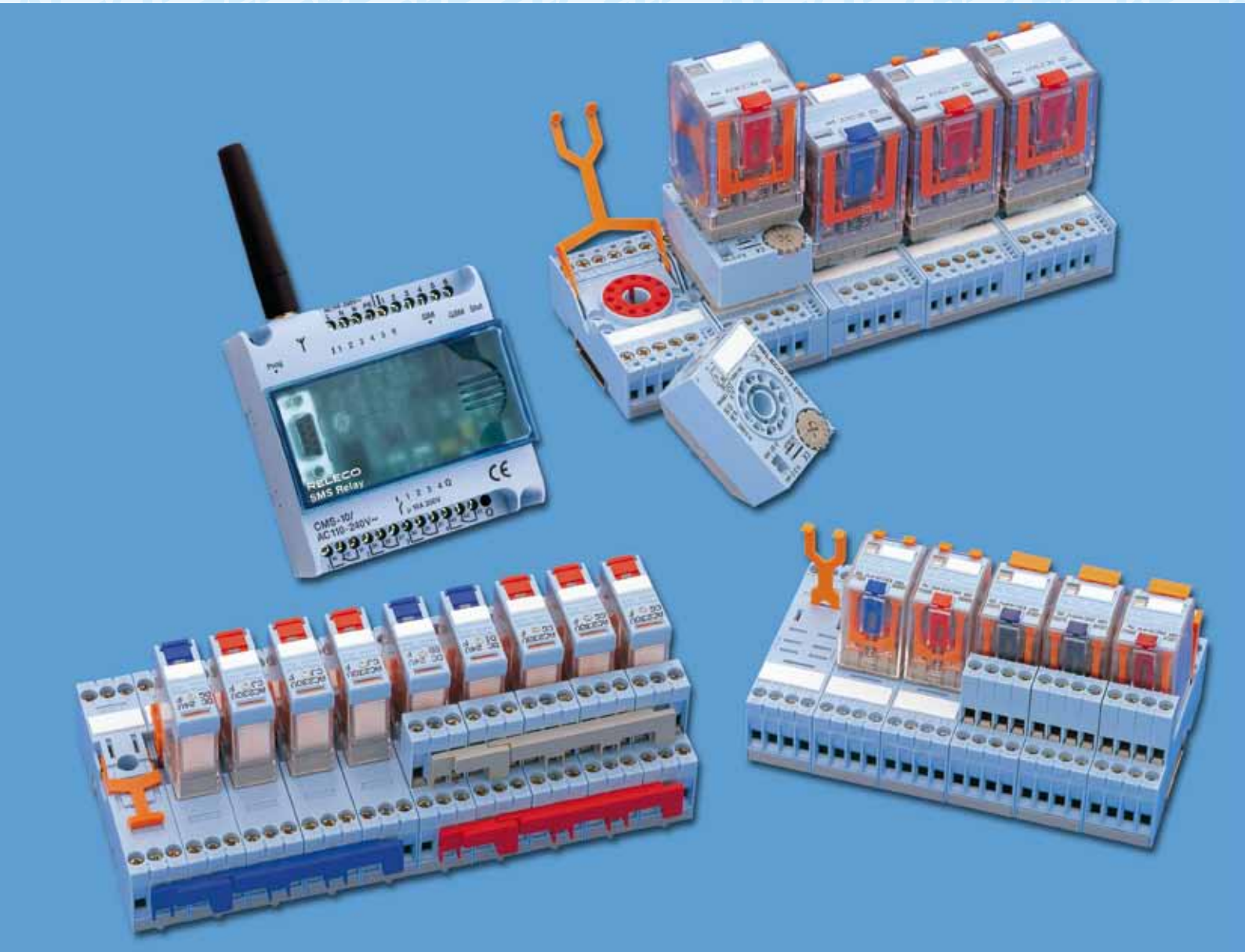
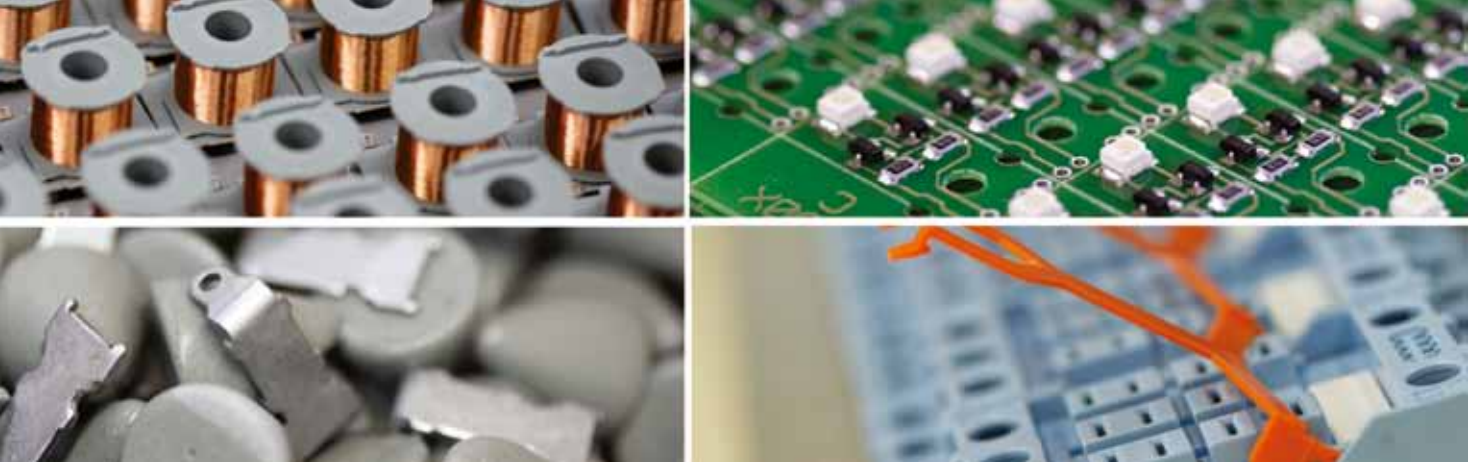
comat RELECO

WORLD OF RELAYS

General Catalogue 2010

- Industrial-Relays
- Control-Relays
- Installation-Relays
- Time-Relays
- Monitoring-Relays
- Automation-Relays





The Comat/Releco group is the leader in the design and manufacturing of relays. The product range includes all kind of relays for switching, monitoring, timing and automation applications.

Comat AG, based in Switzerland, founded 1970 and Releco SA based in Spain, founded 1962, is a team of more than 200 professionals. The export activities to over 60 countries worldwide represent 80% of the total production. The output is over 5 Millions relays per year.

Our secret is simply to own the whole process from engineering to manufacturing. This provides us not only a total integration, full control from design, production and marketing, but also flexibility to respond to marked demands, and providing customized solutions for specific applications.

That means:
R&D
Coil winding
Molding and tooling
Contact mounting
Metal stamping
Electrolytic metal treatment
Plastic injection
Assembling
Testing
Laboratory
Software
Quality control
Application support
Marketing and sales

We strive to create innovative and best quality products and our international presence in the market is our strength to detect problems and the requirements of the end users.
Comat/Releco: A strong name in the field of relays.
Relays: That is what we know and stand for.

Index

Index

comat RELECO

Relays 1

Time Relays 2

Monitoring Relays 3

Sockets 4

Relays

MRC

QRC

IRC

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 electro-mechanical 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 3 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 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.

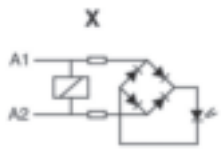
D Free-wheeling diode.
DX Free-wheeling diode + LED
Dampens transients caused by the relay coil on de-energisation.
Surges of 2000 V up to 60 VDC
Surges of 4000 V from 61 to 250 VDC (*)

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 (*)

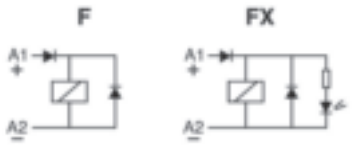
B Bridge rectifier incorporated
BX Bridge rectifier + LED indication
Allows the relay to operate in both AC or DC without any polarity inconvience. Available only in voltages up to 60 V.
Surges of 1000 V

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

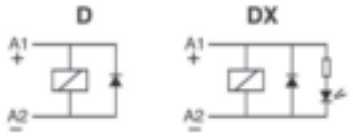
(*) Surges of 2000 V in **QRC** types.



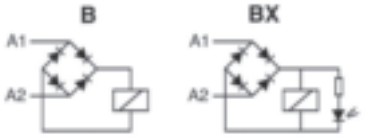
LED consumption: 1mA



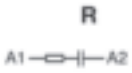
Increase release time approx. 4 times



Increases release time approx. 4 times



Increases release time approx. 3 times



IRC

LED and protection circuit connected to coil.

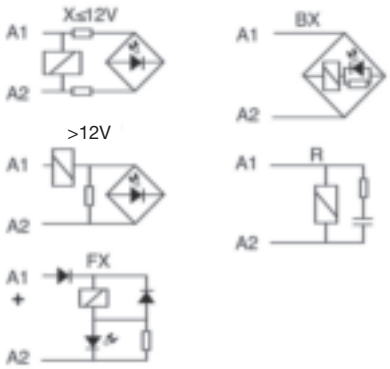
X LED with no polarity, (standard)
Coils ≤ 12 V CC y CA
LED rectifier bridge in parallel
X LED with no polarity, (standard)
Coils ≥ 24 V … CC y CA
LED rectifier bridge in series
FX LED with polarity **A1+** (option)
Every DC coil voltage
Polarity and Free-wheeling diodes
BX LED with no polarity, (option)
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.

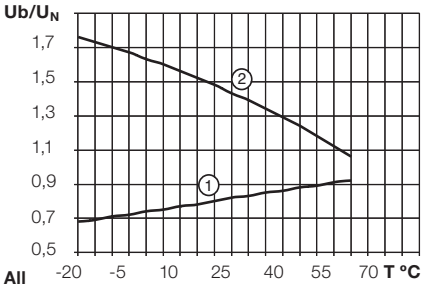
Pick-up voltage, Release voltage

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 0 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 < 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.

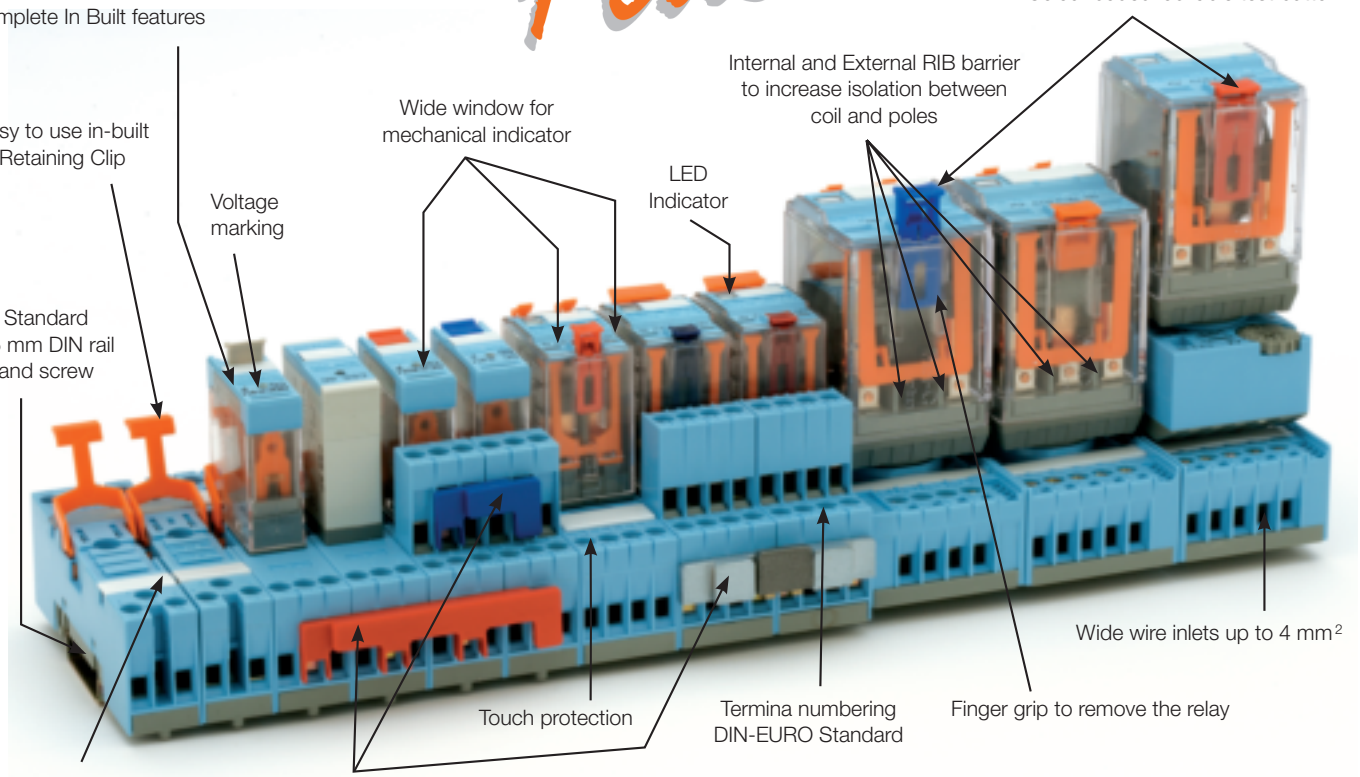
Incandescent lamps, halogen lamps
Switch-on currents during a few ms in the range 10 ... 18 x rated. Switch-off at rated load.

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 C Plus



Five colours for an easier identification of coil voltage


AC red: 230 VAC (North America 120 VAC)


AC dark red: others VAC


AU grey: VAC/DC


DC blue: 24 VDC


DC dark blue: others VDC

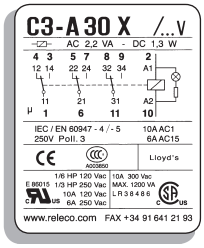
If you don´t want to have the lockable function, you can use the orange "orange - push button". SO - OP for MRC - C and S9 - OP for QRC (5 pieces bag)


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

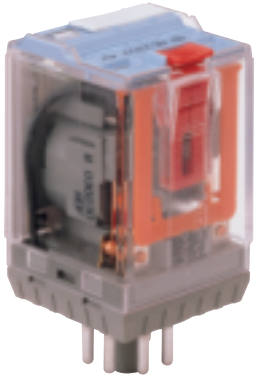
Country	Approval	Country	Approval
Canada	Authority: CSA Specification: C 22,2; UL 508	**United Kingdom**	Authority:Lloyd´s Register of Shipping
China	Authority: CQC Specification: GB14048.5-2001	**USA**	Authority: UL Specification: C 22,2; UL 508
Russia	Authority: KORPORATSIA STANDART Specification: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

Notes

1.1 Plug-in Relays

1.1.1 Industrial Relays

MRC Series



Application	Types	Pins	Contacts	AC ratings	DC ratings	Socket
C2 Series						
General purpose	C2-A2x	8		10 A / 250 V	0.5 A / 110 V	S2
Low switching load	C2-T2x	8		6 A / 250 V	6 A / 30 V	S2
DC load switching	C2-G2x	8		10 A / 250 V	1.2 A / 110 V	S2
C3 Series						
General purpose	C3-A3x	11		10 A / 250 V	0.5 A / 110 V	S3
Low switching load	C3-T3x	11		6 A / 250 V	6 A / 30 V	S3
DC load switching	C3-G3x	11	1.7mm	10 A / 250 V	1.2 A / 110 V	S3
DC load switching with magnetic blow out	C3-M1x	11	>3mm Ma.	10 A / 250 V	10 A / 220 V	S3
DC load switching double make	C3-X1x	11	>3mm	10 A / 250V	7 A / 110 V	S3
Latching relay	C3-R2x	11	Rem.	10 A /250 V	0.5 A / 110 V	S3
Sensitive Coil 250mW … 300mW	C3-S1x	11		6 A / 250 V	6 A / 30 V	S3
Sensitive Coil 500mW … 800mW	C3-E2x	11		6 A / 250	6 A / 30 V	S3
Sensitive Coil 500mW … 800mW	C3-N3x	11		6 A / 250	6 A / 30 V	S3
Railway application	R3-N3x	11		6 A / 250	6 A / 30 V	S3
C4 Series						
General purpose	C4-A4x			10 A / 250 V	0.5 A / 110 V	S4
DC load switching double make	C4-X2			10 A / 250 V	7 A / 110 V	S4
Latching relay	C4-R3		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

C2-A2x

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

Type	**C2-A2x/ ... V** Standard relay, 2 change-over contacts
Maximum contact load	**10 A/250 V AC1 0,5 A/110 V DC1** **10 A/30 V DC1 0,2 A/220 V DC1**
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 + 10 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	9K2	12
230	7K1	9,5	220	36K1	6

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	90 g

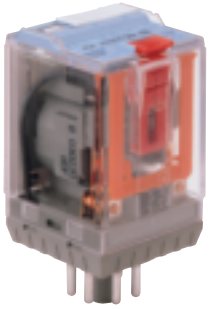
Standard types

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**
RC Suppresor	**C2-A20R/AC ... V**	**C2-A28R/AC ... V**	**C2-A29R/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**



Connection diagram

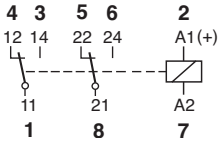


Fig. 1 AC voltage endurance

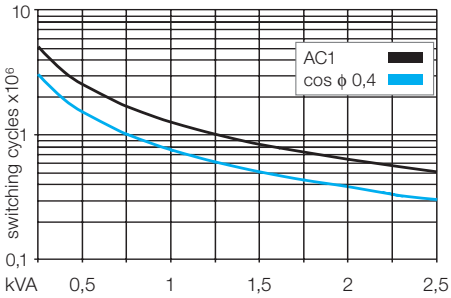
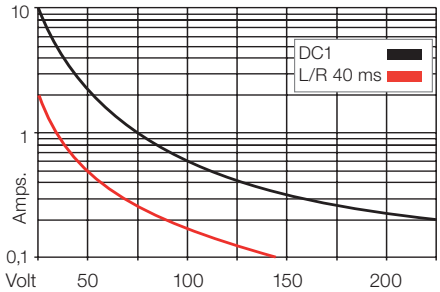
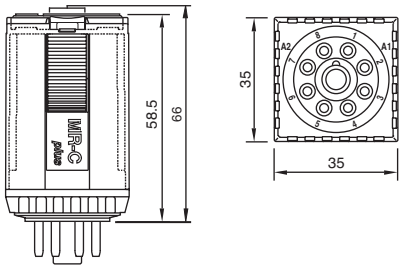


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

Lloyd´s

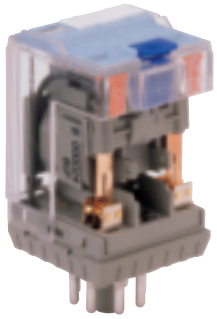
IEC 61810; EN 60947

MRC series

C2-T2x

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

Type	**C2-T2x/ ... V** Standard relay for low level 2 Change-over contacts			
Maximum contact load	**6 A/250 V**	**AC1**	**6 A/30 V**	**DC1**
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 + 10 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	9K2	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	90 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**
RC Suppresor	**C2-T21R/AC ... V**	**C2-T22R/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**

Connection diagram

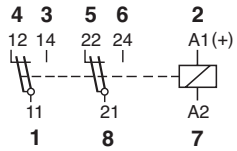


Fig. 1 AC voltage endurance

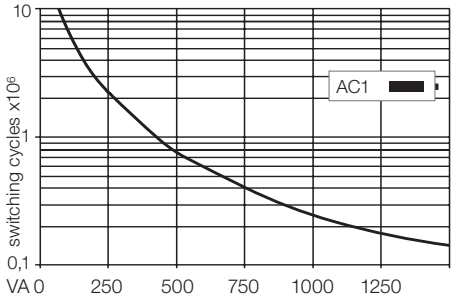
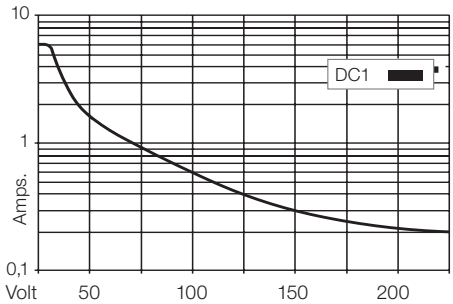
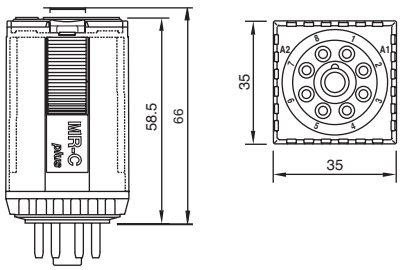


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

IEC 61810; EN 60947

C2-G2x

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

Type	**C2-G2x/ ... V** Standard relays, DC application 2 open contacts
Maximum contact load	**10 A/250 V AC1** **1,2 A/110 V DC1** **10 A/30 V DC1** **0,4 A/220 V DC1**

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	90 g

Standard types

VAC 50 Hz/60 Hz: 24, 48, 115 (120), 230 (240)	**C2-G20/AC ... V**
LED	**C2-G20X/AC ... V**
RC Suppresor	**C2-G20R/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**

Connection diagram

Gap: 1,7 mm

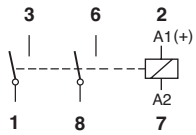


Fig. 1 AC voltage endurance

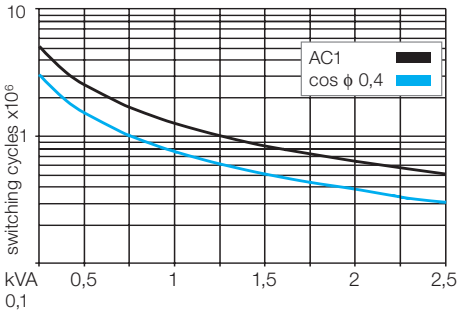
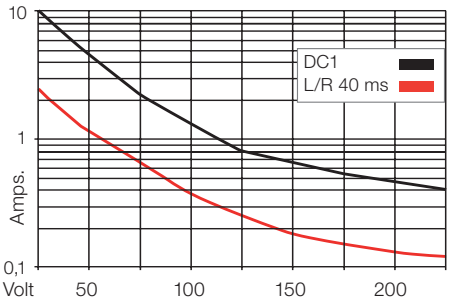
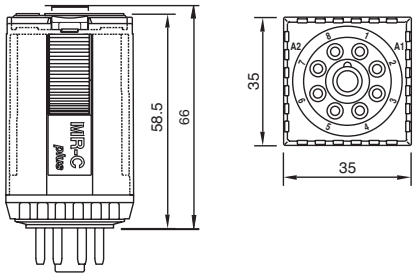


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

IEC 61810; EN 60947

C3-A3x

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

Type	**C3-A3x/ ... V** Standard relays, 3 change-over contacts			
Maximum contact load	**10 A/250**	**ACI**	**0,5 A/110 V**	**DC1**
	10 A/30	**DCI**	**0,2 A/220 V**	**DC1**
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 + 10 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		mA
24	67	92	24	443	54
48	296	46	48	1K8	27
115	1K7	19	110	9K2	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	90 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**
RC Suppresor	**C3-A30R/AC ...V**	**C3-A38R/AC...V**	**C3-A39R/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, S3-MP, S3-MS**
Optional accessories (blanking plug):	**SO-NP, SO-OP**

Connection diagram

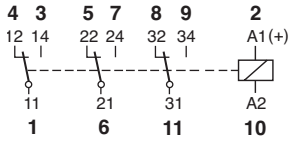


Fig. 1 AC voltage endurance

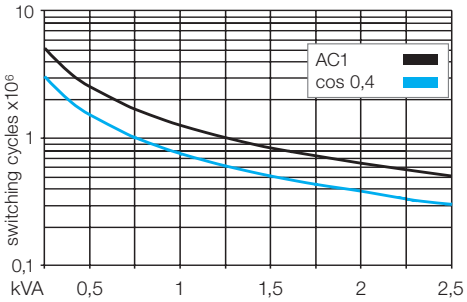
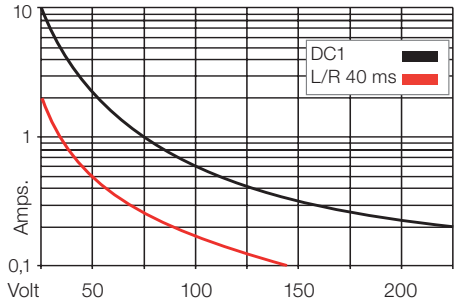
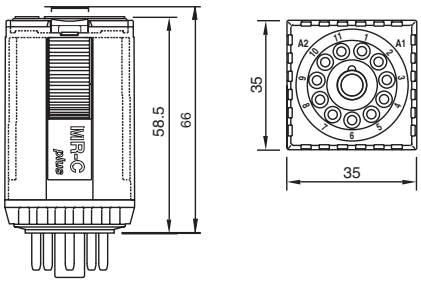


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

Lloyd's

IEC 61810; EN 60947

C3-T3x

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

comat RELECO by RELECO

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 DC1**
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 + 10 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	9K2	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 (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	90 g

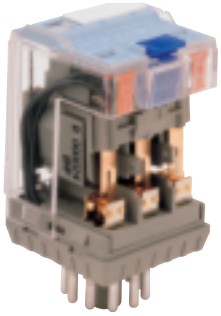
Standard types

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**
RC Suppresor	**C3-T31R/AC ... V**	**C3-T32R/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, S3-MP, S3-MS**
Optional accessories (blanking plug):	**SO-NP, SO-OP**



Connection diagram

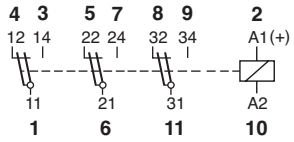


Fig. 1 AC voltage endurance

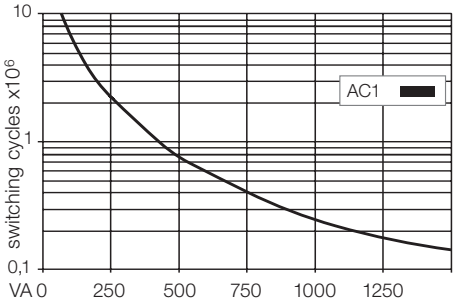
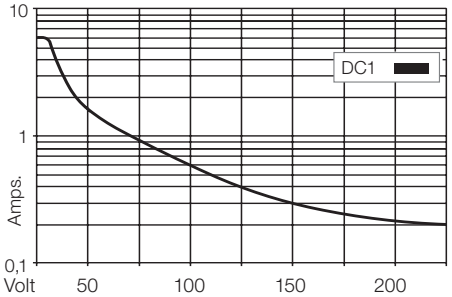
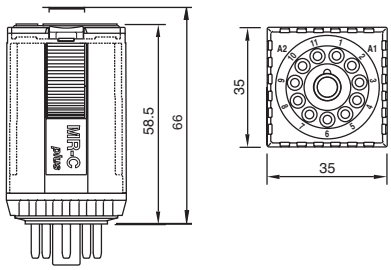


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

IEC 61810; EN 60947

MRC series

C3-G3x

11-pin standard relay, 3-pole, open contact, according to IEC 67-I-18a

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 DC1** **10 A 30 V DC 1 — 0,4 A/220 V DC1**

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	90 g

Standard types

VAC 50 Hz/60 Hz: 24, 48, 115 (120), 230 (240)	**C3-G30/AC ... V**
LED	**C3-G30X/AC ... V**
RC Suppresor	**C3-G30R/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, S3-MP, S3-MS**
Optional accessories (blanking plug):	**SO-NP, SO-OP**

Connection diagram

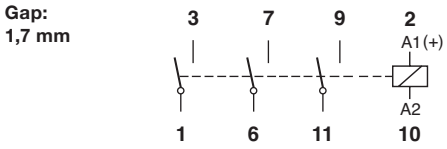


Fig. 1 AC voltage endurance

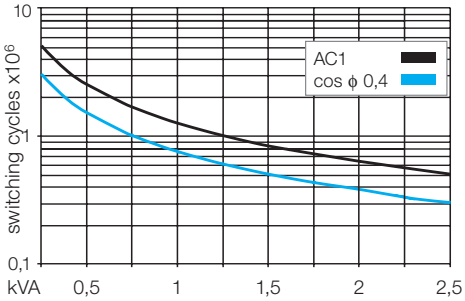
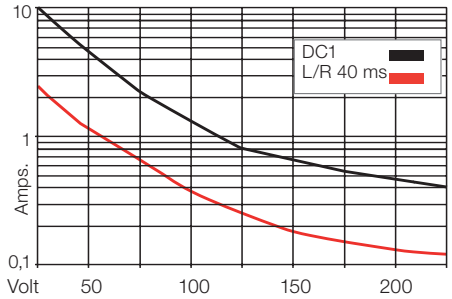
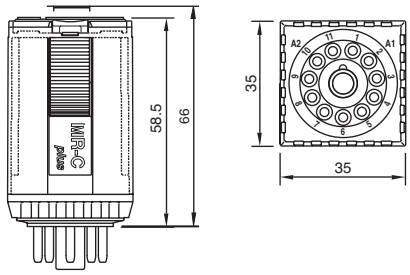


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

IEC 61810; EN 60947

C3-M1x

11-pin power relay, 1-pole, magnetic blow out, according to IEC 67-I-18a

Type	**C3-M1x/ ... V** Power relays, DC, application 1 pole, magnetic blow out
Maximum contact load	**10 A 250 V AC1 10 A 220 V DC1** **3,6 A 110 V L/R 40ms 2 A 220 V L/R 40ms**

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	1K7	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
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

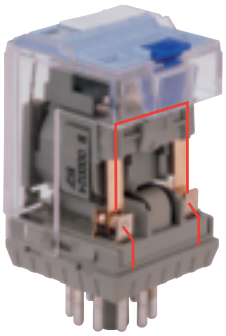
Standard types

VAC 50 Hz/60 Hz: 24, 48, 115 (120), 230 (240)	**C3-M10/AC ... V**
LED	**C3-M10X/AC ... V**
RC Suppresor	**C3-M10R/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, S3-MP, S3-MS**
Optional accessories (blanking plug):	**SO-NP, SO-OP**



Connection diagram

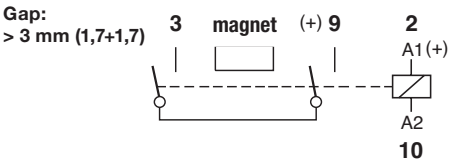


Fig. 1 AC voltage endurance

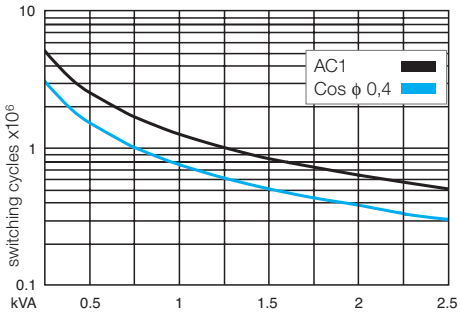
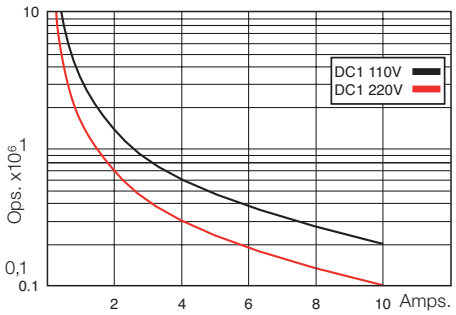
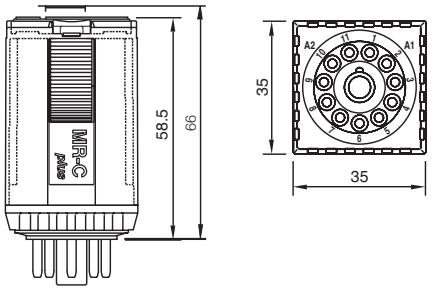


Fig. 2 DC voltage endurance



Dimensions [mm]



Technical approvals, conformities

IEC 61810; EN 60947

C3-X1x

11-pin power relay, 1-pole, double make, according to IEC 67-I-18a

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 DC1** **10 A/30 V DC 1 — 1,2 A/220 V DC1**

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	1K7	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	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

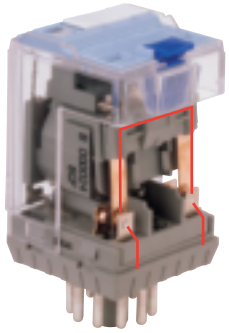
Standard types

VAC 50 Hz/60 Hz: 24, 48, 115 (120), 230 (240)	**C3-X10/AC ... V**
LED	**C3-X10X/AC ... V**
RC Suppresor	**C3-X10R/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, S3-MP, S3-MS**
Optional accessories (blanking plug):	**SO-NP, SO-OP**



Connection diagram

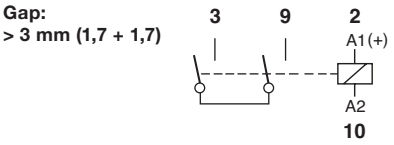


Fig. 1 AC voltage endurance

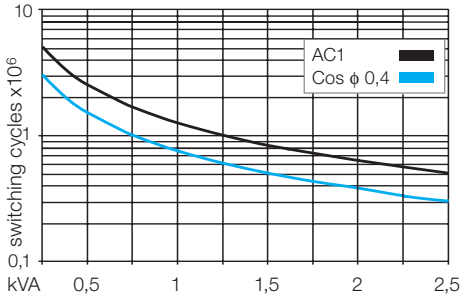
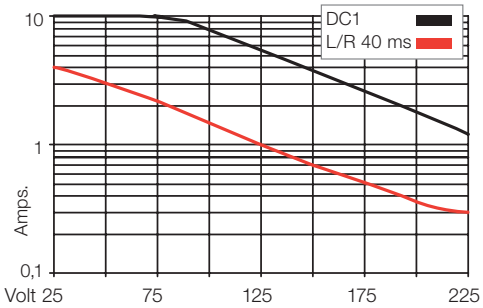
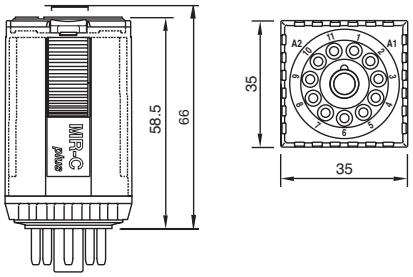


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

IEC 61810; EN 60947

C3-R2x

11-pin remanence relays, 2-pole, according to IEC 67-I-18a

Type	**C3-R2x/ ... V** Remanence plug-in relays, 2 change-over contacts
Maximum contact load	**10 A/250 V AC1 0,5 A/110 V DC1** **10 A/30 V DC1 0,2 A/220 V DC1**
Recommended minimum contact load	**10 mA/10 V Code 0, 9** **5 mA/5 V Code 8**

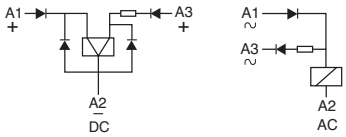
Contacts

Material	Standard	Code 0	AgNi
	Optional	Code 8	AgNi + 10 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

	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	95 g

Standard types

VAC 50 Hz/60 Hz: 24, 48, 115 (120), 230 (240)	**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, S3-MP, S3-MS**
Optional accessories (blanking plug):	**SO-NP, SO-OP**

Connection diagram

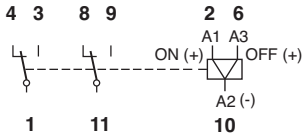


Fig. 1 AC voltage endurance

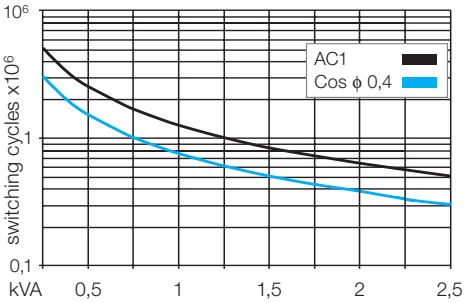
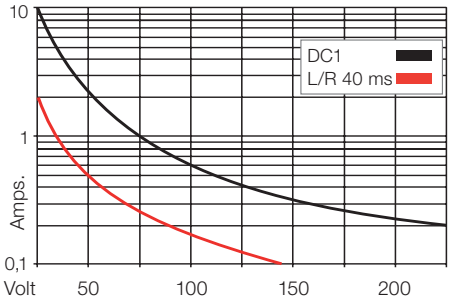
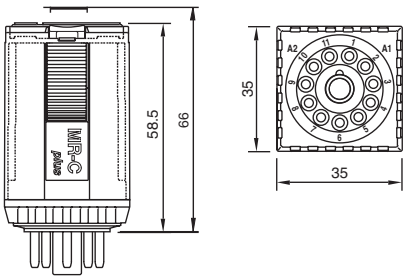


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

IEC 61810; EN 60947

MRC series

C3-S1x

11-pin standard relays, sensitive, 1-pole, according to IEC 67-I-18a

Type	**C3-S1x/ DC... V** Sensitive relays, 250 mW, 1 change-over contacts
Operating range	**0,8 … 2,5 x Un**
Maximum contact load	**6 A/250 V AC1 6 A/30 V DC1**
Recommended minimum contact load	**10 mA/10 V Code 4** **5 mA/5 V Code 8**

Contacts

Material	Standard,	Code 4	AgNi + 0,2 µ Au
	Optional,	Code 8	AgNi + 10 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	250 mW

Coil table

VDC	Ω	mA
6	140	43
12	536	22
24	2164	11
48	8651	5,5

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	18 ms/≤ 3 ms
Release time/bounce time	10 ms/≤ 1 ms
Mechanical life ops	DC: 20 Mill.
DC voltage endurance at rated load	≥100000 switching cycles
Switching frequency at rated load	≤ 1200/ops/h
Protection class	IP40
Weight	73 g

Standard types

VDC 12, 24, 48	**C3-S14/DC ... V**	**C3-S18/DC ... V**
Free wheeling diode	**C3-S14D/DC ... V**	**C3-S18D/DC ... V**
Polarity and free wheeling diode	**C3-S14F/DC ... V**	**C3-S18F/DC ... V**

Connection of diodes to the coil will increase the release time.
LED available upon request.

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

Accessories

Socket:	**S3-B, S3-S, S3-L, S3-P, S3-P0, S3-MP, S3-MS**
Optional accessories (blanking plug):	**SO-NP, SO-OP**

Connection diagram

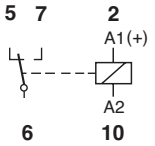


Fig. 1 AC voltage endurance

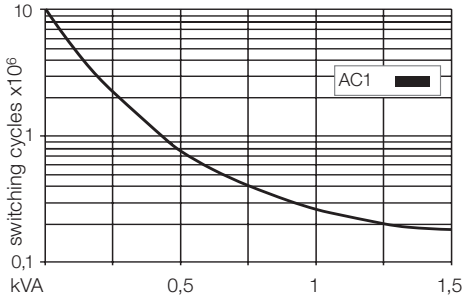
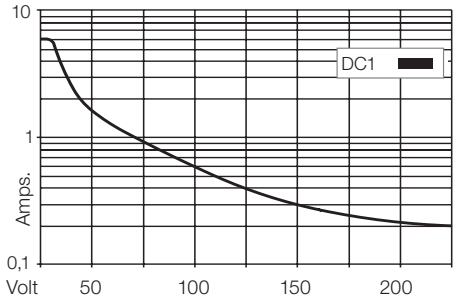
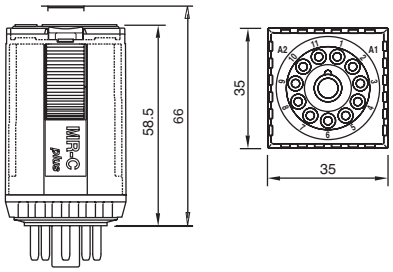


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

IEC 61810; EN 60947

C3-E2x

11-pin standard relays, sensitive, 2-pole, according to IEC 67-I-18a

Type	**C3-E2x/ DC... V** Sensitive relays, 500 mW, 2 change-over contacts
Operating range	**0,8 ... 1,7 x Un**
Maximum contact load	**6 A/250 V AC1 6 A/30 V DC1**
Recommended minimum contact load	**10 mA/10 V Code 4** **5 mA/5 V Code 8**

Contacts

Material	Standard,	Code 4	AgNi + 0,2 µ Au
	Optional,	Code 8	AgNi + 10 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	500 mW

Coil table

VDC	Ω	mA
24	1K1	21
48	4K6	10
60	7K2	8,3
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	18 ms/≤ 3 ms
Release time/bounce time	10 ms/≤ 1 ms
Mechanical life ops	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

VDC 24, 48, 60, 110	**C3-E24/DC ... V**	**C3-E28/DC ... V**
Free wheeling diode	**C3-E24D/DC ... V**	**C3-E28D/DC ... V**
Polarity and free wheeling diode	**C3-E24F/DC ... V**	**C3-E282F/DC ... V**

Connection of diodes to the coil will increase the release time.
LED available upon request.

