230 V / 36 W	65
Fluorescent lamps electronic ballast units 36 W	40

Mounting information
If multiple contactors are mounted side by side, spacers (RIC DIST) have to be inserted for the purpose of heat dissipation.
Example: Ambient temperature up to 40°C: 1 spacer after 3 RIC // 40…55°C: 1 spacer after 2 RIC.

Connection diagram



Coil circuit

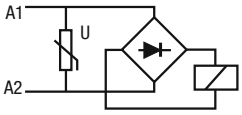
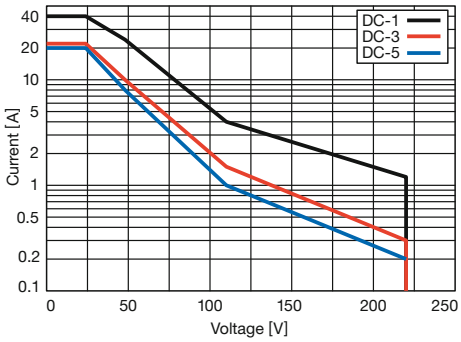
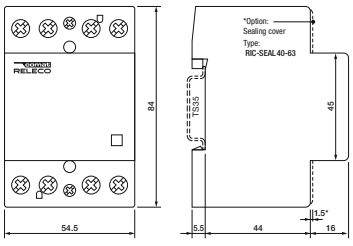


Fig. 1 DC load limit curve DC-1



Dimensions [mm]



Technical approvals, conformities

IEC/EN 60947-4-1
IEC/EN 60947-5-1
IEC/EN 61095

Installation Contactor

RIC63

63 A, AC/DC control voltage, silent operation
DIN Rail mounting according to DIN 43 880

Type: RIC 63-xxx/...V

Hum-free installation contactor, 4 contacts, 4 NO, 2 NO-2 NC types available

Rated operational power AC-1	**Single phase: 13.3 kW / 230 V, 1.2 A / 220 VDC-1** **3 phase 230 V: 24 kW** **3 phase 400 V: 40 kW**
Recommended minimum contact load	**50 mA / 24 V**

Contacts		
Material		$AgSnO_2$
Rated operational current		63 A
Max. inrush current (100ms)		150 A
Max. switching voltage		400 V
Max. AC load 3 phase	AC-1, AC-7a	24 kW / 230 V, 40 kW / 400 V
	AC-3	5 kW / 230 V, 15 kW / 400 V
Max. DC load 24 V / 220 V DC-1(Fig. 1)		1500 W / 260 W

Control input V_N = AC 50 / 60 Hz / DC	**UC 24 V**	**UC 230 V**
Operating voltage range [V]	20.4 ... 26.4	195 ... 253
Typ. pic up voltage [V]	17	160
Typ. release voltage [V]	7	70
Power consumption [W]	≤ 5	≤ 5
Inductive turn-off voltage	None	None
Surge immunity EN 6100-4-5	2 kV	2 kV

Insulation	
Rated insulation voltage	440 V
Rated impulse withstand voltage	4 kV
Min. clearance of open contact	3.6 mm

General Specifications		
Ambient temperature		
storage		-30 ... 80 °C
operation, Spacer after 2 contactors side by side		-5 ... 55 °C
operation, Spacer after 3 contactors side by side		-5 ... 40 °C
Pick-up time		15 ... 20 ms
Release time		35 ... 45 ms
Mechanical life		≥ 3 x 10^6 operations
AC voltage endurance at rated load	AC-3, AC-7b	≥ 1.5 x 10^5 operations
DC voltage endurance at rated load	DC-1	10^5 operations
Operating frequency at rated load	DC-1	≤ 300 operations / h
Operating frequency at rated load	AC-1, AC-3	≤ 600 operations / h
Conductor cross section coil /contacts terminals		Stranded wire 2.5 mm^2 / 16 mm^2
Max. Screw torque coil /contacts		0.6 Nm / 3.5 Nm
Ingress protection degree		IP 20
Weight		420 g

Standard types

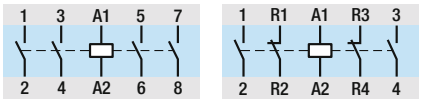
UC (AC / DC) 50 / 60 Hz, 24, 230	**4NO**	**RIC63-400/UC ...V**
"..." enter the voltage for full type designation	**2NO + 2NC**	**RIC63-220/UC ...V**

Accessories	
Auxiliary contact bloc:	**RIC-AUX..**
Sealing cover:	**RIC-SEAL 40-63**
Spacer:	**RIC-DIST**

Samples of lamp loads	**Number of lamps**
Incandescent lamps 230 V / 100 W	50
Fluorescent lamps not corrected 230 V / 36 W	95
Fluorescent lamps electronic ballast units 36 W	57

Mounting information
If multiple contactors are mounted side by side, spacers (RIC DIST) have to be inserted for the purpose of heat dissipation.
Example: Ambient temperature up to 40°C: 1 spacer after 3 RIC // 40...55°C: 1 spacer after 2 RIC.