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

Accessories

Socket:	**S3-B, S3-S, S3-L, S3-P, S3-P0, S3-MP, S3-MS**
Optional accessories (blanking plug):	**SO-NP, SO-OP**

Connection diagram

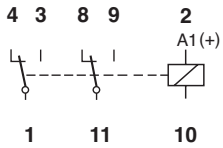


Fig. 1 AC voltage endurance

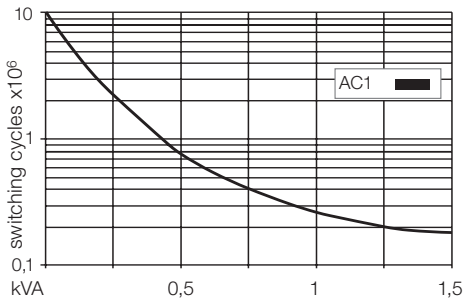
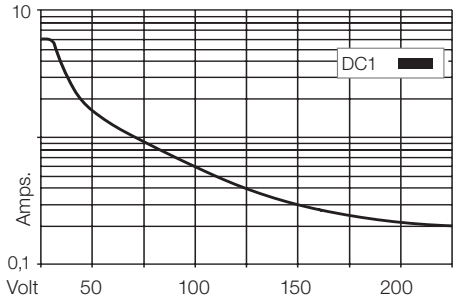
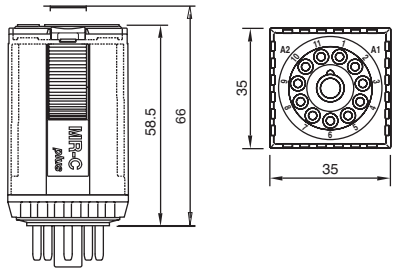


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

IEC 61810; EN 60947

MRC series

C3-N3x

11-pin standard relays, sensitive, 3-pole, according to IEC 67-I-18a

Type	**C3-N3x/DC ... V** Sensitive relays, 800 mw 3 change-over contacts
Operating range	**0,8 ... 1,4 x Un**
Maximum contact load	**6 A/250 V AC 1 6 A/30 V DC1**
Recommended minimum contact load	**10 mA/10 V Code 4** **5 mA/ 5 V Code 8**

Contacts

Material	Standard	Code 4	AgNi + 0,2 µ Au
	Optional	Code 8	AgNi + 10 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	800 mW

Coil table

VDC	Ω	mA
24	720	33
48	2K8	17
60	4K5	13
110	15K	7

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 61810-5	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	10 ms/≤ 1 ms
Mechanical life ops	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

VDC 24, 48, 60, 110		
Free wheeling diode	**C3-N34/DC ... V**	**C3-N38/DC ... V**
Polarity and free wheeling diode	**C3-N34D/DC ... V**	**C3-N38D/DC ... V**
	C3-N34F/DC ... V	**C3-N38F/DC ... V**

Connection of diodes to the coil will increase the release time.
LED available upon request.

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

Accessories

Socket:	**S3-B, S3-S, S3-L, S3-P, S3-P0, S3-MP, S3-MS**
Optional accessories (blanking plug):	**SO-NP, SO-OP**

Connection diagram

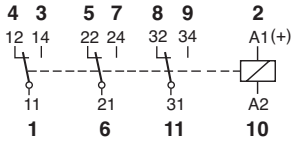


Fig. 1 AC voltage endurance

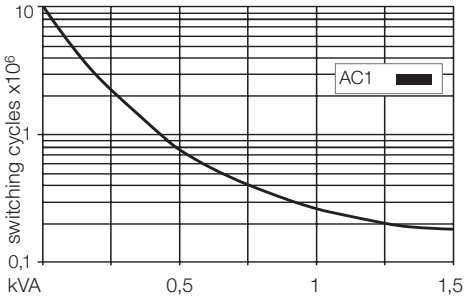
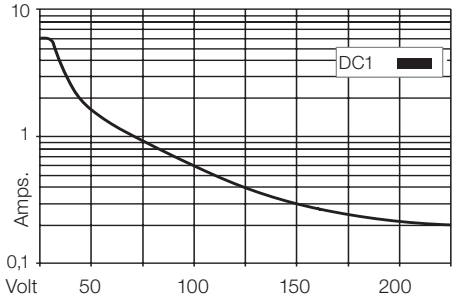
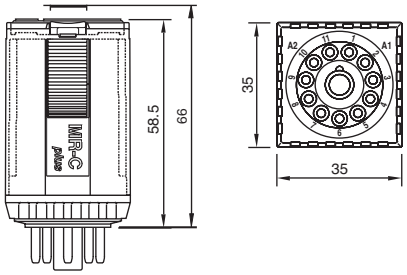


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

IEC 61810; EN 60947

R3-N3xD

11-pin, special relay, 3-pole, according to IEC 67-I-18a
Relay approval: EN 60077-1-2/99 - EN 61373/99 for Railway application

Type	**R3-NxD/ ... V** Relays for Railway application 3 change-over contacts special wide range voltage
Maximum contact load	**6 A 250 V AC1 6 A 30 V DC1**
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 + 0,2µ Au
	Optional	Code 8	AgNi + 10µ Au
Rated current			6 A
Switch-on current max. (20 ms)			15 A
Switching voltage max.			250 V
Max. 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
Nominal power	1,07 W

Coil table

VDC	Ω	mA
24	525	46
48	2133	22
72	4844	15
110	12900	9

Insulation

Pollution grade	PD3
With pulse (1,2 / 50 µs)/Dielectric streght (1Minute/V rms)	
Contact/coil	4 kV / 2220 V
Contact/contact	4 kV / 2220 V
Between contact and the same pole	1550 kV / 850 V

Specifications

Ambient temperature operation/storage	-25 (no ice)....70 °C /-40 ... 80 °C
Number of mechanical operations	≥ 10 millions
Thermic class	B (130 °C)
Vibration : category / class	1 / B Body mounted 5 - 150 Hz (3 axes)
Shock	5 g (3 axes)
Pick-up time/bounce time	18 ms/≤ 3 ms
Release time/bounce time (D version)	35 ms/≤ 1 ms
Weight	95 g
Weight avg. Relay + Socket (S3-B)	150 g
Protection class	IP 40

Standard types

DC 24, 48, 72, 110	**R3-N30/DC ... V**	**R3-N34/DC ... V**	**R3-N38/DC ... V**
Free wheeling diode	**R3-N30D/DC ... V**	**R3-N34D/DC ... V**	**R3-N38D/DC ... V**
LED	**R3-N30X/DC ... V**	**R3-N34X/DC ... V**	**R3-N38X/DC ... V**
LED + free wheeling diode	**R3-N30DX/DC ... V**	**R3-N34DX/DC ... V**	**R3-N38DX/DC ... V***

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

Accessories

Socket:	**S3-B, S3-S, S3-L, S3-P, S3-P0, S3-MP, S3-MS**
Optional accessories (blanking plug):	**SO-NP, SO-OP**

Connection diagram

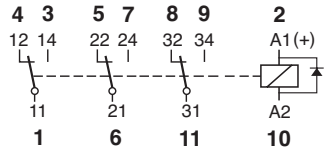


Fig. 1 AC voltage endurance

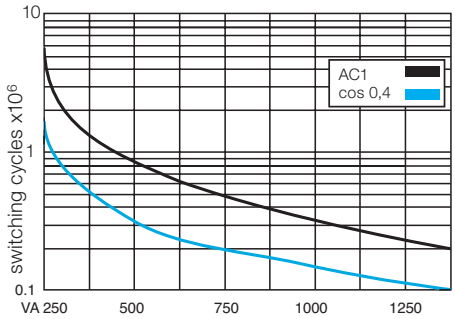
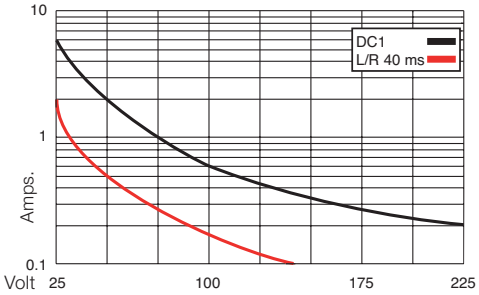
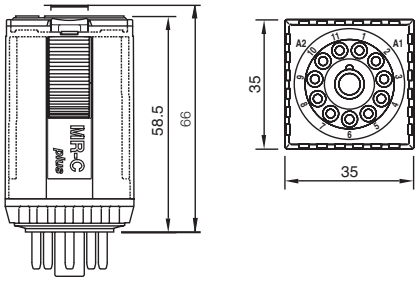


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

IEC 60077/EN60077-1-2/99; EN61373/99

MRC series

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 AC1 0,5 A/110 V DC1** **10 A/30 V DC1 0,2 A/220 V DC1**
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 + 10 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

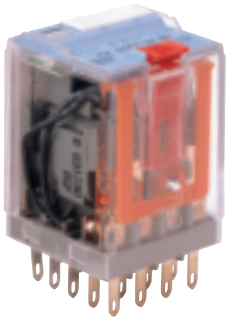
Standard types

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 suppresor	**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

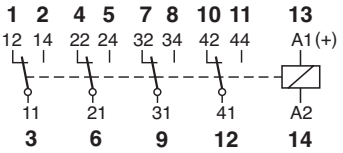


Fig. 1 AC voltage endurance

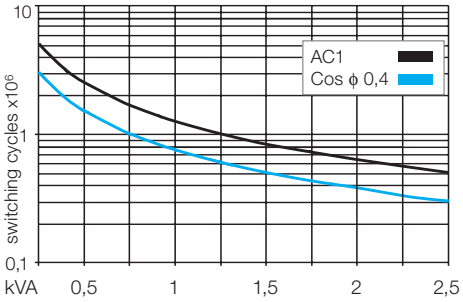
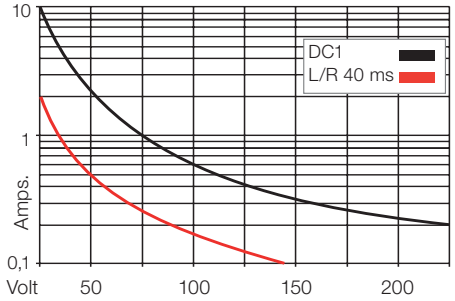
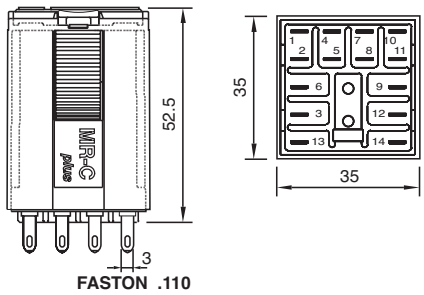


Fig. 2 DC load limit curve



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

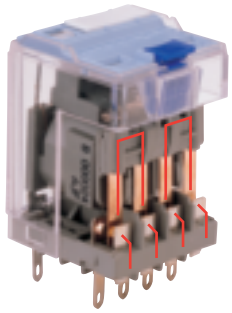
Standard types

VAC 50 Hz/60 Hz: 24, 48, 115, (120), 230, (240)	**C4-X20/AC ... V**
LED	**C4-X20X/AC ... V**
RC Suppresor	**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**

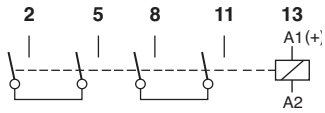
"..." Enter the voltage for full type designation

Accessories

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



Connection diagram



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

Fig. 1 AC voltage endurance

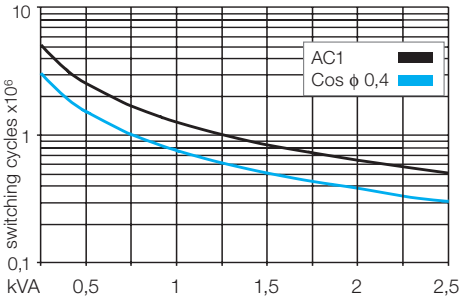
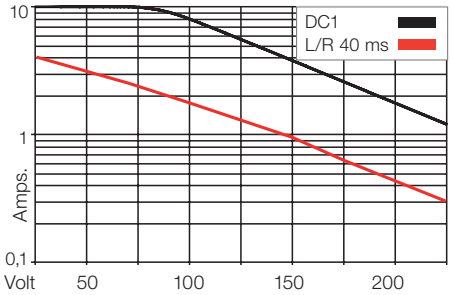
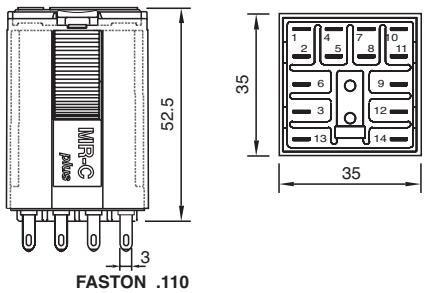


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

IEC 61810; EN 60947

MRC series

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 DC1** **10 A/10 V DC 1 0,2 A/220 V DC1**
Recommended minimum contact load	**10 mA/10 V Code 0, 9** **5 mA/5 V Code 8**

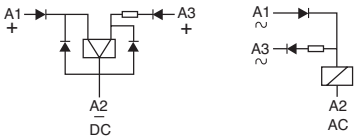
Contacts

Material	Standard	Code 0	AgNi
	Optional	Code 8	AgNi + 10 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 (120), 230 (240)

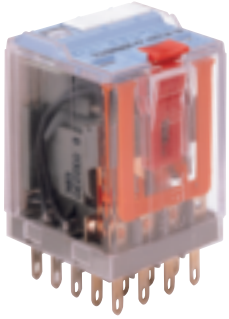
VDC 12, 24, 48, 110

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

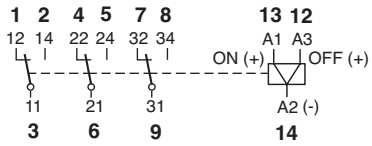


Fig. 1 AC voltage endurance

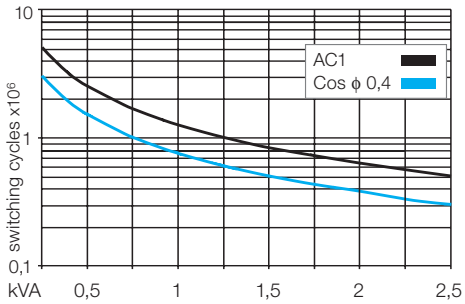
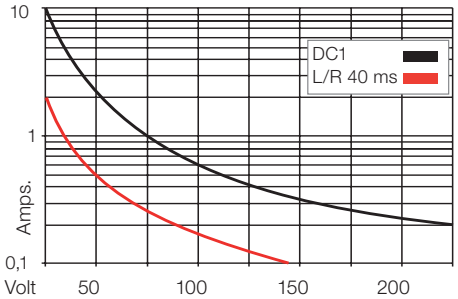
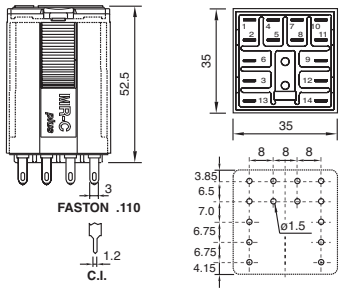


Fig. 2 DC load limit curve



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 AC1** **0,5 A/110 V DC1** **16 A/30 V DC1** **0,2 A/220 V DC1**

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 suppresor (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

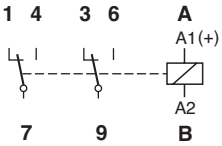


Fig. 1 AC voltage endurance

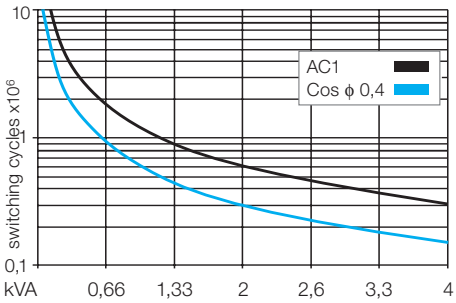
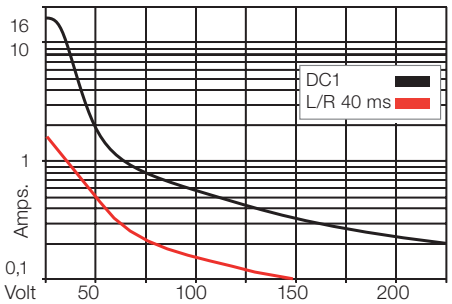
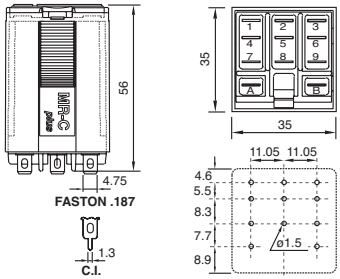


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

IEC 61810; EN 60947

MRC series

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 AC1 — 0,5 A/110 V DC1** **16 A/30 V DC1 — 0,2 A/220 V DC1**

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 suppresor (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

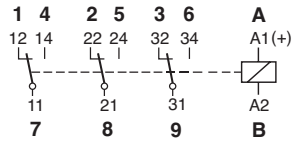


Fig. 1 AC voltage endurance

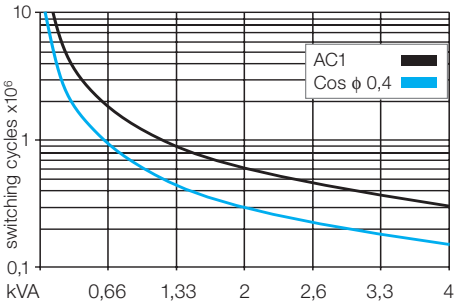
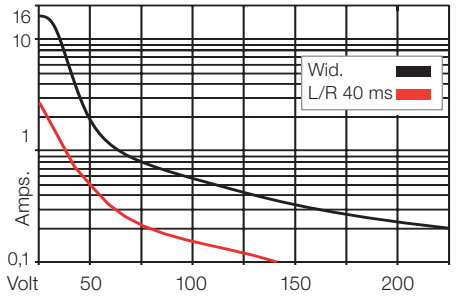
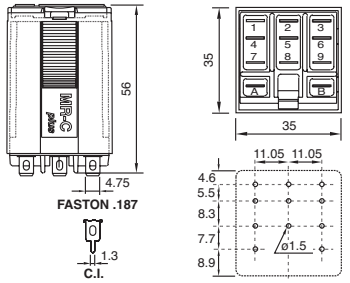


Fig. 2 DC load limit curve



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 AC1** **1,2 A/110 V DC1** **16 A/30 V DC1** **0,4 A/220 V DC1**

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 suppresor (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

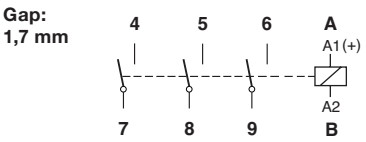


Fig. 1 AC voltage endurance

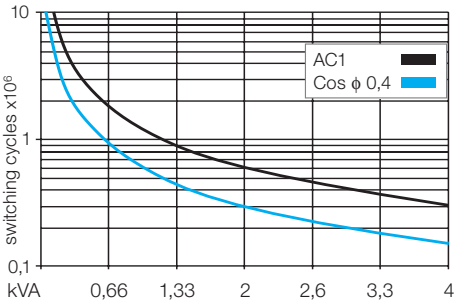
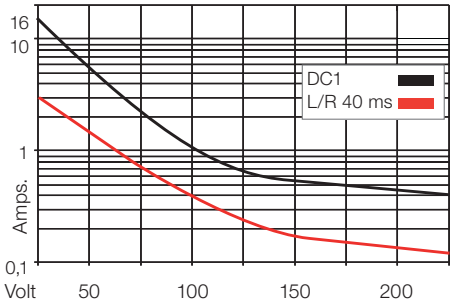
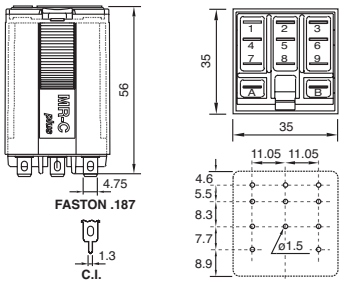


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

EN 60947; IEC 61810

MRC series

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 AC1 — 7 A/110 V DC1** **16 A/30 V DC1 — 1,2 A/220V DC13**

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

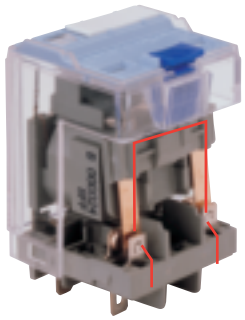
Standard types

VAC 50 Hz/60 Hz: 24, 48, 115 (120), 230 (240)	**C5-X10/AC ... V**
LED	**C5-X10X/AC ... V**
RC suppresor (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

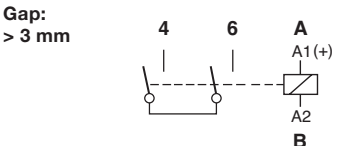


Fig. 1 AC voltage endurance

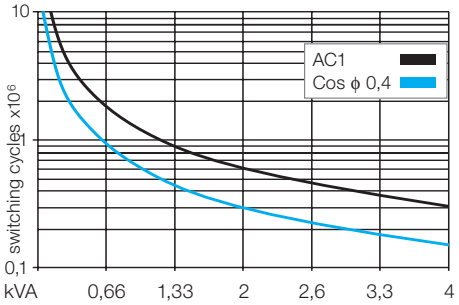
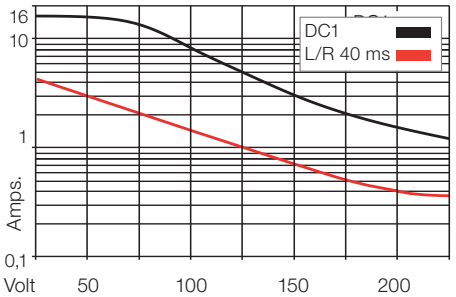
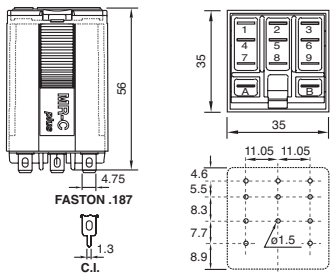


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

IEC 61810; EN 60947

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 AC1 10 A/220 V DC1** **3,6 A/110 V DC13 2 A/220 V DC13**

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

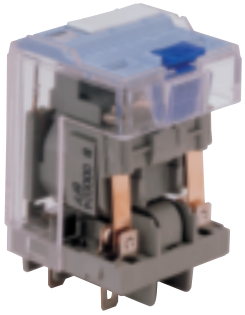
Standard types

VAC 50 Hz/60 Hz: 24, 48, 115 (120), 230 (240)	**C5-M10/AC ... V**
LED	**C5-M10X/AC ... V**
RC suppresor (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

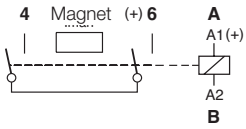


Fig. 1 AC voltage endurance

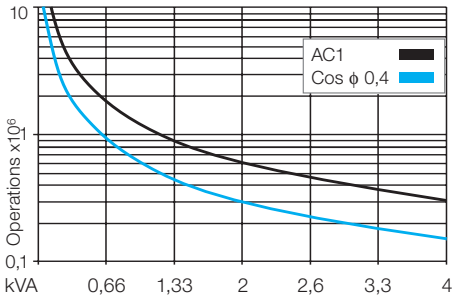
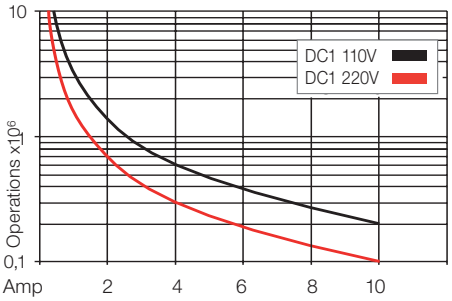
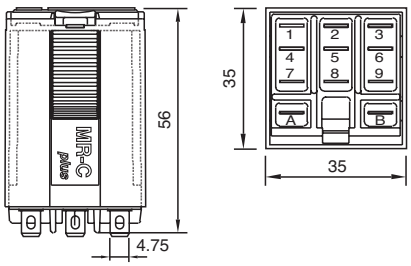


Fig. 2 DC voltage endurance



Dimensions [mm]



Technical approvals, conformities

IEC 61810; EN 60947

MRC series

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 AC1** **7 A @ 110 V DC1** **3 A @ 220 V DC1**

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 suppresor (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

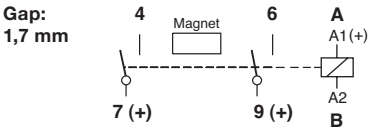


Fig. 1 AC voltage endurance

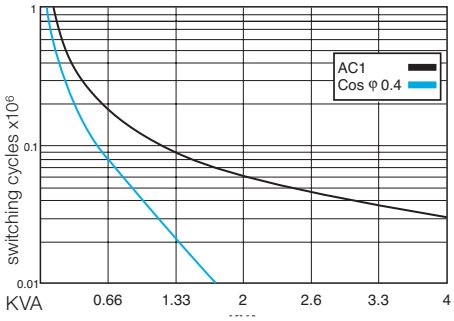
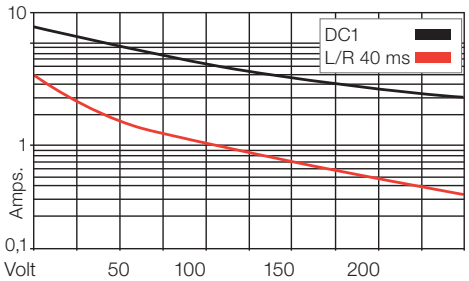
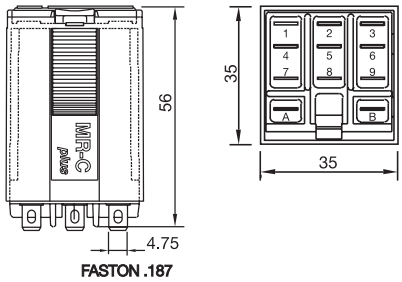


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

IEC 61810; EN 60947

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 AC1** **10 A/30 V DC1** **0,2 A/250 V DC1** **0,5 A/110 V DC1**

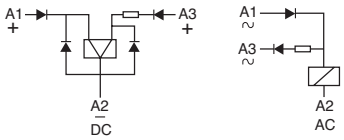
Contacts

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 (120), 230 (240)	**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

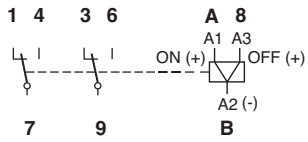


Fig. 1 AC voltage endurance

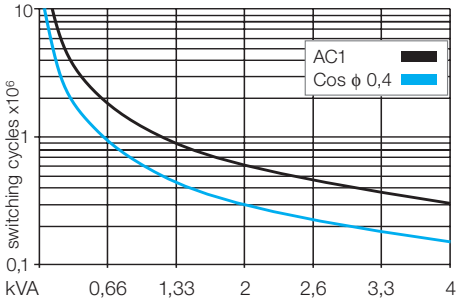
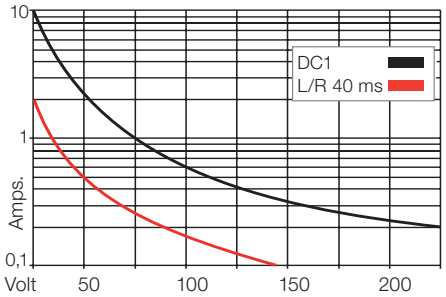
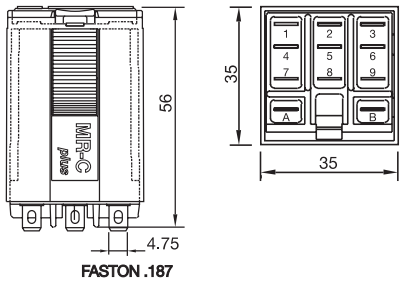


Fig. 2 DC load limit curves



Dimensions [mm]



Technical approvals, conformities

IEC 61810, EN 60947

Notes

1.1.2 Miniature Industrial Relays

QRC Series

Application	Types	Pins	Contacts	AC ratings	DC ratings	Socket
C7 Series						
Miniature power relay	C7-A1			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

QRC series

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 AC1** **0,5 A/110 V DC1** **16 A/30 V DC1** **0,2 A/220 V DC1**

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
Relay compatible with socket S7-16			

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.
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-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:	**S7-16**

Connection diagram

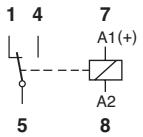


Fig. 1 AC voltage endurance

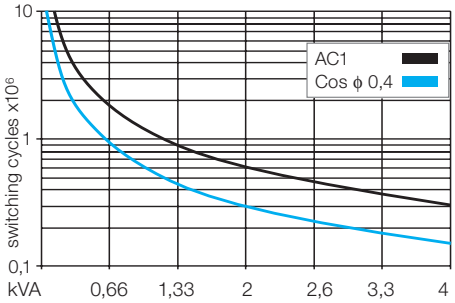
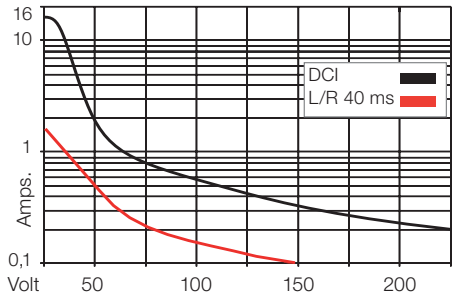
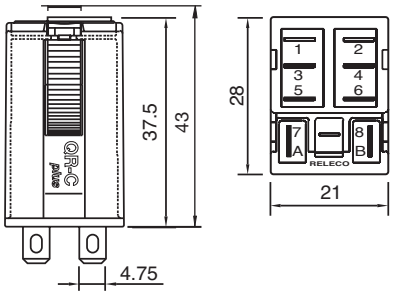


Fig. 2 DC load limit curve



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**	**AC1**	**0,5 A/110 V**	**DC1**
	10 A/30 V	**DC1**	**0,2 A/220 V**	**DC1**
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 + 10 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-M, S7-I/O, S7-L, S7-P, S7-P0**

Connection diagram

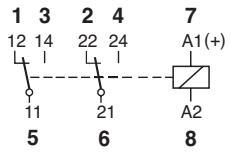


Fig. 1 AC voltage endurance

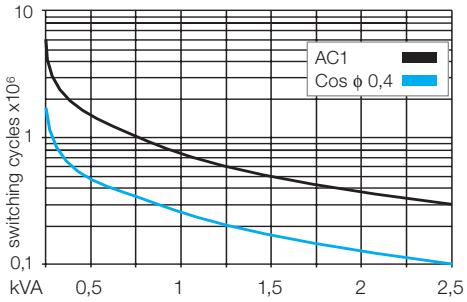
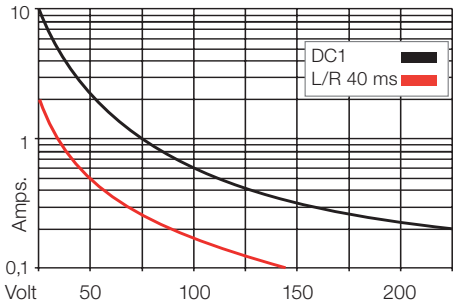
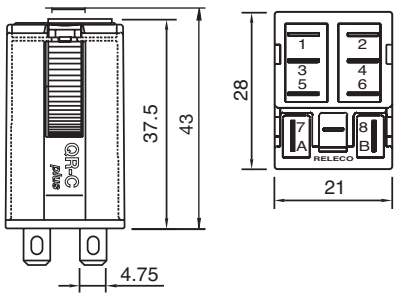


Fig. 2 DC load limit curve



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**	**AC1**	**6 A/30 V**	**DC1**
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 + 10 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-M, S7-I/O, S7-L, S7-P, S7-P0**

Connection diagram

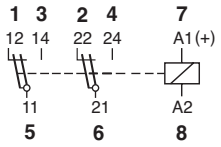


Fig. 1 AC voltage endurance

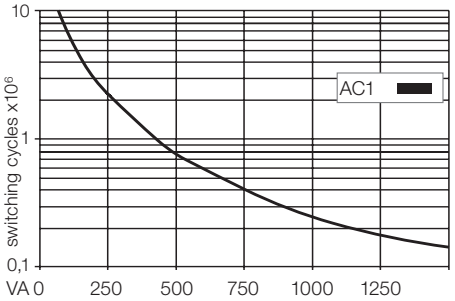
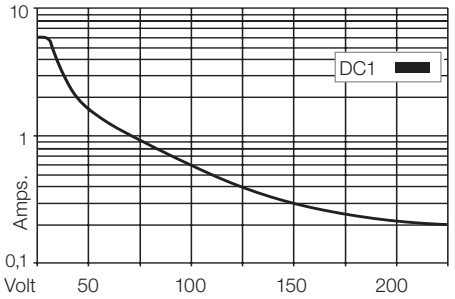
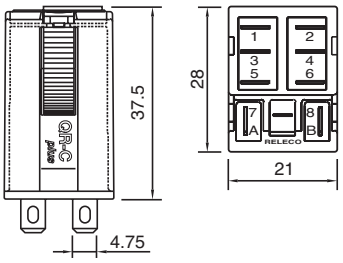


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

IEC 61810; EN 60947

C7-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 AC1** **0,8 A/110 V DC1** **10 A/30 V DC1** **0,4 A/220 V DC1**

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-M, S7-I/O, S7-L, S7-P, S7-P0**

Connection diagram

Gap: 1,5 mm

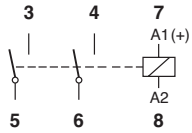


Fig. 1 AC voltage endurance

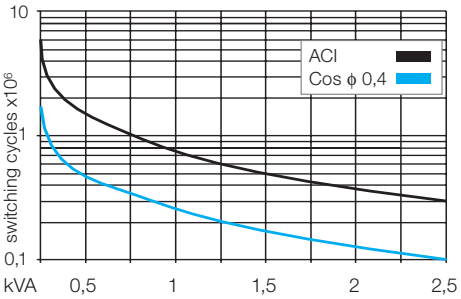
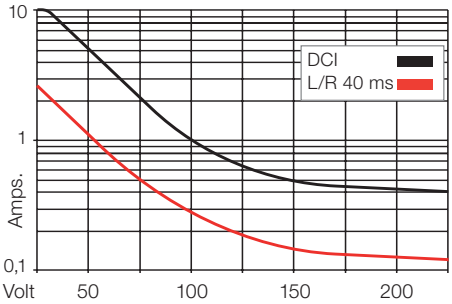
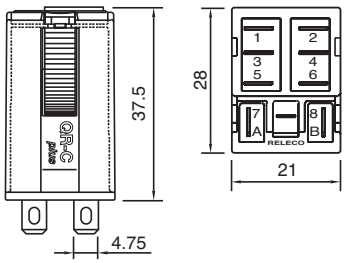


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

Lloyd´s

IEC 61810; EN 60947

QRC series

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 AC1 — 6 A/110 V DC1** **10 A/30 V DC1 — 1 A/220 V DC1**

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

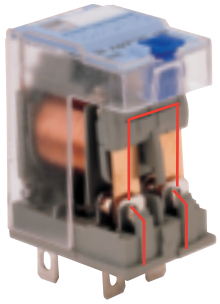
Standard types

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-M, S7-I/O, S7-L, S7-P, S7-P0**



Connection diagram

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

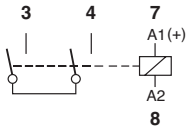


Fig. 1 AC voltage endurance

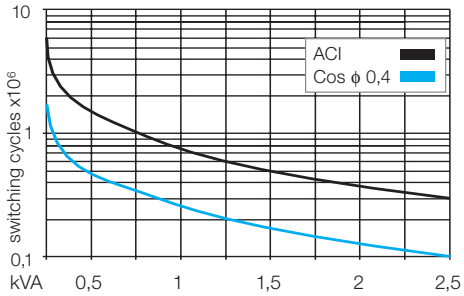
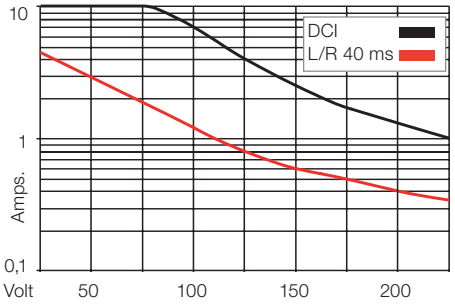
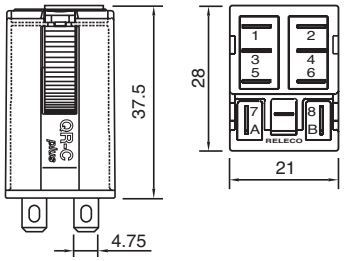


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

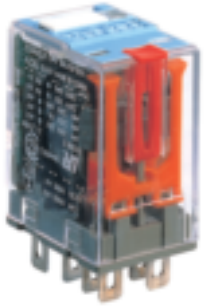
Lloyd´s

IEC 61810; EN 60947

C7-H23

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

comat RELECO by RELECO



Type	**C7-H23/ ... V** Special relays 1 x CO power contact 1 x CO twin contact
Maximum contact load	**10 A 250 V AC1 6 A 250 V AC1** **10 A 30 V DC1 6 A 30 V DC1**
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

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-M, S7-I/O, S7-L, S7-P, S7-P0**

Connection diagram

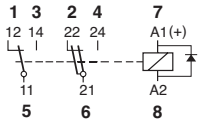


Fig. 1 AC voltage endurance

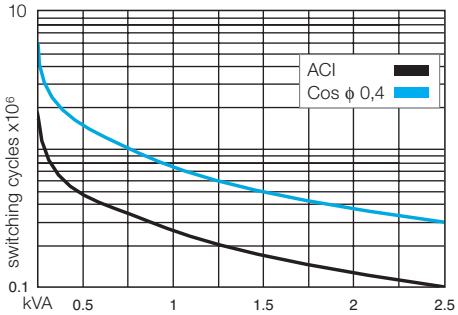
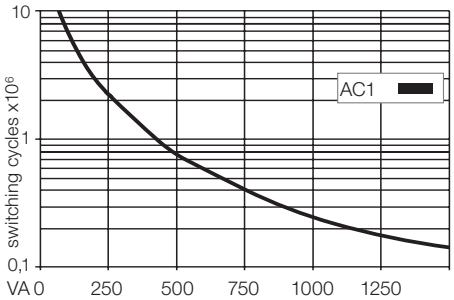
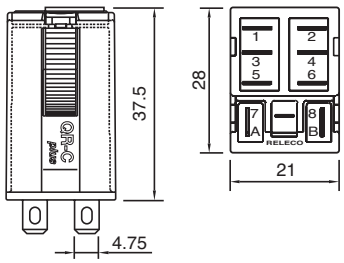


Fig. 2 AC voltage endurance



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** **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

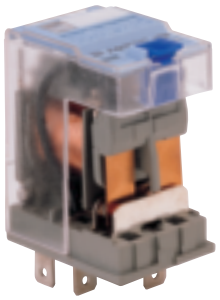
Standard types

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

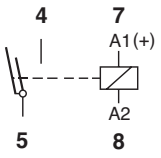


Fig. 1 AC voltage endurance

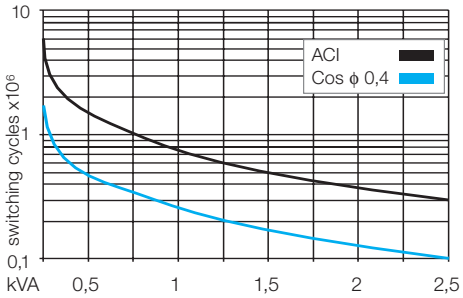
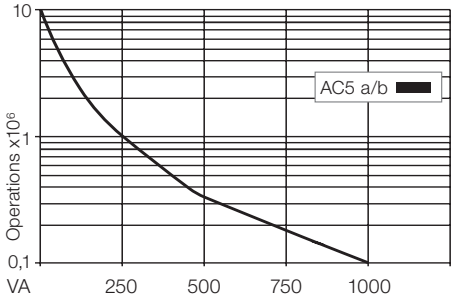
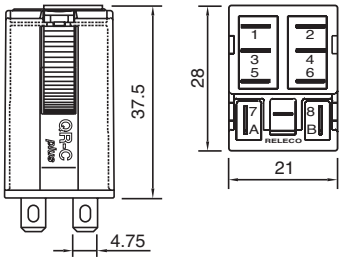


Fig. 2 AC voltage endurance



Dimensions [mm]



Technical approvals, conformities

Lloyd's

IEC 61810; EN 60947

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 AC1 10A/30V DC1**
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 + 0,2µ Au
	Optional	Code 8	AgNi + 10µ 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 %
Pick-up voltage	0,7 U_N ... 1,25 U_N
Release 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 streght (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-M, S7-I/O, S7-L, S7-P, S7-P0**

Connection diagram

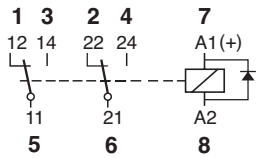


Fig. 1 AC voltage endurance

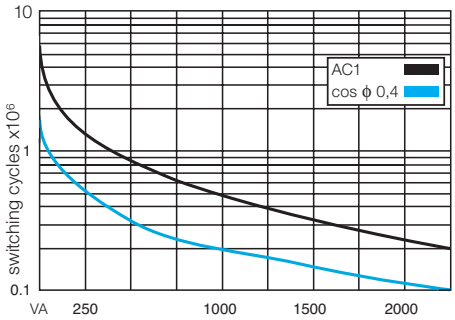
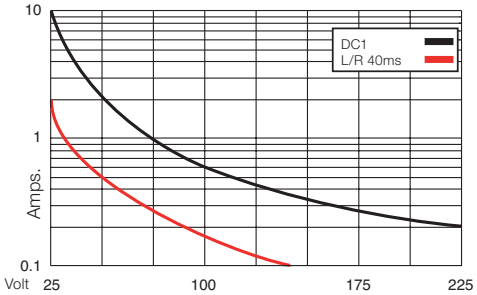
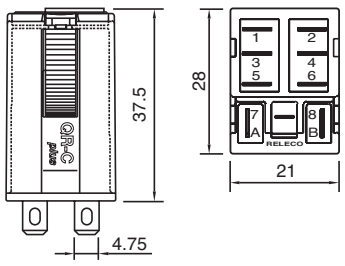


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

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

QRC series

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 AC1 6 A 30 V DC1**
Recommended minimum contact load	**5 mA/5 V Code 1** **1 mA/5 V Code 2**

Contacts

Material	Standard	Code 1	AgNi + 0,2µ Au
	Optional	Code 2	AgNi + 10µ 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 %
Contact open	0,7 U_N ... 1,25 U_N
Operation range	≥ 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 /50hs) Dielectric streght (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-M, S7-I/O, S7-L, S7-P, S7-P0**

Connection diagram

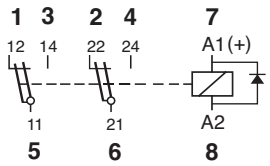


Fig. 1 AC voltage endurance

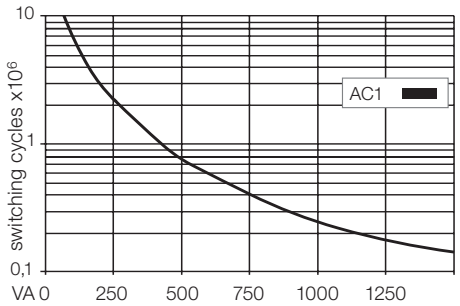
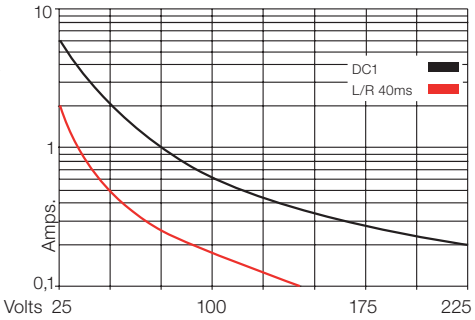
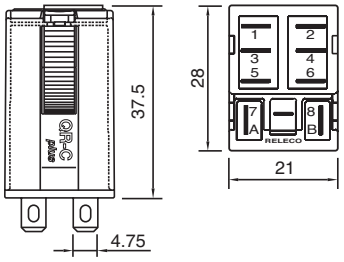


Fig. 2 DC load limit curve



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 DC1**
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 + 10 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

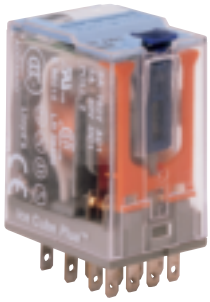
Standard types

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

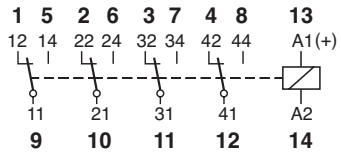


Fig. 1 AC voltage endurance

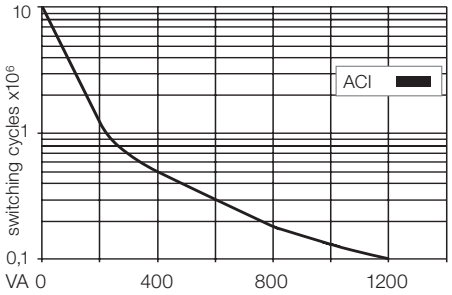
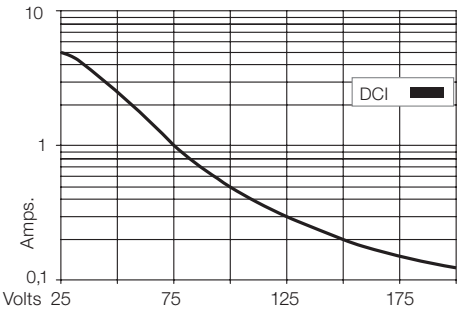
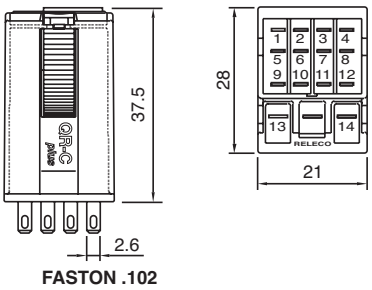


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

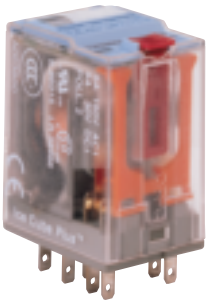
Lloyd´s

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 AC1 5 A/30 V DC1**
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 + 10 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

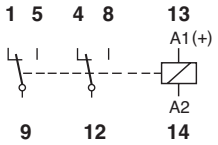


Fig. 1 AC voltage endurance

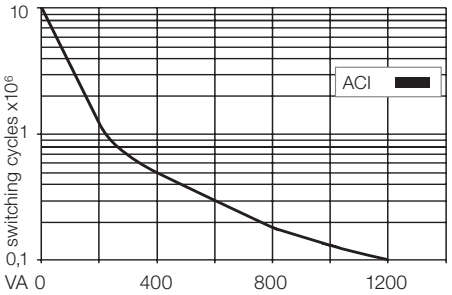
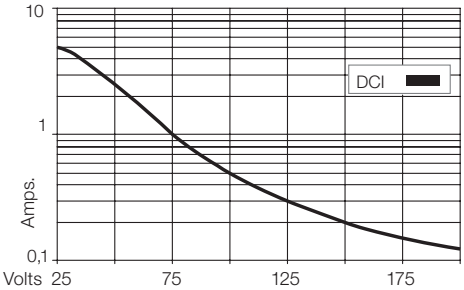
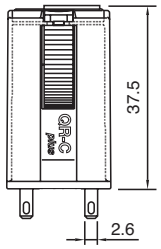


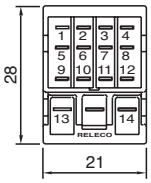
Fig. 2 DC load limit curve



Dimensions [mm]



FASTON .102



Technical approvals, conformities

Lloyd´s

IEC 61810; EN 60947

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 AC1** **5 A/30 V DC1**
Recommended minimum contact load	**10 mA/10 V**

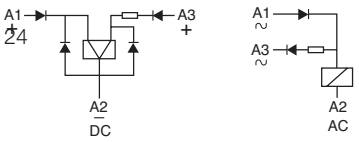
Contacts

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

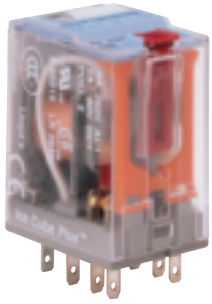
Standard types

AC 50 Hz/60 Hz: 24, 48, 115, (120), 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

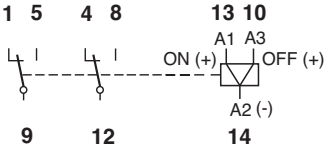


Fig. 1 AC voltage endurance

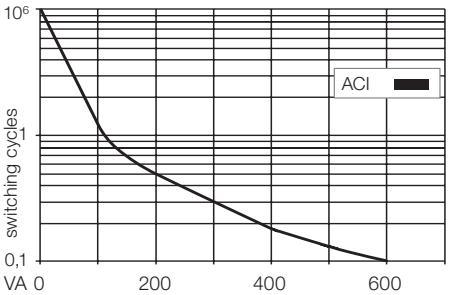
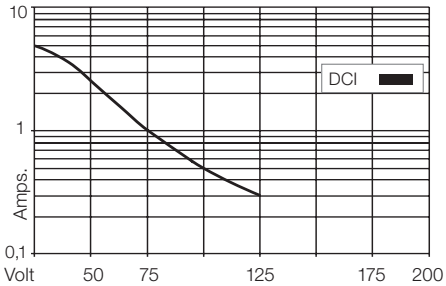
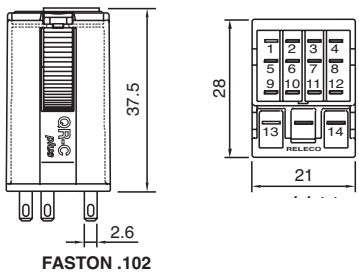


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

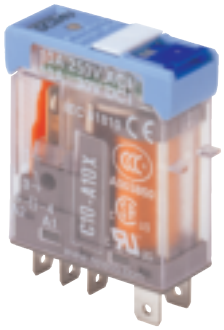
Lloyd´s

IEC 61810; EN 60947

Notes

1.1.3 Interface Relays

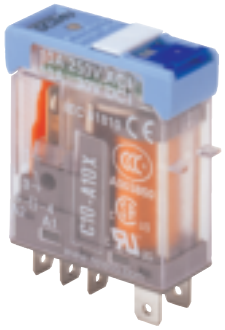
IRC Series



Application	Types	Pins	Contacts	AC ratings	DC ratings	Socket
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
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

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 AC1** **0,5 A/110 V DC1** **10 A/30 V DC1** **0,2 A/220 V DC1** **13 A/250 V AC1**
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+ 10 µ Au
	Optional	Code 5	Ag Sn O2
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	1,1 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 suppresor	**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

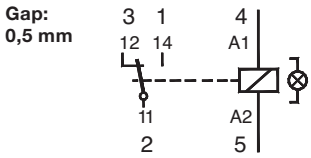


Fig. 1 AC voltage endurance

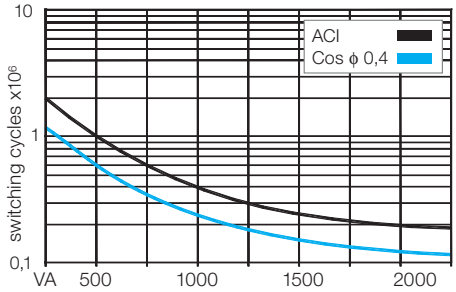
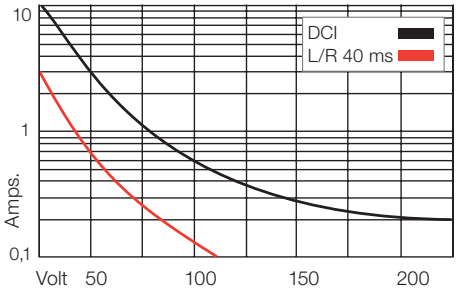
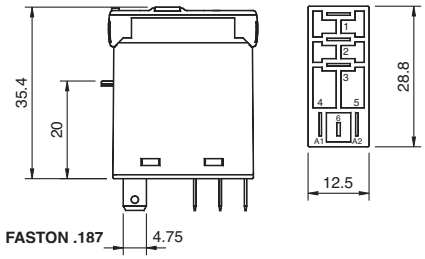


Fig. 2 DC load limit curve



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 AC1** **0,8 A/110 V DC1** **10 A/30 V DC1** **0,4 A/220 V DC1**
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 +10 µ Au
	Optional	Code 5	Ag SnO2
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	1,1 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

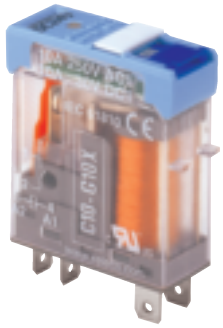
Standard types

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 suppresor	**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

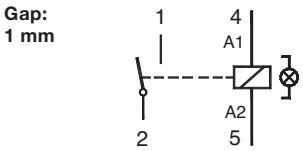


Fig. 1 AC voltage endurance

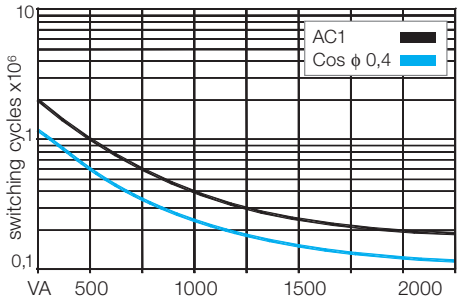
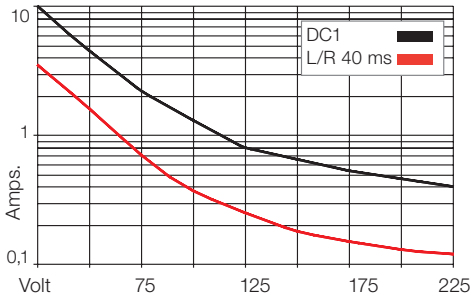
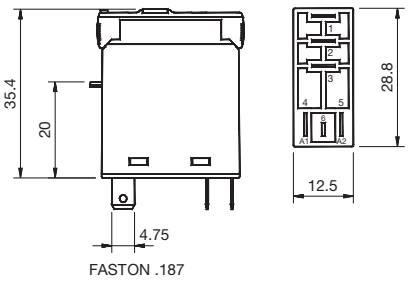


Fig. 2 DC load limit curve



Dimensions [mm]



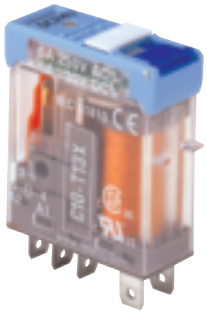
Technical approvals, conformities

IEC 61810; EN 60947

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**	**AC1**	**0,5 A/110 V**	**DC1**
	6 A/30 V	**DC1**	**0,2 A/220 V**	**DC1**
Recommended minimum contact load	**5 mA/5 V**	**Code 3**		
	1 mA/5 V	**Code 2**		



Contacts

Material	Standard	Code 3	AgNi + 3 µ Au
	Optional	Code 2	AgNi + 10 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-T13/AC ... V**	**C10-T12/AC ... V**
LED	**C10-T13X/AC ... V**	**C10-T12X/AC ... V**
RC suppresor	**C10-T13R/AC...V**	**C10-T12R/AC...V**
VDC12, 24, 48, 110	**C10-T13/DC ... V**	**C10-T12/DC ... V**
LED	**C10-T13X/DC ... V**	**C10-T12X/DC ... V**
Polarity and free wheeling diode	**C10-T13FX/DC ... V**	**C10-T12FX/DC ... V**
AC/DC bridge rectifier 24 V, 48 V	**C10-T13BX/UC ... V**	**C10-T12BX/UC ... V**

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

Accessories

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

Connection diagram

Gap: 0,5 mm

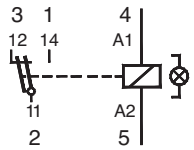


Fig. 1 AC voltage endurance

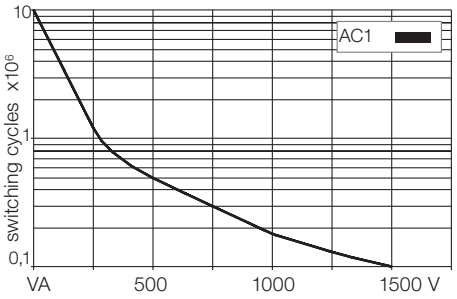
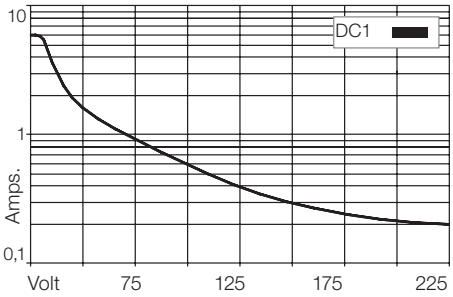
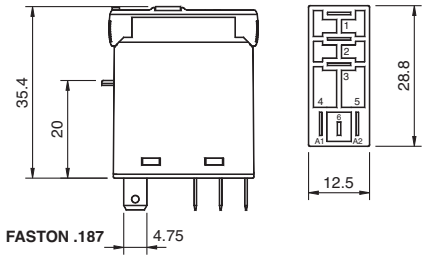


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

IEC 61810; EN 60947

C10-GT1x

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

Type	**C10-GT1x/ ... V** Standard relay for low power application 1 open contact
Maximum contact load	**6 A/250 V AC1 0,8 A/110 V DC1** **6 A/30 V DC1 0,4 A/220 V DC1**
Recommended minimum contact load	**5 mA/5 V Code 3** **1 mA/5 V Code 2**

Contacts

Material	Standard	Code 3	AgNi + 3 µ
	Optional	Code 2	AgNi + 10 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	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	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

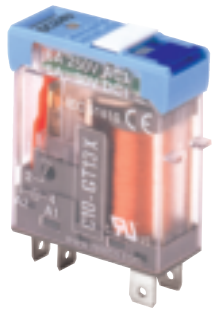
Standard types

VAC 50 Hz/60 Hz: 24, 48, 115, (120), 230, (240)	**C10-GT13/AC ... V**	**C10-GT12/AC ... V**
LED	**C10-GT13X/AC ... V**	**C10-GT12X/AC ... V**
RC suppresor	**C10-GT13R/AC ... V**	**C10-GT12R/AC ...V**
VDC 12, 24, 48, 110	**C10-GT13/DC ... V**	**C10-GT12/DC ... V**
LED	**C10-GT13X/DC ... V**	**C10-GT12X/DC ... V**
Polarity and free wheeling diode	**C10-GT13FX/DC ... V**	**C10-GT12FX/DC ... V**
AC/DC bridge rectifier 24 V, 48 V	**C10-GT13BX/UC ... V**	**C10-GT12BX/UC ... V**

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

Accessories

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



Connection diagram

Gap: 1 mm

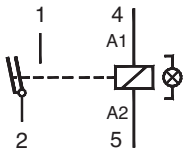


Fig. 1 AC voltage endurance

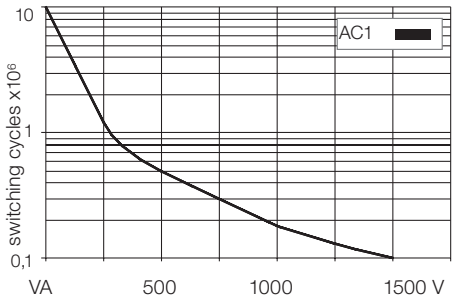
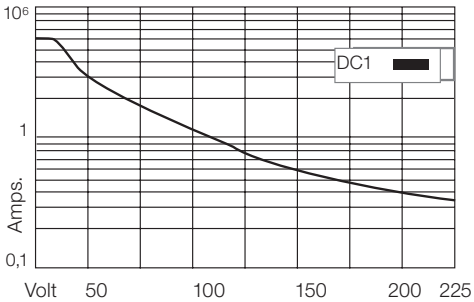
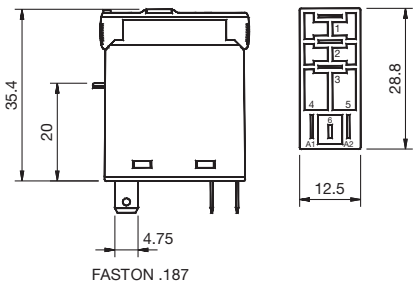


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

IEC 61810; EN 60947

IRC series

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 AC1** **0,5 A/110 V DC1** **5 A/30 V DC1** **0,2 A/220 V DC1**
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 + 10 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

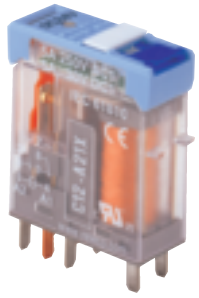
Standard types

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 suppresor	**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

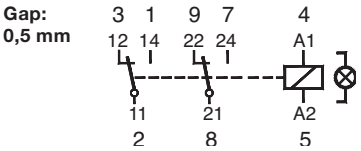


Fig. 1 AC voltage endurance

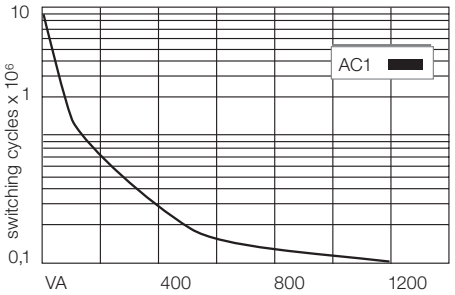
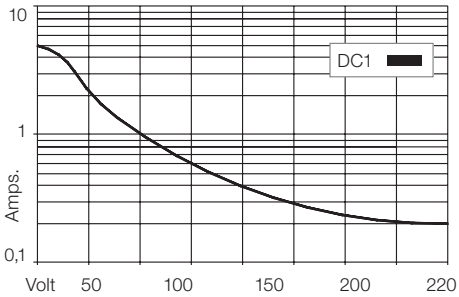
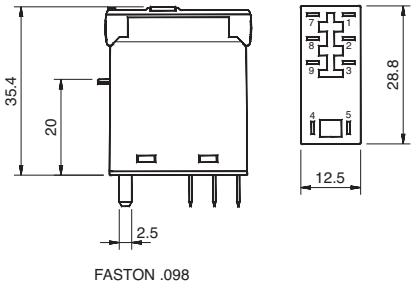


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

IEC 61810; EN 60947

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**	**AC1**	**0,8 A/110 V**	**DC1**
	5 A/30 V	**DC1**	**0,4 A/220 V**	**DC1**
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 + 10 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

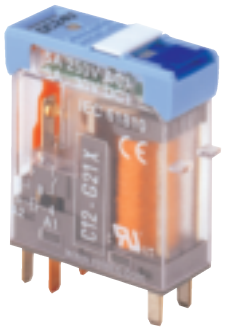
Standard types

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 suppresor	**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

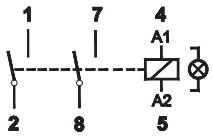


Fig. 1 AC voltage endurance

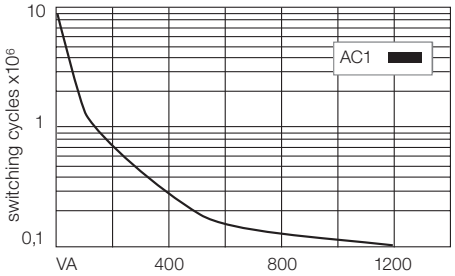
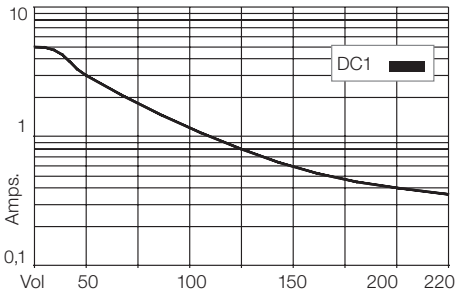
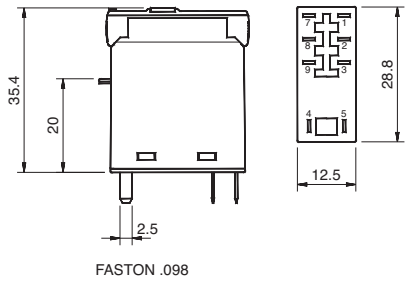


Fig. 2 DC load limit curve



Dimensions [mm]



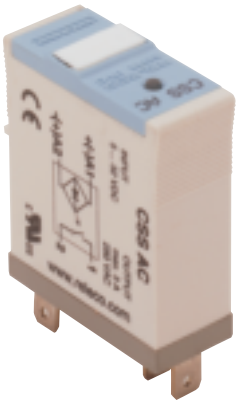
Technical approvals, conformities

IEC 61810; EN 60947

Notes

1.1.4 Solid State Relays

CSS Series



Application	Types	Pins	Contacts	AC ratings	DC ratings	Socket
CSS Series						
AC Solid state relay, Instantaneous switching	CSS-AC			3 A / 250 V		S10
AC Solid state relay synchronized to zero	CSS-AZ			3 A / 250 V		S10
NPN Solid state relay	CSS-DCN				2 A / 50 V	S10
PNP Solid state relay	CSS-DCP				2 A / 50 V	S10

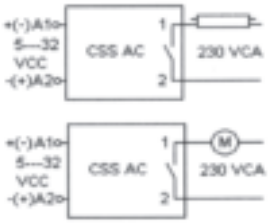
CSS-AC

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

Type	**CSS-AC** 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	**50 mA**
Control circuit	
Input voltage range	5 ... 32 VDC
Release voltage	< 2,5 VDC
Input current	5 ... 15 mA
Stabilised current regulator	yes
Input voltage protection	IEC-1000-4-5 level 1
Output circuit	Instantaneous
Max. output current	3 A
Min. output current	50 mA
Output voltage range	24...250 VAC
Inrush current	30 A/10 ms
Max. release voltage	< 1,5 VAC
Residual current	≤ 0,55 mA
di/dt	≤ 50 A µs
I^2t value	50 A^2s
Specifications	
Ambient temperature operation/storage	-25 ... 60 °C /-40 ... 80 °C
Test voltage between input/output	4 kV rms/1min
Pick-up time	max. 1/2 wave
Release time	2 ms + 1/2 wave
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 (max. Di/dt 50A/µs) as transformers, motors or fluorescents, the maximum output current will limit to 2 A.



Accessories

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

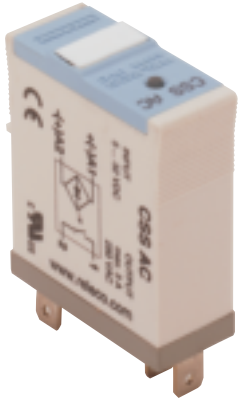
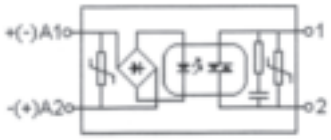
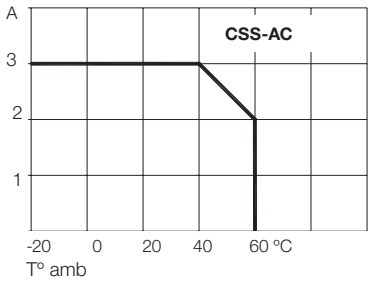


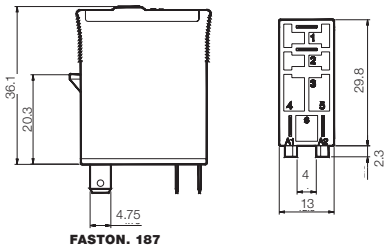
Fig. 1 CSS-AC diagram



Tab. 2 AC load limit curve



Dimensions [mm]



Technical approvals, conformities

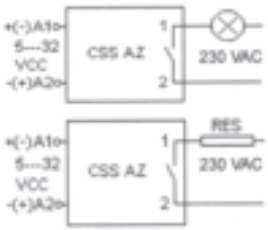
CSS-AZ

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

Type	**CSS-AZ** Solid state relay For switching resistive lamps and AC loads Synchronized to zero
Output	**1 N/O contact**
Operating range	**3 A, 24 ... 250 VAC, 50/60 Hz**
Minimum contact load	**50 mA**
Control parameters	
Input voltage range	5 ... 32 VDC
Release voltage	< 2,5 VDC
Input current	5 ... 15 mA
Stabilised current regulator	yes
Input voltage protection	IEC-1000-4-5 Level 1
Output	Synchronized zero
Max. output current	3 A
Min. output current	50 mA
Output voltage range	24 ... 250 VAC
Inrush current	30 A/10 ms
Max. release voltage	< 1,5 VAC
Residual current	≤ 0,55 mA
du/dt//di/dt	≤ 50 A µs
I^2t value	50 A^2s
Specifications	
Ambient temperature operation/storage	-25….60 °C /-40 ... 80 °C
Test voltage between input/output	4 kV rms/1min
Pick-up time	max. 1/2 cycle
Release time	2 ms + 1/2 cycle
Weight	28 g

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



Accessories

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

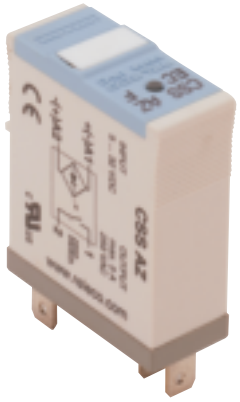
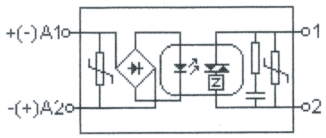
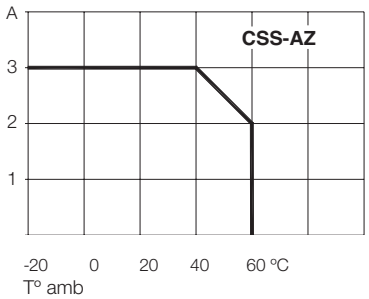


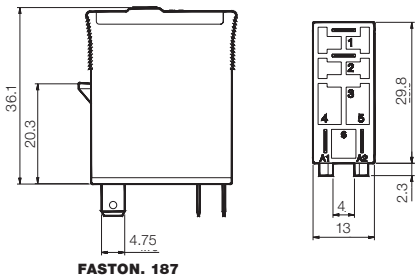
Fig. 1 CSS-AZ diagram



Tab. 2 AC load limit curve



Dimensions [mm]



Technical approvals, conformities

CSS-DCN

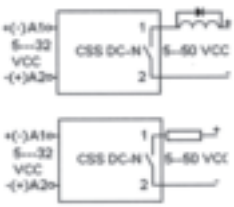
4-pin, Interface solid state relay, 1-pole, plug-in faston

Type	**CSS-DCN** NPN solid state relay Terminal commun 2 negative (S10 socket)
Output	1 N/O contact
Operating range	**2 A, 5 ... 50 VDC**
Minimum contact load	**1 mA**
Control parameters	
Input voltage range	5 ... 32 VDC
Release voltage	< 2,5 VDC
Input current	3 ± 1 mA
Stabilised current regulator	yes
Input voltage protection	IEC-1000-4-5 Level 1
Output	
Type	NPN
Max. output current	2 A
Output voltage range	5 ... 50 VDC
Switch-on current max.	5 A/ 350µs
Max. release voltage	≤ 1,3 VDC
Residual current	< 100 µA/48 VDC
EMC protection	IEC-1000-4-5 Level 1
Inverse current	≤ 1 A
Specifications	
Ambient temperature operation/storage	-25 ... 60 °C/-40 ... 80 °C
Test voltage between input/output	4 kV rms/1 min.
Turn-on delay	1 ms
Release delay	≤ 2 ms
Weight	28 g

Applications

For switching heating elements, electro valves, motors, PLC input/output signals, solenoids, incandescent and fluorescent lamps, etc. (up to 50 VDC).

Inductive loads must be shunted with an antiparallel diode.



Accessories

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

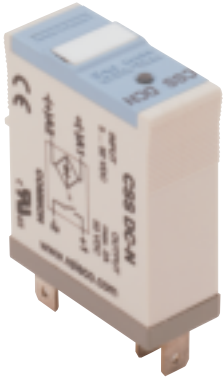
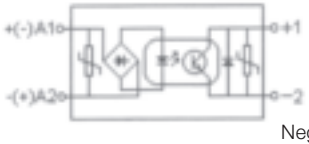
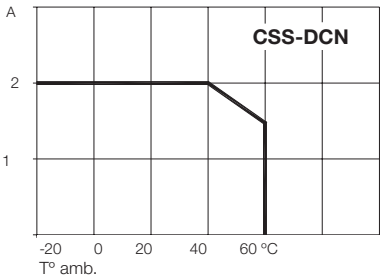


Fig. 1 CSS-DCN diagram

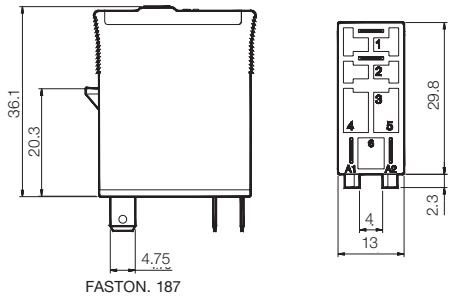


Negative Common

Tab. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

CSS-DCP

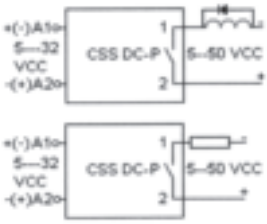
4-pin, Interface solid state relay, 1-pole, plug-in faston

Type	**CSS-DCP** NPN solid state relay Terminal commun 2 positive (S10 socket)
Output	1 N/O contact
Operating range	**2 A, 5 ... 50 VDC**
Minimum contact load	**1 mA**
Control parameters	
Input voltage range	5 ... 32 VDC
Release voltage	< 2,5 VDC
Input current	3 ± 1 mA
Stabilised current regulator	yes
Input voltage protection	IEC-1000-4-5 Level 1
Output	
Type	NPN
Max. output current	2 A
Output voltage range	5 ... 50 VDC
Max. switch-on current	5 A/ 350µs
Max. release voltage	≤ 1,3 VDC
Residual current	< 100 µA/48 VDC
EMC protection	IEC-1000-4-5 Level 1
Inverse current	≤ 1 A
Specifications	
Ambient temperature operation/storage	-25….60 °C /-40 ... 80 °C
Test voltage between input/output	4 kV rms/1 min.
Turn-on delay	1 ms
Release delay	≤ 2 ms
Weight	28 g

Applications

For switching heating elements, electro valves, motors, PLC input/output signals, solenoids, incandescent and fluorescent lamps, etc. (up to 50 VDC).

Inductive loads must be shunted with an antiparallel diode.



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

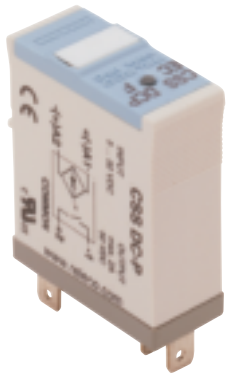
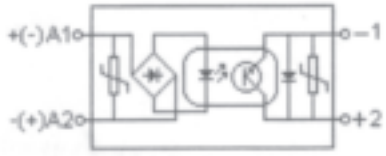
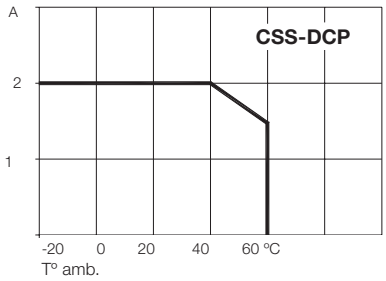


Fig. 1 CSS-DCP diagram

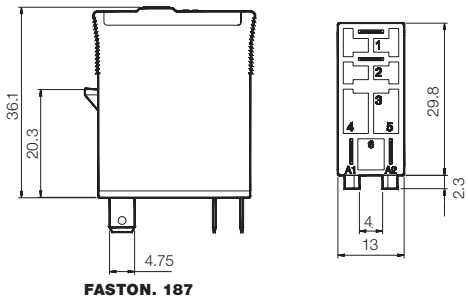


positive comon

Tab. 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)

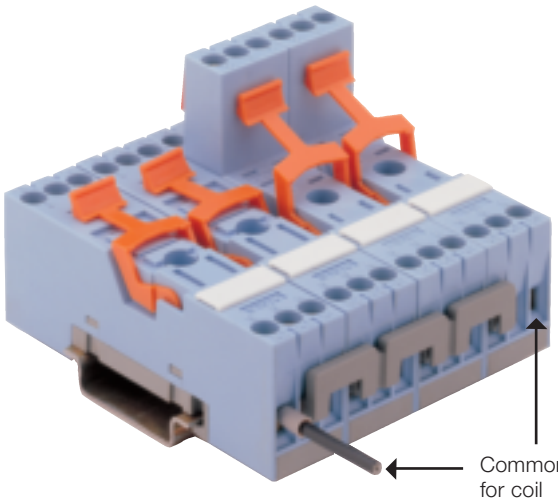
Power terminals at level 1:
(12, 11, 14)

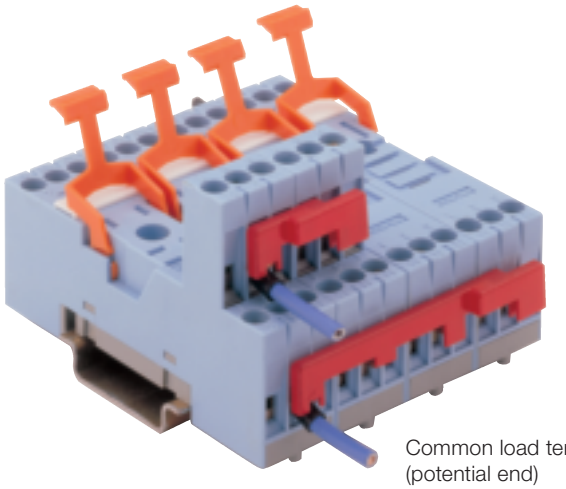
Power terminals at level 2:
(22, 21, 24)
General

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.

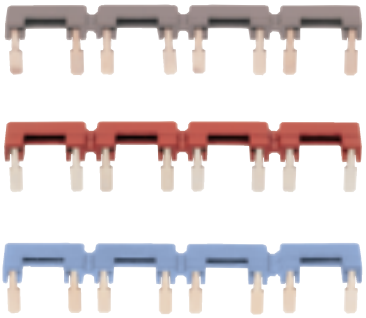
The jumpers are available in the colours grey, blue and red. .

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

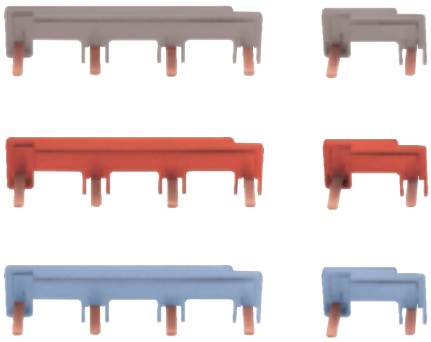




B20 plug-in jumpers for the control end



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

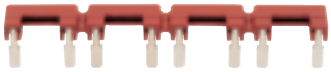
V10-G

B20-G

V40-R

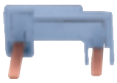
V10-R

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.

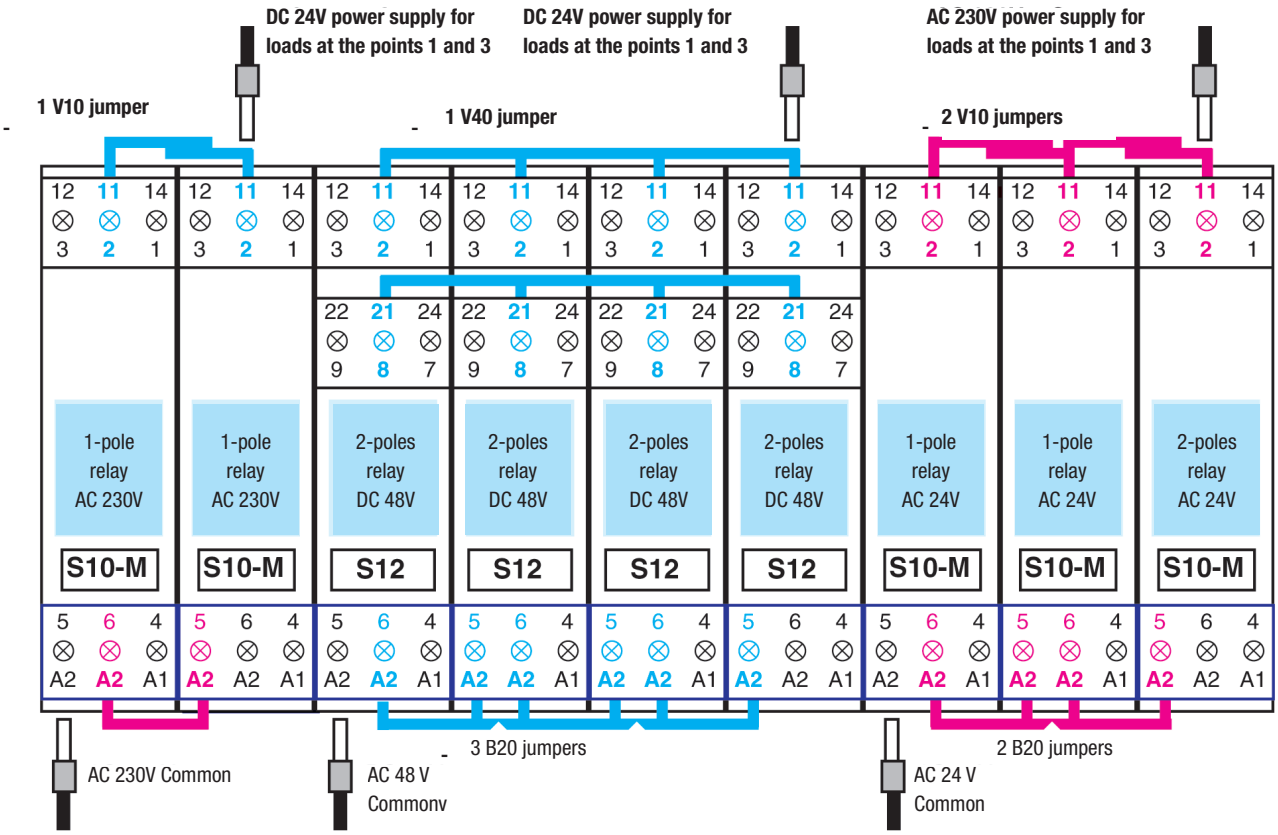
Attention needs to be paid only to the total current. At higher currents and also for safety reasons, a current supply at the start and end of a jumpered connection is recommended.

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

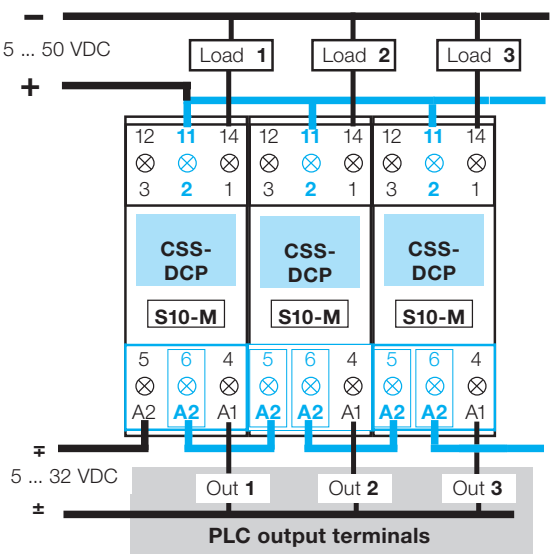
Drive
All versions feature an electrically isolated input for 5 to 32 V DC. The inputs are characterised by a minimum delay with a simultaneously high interference immunity.