Connection diagram



4xNO
RIC63-400

2xNO + 2xNC
RIC63-220

Coil circuit

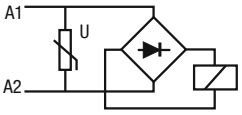
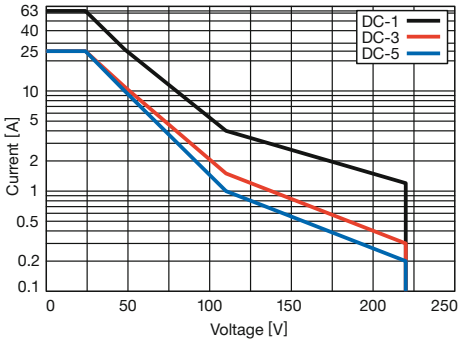
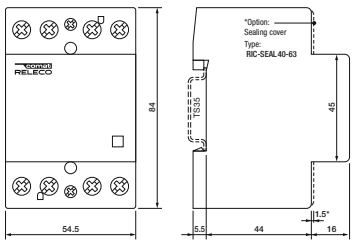


Fig. 1 DC load limit curve DC-1



Dimensions [mm]



Technical approvals, conformities

IEC/EN 60947-4-1
IEC/EN 60947-5-1
IEC/EN 61095

Installation Contactor

RIC-AUX

4 A auxiliary contact bloc with 2 double contacts, 3 different combinations of NO / NC contacts

Type: RIC AUXxx

2 double contacts, 2 NO, 1 NC-1 NO, 2 NC types available

Maximum contact load AC-15	**4 A / 230 V, 4 A / 400 V**
Recommended minimum contact load	**5 mA / 24 V**

Contacts

Material	AgNi
Rated operational current AC-15	4 A / 230 V, 4 A / 400 V
Max. switching voltage with RIC 20	400 V

Insulation

Rated insulation voltage	500 V
Rated impulse withstand voltage	4 kV

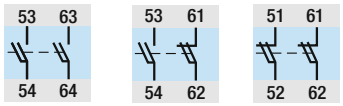
Specifications

Ambient temperature storage / operation	-30 … 80 °C / -5 … 55 °C
Operating frequency at rated load	≤ 600 operations / h
Conductor cross section	Stranded wire 2.5 mm^2
Max. Screw torque	0.6 Nm
Ingress protection degree	IP 20
Weight	50 g

Standard types

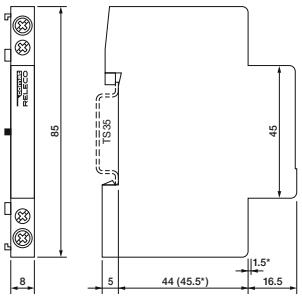
2NO	**RIC-AUX20**
1NO + 1NC	**RIC-AUX11**
2NC	**RIC-AUX02**

Connection diagram



2xNO RIC-AUX20 | 1xNO + 1xNC RIC-AUX11 | 2xNC RIC-AUX02

Dimensions [mm]



Technical approvals, conformities

IEC/EN 60947-4-1
IEC/EN 60947-5-1
IEC/EN 61095

Installation Contactor

RAC20

20 A, AC/DC control voltage, silent operation
DIN rail mounting according to DIN 43 880

Type: RAC20-xxx/ ...V

Hum-free installation contactor, 2 contacts, 2 NO, 1 NO-1 NC, 2 NC types available.
Manual actuating and locking

Rated operational power	**4 kW / 230 V AC-1, 0.6 A / 220 V DC-1**
Recommended minimum contact load	**50 mA / 24 V**

Contacts		
Material		AgNi
Rated operational current		20 A
Max. inrush current (100ms)		50 A
Max. switching voltage		230 V
Max. AC load	AC-1, AC-7a	4 kW / 230 V
	AC-3	1.3 kW /230 V (NO) 0.75 kW / 230 V (NC)
Max. DC load 24 V / 220 V DC-1 (Fig. 1)		480 W / 130 W

Control input V_n =	**UC 24 V**	**UC 36 V**	**UC 230 V**
Operating voltage range [V]	20.4 … 26.4	30.6 … 39.6	195 … 253
Typ. pic up voltage [V]	17	25	160
Typ. release voltage [V]	7	11	70
Power consumption [W]	2.1	2.1	2.1
Inductive turn-off voltage	None	None	None
Surge immunity EN 6100-4-5	2 kV	2 kV	2 kV

Insulation	
Rated insulation voltage	230 V
Rated impulse withstand voltage	4 kV
Min. clearance of open contact	3.6 mm

General Specifications	
Ambient temperature	
storage	-30 … 80 °C
operation, Spacer after 2 contactors side by side	-5 … 55 °C
operation, Spacer after 3 contactors side by side	-5 … 40 °C
Pick-up time	15 … 45 ms
Release time	20 … 50 ms
Mechanical life	≥ 3 x 10^6 operations
AC voltage endurance at rated load AC-3, AC-7b	≥ 3 x 10^5 operations
DC voltage endurance at rated load DC-1	10^5 operations
Operating frequency at rated load DC-1	≤ 300 operations / h
Operating frequency at rated load AC-1	≤ 600 operations / h
Conductor cross section coil /contacts	Stranded wire 2.5 mm² / 6 mm²
Max. Screw torque coil /contacts	0.6 Nm / 1.2 Nm
Ingress protection degree	IP 20
Weight	140 g

Standard types

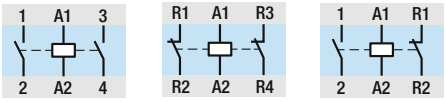
UC (AC / DC) 50 / 60 Hz, 24, 36, 230	**2NO**	**RAC20-200/UC ...V**
	1NO + 1NC	**RAC20-110/UC ...V**
"..." enter the voltage for full type designation	**2NC**	**RAC20-020/UC ...V**

Accessories	
Auxiliary contact bloc:	**RIC-AUX..**
Sealing cover:	**RIC-SEAL 20**
Spacer:	**RIC-DIST**

Samples of lamp loads	**Number of lamps**
Incandescent lamps 230 V / 100 W	20
Fluorescent lamps not corrected 230 V / 36 W	17
Fluorescent lamps electronic ballast units 36 W	10

Mounting information
If multiple contactors are mounted side by side, spacers (RIC DIST) have to be inserted for the purpose of heat dissipation.
Example: Ambient temperature up to 40°C: 1 spacer after 3 RAC // 40...55°C: 1 spacer after 2 RAC.