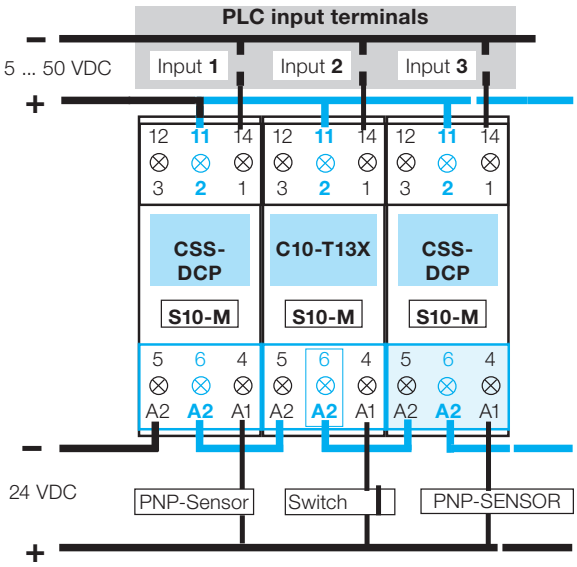
DC semiconductor switches
There are two versions with identical performance data.
The CSS-DCN version has the common negative terminal 2, and the load is connected to terminal 1. The CSS-DCP has the common positive terminal at terminal 2. The load is connected to terminal 1. This corresponds to an NPN 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.

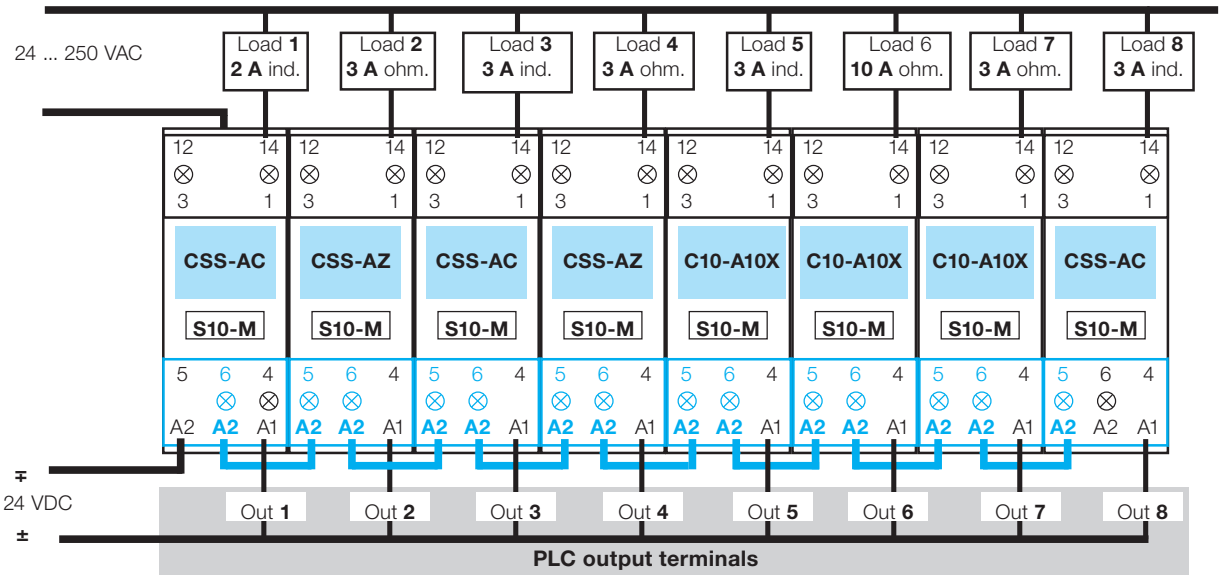
DC applications with mixed components

DC applications with mixed components





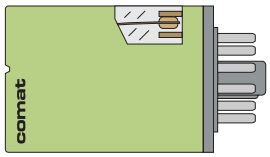
AC applications with mixed components

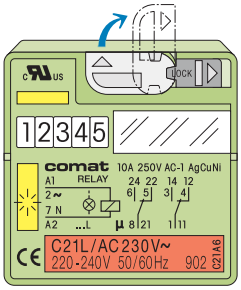


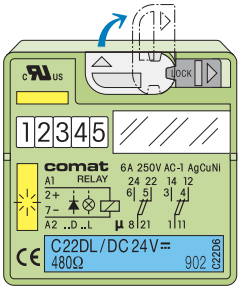
Notes

1.1.5 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
Low switching load	C22	8		5 A / 250 V	S2
C30 Series					
Long Life, Railway	C31	11		10 A / 250 V	S3
Long life. low switching load, 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, 4 A / 440 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/Max. switching voltage AC-1	250 V / 440 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

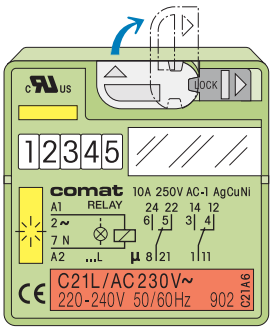
Standard types

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

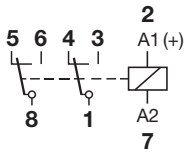


Fig.1 AC voltage endurance

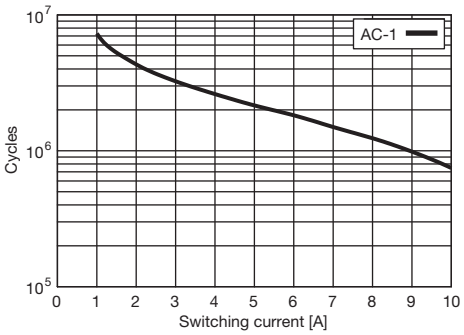
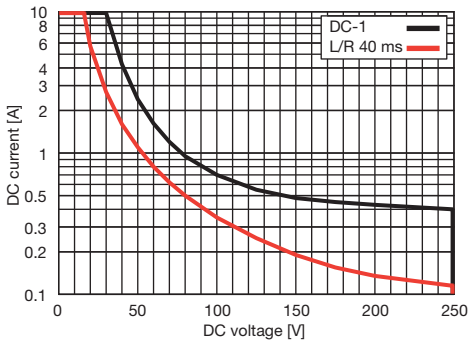
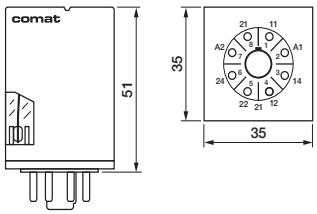


Fig. 2 DC load limit curve



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
Max. 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	$\leq 0.8 \times V_N$
Release voltage AC / DC	$> 0.15 \times V_N$ / $> 0.05 \times V_N$
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	$\geq 10^8$ operations
Operating frequency at nominal load	≤ 360 operations / h
Ingress Protection degree	IP 40
Weight	80 g

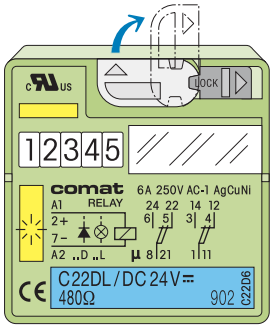
Standard types

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

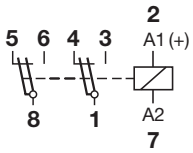


Fig.1 AC voltage endurance

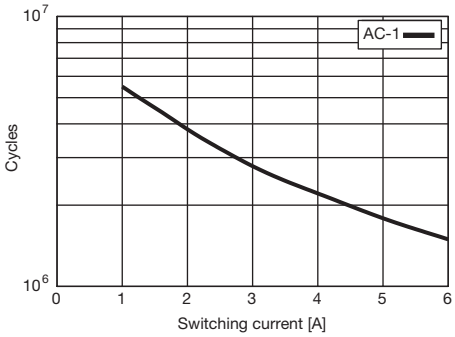
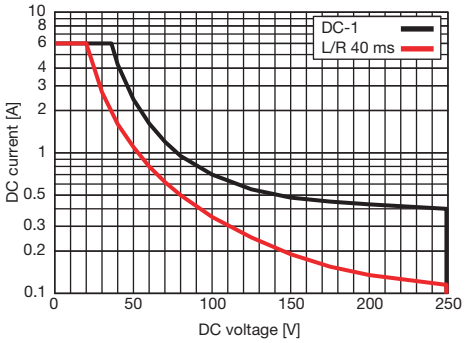
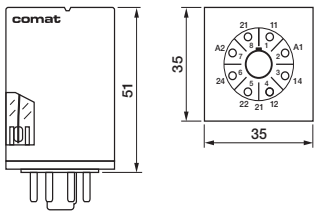


Fig. 2 DC load limit curve



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, 4 A / 440 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/max. switching voltage	250 V / 440 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

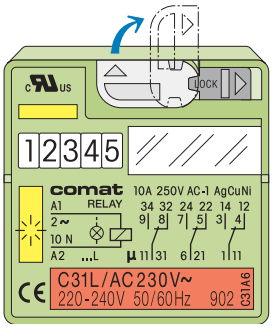
Standard types

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 NFF16101/2; ISO9125/2	**C31DR/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

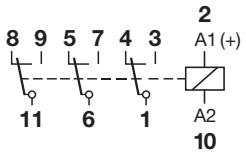


Fig.1 AC voltage endurance

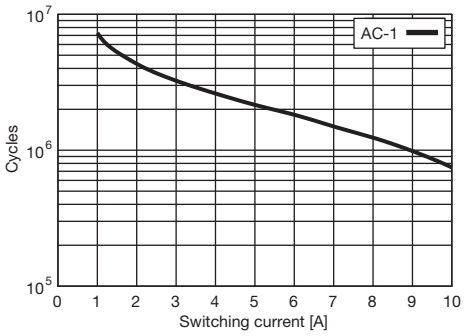
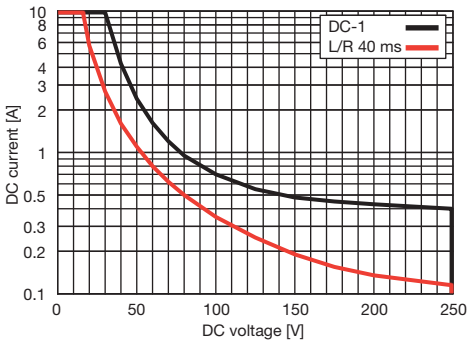
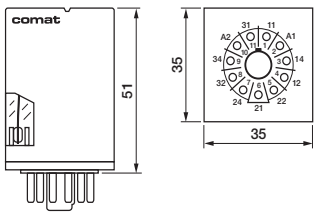


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

Long life series (Railway) EN 50155

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
Max. 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

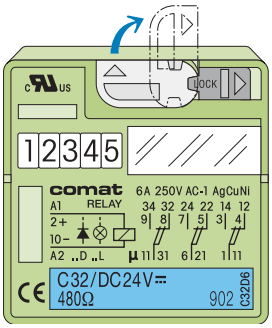
Standard types

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 NFF16101/2; ISO9125/2	**C32DR/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

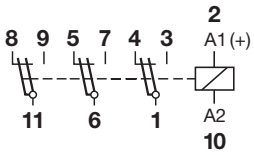


Fig.1 AC voltage endurance

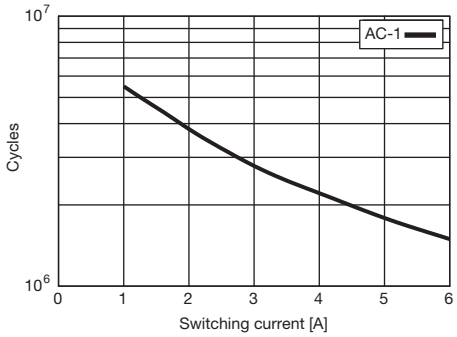
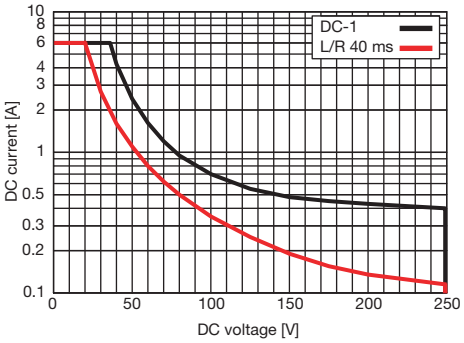
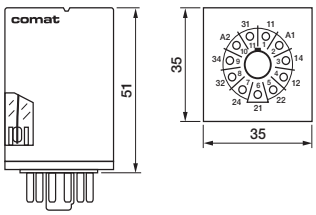


Fig. 2 DC load limit curve



Dimensions [mm]

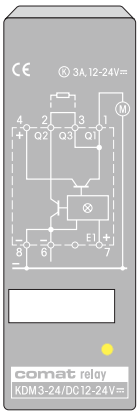


Technical approvals, conformities

Notes

1.1.6 Motor Control Relay

DC Motor Control Relay

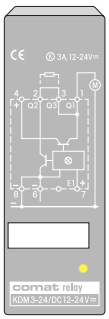


Application	Types	Output	DC ratings	Socket
KDM				
DC Motor control	KDM3-24	1xPNP & 1xNPN	3 A / 32 V	S7-C

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 ≤ 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 … m +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

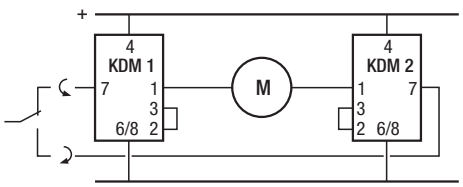
Standard types

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

Accessories

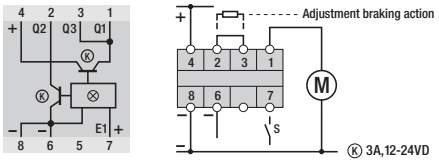
Socket:	**S7-C**

Application sample
Four quadrant (forward / reversed) motor control

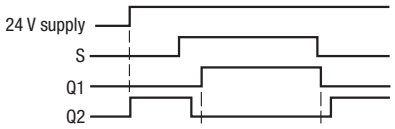


Operating with brake resistors (on 2–3) is not recommended in this application.

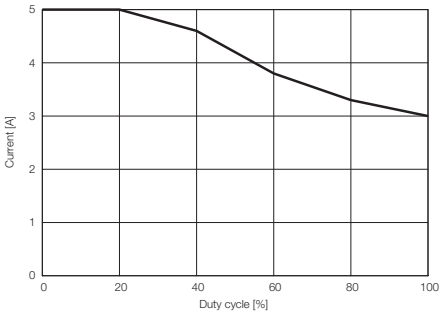
Connection diagram



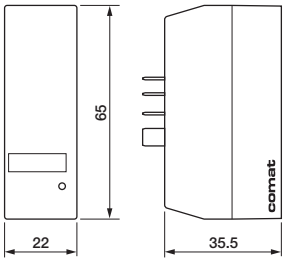
Function diagramm



Output current vs. duty cycle



Dimensions [mm]

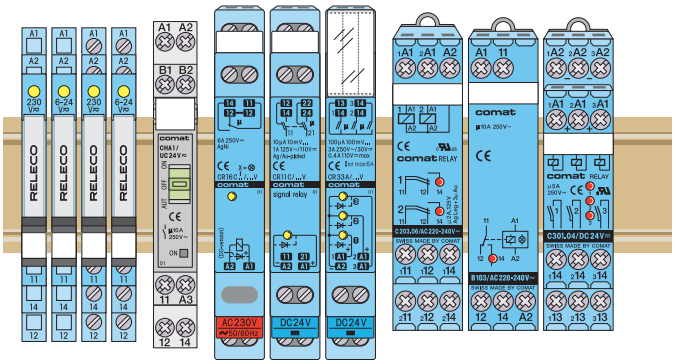


Technical approvals, conformities

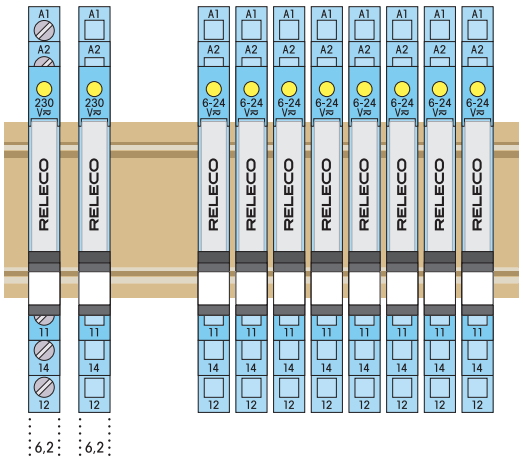
1.2 DIN Relays

1.2.1 Interface Relays

DIN Relays



Application	Types	Size	Outputs	AC ratings	DC ratings	Design
Interface relay for PLC, power contact	RINT-11	6.2 mm		6 A / 250 V	6 A / 25 V	Screw type
Interface relay for PLC, power contact	RINT-21	6.2 mm		6 A / 250 V	6 A / 25 V	Cage clamp type
Interface relay for PLC, signal contact	RINT-12	6.2 mm		6 A / 250 V	6 A / 25 V	Screw type
Interface relay for PLC, signal contact	RINT-22	6.2 mm		6 A / 250 V	6 A / 25 V	Cage clamp type
Interface relay for PLC, DC-solid state contact	RINT-15	6.2 mm			2 A / 33 V	Screw type
Interface relay for PLC, DC-solid state contact	RINT-25	6.2 mm			2 A / 33 V	Cage clamp type
Interface relay for PLC, AC-solid state contact	RINT-18	6.2 mm		0.75 A / 250 V		Screw type
Interface relay for PLC, AC-solid state contact	RINT-28	6.2 mm		0.75 A / 250 V		Cage clamp type
AUTO-ON-OFF realy High power & signal contact	CHA1	11.5 mm		10 A / 250 V 300 mA / 30 V		
Power relay	CR16CX	13 mm		6 A / 250 V	6 A / 30 V	
Signal realy	CR11C	13 mm		1 A / 125 V	1 A / 30 V	
Control relay	CR33A	13 mm	3x	3 A / 250 V	3 A / 30 V	
Steping relay	CRS1C	13 mm		6 A / 250 V	6 A / 30 V	
Power relay	B103	17.5 mm		10 A / 250 V	6 A / 25 V	
Power relay, 2 channels	C203.01	17.5 mm	2x	6 A / 250 V	6 A / 25 V	
Signal realy	C203.04	17.5 mm	2x	5 A / 250 V	5 A / 30 V	
Signal realy	C301.04	17.5 mm	3x	5 A / 250 V	5 A / 30 V	
Solid-state relay	KDW3-24	17.5 mm			3 A / 24 V	



- ✔ Relay module up to 6A 250V, different contact material
- ✔ Solid state modules DC, AC up to 2A
- ✔ Coil UC = AC/DC, not polarised, integrated freewheeling circuit
- ✔ LED status display
- ✔ Screw terminals or spring cage terminals
- ✔ Optional coloured plug-in bridges for different connections
- ✔ Narrow mounting 6,2 mm

RINT RELAY CODIFICATION AND ACCESSORIES

RINT INTERFACE RELAY CONSISTS OF TWO COMPONENTS.

- RELAY
- SOCKET

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

RINT	Y	X	/UC...V

Nominal Voltage
24 V
230 V

Relay contact material
X = 1 $AgSnO_2$
X = 2 $AgSnO_2$ + min. 3µ Au
X = 5 Solid State N.O. 2 A DC 24 V
X = 8 Solid State N.O. 2 A AC 250 V

Socket terminal type
Y = 1 Screw terminal
Y = 2 Cage clamp terminal

RELAY CODIFICATION

RINT	RX	/DC...V

Nominal Voltage
24 V (for UC 24 V)
60 V (for UC 230 V)

Relay contact material
X = 1 $AgSnO_2$
X = 2 $AgSnO_2$ + min. 3µ Au
X = 5 Solid State N.O. 2 A DC 24 V
X = 8 Solid State N.O. 2 A AC 250 V

RINT 11 … 22 series 6.2 mm wide

Interface module with mechanical CO output contact

DIN Rail mounting according to DIN 43 880

Types: RINT-11, RINT-12, RINT-21, RINT-22, / …V
Standard interface module, 1 change over contact
Type 1x: Screw terminal, Type 2x: Spring cage terminal
Control voltage UC 24 V and UC 230 V, 50/60 Hz
User friendly jumper system for in- and outputs, Yellow LED for status indication

Max. contact load	**6 A, 250 V AC-1**	**6 A, 25 V DC-1**

Contact Data			
Type		micro disconnection	
Material	Standard Code x1	$AgSnO_2$	
	Optional Code x2	$AgSnO_2$ + 5µ gold plated	
		$AgSnO_2$:	**+ 5 µAu:**
Max. operational current		6 A	50 mA
Max. inrush current AC 15 op.		30 A	50 mA
Max. switching voltage AC-1		250 V	30 V
Max. AC load		1500 VA	—
Max. DC load 24 V/220 V		140 W/40 W	24 V: 1.2 W
Recommended min. contact load		100 mA, 12 V	1 mA, 0.1 V

Control input V_n =	**UC 24 V**	**UC 230 V**
Operating voltage range @ 40 °C	20.5 … 33 V	184 … 257 V
Typical input current	11 / 8.5 mA	3 mA
Release voltage	< 4 V	< 60 V
Nominal power consumption	270 mW	700 mW

Insulation	
Test voltage I / O	4 kVrms 1minute
Pollution degree	3
Over voltage category	III
Open contact	1000 Vrms dielectric strength 1 min
Max. working voltage	250 V
Standard	IEC 60 664

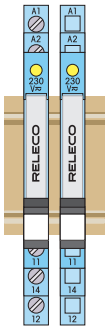
General Specifications	
Ambient temperature: operation	-25 … +60 °C, 230 V: …+55 °C
storage	-40 … 85 °C
Typical response time @ V_n	7 ms
Typical release time @ V_n	15 ms
Service life mech./elec.	≥ 10^7/ ≥ 10^5 operations
Cond. cross section screw terminal	solid/stranded wire 0.14 … 2.5 / 1.5 mm^2
Cond. cross section spring cage	solid/stranded wire 0.2 … 2.5 / 1.5 mm^2
Ingress protection	IP 20, plug-in module: IP57
Mounting position	any
Housing material	Polyamide PA

Standard types

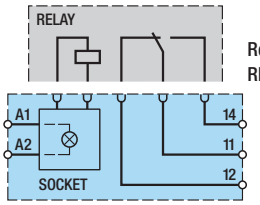
UC 24, UC230, screw terminal:	**RINT-11/UC…V**	" …" enter the voltage for full type designation
UC 24, UC230, screw terminal, gold plated:	**RINT-12/UC…V**	
UC 24, UC230, spring cage terminal:	**RINT-21/UC…V**	
UC 24, UC230, spring cage terminal, gold plated:	**RINT-22/UC…V**	

Accessories

Plug-in bridges 500 mm:	blue:	**RINT-BR1-500B**	gray:	**RINT-BR1-500G**
Plug-in bridges 6 mm:	blue:	**RINT-BR2-6B/10**	gray:	**RINT-BR2-6G/10**
	red:	**RINT-BR2-6R/10**		
Label plate:		**RINT-MA6-0/100** (100 pieces)		
Replacement relay for RINT-11/21:		**RINT-R1/DC (for UC24V)**		
		RINT-R1/DC 60V (for UC230V)		
Replacement relay for RINT-12/22:		**RINT-R2/DC (for UC24V)**		
		RINT-R2/DC 60V (for UC230V)		



Connection diagram



Relay module
RINT-R1… / RINT-R2…

Fig.1 AC voltage endurance RINT 11, 21

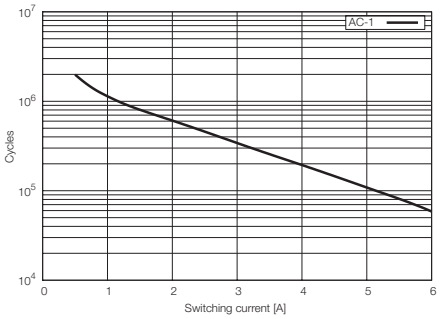
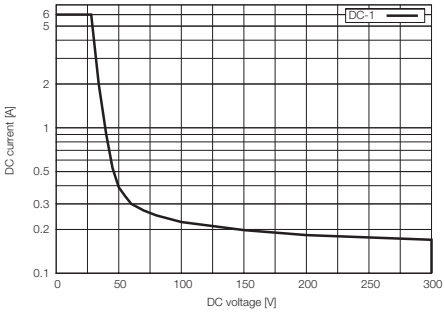
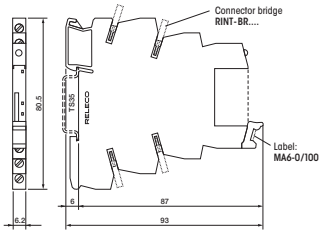


Fig. 2 DC load limit curve RINT 11, 21



Dimensions [mm]



Technical approvals, conformities

RINT 15 … 25 series 6.2 mm wide

Interface module with solid state DC relay

DIN Rail mounting according to DIN 43 880

Types: RINT-15, RINT-25, /DC24V
Standard interface module, Solid state DC
Type 1x: Screw terminal, Type 2x: Spring cage terminal
DC 24 V control voltage, User friendly jumper system for in- and outputs
Yellow LED for status indication

Max. output load	**2 A / 33 V**

Output data	
Type	NO solid state DC, 2 wire floating
Polarity reversal & overvoltage	protected
Max. continuous current	2 A
Max. inrush current (10 ms)	15 A
Switching voltage	3 … 33 V
Max. DC load 24 V	48 W
Max. voltage drop @ 2 A	200 mV

Control input V_n =	**DC 24 V**
Operating voltage range	19 … 29 V
Release voltage	< 9 V
Typical input current @ 24 V	8.5 mA
Nominal power consumption	210 mW
Polarity reversal	protected

Insulation	
Test voltage I / O	2.5 kVrms 1 minute
Pollution degree	2
Over voltage category	III
Standard	IEC 60 664

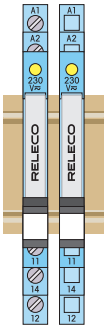
General Specifications	
Ambient temperature: operation	-25 … +60 °C
storage	-25 … 70 °C
Typical response time @ V_n	20 µs
Typical release time @ V_n	500 µs
Wire size, screw terminal	solid/stranded wire 0.14 … 2.5 mm^2
Wire size, spring cage	solid/stranded wire 0.14 … 2.5 mm^2
Ingress protection	IP 20, plug-in module: IP57
Mounting position	any
Housing material	Polyamide PA

Standard types

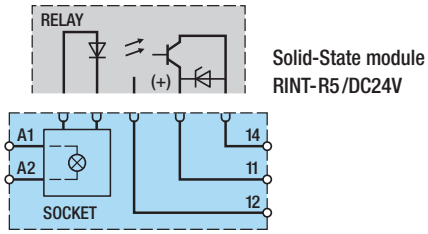
DC 24V, screw terminal:	**RINT-15/DC24V**
DC 24V, spring cage terminal:	**RINT-25/DC24V**

Accessories

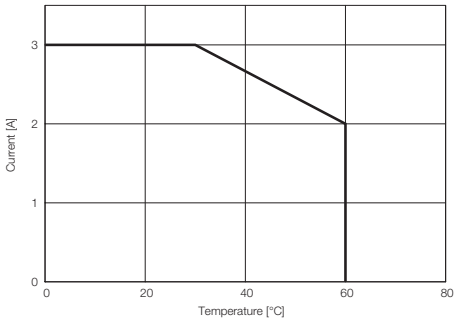
Plug-in bridges: 500 mm:	blue:	**RINT-BR1-500B**
	gray:	**RINT-BR1-500G**
Plug-in bridges: 6 mm:	blue:	**RINT-BR2-6B/10**
	gray:	**RINT-BR2-6G/10**
	red:	**RINT-BR2-6R/10**
Label:		**RINT-MA6-0/100** (100 pieces)
Replacement relay:		**RINT-R5/DC24V**



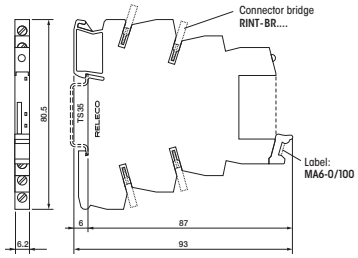
Connection diagram



Output derating curve



Dimensions [mm]



Technical approvals, conformities

RINT 18 … 28 series 6.2 mm wide

Interface module with solid state AC triac

DIN Rail mounting according to DIN 43 880

Types: RINT-18, RINT-28, / DC24V
Standard interface module, Solid state AC (triac)
Type 1x: Screw terminal, Type 2x: Spring cage terminal
DC 24 V control voltage, User friendly jumper system for in- and outputs
Yellow LED for status indication

Max. output load	**0.75 A / 250 V**

Output data	
Type	NO solid state AC, 2 wire floating
Switching AC voltage range	24 … 253 V
Max. voltage drop	< 1 V
Max. continuous current	0.75 A
Max. inrush current (10 ms)	30 A
Min. load current	10 mA
I^2t value	4.5 A^2s
Leakage current	< 1 mA
Protection	RCV circuit

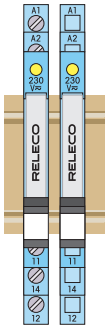
Control input V_n =	**DC 24 V**
Operating voltage range	19 … 29 V
Release voltage	< 6 V
Typical input current @ 24 V	8 mA
Nominal power consumption	200 mW
Polarity reversal	protected

Insulation	
Test voltage I / O	2.5 kVrms 1minute
Pollution degree	2
Over voltage category	III
Standard	IEC 60 664

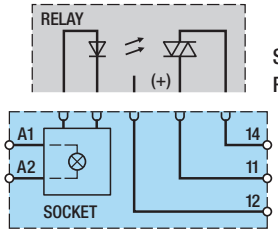
General Specifications		
Ambient temperature:	operation	-25 … +60 °C
	storage	-25 … 70 °C
Typical response time @ V_n		10 ms
Typical release time @ V_n		10 ms
Wire size, screw terminal		solid/stranded wire 0.14 … 2.5 mm^2
Wire size, spring cage		solid/stranded wire 0.14 … 2.5 mm^2
Ingress protection		IP 20
Mounting position		any
Housing material		Polyamide PA

Standard types	
DC24V, screw terminal:	**RINT-18/DC24V**
DC24V, spring cage terminal:	**RINT-28/DC24V**

Accessories		
Plug-in bridges: 500 mm:	blue:	**RINT-BR1-500B**
	gray:	**RINT-BR1-500G**
Plug-in bridges: 6 mm	blue:	**RINT-BR2-6B/10**
	gray:	**RINT-BR2-6G/10**
	red:	**RINT-BR2-6R/10**
Label:		**RINT-MA6-0/100** (100 pieces)
Replacement relay:		**RINT-R8/DC24V**

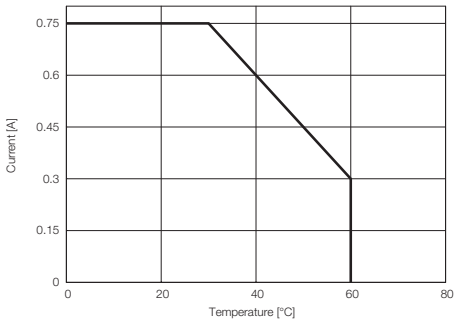


Connection diagram

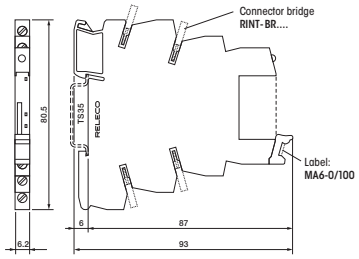


Solid-State module
RINT-R8/DC24V

Output derating curve



Dimensions [mm]



Technical approvals, conformities

CHA1

Auto-ON-OFF Interface Relay

DIN Rail mounting according to DIN 43 880

Type: CHA1/UC24V
Auto ON-OFF relay with override switch and check back signal contact, e.g. for PLC. It is suitable for either automatic control or function override for maintenance, emergency, installations etc.
1 change over power contact with 2500 VA switching capacity
1 normally closed signal contact 0.3 A, 30 V
UC 24 V control voltage, DC, AC 50 / 60 Hz
LED for status indication

Maximum contact load	**2500 VA AC1, 250 W DC1**
Recommended minimum contact load	**10 mA / 12 V**

Contact data	**Power cont.**	**Signal cont.**
Contact type	1CO, micro disconnection	1NC
Material	$AgSnO_2$	Ag
Rated operational current	10 A	0.3 A
Max. inrush current (20 ms)	15 A	0.5 A
Max. switching voltage AC-1	250 V	30 V
Max. AC load	2500 VA AC-1, 500 VA AC-15	
Max. Motor load AC-3	0.44 kW	
Max. DC load DC-1	10 A 24 V, 0.12 A 220 V	10 W
Min. switching load	300 mW	

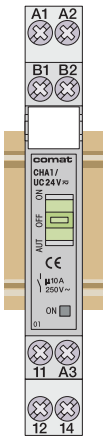
Control input V_n =	**UC 24 V (AC or DC)**
Operating voltage range	19 … 26.5 V
Release voltage	< 3 V, typically 5 V
input current @ V_n	≤ 17 mA
Nominal power consumption	400 mW

Insulation	
Withstand voltage I / O	Pulse 4 kV (1.2/50µs)
Open contact	1000 Vrms dielectric strength

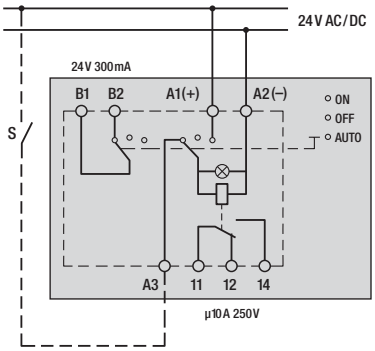
General Specifications	
Ambient temperature: operation	-10 … +50 °C
Typical response time @ Vnom	5 … 10 ms
Typical release time @ Vnom	7 … 12 ms
Mechanical life	≥ 10^7 operations
Electrical life AC-1	≥ 10^5 operations
Ingress protection degree	IP 20
Conductor cross section, solid wire size	1 x 6 mm^2/ AWG10, 2 x 2.5 mm^2/AWG 12
Conductor cross section, stranded wire size	1 x 4 mm^2/ AWG12, 2 x 1.5 mm^2/AWG 16
Max. Screw torque	0.5 Nm

Standard types

CHA1/UC24V



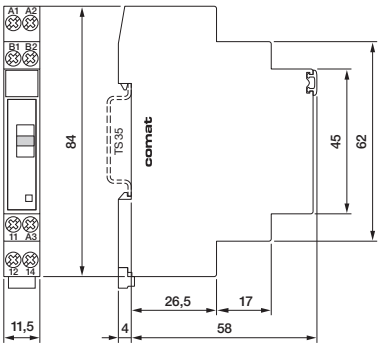
Connection diagram



Function table

Green ON-OFF-switch	Control input A3	Relay / LED	Check back contact
AUTO	1	1	1
	0	0	1
ON	-	1	0
OFF	-	0	0

Dimensions [mm]



Technical approvals, conformities

DIN Relay 13 mm interface series

CR16CX

Power relay with 1-pole change over contact
DIN Rail mounting according to DIN 43 880

Type: CR16CX/...V R
Power relay
1 change over contact
control voltage DC 24 V and AC 230 V / 50 Hz
LED status indicator
Wash tight relay built in

Maximum contact load	**6 A 250 V AC-1, 6 A 30 V DC-1**
Recommended minimum contact load	**10 mA / 12 V**

Contacts

Type	Single contact micro disconnection
Material	AgNi
Rated operational current	6 A
Max. inrush current (20ms)	15 A
Max. switching voltage AC-1	250 V
Max. AC load AC-1	1500 VA
Max. DC load 24V/220V (Fig. 2)	180 W

Control input V_n =	**DC 24 V**	**AC 230**
Operating voltage range	18 … 27 V	190 … 255 V
Input current @ V_n	12 … 15 mA	12 … 16 mA
Starting current	—	≤ 0.65 A / 0.1 ms
Release voltage	2.4 V	33 V
Nominal power consumption	330 mW	330 mW
Inductive turn-off voltage	damped, 57 Vp	suppressed

Insulation

Test voltage open contact	1 kVrms
Test voltage between contacts and coil	2.5 kVrms 1 minute

General Specifications

Ambient temperature storage / operation		-40 … +85 °C / -25 … +60 °C
Response time AC / DC		10 ms / 6 ms
Release time AC / DC		8 … 20 ms / 10 … 15 ms
Bounce time NO contact		2.5 ms
Operating frequency at nominal load		≤ 400 operations / h
Service live, mech./elec.		≥ 30 x 10^6 / ≥ 1.5 x 10^5 operations (Fig. 1)
Ingress protection degree	Housing:	IP 40, terminals: IP 20
	contact:	IP67
Max. Screw torque		0.4 Nm
Housing material		Lexan
Weight		50 g

Standard types

AC 230 V 50 Hz:	**CR16CX/AC230V R**
DC 24 V:	**CR16CX/DC24V R**

Accessories

Marking Strip:	
Large:	**BS-13G**
Small:	**BS-13K**

Connection diagram

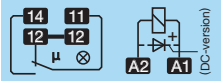


Fig.1 AC voltage endurance 250 V

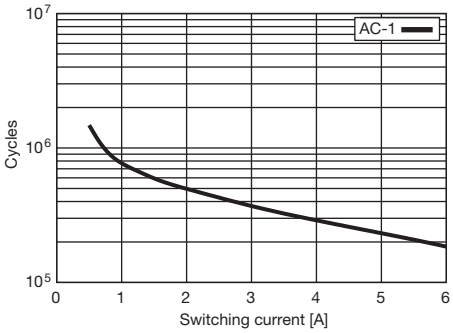
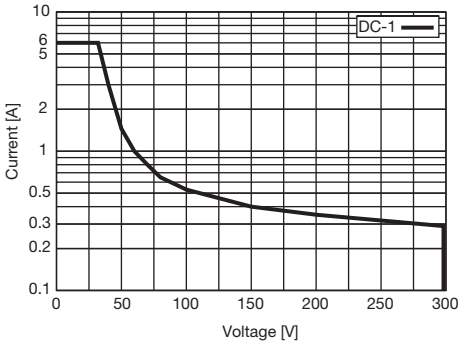
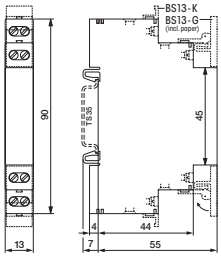


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

DIN Relay 13 mm interface series

CR11C

Signal relay with 2-pole change over double contacts
DIN Rail mounting TS 35, according to DIN 43 880

Type: CR11C/DC24V R
Signal relay
2 change over double contacts
LED status indicator
Sealed relay built in

Maximum contact load	**1 A, 125 V AC-1, 1 A 30 V DC-1**
Minimum contact load	**10 µA / 10 mV**

Contacts

Type	double contact micro disconnection
Material	Ag gold plated
Max. operational current	1 A
Max. switching voltage AC-1	125 V
Max. AC load AC-1	0.5 A, 125 V, 62.5 VA
Max. DC load (Fig. 2)	30 W

Remark: For preserving the gold plating do not exceed 30 V / 0.1 A resistive load.

Control input V_n =	**DC 24 V**
Operating voltage range	18 … 30 V
Input current @ V_n	10.5 … 12 mA
Release voltage	2.4 V
Nominal power consumption	280 mW
Inductive turn-off voltage	damped, 45 Vp

Insulation

Test voltage open contact	0.75 kVrms 1 minute
Test voltage between adjacent poles	0.5 kVrms, 1minute
Test voltage between contacts and coil	1 kVrms 1 minute

General Specifications

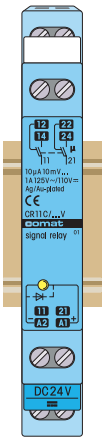
Ambient temperature storage/operation	-40 … +85 °C / -25 … +60 °C
Response time	≤ 3 ms
Release time	≤ 4 ms
Operating frequency at nominal load	≤ 400 operations / h
Bounce time NO contact	≤ 1 ms
Service live, mech./elec.	≥ 10^8 / ≥ 10^5 operations (Fig. 1)
Ingress protection degree	Housing: IP 40, terminals: IP 20 contacts: IP67
Housing material	Lexan
Max. Screw torque	0.4 Nm
Weight	40 g

Standard types

DC 24 V	**CR11C/DC24V R**

Accessories

Marking Strip:	
Large	**BS-13G**
Small	**BS-13K**



Connection diagram

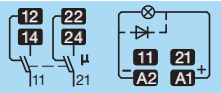


Fig.1 Contact endurance

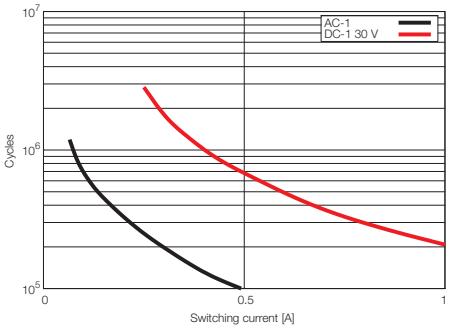
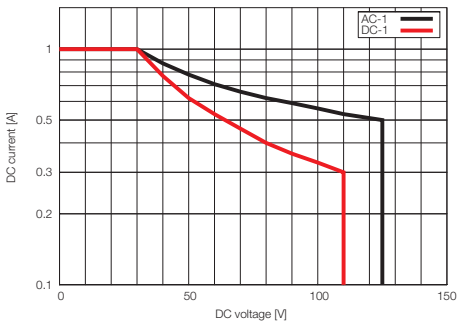
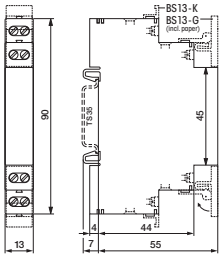


Fig. 2 Load limit curve



Dimensions [mm]



Technical approvals, conformities

EN 60947-4-1, EN 60947-5-1

DIN Relay 13 mm interface series

CR33A

3 channels control relay with normally open double contacts
DIN Rail mounting according to DIN 43 880

Type: CR33A/DC24V R
3 channels control relay
3 NO double contacts on common line
LED status indicator for each channel
Sealed relays built in

Maximum contact load	**3 A, 250 V AC-1, 3 A 30 V DC-1**
Recommended minimum contact load	**100 µA / 100 mV**

Contacts

Type	double contact micro disconnection
Material	Silver alloy gold plated
Max. operational current	3 A
Max. switching voltage AC-1	250 V
Max. AC load AC-1	750 VA
Max. DC load (Fig. 2) DC-1	150 V 0.24 A, 90 W

Remark: For preserving the gold plating do not exceed 30 V / 0.1 A resistive load.

Control input V_N	**DC 24 V**
Operating voltage range	18 … 29 V
Input current per channel @ V_N	8 … 10 mA
Release voltage	2.4 V
Nominal power consumption per channel	250 mW
Inductive turn-off voltage	damped, 30 Vp

Insulation

Test voltage open contact	0.75 kVrms 1 minute
Test voltage between contacts and coil	2 kVrms 1 minute

General Specifications

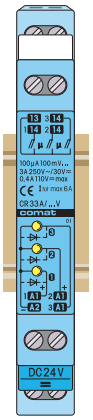
Ambient temperature storage/operation	-40 … +85 °C / -25 … +60 °C
Response time	≤ 6 ms
Release time	≤ 4 ms
Service life, mech./elec.	≥ 2 x 107 / ≥ 10^5 operations (Fig. 1)
Ingress protection degree	Housing: IP 40, terminals: IP 20 contacts: IP 67
Max. Screw torque	0.4 Nm
Housing material	Lexan
Weight	52 g

Standard types

DC 24 V:	**CR33A/DC24V R**

Accessories

Marking Strip:	
Large	**BS-13G**
Small	**BS-13K**



Connection diagram

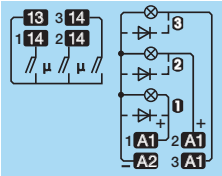


Fig.1 Contact endurance

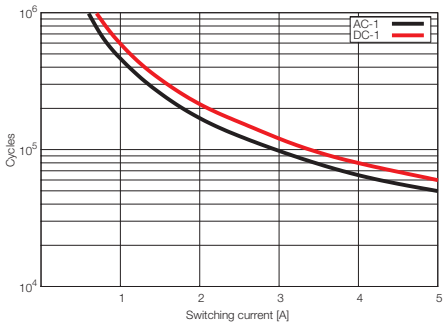
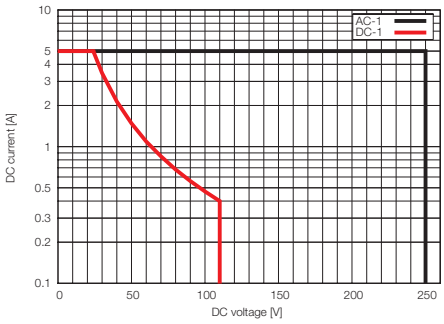
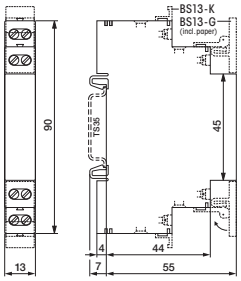


Fig. 2 Load limit curve



Dimensions [mm]



Technical approvals, conformities

EN 60947-4-1
EN 60947-5-1

DIN Relay 13 mm interface series

CRS1C

Stepping relay with 1-pole change over power contact
DIN Rail mounting according to DIN 43 880

Type: CRS1C/...V R
Stepping relay (bistable, mech. latching)
1 change over contact with 0.5 mm gap

Maximum contact load	**6 A / 250 V, 180 W DC-1**
Recommended minimum contact load	**0.1 A / 10 V**

Contacts

Type	Single contact micro disconnection
Material	AgNi 10 + 0.2 µm Au
Rated operational current	
AC-1, AC-5a, AC-5b, AC-7a, AC-7b	6 A
Max. inrush current (20ms)	15 A
Max. switching voltage AC-1	250 V
Max. AC load (Fig. 1) AC-1	1500 VA
Max. DC load (Fig. 2) DC-1	180 W

Coils V_N =	**AC 230 V 50 Hz**	**DC 24 V**
Operating voltage range	185 … 255 V	19 … 27 V
Max. pulse voltage	253 V *$(t_{on}/t_p)^{0.5}$	26.4 V *$(t_{on}/t_p)^{0.5}$
Op. voltage @100% duty cycle, 60 °C, ambient temp., 6 A contact load	≤ 245 V	≤ 25.5 V
Nominal power consumption	1.4 VA	1 W With free wheeling diode

Coil Table

VAC	Ω ± 10%	mA	VDC	Ω ± 10%	mA
230	25 000	60 mA	24	575	42

Insulation

Test voltage open contact	1 kVrms 1 minute
Test voltage between contacts and coil	4 kVrms 1 minute

General Specifications

Ambient temperature storage/operation	-40 … +85 °C / -25 … +60 °C
Min. drive pulse width	50 ms
Mechanical life, DC drive / AC drive	≥ 107 / ≥ 10^5 operations
Electrical life 250 V, AC-1	≥ 10^5 operations
Ingress Protection degree	Housing: IP 40, terminals: IP 20
Max. Screw torque	0.4 Nm
Housing material	Lexan
Weight	47 g

Standard types

AC 230 V, 50Hz/60Hz:	**CRS1C/AC230V R**
DC 24 V:	**CRS1C/DC24V R**

Accessories

Marking Strip:	
Large	**BS-13G**
Small	**BS-13K**

Connection diagram

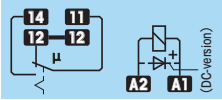


Fig.1 AC voltage endurance

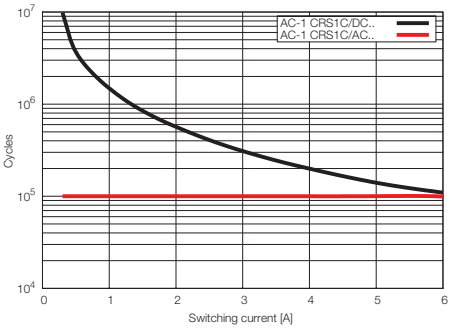
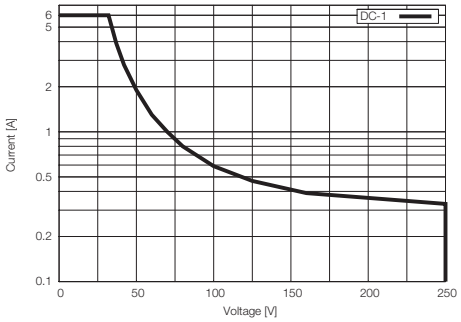
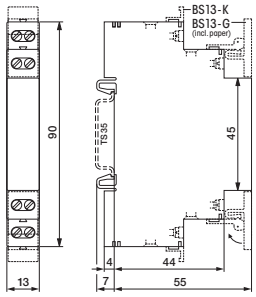


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

IEC 61810; EN 60947

DIN Relay 17.5 mm power series

B103

Power relay with 1-pole change over contact
DIN Rail mounting according to DIN 43 880

Type: B103/...V R
Power relay
1 change over contact
8 … 240 V, UC / AC control voltage
LED status indicator
Wash tight relay built in
Also suitable for panel mounting 2 x M4

Maximum contact load	**10 A 250 V AC-1, 6 A 25 V DC-1**
Recommended minimum contact load	**10 mA / 12 V**

Contacts

Type	Single contact micro disconnection
Material	AgSnO2
Rated operational current	10 A
Max. inrush current (10ms)	16 A
Max. switching voltage AC-1	250 V
Max. AC load	2500 VA AC-1
Max. DC load 24V/220V (Fig. 2)	150 W / 50 W

Control input V_n =	**DC 12 V**	**UC 24 V**	**UC 48 V**	**AC 110 - 127 V** 50Hz/60Hz	**AC 220 - 240 V** 50Hz/60Hz
Operating voltage range [V]	7.5 … 15	19 … 29	38 … 57	90 … 150	190 … 265
Input current @ Vnom [mA]	≤ 100	≤ 25	≤ 15	≤ 25 / 30	≤ 25 / 30
Release voltage [V]	≥ 2	≥ 3.5	≥ 6	≥ 12 / 10	≥ 20 / 18
Nom. power consumption [W]	≤ 0.9/1.2	≤ 0.5/0.6	≤ 0.7/0.8	≤ 0.8/1.2	≤ 0. 8/1.2
Inductive turn-off voltage	None	None	None	None	None

Insulation

Test voltage open contact	1 kVrms
Test voltage between contacts and coil	2 kVrms 1 minute

General Specifications

Ambient temperature storage/operation	-40 … +85 °C /-25 … +60 °C
Response time AC/DC	20 ms / 7 ms
Release time	5 … 12 ms
Bounce time NO/NC contact	typ. 0.5 ms / 3 ms
Mechanical life	≥ 20 x 10^6
Conductor cross section	Stranded wire 2.5 mm^2, 2 x 1.5 mm^2
Ingress protection degree	Housing: IP 40, terminals: IP 20
Max. Screw torque	0.4 Nm
Housing material	Lexan
Weight	50 g

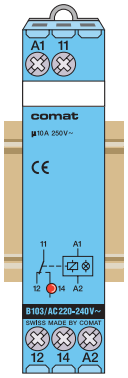
Standard types

UC (AC / DC) 50/60Hz: 8-12, 24, 48	**B103/UC ...V R**
AC 50 / 60 Hz: 110-127, 220-240	**B103/AC ...V R**

"…" enter the voltage for full type designation

Accessories

Label plate:	**BZS-DIN17.5**



Connection diagram

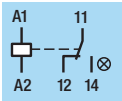


Fig.1 AC voltage endurance 250 V AC-1

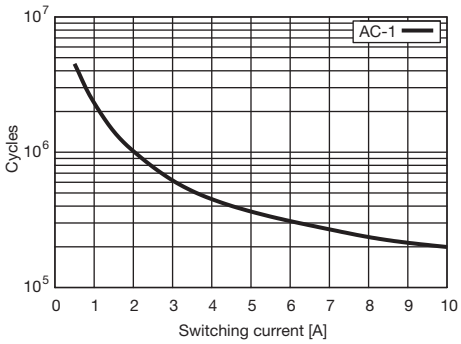
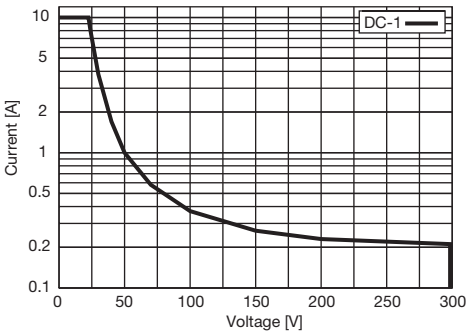
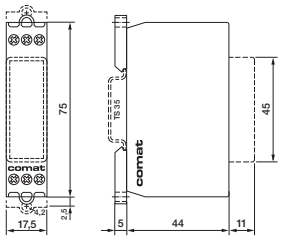


Fig. 2 DC load limit curve DC-1



Dimensions [mm]



Technical approvals, conformities

DIN Relay 17.5 mm interface series

C203.01

2 channels power relay with change over single contacts
DIN Rail mounting according to DIN 43 880

Type: C203.01/...V R
2 channels power relay
2 separate change over contacts
12 … 230 V control inputs
LED status indicator for each channel
Wash tight relays built in
Also suitable for panel mounting 2 x M4

Maximum contact load	**6 A 250 V AC-1, 6 A 25 V DC-1**
Recommended minimum contact load	**100 mA / 12 V**

Contacts

Type	Single contact micro disconnection
Material	AgNi
Rated operational current	6 A
Max. inrush current (20ms)	15 A
Max. switching voltage AC-1	250 V
Max. AC load (Fig.1)	1500 VA AC-1
Max. DC load 24 V/220 V (Fig.2)	150 W / 50 W

Control input V_n = per channel gew	**DC 12 V**	**UC 24 V**	**UC 48 V**	**AC 110 - 127 V** 50Hz/60Hz	**AC 220 - 240 V** 50Hz/60Hz
Operating voltage range [V]	10 … 15	20 … 29	38 … 57	90 … 150	190 … 265
Input current @ Vnom [mA]	≤ 40	≤ 25	≤ 11	≤ 12/15	≤ 12/15
Release voltage [V]	≥ 1.2	≥ 2.4	≥ 4.8	≥ 20	≥ 40
Nom. power consumption [W]	≤ 0.4	≤ 0.6	≤ 0.55	≤ 0.8 / 1	≤ 0. 9 / 1.2
Inductive turn-off voltage	None	None	None	None	None

Insulation

Open contact	1 kVrms 1 minute
Between adjacent poles	2 kVrms 1 minute
Between contacts and coil	2 kVrms 1 minute

General Specifications

Ambient temperature storage/operation	-40 … +85 °C / -25 … +60 °C
Response time	2 – 15 ms
Release time	10 – 35 ms
Bounce time	≤ 3 ms
Mechanical life	20 x 10^6 operations
Conductor cross section	Stranded wire 2.5 mm^2, 2 x 1.5 mm^2
Max. screw torque	0.4 Nm
Ingress protection degree	Housing: IP 40, terminals: IP 20
Housing material	Lexan
Weight	80 g

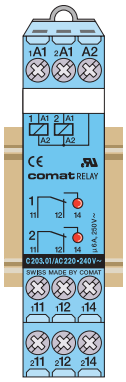
Standard types

AC 50 Hz / 60 Hz: 110 – 127, 220 – 240	**C203.01/AC...V R**
UC (AC / DC): 24, 48	**C203.01/UC ...V R**
DC 12 V:	**C203.01/DC12V R**

"…" enter the voltage for full type designation

Accessories

Label plate:	**BZS-DIN17.5**



Connection diagram

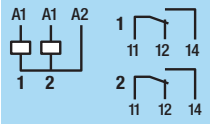


Fig. 1 AC voltage endurance 250 V

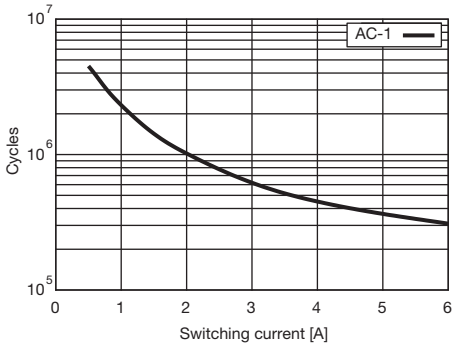
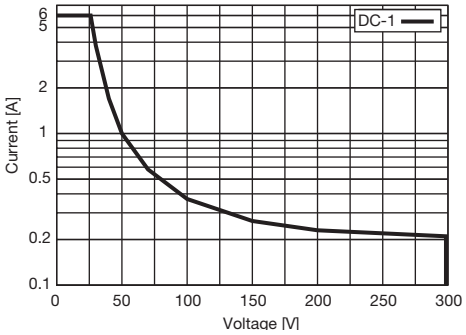
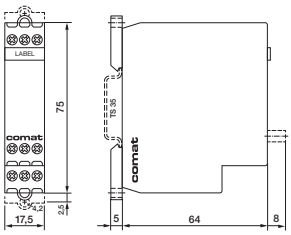


Fig. 2 DC load limit curve DC-1



Dimensions [mm]



Technical approvals, conformities

EN 60947-4-1, EN 60947-5-1

DIN Relay 17.5 mm interface series

C203.04

2 channels control relay for medium and very low contact load with change over single contacts, DIN Rail mounting according to DIN 43 880

Type: C203.04/...V R
2 channels power relay
2 separate change over contacts
12 … 48 V control inputs
LED status indicator for each channel
Sealed relays built in
Also suitable for panel mounting 2 x M4

Maximum contact load	**5 A 250 V AC-1, 5 A 30 V DC-1**
Recommended minimum contact load	**1 mA / 0.1 V**

Contacts

Type	Single contact micro disconnection
Material	Gold flash over silver alloy
Rated operational current	5 A
Max. switching voltage AC-1	250 V
Max. switching voltage DC-1	125 V
Max. AC load (Fig.1) AC-1	1250 VA
Max. DC load 30 V / 125 V (Fig.2)	150 W / 25 W

Control input V_n =, per channel	**DC 12–15 V**	**UC 24 V**	**UC 48 V**
Operating voltage range [V]	11 … 18	20 … 29	38 … 53
Input current @ Vnom [mA]	≤ 25	≤ 16	≤ 25
Release voltage [V]	≥ 2	≥ 3.5	≥ 6
Nom. power consumption [W]	≤ 0.35	≤ 0.4	≤ 1
Inductive turn-off voltage	None	None	None
Polarity reversal	protected	protected	protected

Insulation

Open contact	1 kVrms
Between adjacent poles	2 kVrms
Between contacts and coil	2 kVrms

General Specifications

Ambient temperature storage/operation	-40 … +85 °C / -25 … +60 °C
ON delay	≤ 6 ms
Release time	≤ 30 ms
Bounce time NO contact	≤ 3 ms
Mechanical life	≥ 50 x 10^6 operations
Conductor cross section	Stranded wire 2.5 mm^2, 2 x 1.5 mm^2
Max. Screw torque	0.4 Nm
Ingress protection degree	Housing: IP 40, terminals: IP 20
Housing material	Lexan
Weight	80 g

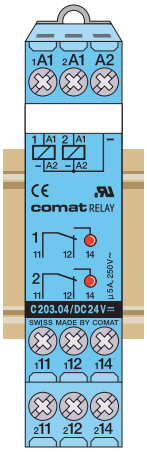
Standard types

DC: 12-15, 24, 48	**C203.04/DC ...V R**

"…" enter the voltage for full type designation

Accessories

Label plate:	**BZS-DIN17.5**



Connection diagram

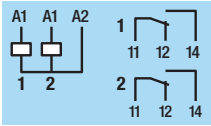


Fig.1 Contact endurance

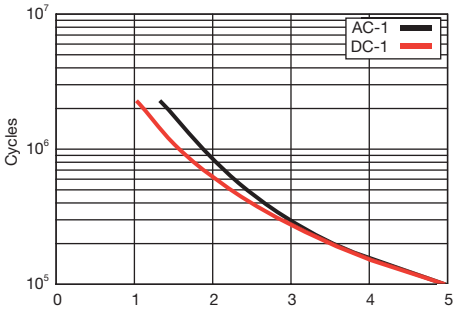
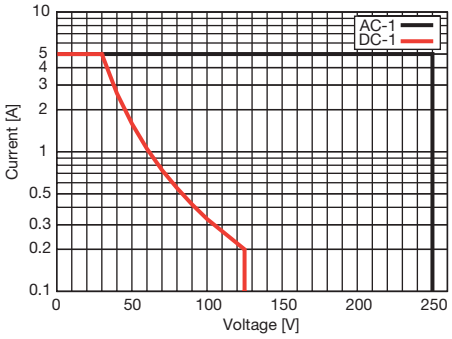
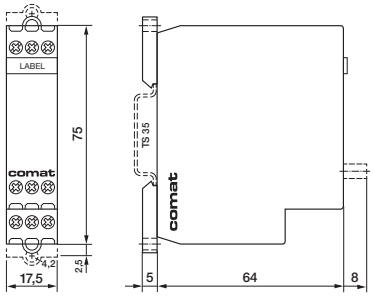


Fig. 2 Load limit curve



Dimensions [mm]



Technical approvals, conformities

EN 60947-4-1, EN 60947-5-1

DIN Relay 17.5 mm interface series

C301.04

3 channels control relay for medium and very low contact load with normally open double contacts, DIN Rail mounting according to DIN 43 880

Type: C301.04/…V R
3 channels control relay
3 separate normally open double contacts of high reliability
12 … 48 V control inputs
LED status indicator for each channel
Sealed relays built in
Also suitable for panel mounting 2 x M4

Maximum contact load	**5 A 250 V AC-1, 5 A 30 V DC-1**
Recommended minimum contact load	**1 mA / 0.1 V**

Contacts

Type	Double contact micro disconnection
Material	Gold flash over silver alloy
Rated operational current	5 A
Max. switching voltage AC-1	250 V
Max. switching voltage DC-1	125 V
Max. AC load (Fig.1) AC-1	1250 VA
Max. DC load 30 V / 125 V (Fig.2)	150 W / 25 W

Control input = per channel V_n	**DC 12 -15 V**	**DC 24 V**	**DC 48 V**
Operating voltage range [V]	11 … 18	20 … 29	38 … 53
Input current @ Vnom [mA]	≤ 25	≤ 16	≤ 25
Release voltage [V]	≥ 2	≥ 3.5	≥ 6
Nom. power consumption [W]	≤ 0.35	≤ 0.4	≤ 1
Inductive turn-off voltage	None	None	None
Polarity reversal	protected	protected	protected

Insulation

Open contact	1 kVrms
Between adjacent poles	2 kVrms
Between contacts and coil	2 kVrms

General Specifications

Ambient temperature storage/operation	-40 … +85 °C / -25 … +60 °C
ON delay	≤ 6 ms
Release time	≤ 30 ms
Bounce time NO contact	≤ 3 ms
Mechanical life	≥ 50 x 10^6 operations
Conductor cross section	Stranded wire 2.5 mm^2, 2 x 1.5 mm^2
Max. Screw torque	0.4 Nm
Ingress protection degree	Housing: IP 40, terminals: IP 20
Housing material	Lexan
Weight	80 g

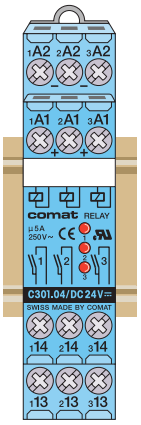
Standard types

DC, 12-15, 24, 48:	**C301.04/DC …V R**

"…" enter the voltage for full type designation

Accessories

Label plate:	**BZS-DIN17.5**



Connection diagram

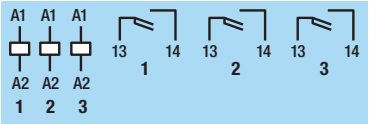


Fig.1 Contact endurance

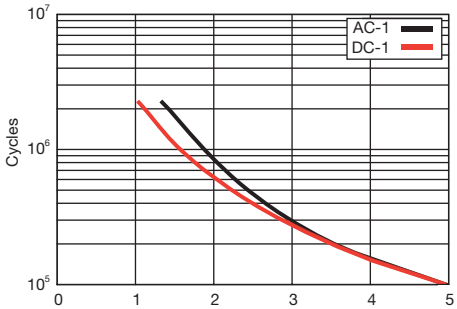
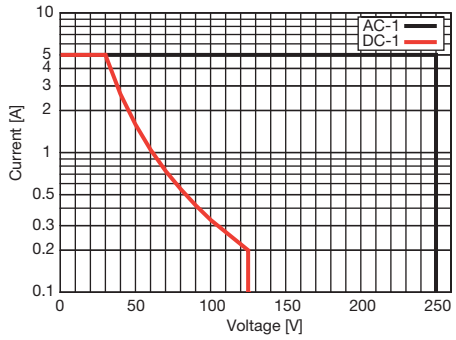
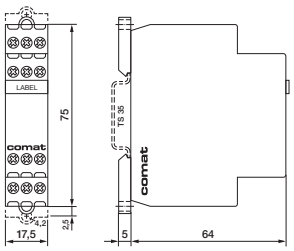


Fig. 2 Load limit curve



Dimensions [mm]



Technical approvals, conformities

DIN Relay 17.5 mm

KDW 3-24

Solid state switching over interface module with two output channels and galvanically separated control input with wide voltage range DIN Rail mounting according to DIN 43 880

Type: KDW 3-24/UC24-240V R
24 V solid state switching over relay
Two high side switches for 24 V/3 A
all overload and short circuit protected
suitable for all kind of loads, such as lamps, DC-motors, valves, etc.
Control input for UC 24 … 240 V (AC/DC)
LED status indicator

Maximum load	**3 A / 32 V**

Output data for each channel	
Type: Power MOS FET	High side switch
Max. switching current	3 A
Max. continuous current	3 A (5 A) [1])
Max. inrush current, 1 sec [2])	20 A
Switching voltage range	9 … 32 V
Max. Load	100 W
Thermal overload protection [2])	self restoring
Over current limiting [2])	20 … 30 A
Clamp voltage	41 … 52 V
Max. inductive switch-off energy[2])	0.27 … 340 Ws (see fig. 1)
ON resistance @ 25 °C	≤ 30 mΩ
Leakage current	≤ 50 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 ≤ 50 °C. See fig. 2.
[2]) Not for continuous repetitive operation

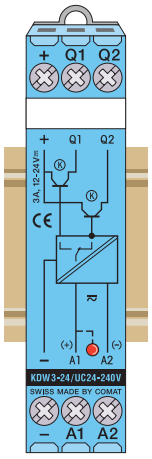
Control input V_N =	**UC 24-240 V (AC / DC)**
Operating voltage range	18 … 255 V
Release voltage / current	≤ 8 V / ≤ 1 mA
Input current	2 mA – 8 mA
Max. power consumption	800 mW
Surge immunity EN 61000-4-5	2 kV

Insulation	
Between input and outputs	2 kVrms 1 minute

General Specifications	
Ambient temperature storage/operation	-40 … +85 °C/-25 … +60 °C
ON delay	≤ 3 ms
Release time	≤ 4 ms
Max. Switching frequency	3600 ops/minute
Conductor cross section	Stranded wire 2.5 mm², 2 x 1.5 mm²
Max. Screw torque	0.4 Nm
Ingress protection degree	Housing: IP 40, terminals: IP 20
Housing material	Lexan
Weight	30 g

Standard types	
UC 50/60Hz (AC/DC)	**KDW3-24 / UC24-240V R**

Accessories	
Label plate:	**BZS-DIN17.5**



Connection diagram

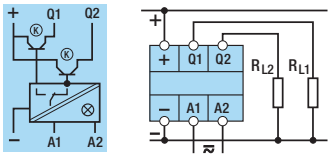


Fig.1 Load inductance vs. Loadcurrent

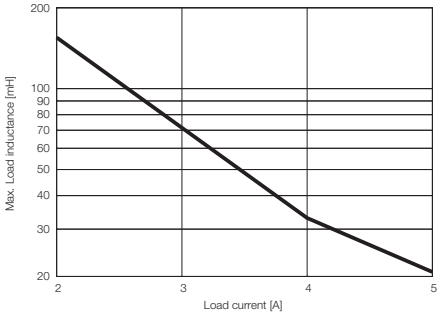
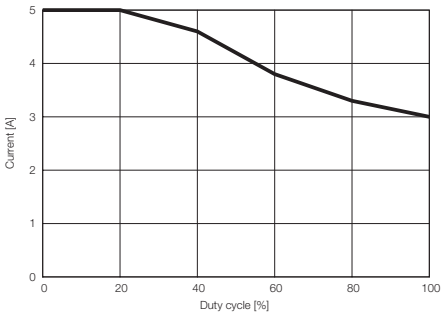
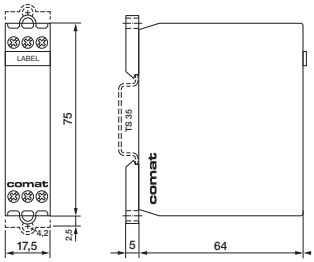


Fig. 2 Output current vs. duty cycle



Dimensions [mm]

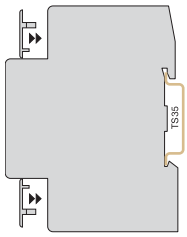


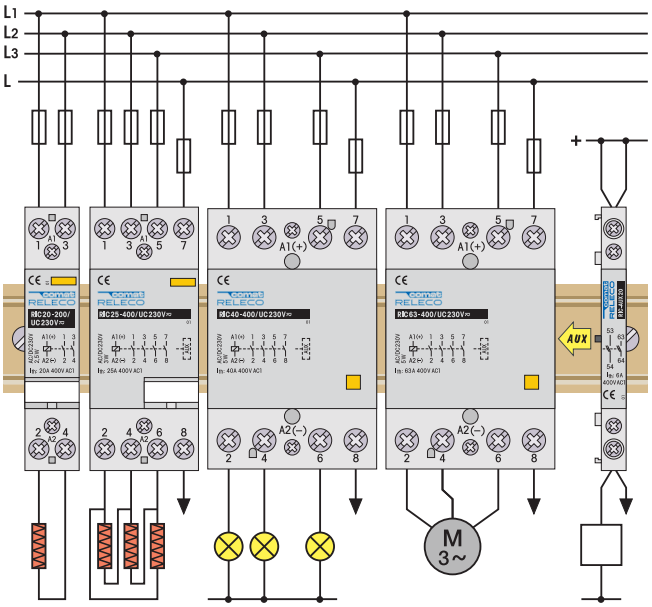
Technical approvals, conformities

Notes

1.2.2 Power Relays

Installation Contactor





- 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, 0.5 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 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]	≤ 2.5	≤ 2.5
Inductive turn-off voltage	None	None
Surge immunity EN 6100-4-5	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

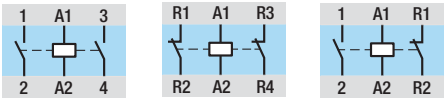
Standard types

UC (AC / DC) 50 / 60 Hz, 24, 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	
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	15

Connection diagram



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

Coil circuit

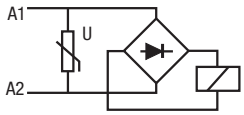
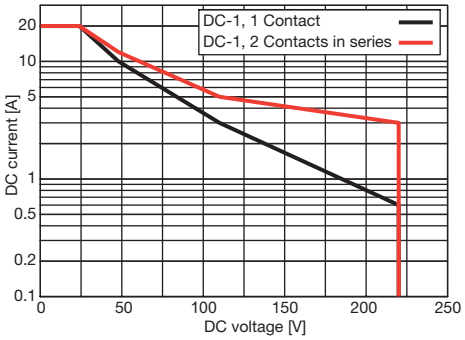
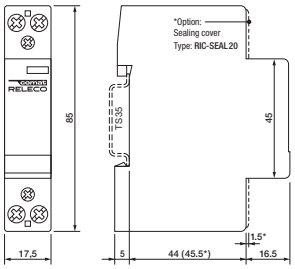


Fig. 1 DC load limit curve DC1



Dimensions [mm]



Technical approvals, conformities

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

Installation Contactor

RIC25 (Railway)

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, 0.5 A/220 V DC-1** **3 phase 230 V: 9 kW** **3 phase 400 V: 16 kW**
Recommended minimum contact load	**10 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 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]	≤ 3	≤ 3
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

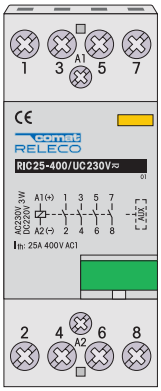
General Specifications		
Ambient temperature		
storage		-30 … 80 °C
operation, Spacer after 2 contactors side by side		-5 … 55 °C
operation, Spacer after 3 contactors side by side		-5 … 40 °C
Pick-up time		15 … 45 ms
Release time		20 … 70 ms
Mechanical life		≥ 3 x 10^6 operations
AC voltage endurance 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 mm^2 / 6 mm^2
Max. Screw torque coil / contacts		0.6 Nm / 1.2 Nm
Ingress protection degree		IP 20
Weight		270 g

Standard types

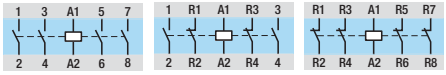
UC (AC / DC) 50 / 60 Hz, 24, 230	**4NO**	**RIC25-400/UC …V**
	2NO + 2NC	**RIC25-220/UC …V**
"…" enter the voltage for full type designation	**4NC**	**RIC25-040/UC …V**

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	20



Connection diagram



4xNO RIC25-400 | 2xNO + 2xNC RIC25-220 | 4xNC RIC25-040

Coil circuit

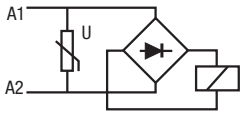
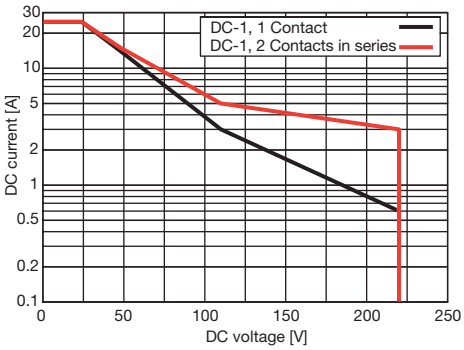
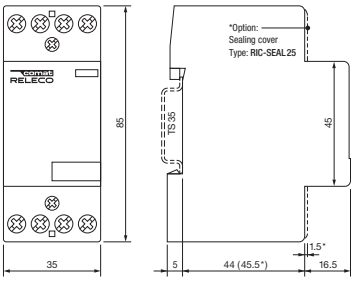


Fig. 1 DC load limit curve DC-1



Dimensions [mm]



Technical approvals, conformities

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

Installation Contactor

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, 0.5 A / 220 V DC-1**
	3 phase 230 V: 16 kW
	3 phase 400 V: 26 kW
Recommended minimum contact load	**10 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]	≤ 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 … 45 ms
Release time		20 … 70 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 / 2 Nm
Ingress protection degree		IP 20
Weight		420 g

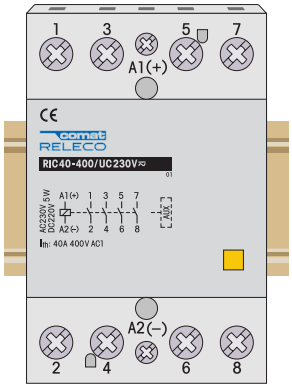
Standard types

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**

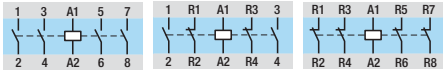
Accessories

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	52



Connection diagram



4xNO RIC40-400 | 2xNO + 2xNC RIC40-220 | 4xNC RIC40-040

Coil circuit

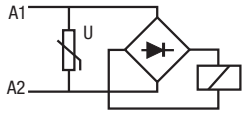
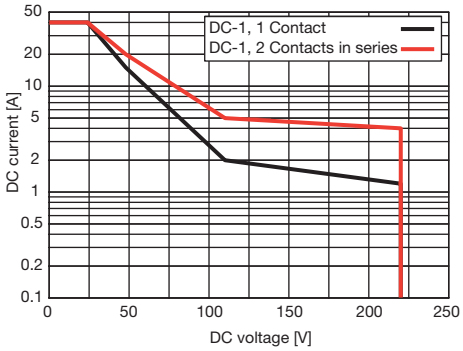
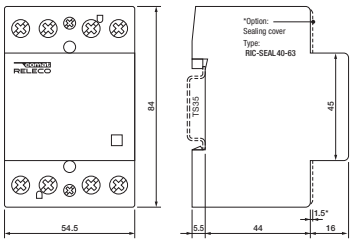


Fig. 1 DC load limit curve DC1



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/220VDC-1**
	3 phase 230 V: 24 kW
	3 phase 400 V: 40 kW
Recommended minimum contact load	**10 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

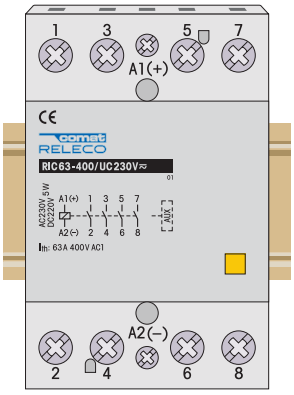
Insulation	
Rated insulation voltage	440 V
Rated impulse withstand voltage	4 kV
Min. clearance of open contact	3.6 mm

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 ... 45 ms
Release time		20 ... 70 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 / 2 Nm
Ingress protection degree		IP 20
Weight		420 g

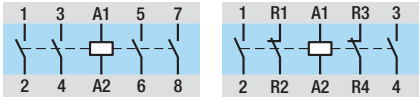
Standard types		
UC (AC / DC) 50 / 60 Hz, 24, 230	**4NO**	**RIC63-400/UC ...V**
"..." enter the voltage for full type designation	**2NO + 2NC**	**RIC63-220/UC ...V**

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	75



Connection diagram



4xNO
RIC63-400

2xNO + 2xNC
RIC63-220

Coil circuit

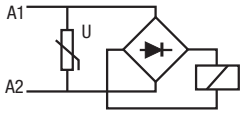
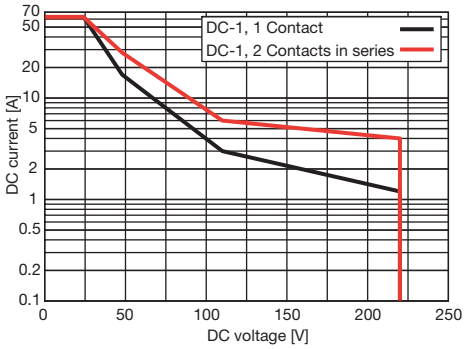
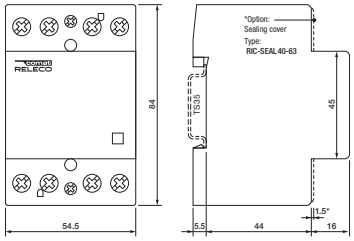


Fig. 1 DC load limit curve DC-1



Dimensions [mm]



Technical approvals, conformities

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

Installation Contactor

RIC-AUX

6 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	**6 A / 230 V, 4 A / 400 V**
Recommended minimum contact load	**10 mA / 24 V**

Contacts

Material	AgNi
Rated operational current AC-15	6 A / 230 V, 4 A / 400 V
Max. switching voltage with RIC 20	400 V

Insulation

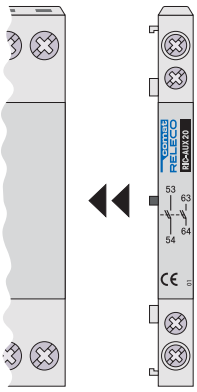
Rated insulation voltage	on RIC 20 / 25	440 V
	on RIC 40 / 63	500 V
Rated impulse withstand voltage		4 kV

Specifications

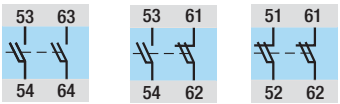
Ambient temperature storage / operation	-30 … 80 °C / -5 … 55 °C
Operating frequency at rated load	≤ 600 operations / h
Conductor cross section	Stranded wire 2.5 mm^2
Max. Screw torque	0.8 Nm
Ingress protection degree	IP 20
Weight	50 g

Standard types

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

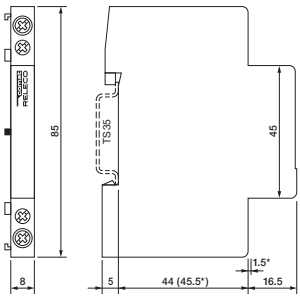


Connection diagram



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

Dimensions [mm]