Connection diagram



2xNO RAC20-200 | 2xNC RAC20-020 | 1xNO + 1xNC RAC20-110

Coil circuit

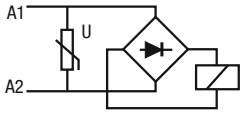
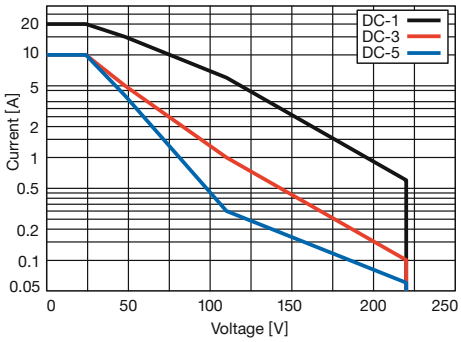
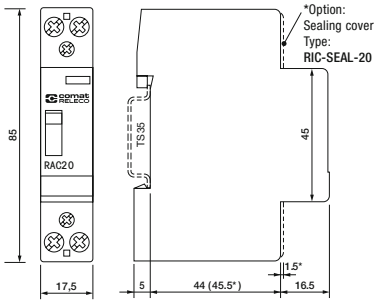


Fig. 1 DC load limit curve DC-1



Dimensions [mm]



Technical approvals, conformities

IEC/EN 60947-4-1, VDE 0660
IEC/EN 60947-5-1
IEC/EN 61095, VDE 0637

Installation Contactor

RAC25

25 A, AC/DC control voltage, silent operation
DIN Rail mounting according to DIN 43 880

Type: RAC25-xxx/ ...V

Hum-free installation contactor, 4 contacts, 4 NO, 4 NC, 2 NO-2 NC types available
Manual actuating and locking

Rated operational power AC-1	**Single phase: 5.4 kW/230 V, 0.6 A/220 V DC-1**
	3 phase 230 V: 9 kW
	3 phase 400 V: 16 kW
Recommended minimum contact load	**50 mA / 24 V**

Contacts

Material		AgNi
Rated operational current		25 A
Max. inrush current (100ms)		50 A
Max. switching voltage		400 V
Max. AC load 3 phase	AC-1, AC-7a	9 kW / 230 V, 16 kW / 400 V
	AC-3	2.2 kW /230 V, 4 kW / 400 V
Max. DC load 24V/220V	DC-1 (Fig. 1)	600 W / 130 W

Control input V_n =	**UC 24 V**	**UC 36 V**	**UC 230 V**
Operating voltage range [V]	20.4 ... 26.4	30.6 ... 39.6	195 ... 253
Typ. pic up voltage [V]	17	25	160
Typ. release voltage [V]	7	11	70
Power consumption [W]	2.6	2.6	2.6
Inductive turn-off voltage	None	None	None
Surge immunity EN 6100-4-5	2 kV	2 kV	2 kV

Insulation

Rated insulation voltage	440 V
Rated impulse withstand voltage	4 KV
Min. clearance of open contact	3.6 mm

General Specifications

Ambient temperature		
storage		-30 ... 80 °C
operation, Spacer after 2 contactors side by side		-5 ... 55 °C
operation, Spacer after 3 contactors side by side		-5 ... 40 °C
Pick-up time		15 ... 45 ms
Release time		20 ... 70 ms
Mechanical life		≥ 3 x 10^6 operations
AC voltage endurance at rated load	AC-3, AC-7b	≥ 5 x 10^5 operations
DC voltage endurance at rated load	DC-1	10^5 operations
Operating frequency at rated load	DC-1	≤ 300 operations / h
Operating frequency at rated load	AC-1, AC-3	≤ 600 operations / h
Conductor cross section coil / contacts terminals		Stranded wire 2.5 mm² / 6 mm²
Max. Screw torque coil / contacts		0.6 Nm / 1.2 Nm
Ingress protection degree		IP 20
Weight		270 g

Standard types

UC (AC / DC) 50 / 60 Hz, 24, 36, 230	**4NO**	**RAC25-400/UC ...V**
	2NO + 2NC	**RAC25-220/UC ...V**
"..." enter the voltage for full type designation	**4NC**	**RAC25-040/UC ...V**

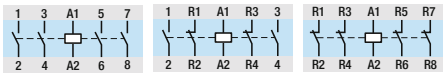
Accessories

Auxiliary contact bloc:	**RIC-AUX..**
Sealing cover:	**RIC-SEAL 25**
Spacer:	**RIC-DIST**

Samples of lamp loads	**Number of lamps**
Incandescent lamps 230 V/ 100 W	20
Fluorescent lamps not corrected 230 V/ 36 W	20
Fluorescent lamps electronic ballast units 36 W	14

Mounting information
If multiple contactors are mounted side by side, spacers (RIC DIST) have to be inserted for the purpose of heat dissipation.
Example: Ambient temperature up to 40°C: 1 spacer after 3 RAC // 40...55°C: 1 spacer after 2 RAC.