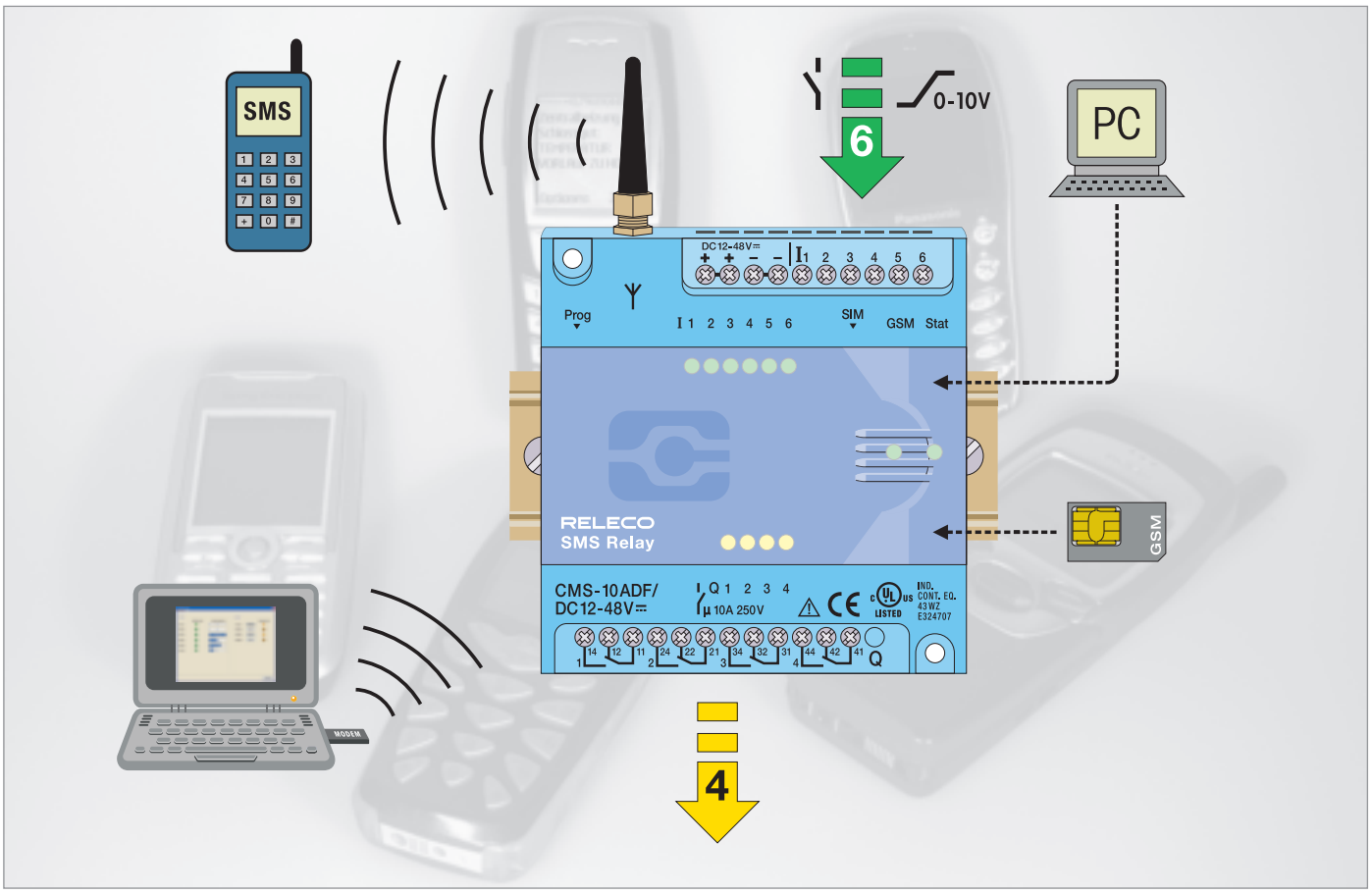
Technical approvals, conformities

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

NEW
With Remote Access

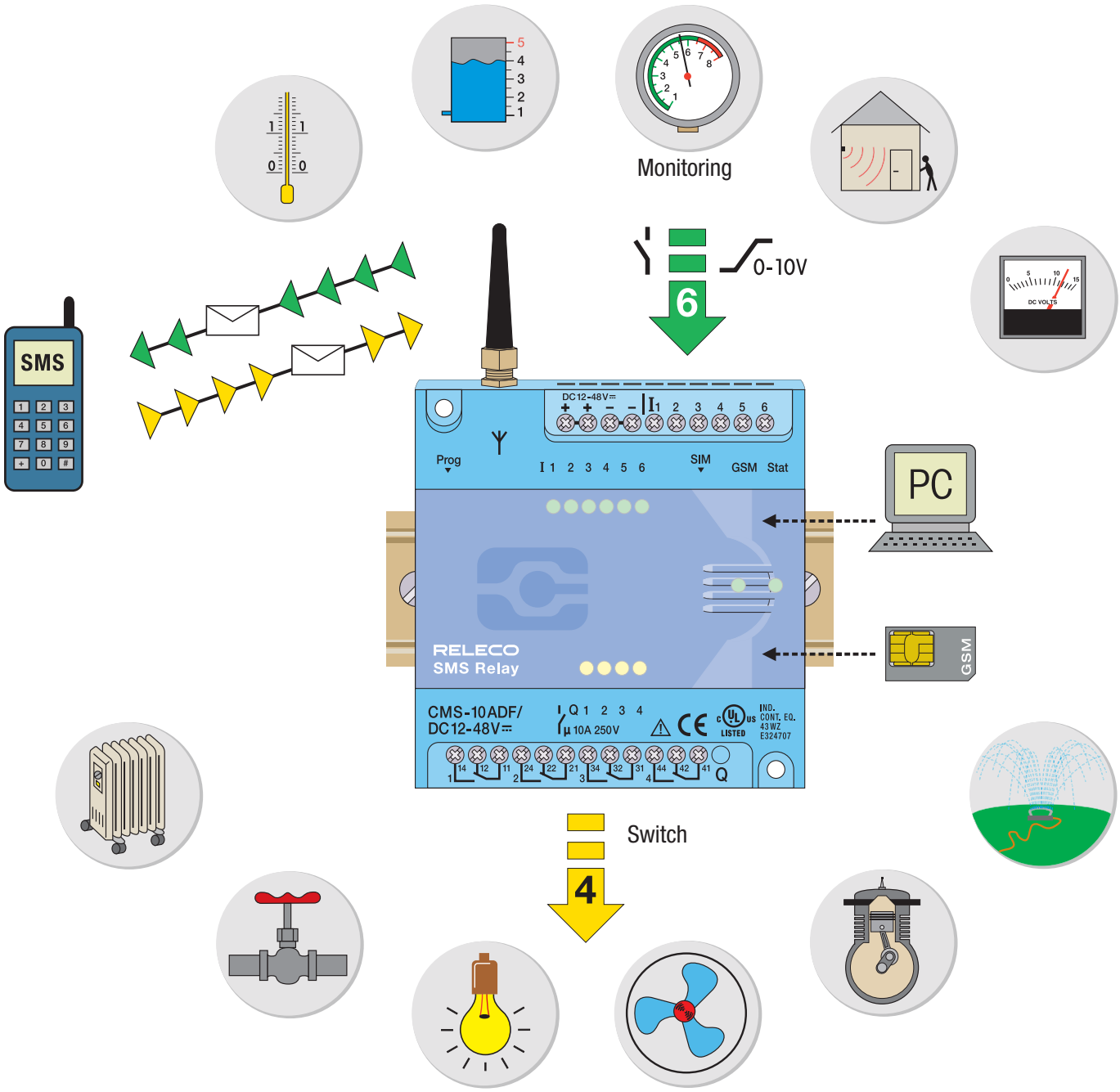
1.3 Automation Relays
1.3.1 Remote Control Relay

SMS Relay



- Easy configuration with PC and «Fast SMS Set™»-up configuration software
- Sequential alert messaging to 5 different subscribers
- Analog and/or digital inputs
- Monitoring of all inputs and outputs with SMS messaging
- Request of analogue values by SMS
- Remote control of outputs by SMS
- Power failure notification by SMS messaging
- Status change messages by SMS
- User defined message text
- Remote access and status display by PC/Notebook

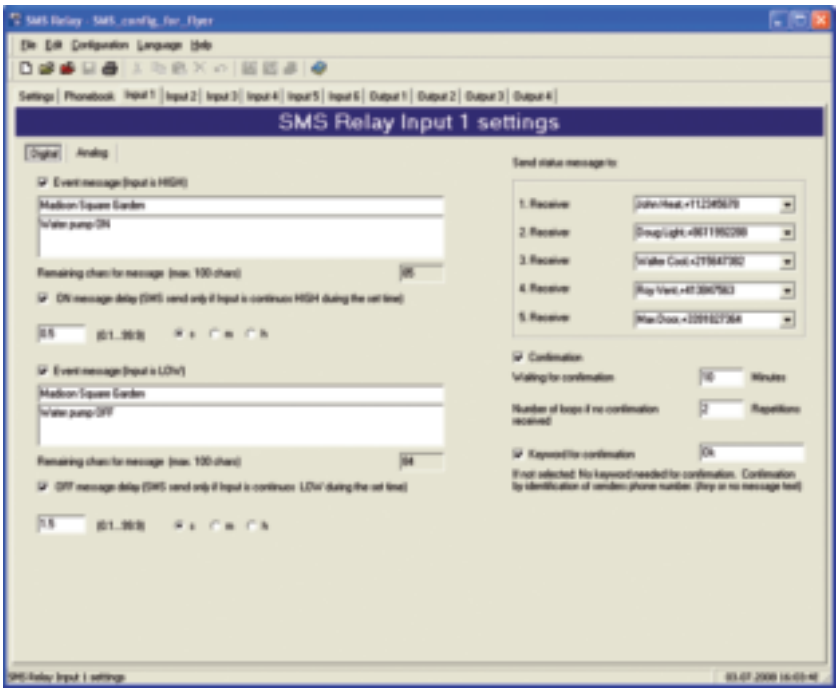
Applications



Monitoring Alerting, Controlling
Alerting **Controlling** Monitoring
Controlling Monitoring **Alerting**

Configuration software

Digital Inputs

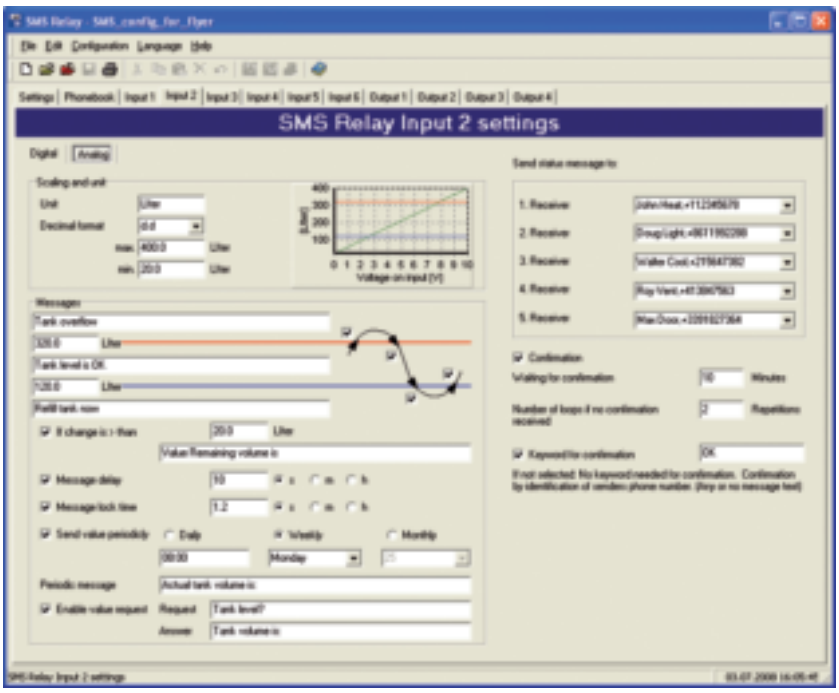


Language

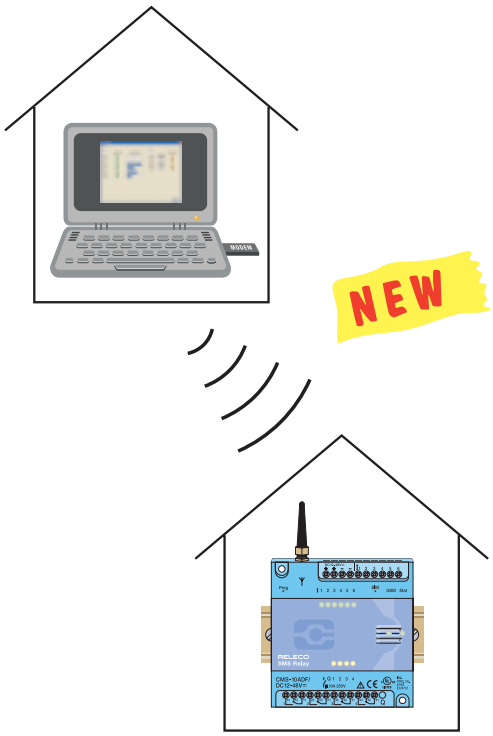
- Chinesisch vereinfacht
- Chinesisch traditionell
- Tschechisch
- Dänisch
- Deutsch
- Holländisch
- Englisch
- Spanisch
- Flämisch
- Französisch
- Italienisch
- Polnisch
- Russisch
- Schwedisch

Analog Inputs

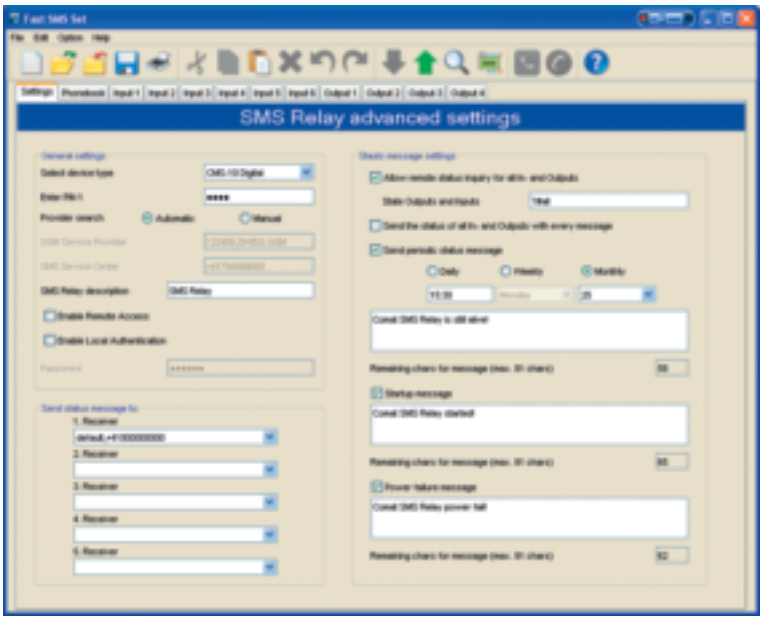
- Free selectable units e.g.: l, kg, m^3, psi, F, sqm, lbs
- Any min/max value can be defined. Scale adjustment automatic
- Value inquire by SMS
- Automatic alerting if min/max values are exceeded
- Status display on PC/Notebook via GSM network



Remote maintenance



Basic settings



Status display on the PC screen

Remote maintenance

The option “remote access” allows users to change the device configuration without presence on site.

The connection with a serial cable is replaced with the communication over the GSM network.

For that purpose, the user has to establish communication with the SMS Relay via a GSM modem. (for example with CMS-GMS-MOD) connected to the PC.

As soon as the connection between the PC and the device is established, a new configuration can be downloaded or the existing configuration may be read out. This allows to simply safe or change a phone number of a message receiver or to modify an analogue value or a time setting.

With the new configuration software it is also possible to display all Input and Output status as well as to switch Outputs without sending an SMS message to the device.

It has to be noted that establishing of communication and data transfers in the GSM network are subject of charges. These costs are variable depending on the provider and subscription. We recommend to keep the connection as short as possible.

The easy and comfortable handling of the SMS Relay is not affected with the new functions. The configuration software “FAS SMS SET” has not changed significantly and remains easy to use.

Technical Data's

Typ	CMS-10F/AC110-240V	CMS-10F/DC12-48V	CMS-10ADF/DC C12-48V
Operating voltage	AC 110-240V~ 50/60Hz	DC 12-48V⎓ ∿∿ max. 10%	DC 12-48V⎓ ∿∿ max. 10%
Power consumption	8VA/6W	4,2W	4,2W
Switching capacity	4x 10A 250V; Sum of current max. 20A		
Temperature range	Tu: -25…+55° C Rel. humidity: 10…95% (non condensing) Protection IP20		
Inputs	6x digital trigger level 85V~	6x digital trigger level 9,5V⎓	6x digital trigger level 9,5V⎓ or analog 0-10V⎓
Outputs	4x CO contacts µ10A/250V AC-1		
Provider (Phone/Network)	User selectable (dependent on SIM card)		
Frequency	GSM QuadBand (850; 900; 1800; 1900MHz)		

Installation note

The base unit device is delivered fully operational and includes the small aerial CMS-ANT.

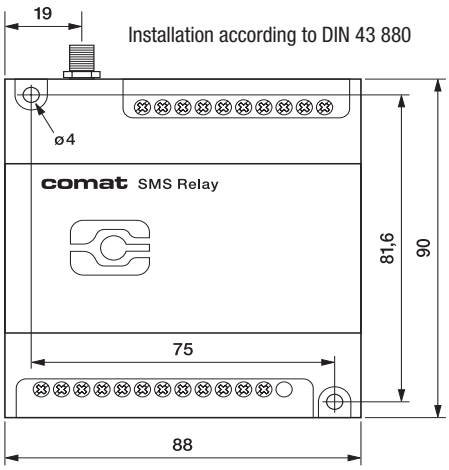
Before installation, the final location of installation must be taken into consideration.

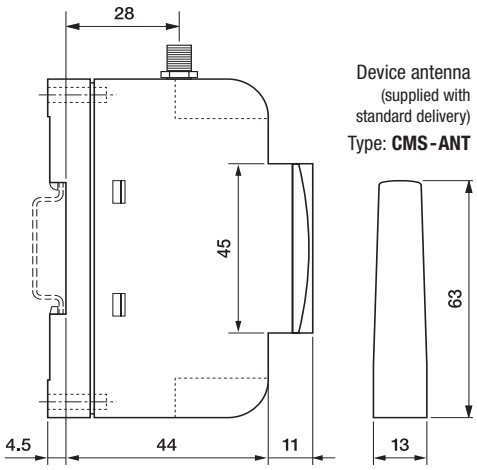
For installation inside a control panel, the small device aerial may not be suitable and needs to be replaced by the antenna with magnetic pod (CMS-ANT-MAG/2.5M) or by the external antenna (CMS-ANT-SPEZ/5M).

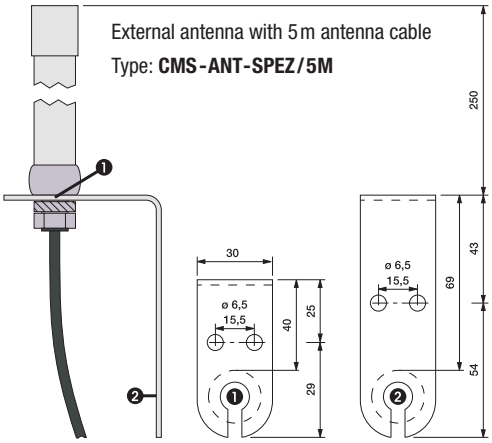
These two antennas provide considerably better results and improve communication with the mobile network.

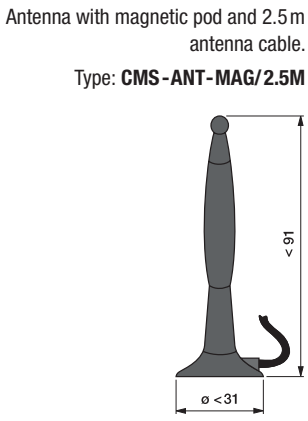
Please ask our product specialists if you require any support.

Dimensions



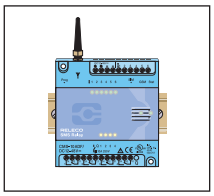






Order-Nr.

Typ	Description
CMS-10F/AC110-240V	SMS Relay AC 110-240V with digital inputs incl. small antenna (CMS-ANT)
CMS-10F/DC12-48V	SMS Relay DC 12-48V with digital inputs incl. small antenna (CMS-ANT)
CMS-10ADF/DC12-48V	SMS Relay DC 12-48V with digital and analog inputs incl. small antenna (CMS-ANT)
KIT consisting of:	A base unit with small antenna, antenna with magnetic pod and 2.5m cable, programming cable, USB-RS232 Interface connector, CD with «FAST SMS SET™»-up programming software and operation manual
CMS-10FKIT/AC110-240V	Installation kit complete with digital inputs (SMS Relay AC110-240V)
CMS-10FKIT/DC12-48V	Installation kit complete with digital inputs (SMS Relay DC12-48V)
CMS-10ADFKIT/DC12-48V	Installation kit complete with digital and/or analog inputs (SMS Relay DC12-48V)
Zubehör	
CMS-RS232	SMS Relay programming cable RS232
CMS-USB	USB-RS232 interface connector (including driver CD)
CMS-ANT	Small spare antenna for base unit, 63mm long
CMS-ANT-MAG/2.5M	Antenna with magnetic pod and 2.5m antenna cable
CMS-ANT-SPEZ/5M	External antenna with 5m antenna cable
CMS-ANT-KAB/5M	Antenna cable 5m (extension)
CMS-ANT-KAB/10M	Antenna cable 10m (extension)
CMS-ANT-ADAPT	Adaptor FME to SMA plug
CMS-CAP	Device cover (spare)
CMS-CD	CD with FAST SMS SET -up programming software and manual
DR-15-24	Power supply 15W, 24V. DIN-rail mounting
DR-30-24	Power supply 36W, 24V. DIN-rail mounting
MK31-112-LU/24V DC	1-channel voltage repeater
4114 PReasy	Universal transmitter PReasy 4114
4501	Display front (to PReasy 4114)
ZPT-10-H	PT100/PT1000 Amplifier
RF01-U	Room temperature sensor 0…50°C without display
RF01-U-D	Room temperature sensor 0…50°C with display
RTBSB-001-010	Room thermostat 5…30°C with operating controls
WF50 ext-U	Outdoor temperature sensor -50…+50°C
KS-110	AC sensor for monitoring of humidity and temperature in control panels, archives and cabinets
PS1	Water gauge suitable for application of level measurements in water installations
CMS-GSM-MOD	GSM Module (Connected to USB port of the PC) for remote access to the SMS Relay



Type

CMS-10F/…
CMS-10ADF/…

SMS Relay
- SMS Relay incl. small antenna 63mm
- WITHOUT programming cable, magnetic pod antenna, USB converter and programming software
- Suitable for user which already possess the accessories

CMS-10FKIT/…
CMS-10ADFKIT/…

SMS Relay KIT
- SMS Relay incl. small antenna 63mm
- Including programming cable, magnetic pod antenna with 2.5m cable, USB converter USB-RS232, and programming software "FASTR SMS SET™" with manual
- Suitable for user first user

Accessories

Type

DR-15-24 — **Power supply**

- Input
  - Voltage range: 85-264 V AC, 120-370 V DC
  - Frequency range: 47-63 Hz
  - Max. current: 0,88 A
- Output
  - DC Nominal voltage: 24 V
  - Setting range: 21,6-26,4 V
  - Power range: 0-0,63 A
  - Nominal load: 15,2 W

DR-30-24 — **Power supply**

- Input
  - Voltage range: 85-264 V AC, 120-370 V DC
  - Frequency range: 47-63 Hz
  - Max. current: 0,88 A
- Output
  - DC Nominal voltage: 24 V
  - Setting range: 21,6-26,4 V
  - Power range: 0-1,5 A
  - Nominal load: 36 W

MK31-112-LU/24V DC — **1-chanel voltage repeater**

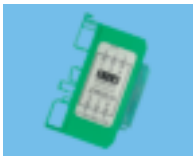
- Input
  - Current: 4…20 mA
  - Voltage: 0…10 V DC
- Output
  - Voltage: 0…10 V DC
  - Linearity: ≤ 0,1 %
- Low temperature drift of less than 0.2 %/K
- Galvanic separation of Input and Output circuit and supply voltage

4114 PReasy — **Universal transmitter**

- Input
  - Current: 0/4…20 mA
  - Voltage: 0/0,2…1; 0/1…5; 0/2…10 V DC
  - PT100: 2-, 3- and 4 wire
  - TE types: B…W5
  - Potentiometer: 10 Ω…100 kΩ
  - Lin. Resistance: 0 Ω…10 kΩ
- Output
  - Current: 0/4…20 mA / 800 Ω
  - Voltage: 0/0,2…1; 0/1…5; 0/2…10 V DC

4501 — **Display/Programming panel for PReasy**

- Communication interface for setting of operative parameters
- Can be plugged from one device to the other for data transmission
- Stationary display to visualize status of process data's
- Password protected
- LCD display with 4 lines



ZPT-10-H — **PT100/PT1000 Amplifier**

- Input: PT100; PT1000: 2-, 3-line switching
- Output: 0…10 V DC
- Supply voltage: 15…35 V DC
- DIN rail mounting

Accessories

Type

RF01-U — **Room temperature sensor without display**

- Integrated transducer
- Output: 0…10 V DC
- Measuring range: 0 °C…50 °C
- Supply voltage: 24 V AC/DC

RF01-U-D — **Room temperature sensor with integrated display**

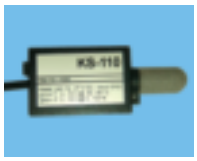
- Integrated transducer
- Output: 0…10 V DC
- Measuring range: 0 °C…50 °C
- Supply voltage: 24 V AC/DC

RTBSB-001-010 — **Room thermostat with operating controls**

- Suitable for temperature monitoring in closed rooms
- Output: 1 CO
- Setting range: 5 °C…30 °C
- Supply voltage: 230 V AC (24 V DC)

WF50 ext-U — **Outdoor temperature sensor**

- Sensor for temperature measuring outdoors or in industrial storage- or cold chambers
- Output: 0…10 V DC
- Measuring range: -50 °C…+50 °C
- Supply voltage: 15…24 V DC
- Protection class: IP65



KS-110 — **AC sensor for indoors and outdoors**

- Measuring of humidity and temperature in control panels, archives and cabinets
- **Temperature**
  - Measuring range: -40 °C…+80 °C
  - Measuring element: Solid state
  - Output: 0-10 V
- **Humidity**
  - Measuring range: 0 %…100 % relative humidity
  - Measuring element Capacitive
  - Output: 0-10 V

PS1 — **Level and water gauge**

- Suitable for applications in fountains or in water installations up to a depth of 5m (0-0.5 bar) Additional measuring ranges on request.
- Cable in special design with pressure compensation line
- Output signal: 0 -10 V, 3-wire
- Application temperature: +5 °C bis +70 °C

CMS-GSM-MOD — **Recommended modem for remote communication with the SMS Relay**

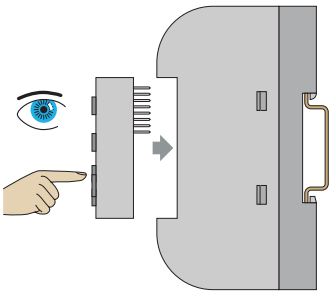
QuadBand (850/900/1800/1900 MHz)
Supports GPRS, CSD, CSF and SMS
USB 2.0 Full speed (12 Mbits/s) interface
With driver for Windows 2000/XP/XPPro/Tablet and Linux

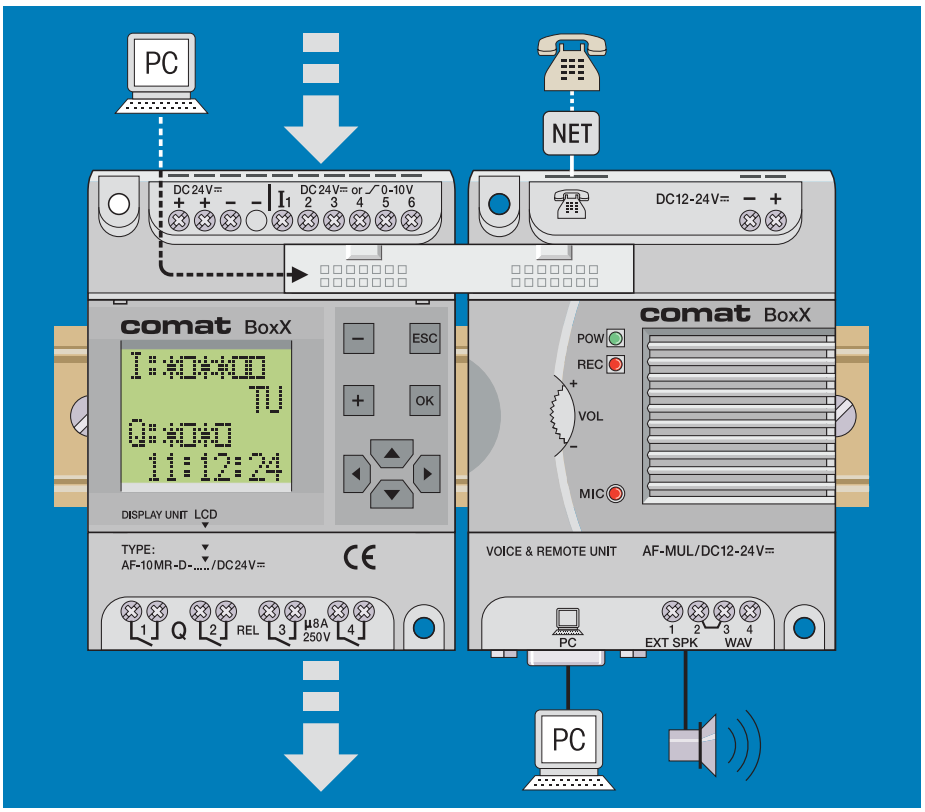
All above products are available from Releco. Don't hesitate to contact us.

Our SMS Relay is very suitable also for applications with products of EnOcean technology.
With accessories of this innovative solar powered wireless technology, these sensors can be used anywhere without expensive wiring.

1.3.2 Smart Relay

Smart Relay "BoxX" Miniature Controller (with Voice Module)



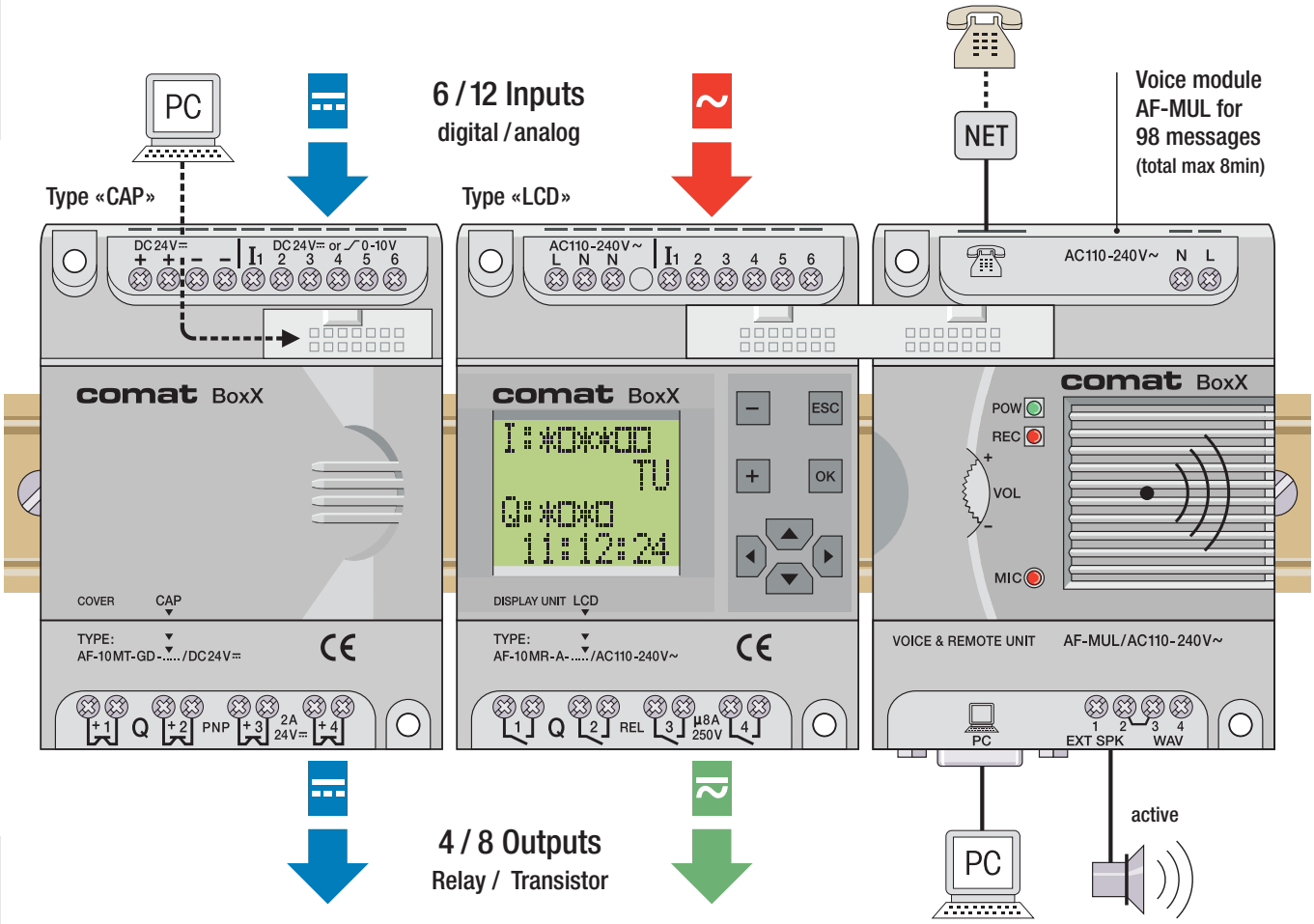


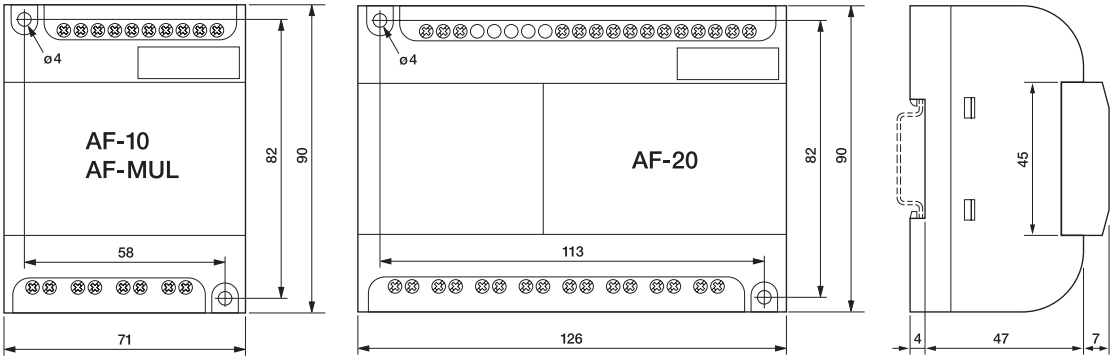
- Programming via PC
- Remote controlling and voice message over telephone network
- Comprehensive function block library
- Password protected

The Controller

127
Function blocks
Intermediate relays
Timer instructions
(up to the year 2099)

- Program storage 64 kByte
- Time range 0,01s-99,99 h
- Counting values 1-999'999
- System timer back up 100 h

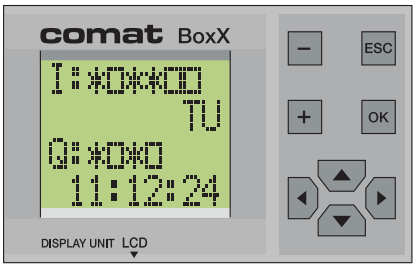




The Application

The Comat BoxX can be programmed by PC or with the snap-on LCD display with integrated function keys.
It is possible to modify time intervals of the function blocks in the existing control program on site directly on installation.
The LCD display can be connected to the Comat BoxX to visualize conditions or may be removed (without voltage) and used on another Comat BoxX.

The 24V versions of the Comat BoxX can also process analogue input signals 0…10V with increments of 0.1V.
All inputs can be used or configured at random as analogue or digital inputs.
Function blocks for the comparison of analogue values are available,
i.e. to monitor temperature in a heating system.



Setting the display

Analogue inputs

Programming software

The programming software QUICK II allows easy and transparent programming of the Comat BoxX with a PC.
QUICK II is based on Windows®.
127 function blocks can be stored inside the program memory of the Comat BoxX.
Stored programs cannot be lost even during a power loss.
Therefore back up batteries are not needed.
With the simulation tool, the set up can be tested on the PC before commissioning.
Example: next page

Programming the function blocks

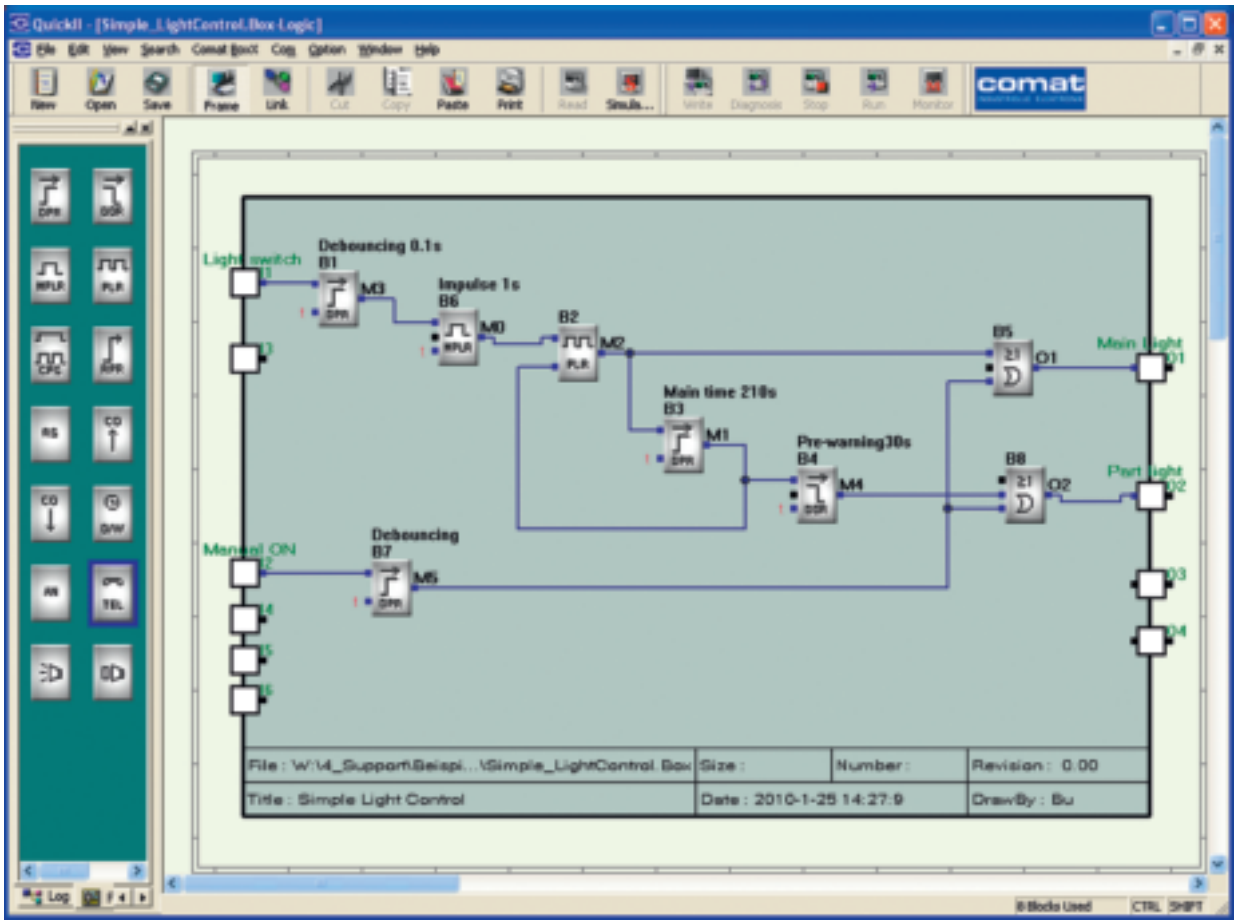
Control tasks can be solved easily with the function blocks available in the library.
Programming codes in a highlevel program language are not required.
Simply place the corresponding function blocks and link them with other function blocks according to the required control function.

The voice and remote module

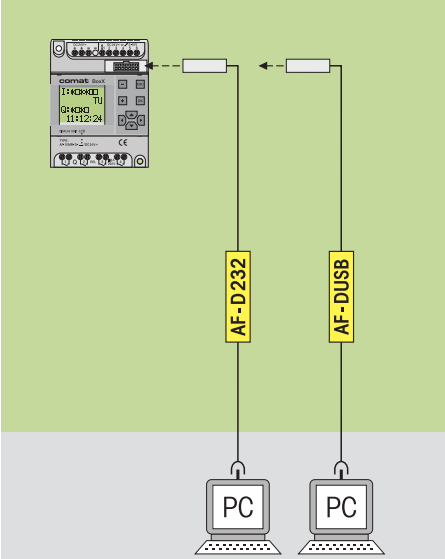
The voice module allows the playing of messages through either the built-in or external loud speakers. The voice module also replays phone calls or dials phone numbers to send emergency or status messages.
Messages are recorded directly over the built-in microphone or are transferred as*.wav files directly from the PC.

Programming software Quick II

Example: Programming environment

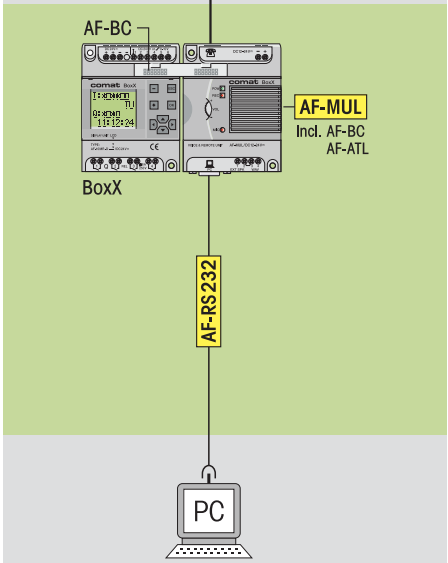


The Extension module



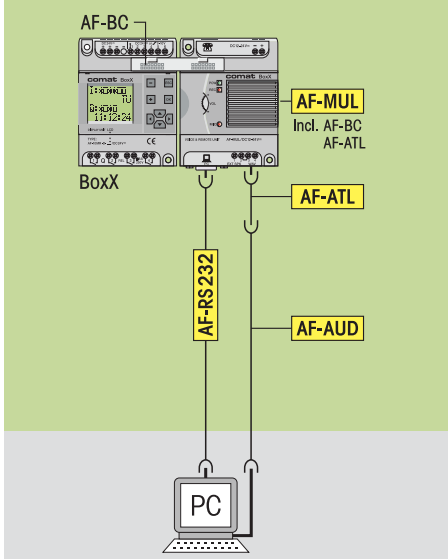
Programming simulation and monitoring with the PC.

Programming via the MUL voice and remote unit



Each Comat BoxX can be controlled via a telephone line if connected to the extension module AF-MUL (voice & remote unit).
The AF-MUL will answer calls and allows access after the password is accepted.
The Comat BoxX with the AF-MUL is able to record up to 98 predefined conditions, for example alarm messages over the phone network. The designated phone number is dialled and the recorded message is played over the telephone.
The message can also be broadcasted over auxiliary loudspeakers.
At the same time, the controller can be remotley accessed by phone, and phone Keys are used to send remote signals to control the installation or to activate controlling steps.

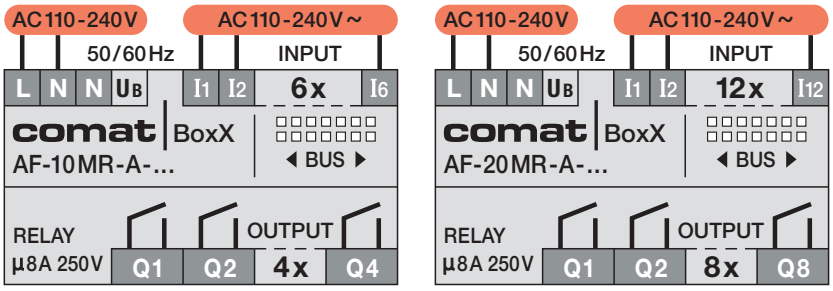
Recording of messages with the PC



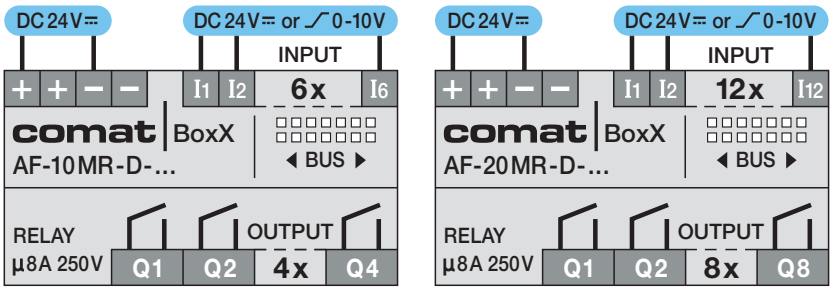
Messages are transferred to the voice module as *.wav files directly from the PC over the AF-AUD cable.