Connection diagram



4xNO RAC25-400 | 2xNO + 2xNC RAC25-220 | 4xNC RAC25-040

Coil circuit

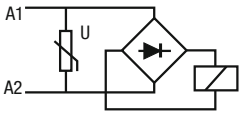
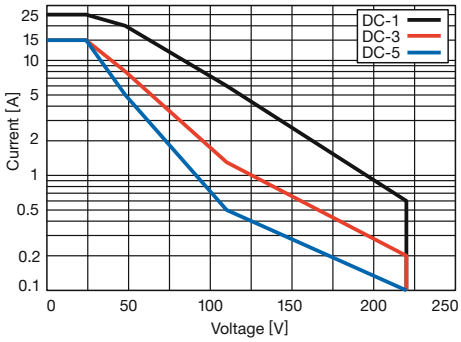
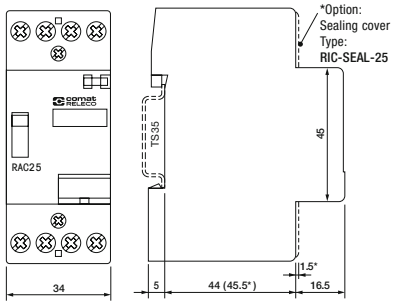


Fig. 1 DC load limit curve DC-1



Dimensions [mm]



Technical approvals, conformities

IEC/EN 60947-4-1
IEC/EN 60947-5-1
IEC/EN 61095

Installation Contactor

RBC20

20 A, AC control voltage, silent operation
DIN rail mounting according to DIN 43 880

Type: RBC20-xxx/AC230V
Step relay, 2 contacts, 2 NO, 1 NO-1 NC types available
Manually switchable

Rated operational power	**4 kW / 230 V AC-1, 0.5 A / 220 V DC-1**
Recommended minimum contact load	**100 mA / 10 V**

Contacts		
Material		AgNi
Rated operational current		20 A
Max. inrush current (100ms)		50 A
Max. switching voltage		440 V
Max. AC load	AC-1, AC-7a	4 kW / 230 V
	AC-3	0.55 kW /230 V
Max. DC load 24 V / 220 V DC-1 (Fig. 1)		480 W / 110 W

Control input V_n =	**AC 230 V**
Operating voltage range [V]	10 … 440
Typ. pic up voltage [V]	160
Typ. release voltage [V]	70
Power consumption [W]	4
Inductive turn-off voltage	None
Surge immunity EN 6100-4-5	2 kV

Insulation	
Rated insulation voltage	440 V
Rated impulse withstand voltage	4 kV
Min. clearance of open contact	3 mm

General Specifications		
Ambient temperature		
storage		-30 … 80 °C
operation		-25 … 55 °C
Pick-up time		15 … 45 ms
Release time		20 … 50 ms
Mechanical life		10^6 operations
AC voltage endurance at rated load	AC-3, AC-7b	10^5 operations
DC voltage endurance at rated load	DC-1	10^5 operations
Operating frequency at rated load	DC-1	≤ 900 operations / h
Operating frequency at rated load	AC-1	≤ 900 operations / h
Conductor cross section coil /contacts		Stranded wire 4 mm^2 / 10 mm^2
Max. Screw torque coil /contacts		0.6 Nm / 1.2 Nm
Ingress protection degree		IP 20
Weight		132 g

Standard types

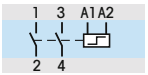
AC 50 / 60 Hz, 230	**2NO**	**RBC20-200/AC230V**
„…“ enter the voltage for full type designation	**1NO + 1NC**	**RBC20-110/AC230V**

Accessories
Auxiliary contact bloc: **RBC-AUX..**

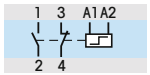
Samples of lamp loads	**Number of lamps**
Incandescent lamps 230 V / 100 W	20
Fluorescent lamps not corrected 230 V / 36 W	29
Fluorescent lamps electronic ballast units 36 W	38

Mounting information
If multiple contactors are mounted side by side, spacers (RIC DIST) have to be inserted for the purpose of heat dissipation.
Example: Ambient temperature up to 40°C: 1 spacer after 3 RBC // 40…55°C: 1 spacer after 2 RBC.

Connection diagram

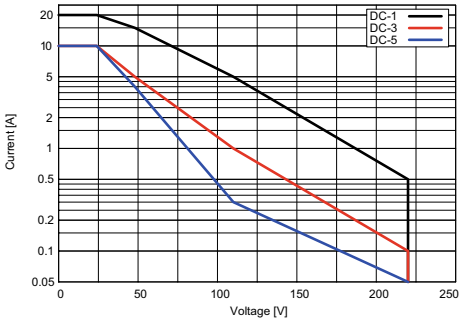


2xNO
RBC20-200

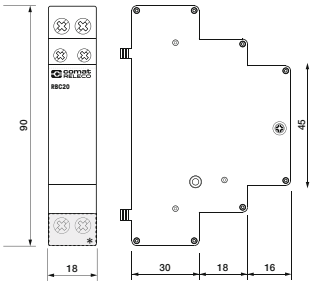


1xNO +1xNC
RBC20-110

Fig. 1 DC load limit curve DC-1



Dimensions [mm]



Technical approvals, conformities

IEC/EN 60947-4-1, VDE 0660
IEC/EN 60947-5-1
IEC/EN 61095, VDE 0637

Installation Contactor

RBC32

32 A, AC control voltage, silent operation
DIN Rail mounting according to DIN 43 880

Type: RBC32-xxx/AC230V

Step relay, 4 contacts, 4 NO, 2 NO-2 NC types available

Rated operational power AC-1	**Single phase: 5.5 kW/230 V, 0.7 A/220 V DC-1** **3 phase 230 V: 9 kW** **3 phase 400 V: 16 kW**
Recommended minimum contact load	**100 mA / 10 V**

Contacts

Material		AgNi
Rated operational current		32 A
Max. inrush current (100ms)		50 A
Max. switching voltage		440 V
Max. AC load 3 phase	AC-1, AC-7a	5.5 kW
	AC-3	0.75 kW
Max. DC load 24V/220V	DC-1 (Fig. 1)	600 W / 130 W

Control input V_n =	**AC 230 V**
Operating voltage range [V]	195 … 253
Typ. pic up voltage [V]	160
Typ. release voltage [V]	70
Power consumption [W]	4
Inductive turn-off voltage	None
Surge immunity EN 6100-4-5	2 kV

Insulation

Rated insulation voltage	440 V
Rated impulse withstand voltage	4 kV
Min. clearance of open contact	3 mm

General Specifications

Ambient temperature		
storage		-30 … 80 °C
operation		-25 … 55 °C
Pick-up time		15 … 45 ms
Release time		20 … 70 ms
Mechanical life		10^6 operations
AC voltage endurance at rated load	AC-3, AC-7b	10^5 operations
DC voltage endurance at rated load	DC-1	10^5 operations
Operating frequency at rated load	DC-1	≤ 900 operations / h
Operating frequency at rated load	AC-1, AC-3	≤ 900 operations / h
Conductor cross section coil / contacts terminals		Stranded wire 4 mm^2 / 10 mm^2
Max. Screw torque coil / contacts		0.6 Nm / 1.2 Nm
Ingress protection degree		IP 20
Weight		192 g

Standard types

AC 50 / 60 Hz, 230	**4NO**	**RBC32-400/AC230V**
„…“ enter the voltage for full type designation	**2NO + 2NC**	**RBC32-220/AC230V**

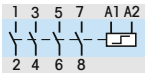
Accessories

Auxillary contact bloc: **RBC-AUX..**

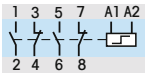
Samples of lamp loads	**Number of lamps**
Incandescent lamps 230 V/ 100 W	35
Fluorescent lamps not corrected 230 V/ 36 W	57
Fluorescent lamps electronic ballast units 36 W	75

Mounting information
If multiple contactors are mounted side by side, spacers (RBC DIST) have to be inserted for the purpose of heat dissipation.
Example: Ambient temperature up to 40°C: 1 spacer after 3 RIC // 40…55°C: 1 spacer after 2 RBC.

Connection diagram

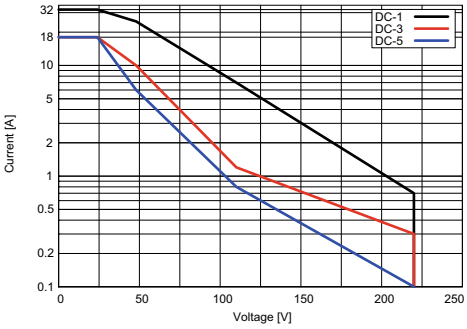


4xNO
RBC32-400

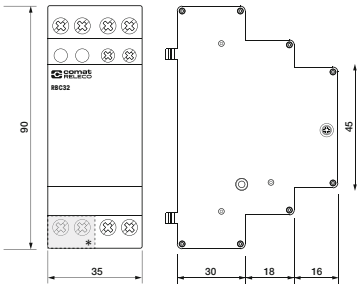


2xNO +2xNC
RBC32-220

Fig. 1 DC load limit curve DC-1



Dimensions [mm]



Technical approvals, conformities

IEC/EN 60947-4-1
IEC/EN 60947-5-1
IEC/EN 61095

Installation Contactor

RBC-AUX

4 A auxiliary contact bloc with 2 double contacts, 2 different combinations of NO / NC contacts

Type: RBC AUXxx

2 double contacts, 2 NO, 1 NC-1 NO types available

Maximum contact load AC-15	**4 A / 230 V**
Recommended minimum contact load	**5 mA / 12 V**

Contacts

Material	AgNi
Rated operational current AC-15	4 A / 230 V
Max. switching voltage	250 V

Insulation

Rated insulation voltage	250 V
Rated impulse withstand voltage	4 kV

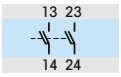
Specifications

Ambient temperature storage / operation	-30 … 80 °C / -25 … 55 °C
Operating frequency at rated load	≤ 600 operations / h
Conductor cross section	Stranded wire 4 mm^2
Max. Screw torque	0.8 Nm
Ingress protection degree	IP 20
Weight	30 g

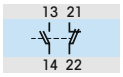
Standard types

2NO	**RBC-AUX20**
1NO + 1NC	**RBC-AUX11**

Connection diagram

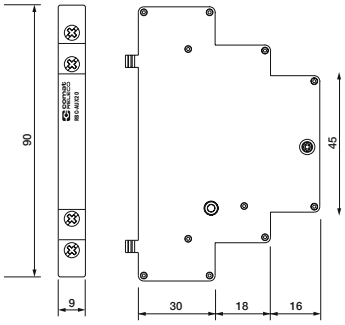


2xNO
RBC-AUX20



1xNO +1xNC
RBC-AUX11

Dimensions [mm]



Technical approvals, conformities

IEC/EN 60947-4-1
IEC/EN 60947-5-1
IEC/EN 61095

Notes

1.9 Solid State Contactors

- For frequent switching without contact bounce
- No wear and tear and silent operation thanks to semiconductor technology
- Non-hazardous switching of inductive loads
- Reduction of switch-on current thanks to zero voltage switching
- Clear LED status display
- Integrated overload protection
- DIN rack or screw assembly
- Space-saving: standard module width from 22.5 to 90 mm
- Integrated cooling element with optional thermal protector

Three phase AC motors have proven themselves for the operation of pumps, conveyor belts, compressors and countless other drive technology applications. The direct start or the star-delta starter cause impact on the mechanical components in the drive train. This leads to signs of wear, damage and premature failures. On the other hand, abrupt starts lead to voltage drops which burden the power supply network and affect the surrounding components.
Softstarter by Comat Releco prevents disruptions and ensures a smooth start-up with a reduced starting torque and slow breaking sequences without loading the drive system. Thanks to modern semiconductor power amplifiers and fanless design, you can enjoy absolutely wear-free. The compact construction with integrated cooling element only requires little space in the control cabinet.

Softstarter by Comat Releco is available in four series:

The CCL range has been developed for the operation of heat pumps and compressors. Intelligent current limitation during start-up reduces the drive power by up to 65%. The integrated motor protection allows the adjustment of the nominal power and replaces an additional motor protection switch. Thanks to an integrated bypass relay, there are no additional costs for external bridging.