The Types

	UB	6 Inputs / 4 Outputs	UB	12 Inputs / 8 Outputs



6/12 Inputs digital AC110-240V				
4/8 Ouputs relays 8A 250V ~				
Order no.	without display	AF-10MR-A-CAP/AC110-240V	without display	AF-20MR-A-CAP/AC110-240V
	with display	AF-10MR-A-LCD/AC110-240V	with display	AF-20MR-A-LCD/AC110-240V



6/12 Inputs configurable: digital / analog 0-10V (0,1V)				
4/8 Outputs relays 8A 250V ~				
Order no.	without display	AF-10MR-D-CAP/DC24V	without display	AF-20MR-D-CAP/DC24V
	with display	AF-10MR-D-LCD/DC24V	with display	AF-20MR-D-LCD/DC24V

4/8 Transistor outputs PNP 2A 24V ⎓				
Order no.	without display	AF-10MT-GD-CAP/DC24V	without display	AF-20MT-GD-CAP/DC24V
	with display	AF-10MT-GD-LCD/DC24V	with display	AF-20MT-GD-LCD/DC24V

Accessories

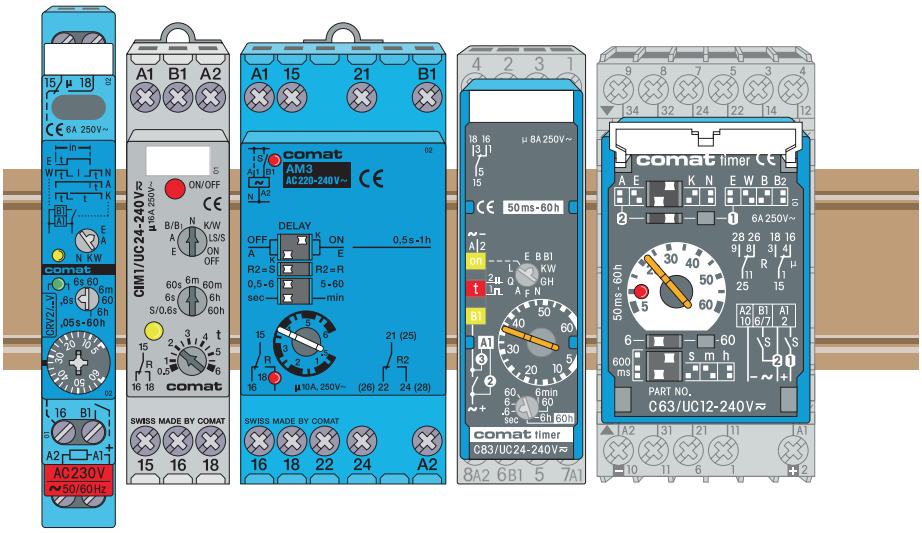
Order no.		Order no.	
AF-MUL/AC110-240V	Voice and remote unit [1]	AF-D232	Programming cable (RS 232)
AF-MUL/DC12-24V	Voice and remote unit [1]	AF-DUSB	Programming cable (BoxX/USB)
AF-RS232	AF-MUL Programming cable	CMS-USB	Converter USB-RS 232
AF-BC	AF-MUL Bridge connector [2]	AF-LCD	Display with function keys
AF-ATL	AF-5MUL Audio Cable [2]	AF-CAP	Cover (instead of AF-LCD)
AF-AUD	Audio Cable	AF-CDR	CD-ROM
DR-15-24	Power supply 15W, 24V		

1) Inclusive AF-BC and AF-ATL
2) Included with AF-MUL

The Data

	AF-10	AF-20	AF-MUL
Operating voltage UB	AC110-240V~ 50/60Hz		AC110-240V~
	DC24V⎓ ∿ max.10%		DC12-24V⎓
Power consumption	Transistor: 2W	Transistor: 2W	0,7W
	Relay: 4W	Relay: 5W	
Switching power	⁄ 8A 250V~	⁄ 2A 24V⎓	
Ambience conditions	Tu without display -25...+55°C	Tu with display 0...+55°C	Rel. humidity: 5...95% (non condensing) / Protection IP20

Time Relays


comat
RELECO
AC230V
50/60Hz
CIM1/UC24-240V
ON/OFF
SWISS MADE BY COMAT
AM3
AC220-240V~
DELAY
0,5s-1h
50ms-60h
comat timer
C83/UC24-240V
C63/UC12-240V
PART NO.

Time functions

Delay functions

E **On delay**

S ⇒ R on with delay
S OFF ⇒ R off

A **Off delay**

S ⇒ R on
S OFF ⇒ R off with delay

F **On and off delay**

S ⇒ R on with delay (t1)
S OFF ⇒ R off with delay (t2)

Shot timing modes

W **On shot leading edge**

S ⇒ R on for t
S OFF ⇒ R off
(pulse clipping)

N **On shot trailing edge**

S OFF ⇒ R on for t
S on for t ⇒ R off

Q **On shot leading and trailing edge**

S ⇒ R on for t1
S OFF ⇒ R on for t2
S OFF off for t1 ⇒ R off

Puls shaping

K **Puls shaping**

S (pulse or continuous contact)
⇒ R on for t
S ▬ no influence on R and t

L **Pulse shaping,** retrigger (subsequ.time operation from 0)

S (pulse or continuous contact)
⇒ R on for t
S on for t = tRESET

M **Puls shaping**

S OFF ⇒ R on for t
S ▬ no influence on R and t

Blinker functions

B **Blinker,** pulse start

S ⇒ R on/off periodically
according to t
S OFF ⇒ R off

B1 **Blinker,** pulse start, trailing pulse

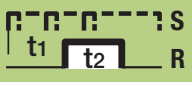
S ⇒ R on/off periodically
according to t
S OFF: last pulse = t

B2 **Blinker,** interval start

S ⇒ R after t on/off periodically
according to t
S OFF ⇒ R off

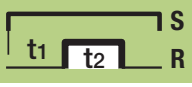
Delayed pulse

G **On delay single shot**



S (pulse or continuous contact)
⇒ R after t1 on for t2
S ▬ no influence on R and t

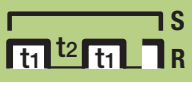
H **On delay single shot**



S ⇒ R after t1 on for t2
S OFF ⇒ R off

Repeat cycle timer

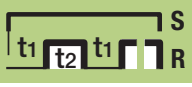
I **Repeat cycle timer,** pulse start



S ⇒ R on/off periodically
according to t1 and t2
S OFF ⇒ R off

P **Repeat cycle timer,** interval start

C55, CT1: t2 t1



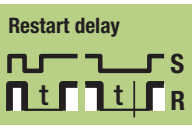
S ⇒ R after t1 (t2) on/off peri-
odically according to t2 and t1
S OFF ⇒ R off

Special functions

Y **Star-delta timer**

S ⇒ Y on for tY
YOFF ⇒ Δ on with delay for tY-Δ
S OFF ⇒ Δ off

X1 **Restart delay**



S ⇒ R on
S OFF ⇒ R off and starts t
S ⇒ R restart only after t

Special functions

S **Step-on / Step-off switch**

S ⇒ R on/off

LS **Step-switching** (staircase lighting timer), with time lapse

S ⇒ R on and starts t
S on for t ⇒ R off

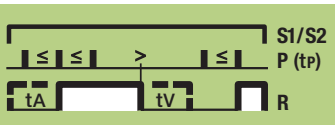
Stop / Reset

t STOP	SSTOP interrupts t (t-addition)	T	t is stopped ▬ ⇒ R on/off
t RESET	SRESET reset t t restarts immediately		Test

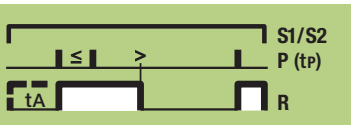
S = Triggering
R = Output circuit
⇒ = switches…
ON OFF

Pulse sequence monitoring

U



V



S1/S2 = Monitoring start
P = Pulse sequence
tP = Pulse separation

≤: Pulse separation is **smaller** than the time tP
>: Pulse separation is **larger** than the time tP

Start with S1 = **without** start-up short-out tA
Start with S2 = start-up short-out tA

tV = settable alarm delay
delay (tA = tV)

01.2010e

2.1 Time Cubes

Timecube

Timecube

CT2, CT3

8- and 11-pin Timecube®

Type

CT2/CT3

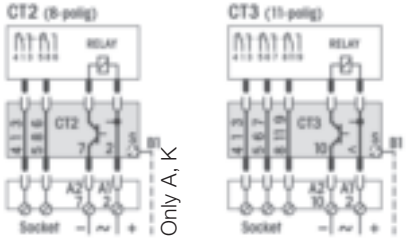
The CT2 or CT3 Timecube is an electronic timer that is inserted between the plug-in industrial relay and the socket.
The result is a modular, complete time-delay relay without additional space requirement.
The CT modules are suitable for all 8- and 11-pin standard industrial relays according to IEC 67 (i.e. C2, C3 series) and for industrial relays from other manufacturers.

Specifications

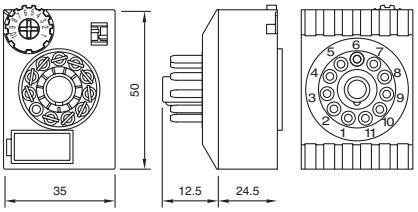
Operating voltage	9,5 ... 275 V, see list
Ambient temperature operation/storage	-25 ... + 60 °C/-40 ... 70 °C
Housing material	Polycarbonate or similar (UL94V-1)
Protection class (DIN 40050)	IP40
Weight	35 g
Time range	0.2 s ... 30 min., 4 sections
Min. control period	50 ms
Reset time	< 200 ms
Fine time adjustment	Potentiometer 1:15
Time range setting	

Range	DIP switch	Time
0,2 - 3 s		Adjusting knob 1 ... 10
2 - 30 s		
0,2 - 3 min		
2 - 30 min		

Diagram



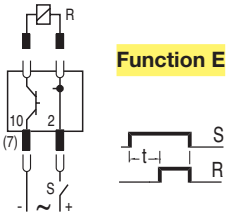
Dimensions [mm]



Only 11-pin version shown.
The dimension of the 8-pin version are identical

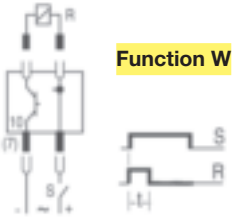
Technical approvals, conformities

CT2-E (8-pin), CT3-E (11-pin)
On delay
Function E



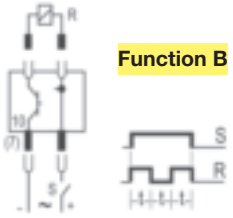
CT2-E30/S	9,5 ... 18 V	DC
CT2-E30/L	20 ... 65 V	UC
CT2-E30/H	90 ... 265 V	UC
CT3-E30/S	9,5 ... 18 V	DC
CT3-E30/L	20 ... 65 V	UC
CT3-E30/H	90 ... 265 V	UC

CT2-W (8-pin), CT3-W (11-pin)
One shot
Function W



CT2-W30/S	9,5 ... 18 V	DC
CT2-W30/L	20 ... 65 V	UC
CT2-W30/H	90 ... 265 V	UC
CT3-W30/S	9,5 ... 18 V	DC
CT3-W30/L	20 ... 65 V	UC
CT3-W30/H	90 ... 265 V	UC

CT2-B (8-pin), CT3-B (11-pin)
Blinker
Function B



CT2-B30/S	9,5 ... 18 V	DC
CT2-B30/L	20 ... 65 V	UC
CT2-B30/H	90 ... 265 V	UC
CT3-B30/S	9,5 ... 18 V	DC
CT3-B30/L	20 ... 65 V	UC
CT3-B30/H	90 ... 265 V	UC

Note: The relay has to be selected according to the actual power supply voltage.

CT2, CT3

8- and 11-pin Timecube®

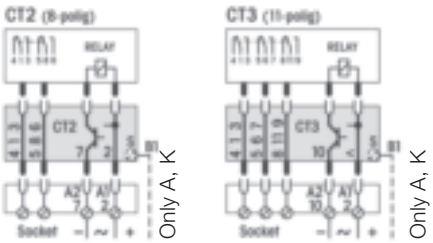
Type	CT2/CT3
	The CT2 or CT3 Timecube is an electronic timer that is inserted between the plug-in industrial relay and the socket. The result is a modular, complete time-delay relay without additional space requirement. The CT modules are suitable for all 8- and 11-pin standard industrial relays according to IEC 67 (i.e. C2, C3 series) and for industrial relays from other manufacturers.

Specifications

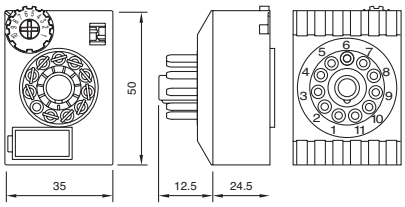
Operating voltage	9,5 ... 275 V, see list
Ambient temperature operation/storage	-25 ... + 60 °C/-40 ... 70 °C
Housing material	Polycarbonate or similar (UL94V-1)
Protection class (DIN 40050)	IP40
Weight	35 g
Time range	0.2 s ... 30 min., 4 sections
Min. control period	50 ms
Reset time	< 200 ms
Fine time adjustment	Potentiometer 1:15
Time range setting	

Range	DIP switch	Time
0,2 - 3 s		Adjusting knob 1 ... 10
2 - 30 s		
0,2 - 3 min		
2 - 30 min		

Diagram



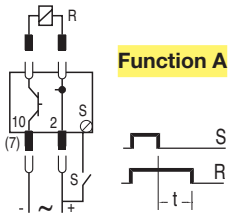
Dimensions [mm]



Only 11-pin version shown.
The dimension of the 8-pin version are identical

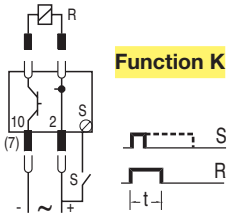
Technical approvals, conformities

CT2-A (8-pin), CT3-A (11-pin)
Switch-off delay
Function A



CT2-A30/S	9,5 ... 18 V	DC
CT2-A30/L	20 ... 65 V	UC
CT2-A30/M	90 ... 150 V	UC
CT2-A30/U	180 ... 265 V	UC
CT3-A30/S	9,5 ... 18 V	DC
CT3-A30/L	20 ... 65 V	UC
CT3-A30/M	90 ... 150 V	UC
CT3-A30/U	180 ... 265 V	UC

CT2-K (8-pin), CT3-K (11-pin)
Impulse-on
Function K



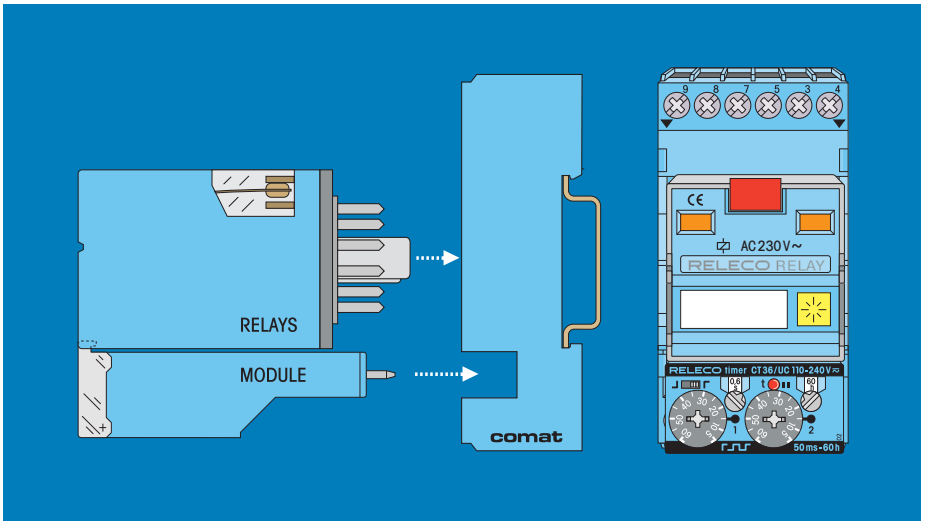
CT2-K30/S	9,5 ... 18 V	DC
CT2-K30/L	20 ... 65 V	UC
CT2-K30/M	90 ... 150 V	UC
CT2-K30/U	180 ... 265 V	UC
CT3-K30/S	9,5 ... 18 V	DC
CT3-K30/L	20 ... 65 V	UC
CT3-K30/M	90 ... 150 V	UC
CT3-K30/U	180 ... 265 V	UC

Note: The relay has to be selected according to the actual power supply voltage.

Notes

2.2 Time Modules

Modular plug-in Time Delay Relays



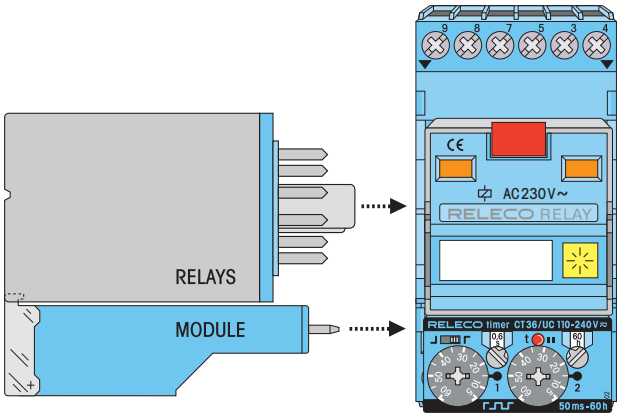
The modular timer system consists of individual plug-in timer modules with front cover, an 11-pole plug-in relay and a system socket with retaining spring.
The individual combination allows an optimal device selection for the foreseen application.
Later modifications as for example an exchange of relay from mechanical contacts to a relay with solid-state outputs are possible at any time.
The user profits of a universal system of worldwide unique flexibility.

The modular Comat timer CT System

The time delay relays and monitoring relays consist of plug-in CT electronic modules and 11-pole output relays. Both system components can be combined in a variety of combinations. This allows adapting the system for the specific application.

Subsequent modifications, for example a change from mechanical contacts to solid-state outputs, are possible at any time just by replacing the relay.

This system provides the user a complete universal system with worldwide unmatched flexibility.



The system sockets C12B0 or C-155 serve as a basis for the secure reception of the electronic modules. The sockets have a 4-pole module slot in which the CT modules lock firmly and vibration proof also without the output relay. Contact is made with reliable twin knife contacts.

With the A2 connector bridge "C-A2", the neutral conductor (N/-) can be connected from socket to socket. It reduces wiring work considerably.

Robust terminals for wires up to 4 mm^2 and spacious labeling are other advantages of this practical Comat modular system.

Clear markings close to the terminal connections on the sockets make it easy to identify the connections for wiring and servicing.

The CT modules are proof of the practical oriented experiences of Comat in the field of industrial electronics. All control and display elements are arranged easy accessible at all times on the front side of the modules. The functions and settings are self-explanatory schematically illustrated on the front and allow to review the set values also during operation.

A transparent cover over the module setting components provides protection from unintentional settings and additionally links the module to the output relay.

Triggering is performed with the operating voltage. (L1 or +). No potential-free contacts are therefore required. The triggering complies to machine standards. Parallel connection to B1 is admissible.

The wide UC voltage range (AC/DC) of the modules give a wide flexibility. It permits the connection to AC or DC supplies and provides a high level of reliability in triggering.

Note: In case of even wider voltage ranges, for example UC 24-240V, triggering currents on B1 are often in the range of 100µA with simultaneous low threshold voltages of less than 20V. Due to capacitive or inductive pickups this may lead to unintentional triggering or switching errors caused by insufficient load on the control contacts (It is not seldom that 50V or more can be measured in open lines).

The output relays show the connection diagram and the technical values on the front side, (exception C3 and C5 relays). A color code indicates an AC coil with red and a DC coil with blue color. Most of the relays have a lockable test button for manual operation .

The standard contacts have proven its reliability for high switching current applications over many years. The contact material AgNi permits a wide switching range and due to the large dimensioning they are designed for a high number of switching cycles. The high breaking capacity of up to 10A/400V and a low load switching capability of 12V/10mA makes the contact suitable for the use in main circuits as well as for low voltage applications.

The twin contacts are switching the load circuit with 2 independent contact tongues. The switching safety for low currents is therefore 100 times higher compared to a single contact relay. Despite the high switching capacity of up to 6A/250V, these contacts are very suitable to switch low currents and voltages up to 1mA/6V.

The solid-state relays are an alternative to mechanical relays. In the standard version, the relay has a potential-free universal semiconductor output for AC or DC loads. The advantage is a bouncing- and wear-free, overload resistant, short circuit protected output with a practical unlimited life cycle.

Solid-state relays are specially recommended for applications of high switching cycles, for example for repeat cycle timers, flushing lights, but also for high inductive switching loads of solenoid valves, couplings, motors, etc. The solid state relays are also suitable for capacitive loads, for example long power lines, or compensated lighting circuits.

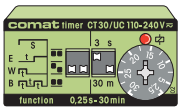
Additional protection circuits of the output or of the load are not necessary in any application for this type of Comat relays.

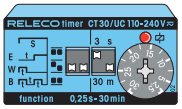
The solid-state relays are insensitive in any aggressive environment such as chemical plants, sewage plants etc. and are therefore an excellent choice for the employment in such environments.

The train symbol indicates products available in a special railway execution according EN 50155.
Please refer to our special railway brochure for details.

CT30, CT32, CT33, CT36

Plug-in time modules (combined with industrial relays)

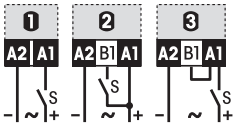




Type **Blue: CT30, CT32, CT33, CT36, /...V R**
Green: CT30, CT32, CT33, CT36, /...V

Plug-in time modules for sockets with module slot in combination with 11p plug-in relays.
Power supply and control voltages 24 … 240 V. Time ranges 30 ms up to 60 h.
LED output state indicator.

Time functions and related connection diagrams (Function diagrams: refer to page 114)



	CT30	CT32	CT33	CT36
	Economy	Universal	Universal	Repeat cycle timer
	E W B 1	E 2 3 A N K B1 2 W B 3	E 2 3 A N L F K G B1 Q 2 W H B 3	I P 1

Time data

Type	CT 30	CT 32	CT33	CT36
Partial time ranges, t_{max}	3, 30 /s /min	1.5, 6, 15, 60 /s /min	150, 600 ms 1.5, 6, 15, 60 /s /min /h	2 x 600 ms 2 x 6, 60 /s /min /h
Min. time t_{min}	0.25 s	0.15 s	30 ms	2 x 50 ms
Fine adj. range t_{min} … t_{max}	2.5 … 30	1 … 1 0	0.2 … 1	2 x 5 … 60
Time range tolerance t_{min}	-25 … 0 %	-25 … 0 %	-25 … 0 %	-25 … 0 %
t_{max}	0 … 35 %	0 … 25 %	0 … 25 %	0 … 25 %
Repetition accuracy	± 0.2 % or 20 ms	± 0.2 % or 20 ms	± 0.2 % or 20 ms	± 0.2 % or 20 ms
Temperature drift of time	0.25 % / K	0.1 % / K	0.1 % / K	0.1 % / K
Min. trigger pulse width B1	-	≥ 30 ms	≥ 30 ms	-
Reset time pow. supply	≤ 200 ms	≤ 150 ms	≤ 150 ms	≤ 150 ms
Power failure security	≥ 20 ms	≥ 20 ms	≥ 20 ms	≥ 20 ms

Output data

Nominal voltage	UC 24 – 48 V	110 – 240, 115, 230 V
Type	Solid state	Solid state
Rated operational current	150 mA	50 mA
On-state resistance	≤ 25 Ω	≤ 100 Ω
Leakage current	≤ 150 µA	≤ 150 µA

Power supply and control input (UC = AC / DC)

Type	CT 30	CT 32	CT33	CT36
Nominal voltage	UC 24 – 48 V	UC 110 – 240 V	UC 24 – 48 V	UC 110 – 240 V
Operating voltage range	19 … 75 V	90 … 265 V	19…60 V	82 … 265 V
Supply current	3 … 5 mA	2 … 4 mA	6 … 12 mA	4 … 8 mA

Type	CT32, CT33	CT32, CT33	CT32, CT33
Nominal voltage	UC 24 – 48 V	UC 115 V	UC 230 V
Operating voltage range	19 … 60 V	90 … 150 V	180 … 265 V
Input B1 inactive	≤ 9 V	≤ 60 V	≤ 100 V
Supply current	5 … 11 mA	4 … 7 mA	1 … 4 mA

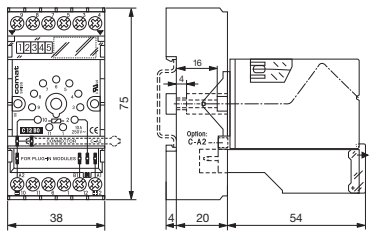
General Specification

Ambient temperature storage /operation	-40 … 85 °C / -25 … 60 °C
Ingress Protection degree	IP 40 when plugged in
Housing material	Lexan
Weight	25 g

Standard types	Blue	Green
CT30, CT32, CT33, CT36, UC24-48	CT3x/UC24-48V R	CT3x/UC24-48V
CT30, CT36, UC110-240	CT3x/UC110-240V R	CT3x/UC110-240V
CT32, CT33, UC115	CT3x/UC115V R	CT3x/UC115V
CT32, CT33, UC230	CT3x/UC230V R	CT3x/UC230V

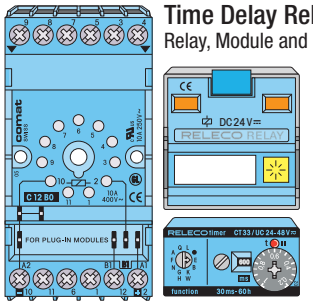
Remark: This module is part of several ready for connection units consisting of socket, relay and module. A wide range of suitable relays are available.

Dimensions [mm]



Technical approvals, conformities

comat RELECO by comat



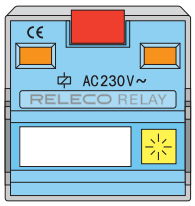
Time Delay Relay-Set

Relay, Module and Socket

Relay data's see:
Section industrial Relays

MAX
MIN

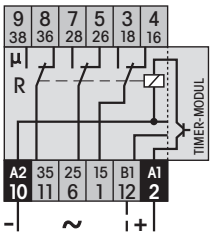
Power Relay



C3-A30X

Universal
Power Relay 10A.
With 3 power changeover-contacts this is the robust relay for AC and DC circuits ranging from 10mA 10V.

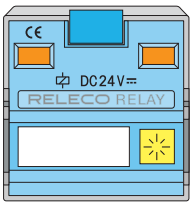
10A~
10mA 10V



Set Order-Nr.:
CT30.3-A30/...V R
AC 24, 48, 115, 230V
DC 24, 48, 110, 220V

Delivery includes:
- Relay C3-A30X/...V
- Module CT30/...V R
- Front cover FS-R
- Socket C12B0 R
- Retaining clip S3-C

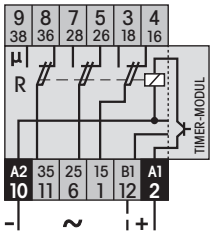
Control Relay



C3-T31X

Relay with 3 twin contacts 6A
The control relay with highest switching reliablility for control and signal circuits ranging from 5mA 5V.

6A 250V~
5mA 5V

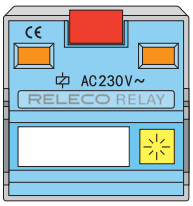


Set Order-Nr.:
CT30.3-T31/...V R
AC 24, 48, 115, 230V
DC24, 48, 110, 220V

Delivery includes:
- Relay C3-T31X/...V
- Module CT30/...V R
- Front cover FS-R
- Socket C12B0 R
- Retaining clip S3-C

Signal Relay

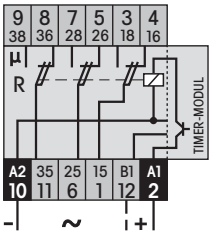
10µAu



C3-T32X

Relay with 3 twin contacts, 10µ gold flush
The twin contact relay with highest switching reliability for signal circuits ranging from 1mA 5V. Recommend. upto 0,2A 30V.

6A 250V~
1mA 5V



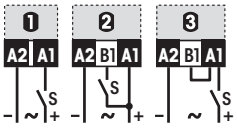
Set Order-Nr.:
CT30.3-T32/...V R
AC 24, 48, 115, 230V
DC 24, 48, 110, 220V

Delivery includes:
- Relay C3-T32X/...V
- Modul CT30/...V R
- Front cover FS-R
- Socket C12B0 R
- Retaining clip S3-C

Timer-Modul (Function diagrams: refer to page 114)

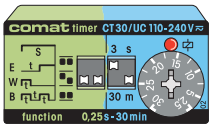
E-❶ Triggering
Function see page 114

R2(R3) = Time function as R1
R2(R3) = Instantaneous contact



CT30 Economy timer

3 functions, voltage controlled, output LED.
Seismic approved.



Function / Triggering
E W B-❶

Time range
0,25s-30min
0,25-3s...
2,5-30min

Set Order-Nr.:
CT30.3-A30/...V R
AC 24, 48, 115, 230V
DC 24, 48, 110, 220V

Delivery includes:
- Relay C3-A30X/...V
- Module CT30/...V R
- Front cover FS-R
- Socket C12B0 R
- Retaining clip S3-C

Set Order-Nr.:
CT30.3-T31/...V R
AC 24, 48, 115, 230V
DC24, 48, 110, 220V

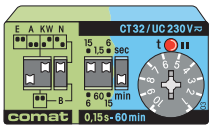
Delivery includes:
- Relay C3-T31X/...V
- Module CT30/...V R
- Front cover FS-R
- Socket C12B0 R
- Retaining clip S3-C

Set Order-Nr.:
CT30.3-T32/...V R
AC 24, 48, 115, 230V
DC 24, 48, 110, 220V

Delivery includes:
- Relay C3-T32X/...V
- Modul CT30/...V R
- Front cover FS-R
- Socket C12B0 R
- Retaining clip S3-C

CT32 Universal timer

7 functions, voltage controlled, time lapse display, blinking.
Seismic approved.



Function / Triggering
E-❷❸
A N K B1-❷
W B-❸

Time range
0,15s-60min
0,15-1,5s...
6-60min

Set Order-Nr.:
CT32.3-A30/...V R
AC 24, 48, 115, 230V
DC 24, 48, 110, 220V

Delivery includes:
- Relay C3-A30X/...V
- Module CT32/...V R
- Front cover FS-R
- Socket C12B0 R
- Retaining clip S3-C

Set Order-Nr.:
CT32.3-T31/...V R
AC 24, 48, 115, 230V
DC 24, 48, 110, 220V

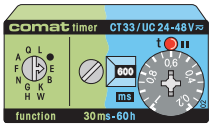
Delivery includes:
- Relay C3-T31X/...V
- Module CT32/...V R
- Front cover FS-R
- Socket C12B0 R
- Retaining clip S3-C

Set Order-Nr.:
CT32.3-T32/...V R
AC 24, 48, 115, 230V
DC 24, 48, 110, 220V

Delivery includes:
- Relay C3-T32X/...V
- Module CT32/...V R
- Front cover FS-R
- Socket C12B0 R
- Retaining clip S3-C

CT33 Universal timer

12 functions, voltage controlled, time lapse display, blinking, high setting accuracy by dial graduation 1:5.



Function / Triggering
E-❷❸ W H B-❸
A N L F K G B1 Q-❷
F Q t2=t1 G H t2=0,5s

Time range
30ms-60h
30-150ms...
12-60h

Set Order-Nr.:
CT33.3-A30/...V R
AC 24, 48, 115, 230V
DC 24, 48, 110, 220V

Delivery includes:
- Relay C3-A30X/...V
- Module CT33/...V R
- Front cover FS-R
- Socket C12B0 R
- Retaining clip S3-C

Set Order-Nr.:
CT33.3-T31/...V R
AC 24, 48, 115, 230V
DC 24, 48, 110, 220V

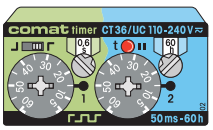
Delivery includes:
- Relay C3-T31X/...V
- Module CT33/...V R
- Front cover FS-R
- Socket C12B0 R
- Retaining clip S3-C

Set Order-Nr.:
CT33.3-T32/...V R
AC 24, 48, 115, 230V
DC 24, 48, 110, 220V

Delivery includes:
- Relay C3-T32X/...V
- Module CT33/...V R
- Front cover FS-R
- Socket C12B0 R
- Retaining clip S3-C

CT36 Repeat cycle timer

Pulse or pause start.
t1/t2 separately settable.
Time lapse display t1/t2.



Function / Triggering
I P-❶

Time range
2x50ms-60h
2x 50-600ms...
5-60h

Set Order-Nr.:
CT36.3-A30/...V R
AC 24,48,115,230V
DC 24, 48, 110, 220V

Delivery includes:
- Relay C3-A30X/...V
- Module CT36/...V R
- Front cover FS-R
- Socket C12B0 R
- Retaining clip S3-C

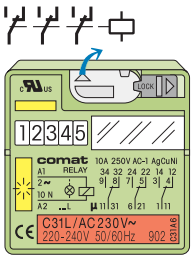
Set Order-Nr.:
CT36.3-T31/...V R
AC 24, 48, 115, 230V
DC 24, 48, 110, 220V

Delivery includes:
- Relay C3-T31X/...V
- Module CT36/...V R
- Front cover FS-R
- Socket C12B0 R
- Retaining clip S3-C

Set Order-Nr.:
CT36.3-T32/...V R
AC 24, 48, 115, 230V
DC 24, 48, 110, 220V

Delivery includes:
- Relay C3-T32X/...V
- Module CT36/...V R
- Front cover FS-R
- Socket C12B0 R
- Retaining clip S3-C

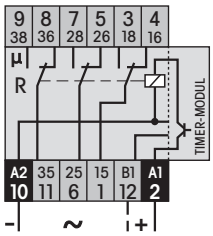
Power Relay



C31L

Universal Power Relay 10 A
with 3 power changeover-contacts this is the robust relay for AC and DC circuits ranging from 50 mA 10 V.

10 A 250V~
50 mA 10 V



Set Order-Nr.:
CT30.31/…V
AC 24, 48, 115, 230V
DC 24, 48, 110, 220V

Delivery includes:
- Relay C31L/…V
- Module CT30/…V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

Set Order-Nr.:
CT32.31/…V
AC 24, 48, 115, 230V
DC 24, 48, 110, 220V

Delivery includes:
- Relay C31L/…V
- Module CT32/…V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

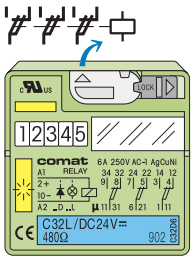
Set Order-Nr.:
CT33.31/…V
AC 24, 48, 115, 230V
DC 24, 48, 110, 220V

Delivery includes:
- Relay C31L/…V
- Module CT33/…V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

Set Order-Nr.:
CT36.31/…V
AC 24, 48, 115, 230V
DC 24, 48, 110, 220V

Delivery includes:
- Relay C31L/…V
- Modul CT36/…V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

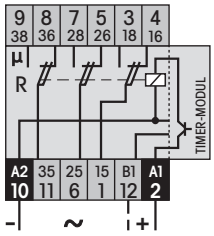
Control Relay



C32L

Relay with 3 twin contacts 6A
The control relay with highest switching reliablility for control and signal circuits ranging from 10 mA 5V.

6 A 250V~
10 mA 5V



Set Order-Nr.:
CT30.32/…V
AC 24, 48, 115, 230V
DC 24, 48, 110, 220V

Delivery includes:
- Relay C32L/…V
- Module CT30/…V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

Set Order-Nr.:
CT32.32/…V
AC 24, 48, 115, 230V
DC 24, 48, 110, 220V

Delivery includes:
- Relay C32L/…V
- Module CT32/…V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

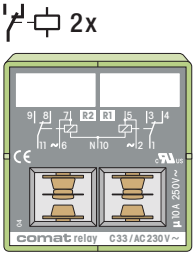
Set Order-Nr.:
CT33.32/…V
AC 24, 48, 115, 230V
DC 24, 48, 110, 220V

Delivery includes:
- Relay C32L/…V
- Module CT33/…V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

Set Order-Nr.:
CT36.32/…V
AC 24, 48, 115, 230V
DC 24, 48, 110, 220V

Delivery includes:
- Relay C32L/…V
- Module CT36/…V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

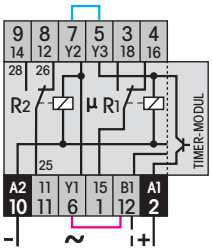
Power Relay



C33

Double-channel Power Relay 10 A
With 2x1 power changeover-contacts this is a robust relay for AC and DC circuits ranging from 10 mA 12V.

10 A 250V~
10 mA 12V



Set Order-Nr.:
CT30.33/…V
AC 24, 48, 115, 230V
DC 24, 48, 110V

Delivery includes:
- Relay C33/…V
- Module CT30/…V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

Set Order-Nr.:
CT32.33/…V
AC 24, 48, 115, 230V
DC 24, 48, 110V

Delivery includes:
- Relay C33/…V
- Module CT32/…V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

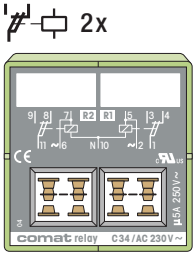
Set Order-Nr.:
CT33.33/…V
AC 24, 48, 115, 230V
DC 24, 48, 110V

Delivery includes:
- Relay C33/…V
- Module CT33/…V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

Set Order-Nr.:
CT36.33/…V
AC 24, 48, 115, 230V
DC 24, 48, 110V

Delivery includes:
- Relay C33/…V
- Module CT36/…V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

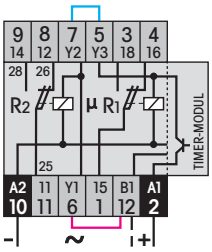
Control Relay



C34

Double-channel Control Relay 5 A
With 2x1 changeover-contact. The control relay with increased switching reliablility for control and signal circuits from 1 mA 6V.

5 A 250V~
1 mA 6V



Set Order-Nr.:
CT30.34/…V
AC 24, 48, 115, 230V
DC 24, 48, 110V

Delivery includes:
- Relay C34/…V
- Module CT30/…V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

Set Order-Nr.:
CT32.34/…V
AC 24, 48, 115, 230V
DC 24, 48, 110V

Delivery includes:
- Relay C34/…V
- Module CT32/…V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

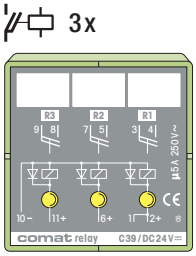
Set Order-Nr.:
CT33.34/…V
AC 24, 48, 115, 230V
DC 24, 48, 110V

Delivery includes:
- Relay C34/…V
- Module CT33/…V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

Set Order-Nr.:
CT36.34/…V
AC 24, 48, 115, 230V
DC 24, 48, 110V

Delivery includes:
- Relay C34/…V
- Module CT36/…V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

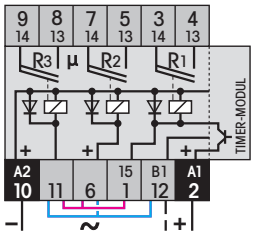
Power- and Signal Relay



C39

Triple-channel Twin Contact Relay 5A
with 3x1 NO contact. Ideal for interface applications ranging from 1 mA 100 mV.
LED display for each channel.

5 A 250V~
1 mA 100 mV



Set Order-Nr.:
CT30.39/…V
– –
DC 24, 48V

Delivery includes:
- Relay C39/…V
- Module CT30/…V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

Set Order-Nr.:
CT32.39/…V
– –
DC 24, 48V

Delivery includes:
- Relay C39/…V
- Module CT32/…V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

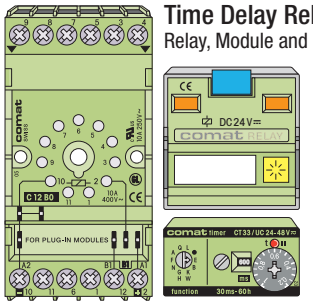
Set Order-Nr.:
CT33.39/…V
– –
DC 24, 48V

Delivery includes:
- Relay C39/…V
- Module CT33/…V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

Set Order-Nr.:
CT36.39/…V
– –
DC 24, 48V

Delivery includes:
- Relay C39/…V
- Module CT36/…V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

comat RELECO by comat



Time Delay Relay-Set

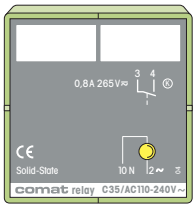
Relay, Module and Socket

Relay data's see:
Section industrial Relays

MAX
MIN

UC Solid-State Relay

1x



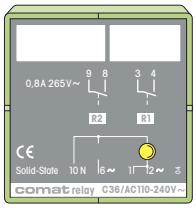
C35

Universal Solid-State Relay for AC or DC load
Highest switching frequency for virtually limitless life cycle due to solid-state operation. No external protective wiring required.

0,8A 10…265V~
1mA 10V

AC Solid-State Relay

2x

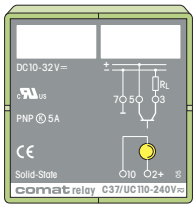


C36

AC SS double-channel
Triac output, crossover switch.
Built-in RC wiring protection.
Specially designed for frequent switching cycles and inductive loads.
Minimum load: 30mA

0,8A 20…265V~
30mA 20V

DC Solid-State Relay



C37

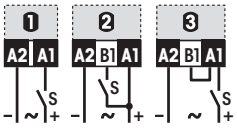
DC SS single-channel
Bounce- and wearing- free for DC loads(inductive/capacitive).
Short-circuit/overload proof.
No external wiring protection required.