The CCM range is available with two or three switched phases and is designed for a large number of switching cycles per hour. The bypass is integrated in accordance with the version. Separate potentiometers allow the adjustment of start-up and breaking times, as well as the kick-start function, and the start-up torque can be limited to 0 to 85 % of the nominal value. The CCMB range also offers a dynamic break function with automatic standstill detection.

The starting torque limiters of the CTC range are activated via an upstream contactor. The start-up torque can be limited to 1 to 85 % of the nominal torque. Typical applications are blowers and smaller machinery.

Solid State Contactor – CC1H215 (one phase)

Type: CC1H215

The CC series solid-state contactors are suitable for the contactless and non-wearing switching of ohmic and inductive AC loads at high switching frequency. They come with an operating voltage up to 600 VAC and nominal current up to 50 A with two and three phases. They come with control voltages of either 5–24 VDC or 24–230 VAC/VDC.

Output

Switching element	Thyristor
Numbers of phases	1
Nominal voltage (U_{nom})	230 VAC
Output voltage range	12 – 240 VAC
Reverse voltage	1000 Vrrm
Peak reverse voltage	1100 Vrsm
Min. load	10 mA
Max. leakage current	1 mA
Operation current AC-1/51 @ U_{nom}	15 A
Operation current AC-3 @ U_{nom}	15 A
Operation current AC-55b @ U_{nom}	15 A
Operation current AC-56a @ U_{nom}	15 A
Response/Release time	20 ms
Limit load	1800 A^2s

Input

Voltage	24 – 230 VAC/VDC
Min. voltage	20,4 VAC/VDC
Max. voltage	253 VAC/VDC
Release voltage	7,2 VAC/VDC
Max. current	6 mA

General Specifications

Ambient temperature storage/operation	-20 – 80°C / -5 – 40°C
Connection terminals	Screw terminal 6 mm^2
Ingress protection degree	IP 20
Mounting	DIN rail T<S35
Housing material	PPE Noryl SE1 / Aluminium
Weight	270 g

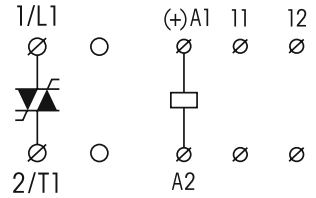
Insulation

Insulation voltage	4 kV
Dielectric strength	660 V

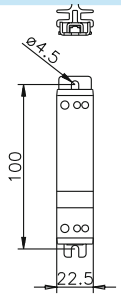
Standard type

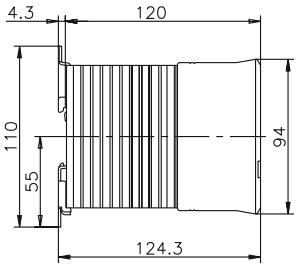
Starting Torque Limiter	**CC1H215**

Connection diagram



Dimensions [mm]





Technical approvals, conformities

Solid State Contactor – CC1H230 (one phase)

Type: CC1H230

The CC series solid-state contactors are suitable for the contactless and non-wearing switching of ohmic and inductive AC loads at high switching frequency. They come with an operating voltage up to 600 VAC and nominal current up to 50 A with two and three phases. They come with control voltages of either 5–24 VDC or 24–230 VAC/VDC.

Output

Switching element	Thyristor
Numbers of phases	1
Nominal voltage (U_{nom})	230 VAC
Output voltage range	12 – 240 VAC
Reverse voltage	1000 Vrrm
Peak reverse voltage	1100 Vrsm
Min. load	10 mA
Max. leakage current	1 mA
Operation current AC-1/51 @ U_{nom}	30 A
Operation current AC-3 @ U_{nom}	15 A
Operation current AC-55b @ U_{nom}	20 A
Operation current AC-56a @ U_{nom}	15 A
Response/Release time	20 ms
Limit load	1800 A^2s

Input

Voltage	24 – 230 VAC/VDC
Min. voltage	20,4 VAC/VDC
Max. voltage	253 VAC/VDC
Release voltage	7,2 VAC/VDC
Max. current	6 mA

General Specifications

Ambient temperature storage/operation	-20 – 80°C / -5 – 40°C
Connection terminals	Screw terminal 10 mm^2
Ingress protection degree	IP 20
Mounting	DIN rail TS35
Housing material	PPE Noryl SE1 / Aluminium
Weight	650 g

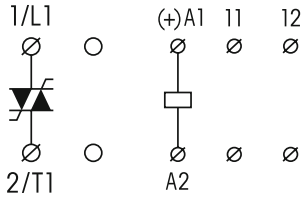
Insulation

Insulation voltage	4 kV
Dielectric strength	660 V

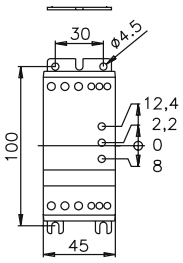
Standard type

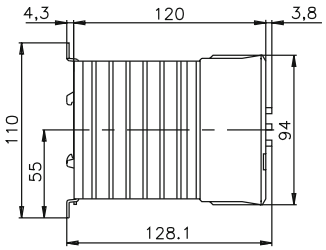
Starting Torque Limiter	**CC1H230**

Connection diagram



Dimensions [mm]





Technical approvals, conformities

CE cULus LISTED

Solid State Contactor – CC1H250 (one phase)

Type: CC1H250

The CC series solid-state contactors are suitable for the contactless and non-wearing switching of ohmic and inductive AC loads at high switching frequency. They come with an operating voltage up to 600 VAC and nominal current up to 50 A with two and three phases. They come with control voltages of either 5–24 VDC or 24–230 VAC/VDC.

Output

Switching element	Thyristor
Numbers of phases	1
Nominal voltage (U_{nom})	230 VAC
Output voltage range	12 – 240 VAC
Reverse voltage	1000 Vrrm
Peak reverse voltage	1100 Vrsm
Min. load	10 mA
Max. leakage current	1 mA
Operation current AC-1/51 @ U_{nom}	50 A
Operation current AC-3 @ U_{nom}	15 A
Operation current AC-55b @ U_{nom}	20 A
Operation current AC-56a @ U_{nom}	15 A
Response/Release time	20 ms
Limit load	1800 A^2s

Input

Voltage	24 – 230 VAC/VDC
Min. voltage	20,4 VAC/VDC
Max. voltage	253 VAC/VDC
Release voltage	7,2 VAC/VDC
Max. current	6 mA

General Specifications

Ambient temperature storage/operation	-20 – 80°C / -5 – 40°C
Connection terminals	Screw terminal 10 mm^2
Ingress protection degree	IP 20
Mounting	DIN rail TS35
Housing material	PPE Noryl SE1 / Aluminium
Weight	1050 g

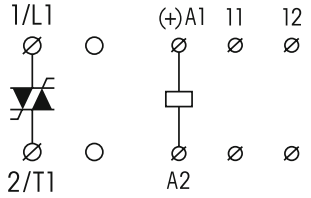
Insulation

Insulation voltage	4 kV
Dielectric strength	660 V

Standard type

Starting Torque Limiter	**CC1H250**

Connection diagram



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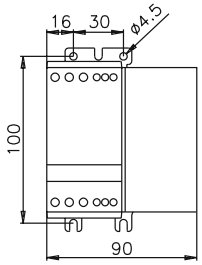
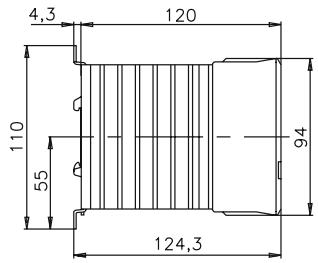




Technical approvals, conformities

CE cULus LISTED

Solid State Contactor – CC1H415 (one phase)

Type: CC1H415

The CC series solid-state contactors are suitable for the contactless and non-wearing switching of ohmic and inductive AC loads at high switching frequency. They come with an operating voltage up to 600 VAC and nominal current up to 50 A with two and three phases. They come with control voltages of either 5–24 VDC or 24–230 VAC/VDC.

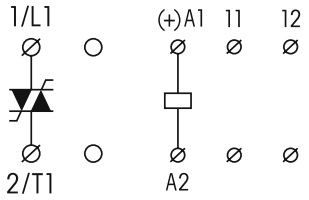
Output	
Switching element	Thyristor
Numbers of phases	1
Nominal voltage (U_{nom})	400 VAC
Output voltage range	24 – 480 VAC
Reverse voltage	1200 Vrrm
Peak reverse voltage	1300 Vrsm
Min. load	10 mA
Max. leakage current	1 mA
Operation current AC-1/51 @ U_{nom}	15 A
Operation current AC-3 @ U_{nom}	15 A
Operation current AC-55b @ U_{nom}	15 A
Operation current AC-56a @ U_{nom}	15 A
Response/Release time	20 ms
Limit load	1800 A^2s

Input	
Voltage	24 – 230 VAC/VDC
Min. voltage	20,4 VAC/VDC
Max. voltage	253 VAC/VDC
Release voltage	7,2 VAC/VDC
Max. current	6 mA

General Specifications	
Ambient temperature storage/operation	-20 – 80°C / -5 – 40°C
Connection terminals	Screw terminal 6 mm^2
Ingress protection degree	IP 20
Mounting	DIN rail TS35
Housing material	PPE Noryl SE1 / Aluminium
Weight	270 g
Insulation	
Insulation voltage	4 kV
Dielectric strength	660 V

Standard type	
Starting Torque Limiter	**CC1H415**

Connection diagram



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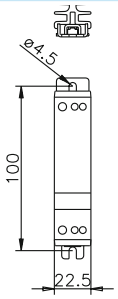
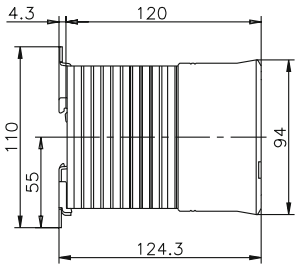




Technical approvals, conformities

CE cULus LISTED

Solid State Contactor – CC1H450 (one phase)

Type: CC1H450

The CC series solid-state contactors are suitable for the contactless and non-wearing switching of ohmic and inductive AC loads at high switching frequency. They come with an operating voltage up to 600 VAC and nominal current up to 50 A with two and three phases. They come with control voltages of either 5–24 VDC or 24–230 VAC/VDC.

Output

Switching element	Thyristor
Numbers of phases	1
Nominal voltage (U_{nom})	400 VAC
Output voltage range	24 – 480 VAC
Reverse voltage	1200 Vrrm
Peak reverse voltage	1300 Vrsm
Min. load	10 mA
Max. leakage current	1 mA
Operation current AC-1/51 @ U_{nom}	50 A
Operation current AC-3 @ U_{nom}	15 A
Operation current AC-55b @ U_{nom}	20 A
Operation current AC-56a @ U_{nom}	15 A
Response/Release time	20 ms
Limit load	1800 A^2s

Input

Voltage	24 – 230 VAC/VDC
Min. voltage	20,4 VAC/VDC
Max. voltage	253 VAC/VDC
Release voltage	7,2 VAC/VDC
Max. current	6 mA

General Specifications

Ambient temperature storage/operation	-20 – 80°C / -5 – 40°C
Connection terminals	Screw terminal 10 mm^2
Ingress protection degree	IP 20
Mounting	DIN rail TS35
Housing material	PPE Noryl SE1 / Aluminium
Weight	1050 g

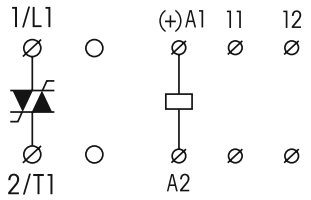
Insulation

Insulation voltage	4 kV
Dielectric strength	660 V

Standard type

Starting Torque Limiter	**CC1H450**

Connection diagram



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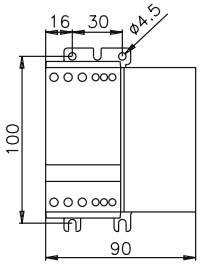
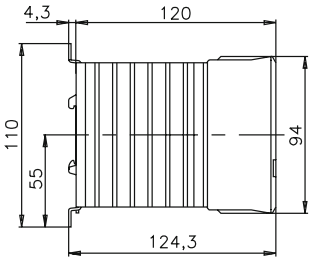




Technical approvals, conformities

CE cULus LISTED

Solid State Contactor – CC2H230 (two phase)

Type: CC2H230

The CC series solid-state contactors are suitable for the contactless and non-wearing switching of ohmic and inductive AC loads at high switching frequency. They come with an operating voltage up to 600 VAC and nominal current up to 50 A with two and three phases. They come with control voltages of either 5–24 VDC or 24–230 VAC/VDC.

Output

Switching element	Thyristor
Numbers of phases	2
Nominal voltage (U_{nom})	230 VAC
Output voltage range	12 – 240 VAC
Reverse voltage	1000 Vrrm
Peak reverse voltage	1100 Vrsm
Min. load	10 mA
Max. leakage current	1 mA
Operation current AC-1/51 @ U_{nom}	30 A
Operation current AC-3 @ U_{nom}	15 A
Operation current AC-55b @ U_{nom}	20 A
Operation current AC-56a @ U_{nom}	15 A
Response/Release time	20 ms
Limit load	1800 A^2s

Input

Voltage	24 – 230 VAC/VDC
Min. voltage	20,4 VAC/VDC
Max. voltage	253 VAC/VDC
Release voltage	7,2 VAC/VDC
Max. current	6 mA

General Specifications

Ambient temperature storage/operation	-20 – 80°C / -5 – 40°C
Connection terminals	Screw terminal 10 mm^2
Ingress protection degree	IP 20
Mounting	DIN rail TS35
Housing material	PPE Noryl SE1 / Aluminium
Weight	650 g

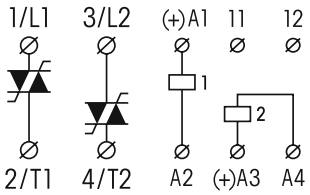
Insulation

Insulation voltage	4 kV
Dielectric strength	660 V

Standard type

Starting Torque Limiter	**CC2H230**

Connection diagram



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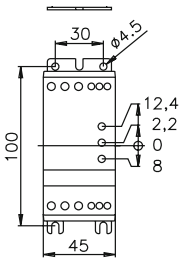
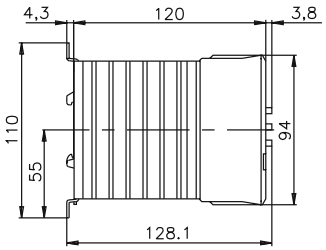




Technical approvals, conformities

CE cULus LISTED

Solid State Contactor – CC3H410 (three phase)

Type: CC3H410

The CC series solid-state contactors are suitable for the contactless and non-wearing switching of ohmic and inductive AC loads at high switching frequency. They come with an operating voltage up to 600 VAC and nominal current up to 50 A with two and three phases. They come with control voltages of either 5–24 VDC or 24–230 VAC/VDC.

Output

Switching element	Thyristor
Numbers of phases	3
Nominal voltage (U_{nom})	400 VAC
Output voltage range	24 – 480 VAC
Reverse voltage	1200 Vrrm
Peak reverse voltage	1300 Vrsm
Min. load	10 mA
Max. leakage current	1 mA
Operation current AC-1/51 @ U_{nom}	10 A
Operation current AC-3 @ U_{nom}	10 A
Operation current AC-55b @ U_{nom}	10 A
Operation current AC-56a @ U_{nom}	5 A
Response/Release time	20 ms
Limit load	610 A^2s

Input

Voltage	24 – 230 VAC/VDC
Min. voltage	20,4 VAC/VDC
Max. voltage	253 VAC/VDC
Release voltage	7,2 VAC/VDC
Max. current	6 mA

General Specifications

Ambient temperature storage/operation	-20 – 80°C / -5 – 40°C
Connection terminals	Screw terminal 6 mm^2
Ingress protection degree	IP 20
Mounting	DIN rail TS35
Housing material	PPE Noryl SE1 / Aluminium
Weight	650 g

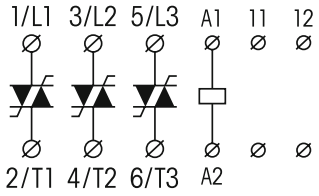
Insulation

Insulation voltage	4 kV
Dielectric strength	660 V

Standard type

Starting Torque Limiter	**CC3H410**

Connection diagram



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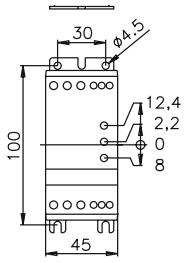

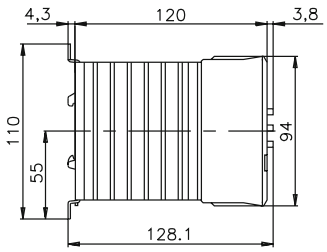

Technical approvals, conformities

CE cULus LISTED