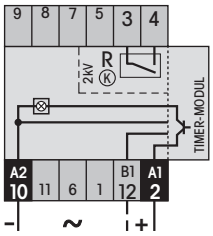
5A 10…32V⎓
1mA 10V

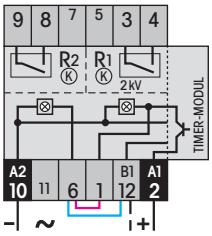
Timer-Modul (Function diagrams: refer to page 114)

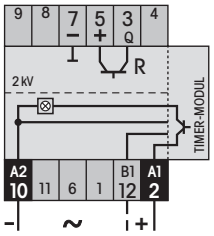
E 1 Triggering
Function see page 114

R2(R3) = Time function as R1
R2(R3) = Instantaneous contact



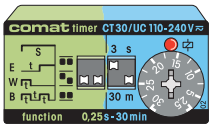






CT30 Economy timer

3 functions, voltage controlled, output LED.
Seismic approved.



Function / Triggering
E W B 1

Time range
0,25s-30min
0,25-3s…
2,5-30min

Set Order-Nr.:
CT30.35/…V
AC 110-240V
UC 24-48V

Delivery includes:
- Relay C35/…V
- Module CT30/…V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

Set Order-Nr.:
CT30.36/…V
AC 110-240V
UC 24V

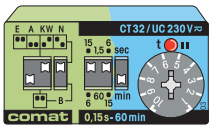
Delivery includes:
- Relay C36/…V
- Module CT30/…V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

Set Order-Nr.:
CT30.37/…V
UC 110-240V
UC 24-48V

Delivery includes:
- Relay C37/…V
- Module CT30/…V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

CT32 Universal timer

7 functions, voltage controlled, time lapse display, blinking.
Seismic approved.



Function / Triggering
E 2 3
A N K B1 2
W B 3

Time range
0,15s-60min
0,15-1,5s…
6-60min

Set Order-Nr.:
CT32.35/…V
AC 115, 230V
UC 24-48V

Delivery includes:
- Relay C35/…V
- Module CT32/…V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

Set Order-Nr.:
CT32.36/…V
AC 115, 230V
UC 24V

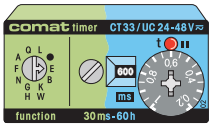
Delivery includes:
- Relay C36/…V
- Module CT32/…V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

Set Order-Nr.:
CT32.37/…V
UC 115, 230V
UC 24-48V

Delivery includes:
- Relay C37/…V
- Module CT32/…V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

CT33 Universal timer

12 functions, voltage controlled, time lapse display, blinking, high setting accuracy by dial graduation 1:5.



Function / Triggering
E 2 3 W H B 3
A N L F K G B1 Q 2
F Q t2=t1 G H t2=0,5s

Time range
30ms-60h
30-150ms…
12-60h

Set Order-Nr.:
CT33.35/…V
AC 115, 230V
DC 24-48V

Delivery includes:
- Relay C35/…V
- Module CT33/…V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

Set Order-Nr.:
CT33.36/…V
AC 115, 230V
UC 24V

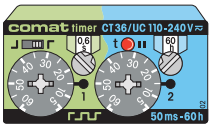
Delivery includes:
- Relay C36/…V
- Module CT33/…V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

Set Order-Nr.:
CT33.37/…V
UC 115, 230V
UC 24-48V

Delivery includes:
- Relay C37/…V
- Module CT33/…V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

CT36 Repeat cycle timer

Pulse or pause start.
t1/t2 separately settable.
Time lapse display t1/t2.



Function / Triggering
I P 1

Time range
2x50ms-60h
2x 50-600ms…
5-60h

Delivery includes:
CT36.35/…V
AC 110-240V
UC 24-48V

Delivery includes:
- Relay C35/…V
- Module CT36/…V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

Set Order-Nr.:
CT36.36/…V
AC 110-240V
UC 24V

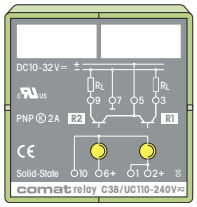
Delivery includes:
- Relay C36/…V
- Module CT36/…V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

Delivery includes:
CT36.37/…V
UC 110-240V
UC 24-48V

Delivery includes:
- Relay C37/…V
- Module CT36/…V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

DC Solid-State Relay

2x

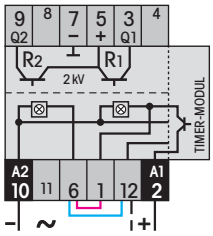


C38

DC SS Relay double-channel
Bounce- and wearing- free for DC loads(inductive/capacitive).
Short-circuit/overload proof. No external wiring protection required.
2A constant current per channel.

2A 10…32V=

1mA 10V



Set Order-Nr.:

CT30.38/…V
- UC 110-240V
- UC 24-48V

Delivery includes:
- Relay C38/…V
- Module CT30/…V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

Set Order-Nr.:

CT32.38/…V
- UC 115, 230V
- UC 24-48V

Delivery includes:
- Relay C38/…V
- Module CT32/…V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

Set Order-Nr.:

CT33.38/…V
- UC 115, 230V
- UC 24-48V

Delivery includes:
- Relay C38/…V
- Module CT33/…V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

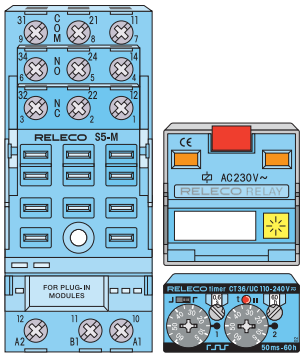
Set Order-Nr.:

CT36.38/…V
- UC 110-240V
- UC 24-48V

Delivery includes:
- Relay C38/…V
- Modul eCT36/…V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

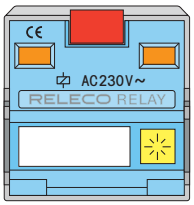
Time Delay Relay-Set

Relay, Module and Socket



High Power Relay DC

16A 400V~

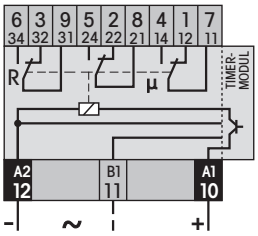


C5-A30X

Universal Power Relay 16A
With 3 power changeover-contacts this is the robust relay for AC and DC circuits ranging from 10mA 10V.

16A 400V~

10mA 10V



Set Order-Nr.:

CT30.5-A30/…V R
- AC 24, 115, 230V
- DC 24, 110, 220V

Delivery includes:
- Relay C5-A30X/…V
- Module CT30/…V R
- Front cover FS-C5
- Socket S-5M
- Retaining clip S3-C

Set Order-Nr.:

CT32.5-A30/…V R
- AC 24, 115, 230V
- DC 24, 110, 220V

Delivery includes:
- Relay C5-A30X/…V
- Module CT32/…V R
- Front cover FS-C5
- Socket S-5M
- Retaining clip S3-C

Set Order-Nr.:

CT33.5-A30/…V R
- AC 24, 115, 230V
- DC 24, 110, 220V

Delivery includes:
- Relay C5-A30X/…V
- Module CT33/…V R
- Front cover FS-C5
- Socket S-5M
- Retaining clip S3-C

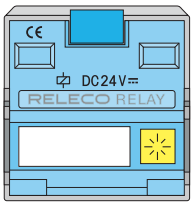
Set Order-Nr.:

CT36.5-A30/…V R
- AC 24, 115, 230V
- DC 24, 110, 220V

Delivery includes:
- Relay C5-A30X/…V
- Module CT36/…V R
- Front cover FS-C5
- Socket S-5M
- Retaining clip S3-C

High Power Relay DC

10A @220V=

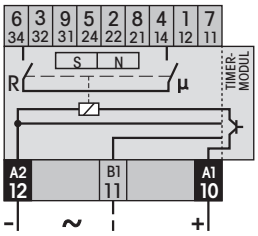


C5-M10X

Highpower Relay, in particular for DC loads upto 10A 220V= (DC1)
With 2 NO contacts in series and a blow magnet for safe arc extinguishing.

16A 400V~

10mA 10V



Set Order-Nr.:

CT30.5-M10/…V R
- AC 24, 230V
- DC 24, 48, 110, 220V

Delivery includes:
- Relay C5-M10X/…V
- Module CT30/…V R
- Front cover FS-C5
- Socket S-5M
- Retaining clip S3-C

Set Order-Nr.:

CT32.5-M10/…V R
- AC 24, 230V
- DC 24, 48, 110, 220V

Delivery includes:
- Relay C5-M10X/…
- Module CT32/…V R
- Front cover FS-C5
- Socket S-5M
- Retaining clip S3-C

Set Order-Nr.:

CT33.5-M10/…V R
- AC 24, 230V
- DC 24, 48, 110, 220V

Delivery includes:
- Relay C5-M10X/…V
- Module CT33/…V R
- Front cover FS-C5
- Socket S-5M
- Retaining clip S3-C

Set Order-Nr.:

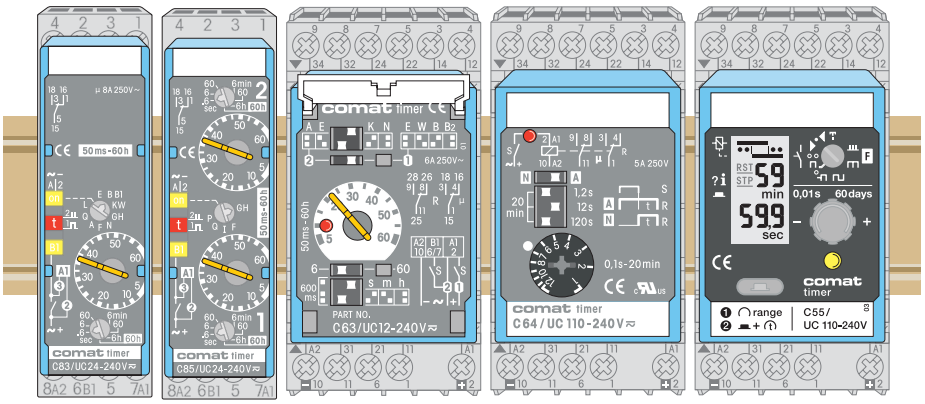
CT36.5-M10/…V R
- AC 24, 230V
- DC 24, 48, 110, 220V

Delivery includes:
- Relay C5-M10X/…V
- Module CT36/…V R
- Front cover FS-C5
- Socket S-5M
- Retaining clip S3-C

Notes

2.3 Plug-in Time Relays

Plug-in Time Relays



Application	Types	Functions*	Min. time	Max. time	contact rating	Socket
12 Time functions, ON switch	C83	E, W, H, B, A, N L, F, K, B1, G, Q	50 ms	60 h	8 A / 250 V	S7-C
Time relay without auxiliary voltage, 1xNO & 1x NC contacts	C84	A, N	0.1 s	20 min.	5 A / 250 V	S7-C
Double and repeat cycle timer	C85	I, P, F, Q, G, H	2 x 50 ms	2 x 60 h	8 A / 250 V	S7-C
Multi function timer with 2 CO contacts	C63	E, W, B, B2, A, K, N	50 ms	60 h	6 A / 250 V	S3-xx
Time Universal relay without auxiliary voltage, 2 CO contacts	C64	A, N	0.1 s	50 min	5 A / 250 V	S3-xx
Multifunction timer with 15 functions and digital display, including pulse sequence monitoring	C55	E, W, H, B, I, P, A K, N, M, G, F, Q, U, V	0.01 s	60 day	5 A / 250 V	S3-xx
Multifunction timer with 15 functions and digital display, including pulse sequence monitoring, solid state output	C55.x	E, W, H, B,I , P, A K, N, M, G, F, Q, U, V	0.01 s	60 day	5 A / 250 V	S3-xx
Multifunction timer with 15 functions and digital display, including pulse sequence monitoring, potential free triggering, 2 CO contacts	C56	E, W, H, B, I, P, A K, N, M, G, F, Q, U, V	0.01 s	60 day	5 A / 250 V	S3-xx
Economy time and blinking relay	CS1	E, W, B, B2	50 ms	60 min	8 A / 250 V	S3-xx
Economy time and blinking relay with external potentiometer option	CS2	E, W, B, B2, A, K, N	50 ms	60 h	8 A / 250 V	S3-xx
Universal timer with 2 CO contacts	CS3	E, W, B, B2, A, K, N	50 ms	60 h	6 A / 250 V	S3-xx

*(Function diagrams: refer to page 114)

C83

Multifunction time relay with mechanical change over output contact 12 time functions + test function "ON", 50 ms … 60 h

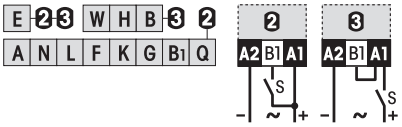
Type: C83/UC24-240V R

Plug-in multifunction time relay, 1 change over power contact, 12 time functions, time ranges: 50 ms … 60 h, 3 LED's for full state indication: Control input, time run and output, Seismic qualification available (precondition for use in nuclear power plants)

Maximum contact load	**8 A / 250 V AC-1 240 W DC-1**
Recommended minimum contact load	**10 mA / 10 V**

Time functions and related connection diagrams (Function diagrams: refer to page 114)

The functions are selectable by rotary switch



LED function table:

Function circuit	State	LED function
Output, yellow LED	active	continuous ON
	passive	OFF
Time run, red LED	active	t1: Double blinking t2: Blinking
	passive	OFF
B1 input, yellow LED	active	continuous ON
	passive	OFF

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}: -30 % … +0 % / t_{max}: -0 % … +25 %
Repetition accuracy	± 0.1 % or DC: 5 ms / AC: 25 ms
Response time, power on, on A1	≤ 40 ms
Min. trigger pulse on B1	30 ms
Reset time B1 (AC/DC)	≤ 50 ms
Power failure security (50 / 60 Hz)	≥ 15 ms

Contacts

Type	1CO, Single contact micro disconnection
Material	AgNi
Rated operational current	8 A
Max. inrush current (10 ms)	30 A
Max. switching voltage AC-1	250 V
Max. AC load AC-1 (Fig.1)	2000 VA
Max. DC load DC-1, 30 V / 250 V (Fig.2)	240 W / 75 W

Power supply and control input (UC = AC / DC)

Nominal voltage (A1, B1)	**UC 24 – 240 V**
Operating voltage range [V]	20 … 265, 60 Hz: … 200 V
Power consumption [W]	≤ 1.8
Frequency range [Hz]	45 … 63
Allowed residual current into B1 [mA]	AC: ≤ 0.8; DC: ≤ 1
Trigger threshold voltage on B1, AC / DC [V]	$V_{threshold} = V_{supp} \times m + b$; m = 0,35; b = 7,5

Insulation

Test voltage open contact	1 kVrms 1 minute
Test voltage between contacts and control input	2 kVrms 1 minute

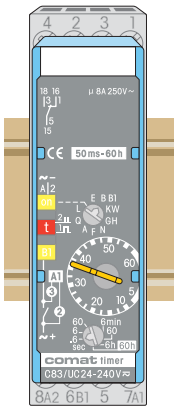
General Specifications

Ambient temperature storage /operation	-40 … 85 °C / -25 …60 °C
Mechanical life of contact	30 x 10^6 operations
Expected life @ 25 °C (except contact)	>> 50 000 h
Ingress protection degree	IP 40 when plugged in
Housing material / Weight	Lexan / approx. 60 g

Standard types

UC (AC/DC) 45…63 Hz	**C83/UC24-240V R**
Seismic qualification:	**C83.C2292/UC24-240V R**

Accessories: Socket: **S7-C**



Connection diagram

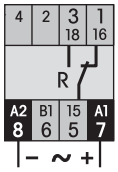


Fig.1 AC electrical endurance

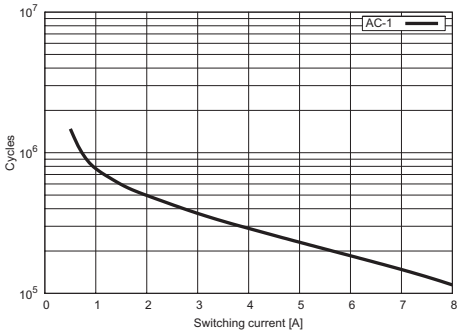
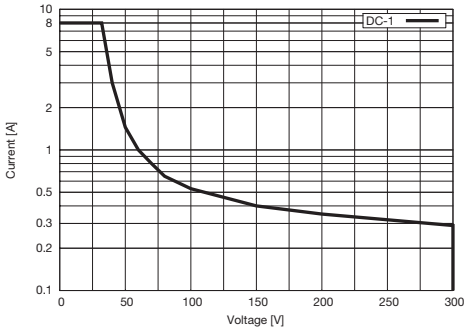
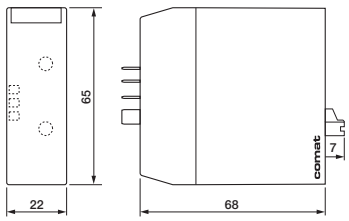


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

Available:
Seismic IEEE 323, IEEE 344

EN 60947

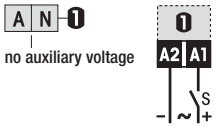
C84

Time relay, time run without supply voltage, with mechanical NO, NC output contacts, 2 time functions, 0,1 s … 20 min

Type: C84/… V R
Plug-in time relay
1 normally open + 1 normally closed contact, 250 V
UC 24 V, UC 110 … 240 V operation voltages
2 time functions, time ranges: 0.1 s … 20 minutes
LED for supply voltage state indication
Seismic qualification available (precondition for use in nuclear power plants)

Maximum contact load	**5 A / 250 V AC-1 5 A / 30 V DC-1**
Recommended minimum contact load	**1 mA / 0.1 V**

Time functions and related connection diagram (Function diagrams: refer to page 114)



The functions are selectable by rotary switch

Time data

4 partial time ranges, t_{max} (rotary switch)	1.2 s / 12 s / 120 s / 20 minutes
Fine adjustment range (rotary knob)	t_{min} … t_{max}, 1 … 12
Time range tolerance	t_{min}: -25 % … +5 % / t_{max}: -5 % … +25 %
Repetition accuracy	± 1 %
Min. start impulse on A1	≥ 150 ms
Reset time	≥ 100 ms
Power failure security	5 … 10 ms

Contacts

Type	1 NO, 1 NC, micro disconnection
Material	Gold flash over silver alloy
Rated operational current	5 A
Max. switching voltage AC-1	250 V
Max. switching voltage DC-1	125 V
Max. AC load (Fig.1) AC-1	1250 VA
Max. DC load 30 V / 125 V (Fig.2)	150 W / 25 W

Control input (UC = AC / DC)

Nominal voltage (A1)	**UC 24 … 48 V**	**UC 110 … 240 V**
Operating voltage range [V]	20 … 60	88 … 265
Input current [mA]	3 … 10	1 … 5
Inrush current (100 ms) [mA]	200	100
Frequency range [Hz]	45 … 63	45 … 63
Threshold voltage AC / DC [V]	≥ 12 / ≥ 16	≥ 55 / ≥ 75

Insulation

Test voltage open contact	1 kVrms 1 minute
Test voltage between poles	2 kVrms 1 minute
Test voltage between contacts and control input	2.5 kVrms 1 minute

General Specifications

Ambient temperature storage /operation	-40 … 85 °C / -25 …60 °C
Mechanical life of contacts	≥ 50 x 10^6 operations
Ingress protection degree	IP 40 when plugged in
Housing material / Weight	Lexan / 50 g

Standard types

UC (AC/DC) 45…63 Hz, 24-48, 110-240	**C84/UC…V R**
Seismic qualification:	**C84.C2292/…V R**

" …" enter the voltage for full type designation

Accessories

Socket:	**S7-C**

Connection diagram

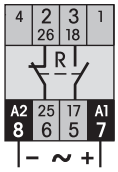


Fig.1 Contact endurance

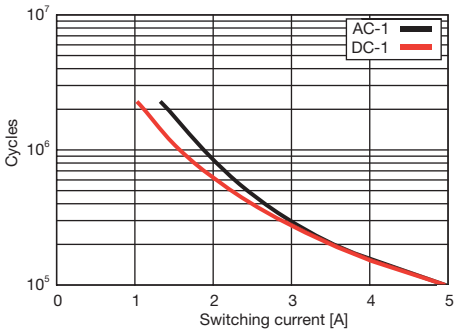
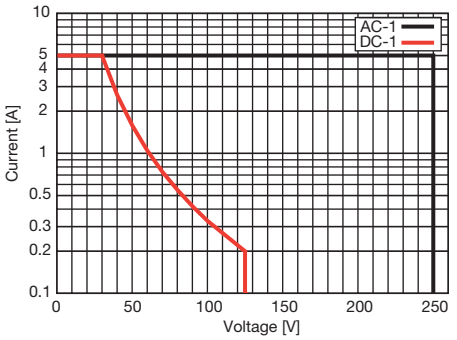
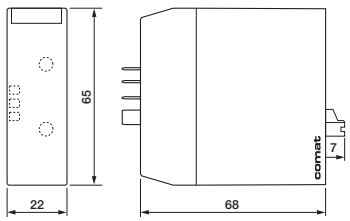


Fig. 2 Load limit curve



Dimensions [mm]



Technical approvals, conformities

Available:
Seismic IEEE 323, IEEE 344

EN 60947

C85

Time relay and repeat cycle timer with 2 time lapses 50 ms … 60 h, mechanical change over output contact, 6 time functions + test function "ON"

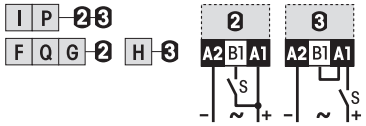
Type: C85/UC24-240 V R

Plug-in multifunction time relay / repeat cycle timer, 1 change over power contact, 6 time functions, time ranges: 2 x 50 ms … 60 h, 3 LED's for full state indication: Control input, time run and output, Seismic qualification available (precondition for use in nuclear power plants)

Maximum contact load	**8 A / 250 V AC-1 240 W DC-1**
Recommended minimum contact load	**10 mA / 10 V**

Time functions and related connection diagrams (Function diagrams: refer to page 114)

The functions are selectable by rotary switch



LED function table:

Function circuit	State	LED function
Output, yellow LED	active	continuous ON
	passive	OFF
Time run, red LED	active	t1: Double blinking t2: Blinking
	passive	OFF
B1 input, yellow LED	active	continuous ON
	passive	OFF

Time data for each time t1 / t2

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}: -30 % … +0 % / t_{max}: -0 % … +25 %
Repetition accuracy	± 0.1 % or DC: 5 ms / AC: 25 ms
Response time, power on, on A1	≤ 40 ms
Min. trigger pulse on B1	30 ms
Reset time B1 (AC/DC)	≤ 50 ms
Power failure security (50 / 60 Hz)	≥ 15 ms

Contacts

Type	1CO, Single contact micro disconnection
Material	AgNi
Rated operational current	8 A
Max. inrush current (10 ms)	30 A
Max. switching voltage AC-1	250 V
Max. AC load AC-1 (Fig.1)	2000 VA
Max. DC load DC-1 30 V / 250 V (Fig.2)	240 W / 75 W

Power supply and control input (UC = AC / DC)

Nominal voltage (A1, B1)	**UC 24 – 240 V**
Operating voltage range [V]	20 … 265, 60 Hz: … 200 V
Power consumption [W]	≤ 1.8
Frequency range [Hz]	45 … 63
Allowed residual current into B1 [mA]	AC: ≤ 0.8; DC: ≤ 1
Trigger threshold voltage on B1, AC / DC [V]	$V_{th} = V_{supp}$ x m + b; m = 0,35; b = 7,5 V

Insulation

Test voltage open contact	1 kVrms 1 minute
Test voltage between contacts and control input	2 kVrms 1 minute

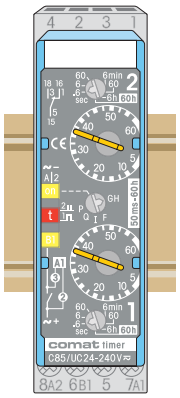
General Specifications

Ambient temperature storage /operation	-40 … 85 °C / -25 …60 °C
Mechanical life of contact	30 x 10^6 operations
Expected life @ 25 °C (except contact)	>> 50 000 h
Ingress protection degree	IP 40 when plugged in
Housing material / Weight	Lexan / approx. 60 g

Standard types

UC (AC/DC) 45…63 Hz	**C85/UC24-240V R**
Seismic qualification:	**C85.C2292/UC24-240V R**

Accessories: Socket: **S7-C**



Connection diagram

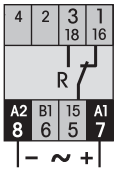


Fig.1 AC electrical endurance

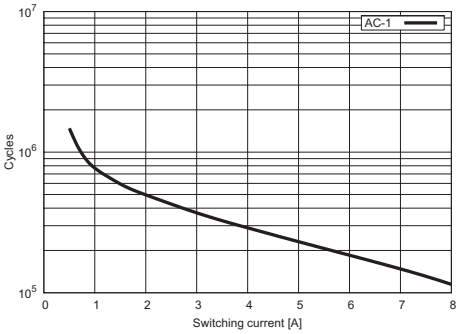
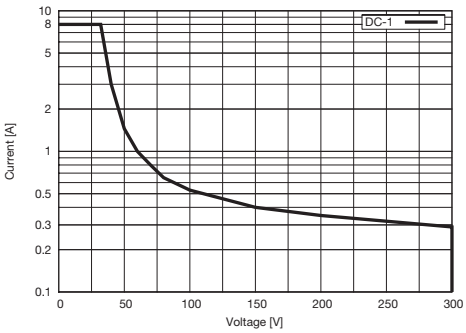
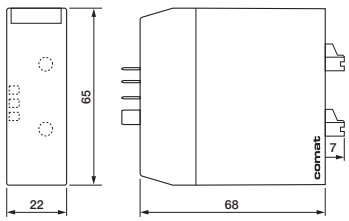


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

Available:
Seismic IEEE 323, IEEE 344

EN 60947

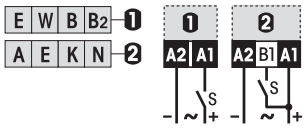
C63

11 pin plug-in time relay according to IEC 67-I-18a, 50 ms … 60 h, wide band 12 … 240 V operating voltage, 2 change over output contacts

Type: C63/UC 12-240V R
Plug-in time relay
2 change over contacts
UC 12-240 V operating voltage
7 time functions, time ranges: 50 ms … 60 h
LED for output state indication

Maximum contact load	**6 A / 250 V AC-1**
Recommended minimum contact load	**10 mA / 10 V**

Time functions and related connection diagrams (Function diagrams: refer to page 114)



Time data

7 partial time ranges, t_{max} (DIP switch)	0.6, 6, 60 s / 6, 60 min / 6, 60 h
Fine adjustment range (rotary knob)	t_{min} … t_{max}, 5 … 60
Time range tolerance	t_{min}: -5 % … +0 % / t_{max}: -0 % … +5 %
Repetition accuracy	± 1 %
Min. trigger impulse on B1	≥ 30 ms
Reset time	≤ 30 ms
Power failure security	20 ms

Contacts

Type	2 CO, micro disconnection
Material	AgNi
Rated operational current	6 A
Max. switching voltage AC-1	250 V
Max. AC load AC-1 (Fig.1)	1500 VA
Max. DC load DC-1 30 V / 250 V (Fig.2)	180 W / 60 W

Power supply- and control input (UC = AC / DC)

Nominal voltage (A1, B1)	**UC 12 … 240 V**
Operating voltage range	19 … 250 V
Power consumption	≤ 1.4 W
Frequency range	45 … 63 Hz
Allowed residual current into B1 AC / DC	≤ 2.3 mA / 1.2 mA
Trigger threshold voltage on B1, AC / DC	6.5 V / 7 V

Insulation

Test voltage open contact	1 kVrms 1 minute
Test voltage between poles	2 kVrms 1 minute
Test voltage between contacts and control input	2 kVrms 1 minute

General Specifications

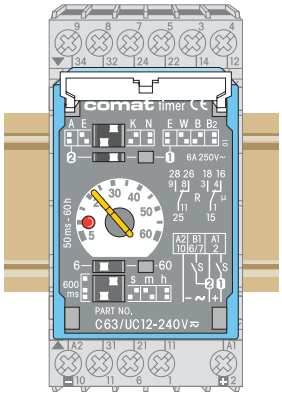
Ambient temperature storage /operation	-40 … 85 °C / -25 …60 °C
Mechanical life of contacts	≥ 30 x 10^6 operations
Ingress protection degree	IP 40 when plugged in
Housing material / Weight	Lexan / 75 g

Standard types

UC (AC/DC)	**C63/UC12-240V R**

Accessories

Socket:	**S3-xx**
Retaining clip	**HF-50**
Transparent front cover	**FA-50**
Front panel mounting set	**FZ-50L** (Frame + retaining clip + socket with soldering connections)



Connection diagram

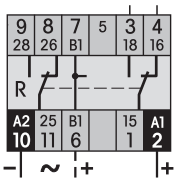


Fig.1 AC electrical endurance

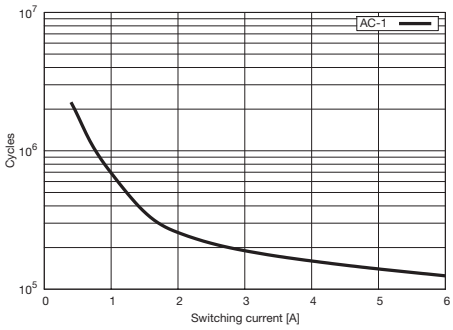
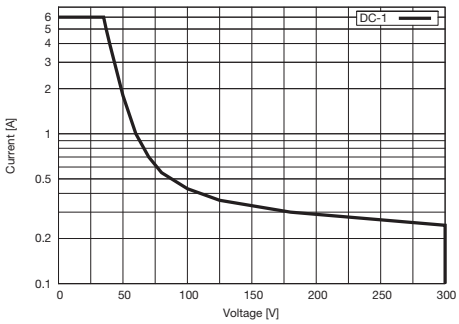
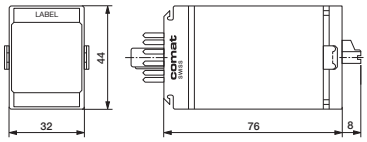


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

EN 60947

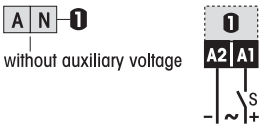
C64

11 pin plug-in time relay according to IEC 67-I-18a, time run without supply voltage, 2 time functions, 2 CO output contacts

Type: C64/… V R
Plug-in time relay, 2 change over contacts, UC 24 V, UC 110 … 240 V operating voltages, 2 time functions, time ranges: 0.1 s … 20 minutes, LED for supply voltage state indication, Seismic qualification available (precondition for use in nuclear power plants)

Maximum contact load	**5 A / 250 V AC-1 5 A / 30 V DC-1**
Recommended minimum contact load	**1 mA / 0.1 V**

Time functions and related connection diagram (Function diagrams: refer to page 114)



The functions are selectable by DIP switch

Time data

4 partial time ranges, t_{max} (DIP switch)	1.2 s / 12 s / 120 s / 20 minutes
Fine adjustment range (rotary knob)	t_{min} … t_{max}, 1 … 12
Time range tolerance	t_{min}: -25 % … +5 % / t_{max}: -5 % … +25 %
Repetition accuracy	± 1 %
Min. start impulse on A1	≥ 150 ms
Reset time	≥ 100 ms
Power failure security	5 … 10 ms

Contacts

Type	2 CO, micro disconnection
Material	Gold flash over silver alloy
Rated operational current	5 A
Max. switching voltage AC-1	250 V
Max. switching voltage DC-1	125 V
Max. load AC-1 (Fig.1)	1250 VA
M ax. DC load DC-1 30 V / 125 V (Fig.2)	150 W / 25 W

Control input (UC = AC / DC)

Nominal voltage (A1)	**UC 24 … 48 V**	**UC 110 … 240 V**
Operating voltage range [V]	20 … 75	88 … 265
Input current [mA]	3 … 15	1 … 5
Inrush current (100 ms) [mA]	200	100
Frequency range [Hz]	48 … 400	45 … 400
Threshold voltage AC / DC [V]	≥ 12 / ≥ 16	≥ 55 / ≥ 75

Insulation

Test voltage open contact	1 kVrms 1 minute
Test voltage between poles	2 kVrms 1 minute
Test voltage between contacts and control input	2 kVrms 1 minute

General Specifications

Ambient temperature storage /operation	-40 … 70 °C / -25 …60 °C
Mechanical life of contacts	≥ 50 x 10^6 operations
Ingress protection degree	IP 40 when plugged in
Housing material / Weight	Lexan / 75 g

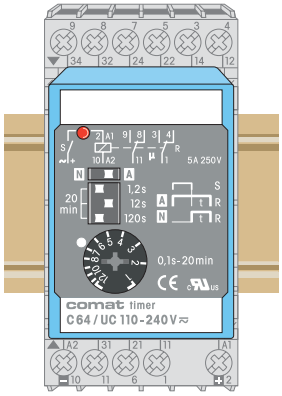
Standard types

UC (AC/DC) 48…400 Hz, 24-48, 110-240	**C64/UC…V R**
Seismic qualification:	**C64.C2292/…V R**

" …" enter the voltage for full type designation

Accessories:

Socket:	**S3-xx**
Retaining clip	**HF-50**
Transparent front cover	**FA-50**
Front panel mounting set	**FZ-50L** (Frame + retaining clip + socket with soldering connections)



Connection diagram

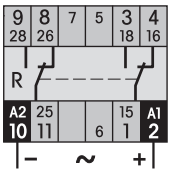


Fig.1 Contact endurance

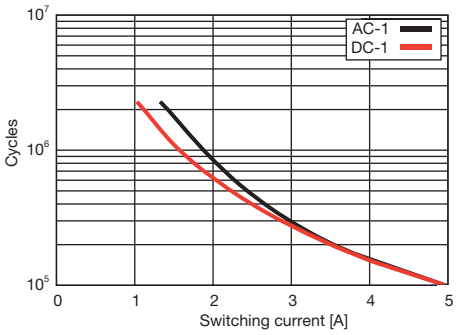
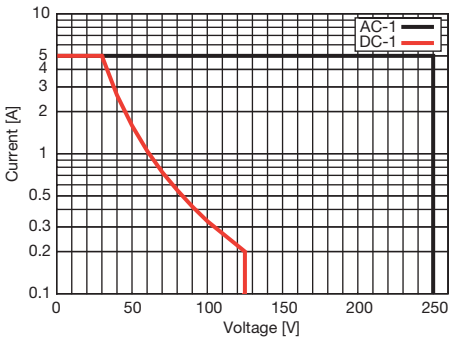
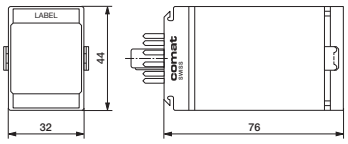


Fig. 2 Load limit curve



Dimensions [mm]



Technical approvals, conformities

Available:
Seismic IEEE 323, IEEE 344

EN 60947

C55

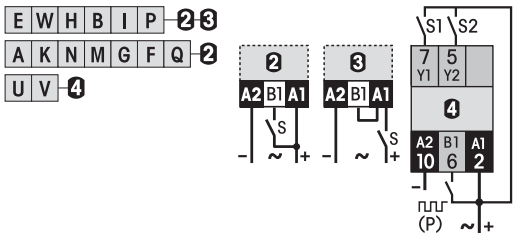
11 pin plug-in time relay according to IEC 67-I-18a, 2 change over contacts Digital quartz time relay with 15 time functions including pulse sequence monitoring. Time- Stop and Reset inputs. 10 ms … 60 days.

Type: C55/… V R

Plug-in digital time relay, 2 change over contacts, UC 24 … 60 V, UC 110 … 240 V operating voltages, 15 time functions including rotational speed monitoring , or similar applications, time- STOP and RESET function inputs , Time run / function state display and interactive time setting by display, Digital setting of time until 60 days, quartz precision

Maximum contact load	**5 A / 250 V AC-1 5 A / 35 V DC-1**
Recommended minimum contact load	**10 mA / 12 V**

Time functions and related connection diagrams (Function diagrams: refer to page 114)



Stop input (static):
Stops time run

Reset input (dynamic):
Sets timer to start condition, time runs again from beginning

Time data

Time ranges seconds	0.01 s … 59.9 s	resolution 0.01s
Time ranges minutes	0.1 s … 59 min 59.9 s	resolution 0.1 s
Time ranges hours	0.1 min … 59 h 59.9 min	resolution 0.1 min
Time ranges days	0.1 h … 59 day 23.9 h	resolution 0.1 h
Time accuracy, % from set value	0.05%	
Repetition accuracy	0.05% or ±10 ms	
Min. trigger pulse on B1 AC / DC 40 ms / 30 ms		
Reset time on A1	≤ 200 ms	

Contacts

Type	2 CO, micro disconnection
Material	AgNi
Rated operational current	5 A
Max. switching voltage AC-1	250 V
Max. AC load AC-1 (Fig.1)	1250 VA
Max. DC load DC-1, 30 V / 250 V (Fig.2)	150 W / 60 W

Power supply- and control inputs (Start, Stop, Reset) (UC = AC / DC)

Nominal voltage	**UC 24…60 V**	**UC 110…240 V**
Operating voltage range [V]	19 … 75	88 … 265
Power consumption [W]	≤ 2	≤ 2
Frequency range [Hz]	48 … 400	48 … 400
Allowed residual current AC / DC [mA]	≤ 1.5	≤ 1
Threshold voltage control inputs [V]	≥ 11	≥ 50

Insulation

Test voltage between contacts and other connections: 2 kVrms 1 minute

General Specifications

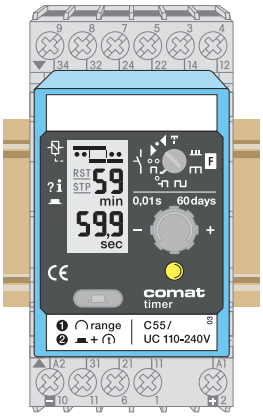
Ambient temperature storage /operation	-40 … 85 °C / -25 …60 °C
Mechanical life of contacts	≥ 30 x 10^6 operations
Expected life @ 40 °C (MTBF) (except contacts)	> 150 000 h
Ingress protection degree	IP 40 when plugged in
Housing material / Weight	Lexan / 80 g

Standard types

UC (AC/DC) 48…400 Hz	**C55/UC24-60V R**
UC (AC/DC) 48…400 Hz	**C55/UC110-240V R**

Accessories:

Socket:	**S3-xx**
Retaining clip	**HF-50**
Transparent front cover	**FA-50**
Front panel mounting set	**FZ-50L** (Frame + retaining clip + socket with soldering connections)



Connection diagram

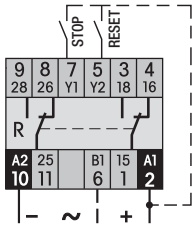


Fig.1 AC electrical endurance

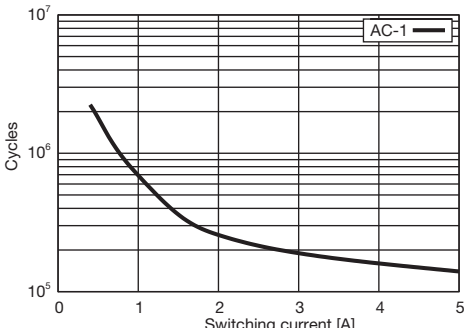
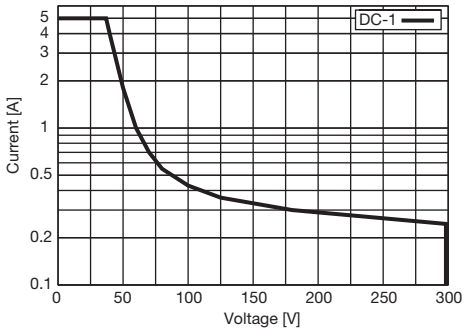
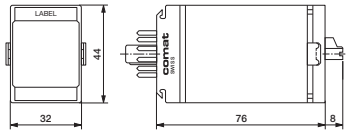


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

EN 60947

C55.3; C55.4

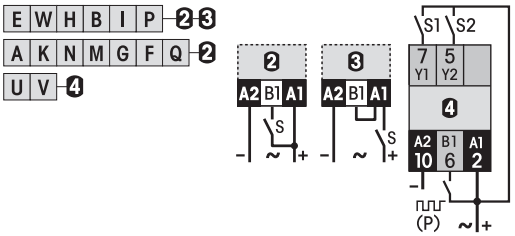
Solid state outputs 11 pin plug-in time relay according to IEC 67-I-18a.

Type: C55.3/… V R, C55.4/DC24V R

Plug-in digital time relay, 2 types of solid state outputs: DC 24 V, UC 10…265 V, DC 24 V, UC 24 … 60 V, UC 110 … 240 V operating voltages, 15 time functions including rotational speed monitoring or similar applications, time- STOP and RESET function inputs, Time run / function state display and interactive time setting by display, Digital setting of time until 60 days, quartz precision

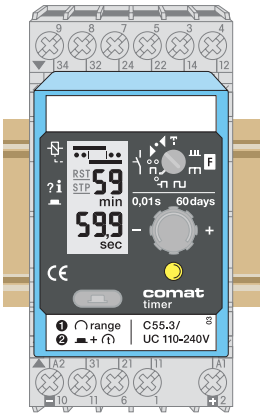
Maximum output load xxx.3: 0.5 A / 265 V AC / DC; xxx.4: 2 A / 30 V DC

Time functions and related connection diagrams (Function diagrams: refer to page 114)



Stop input Y1, pin 7 (static):
Stops time run while active

Reset input Y2, pin 5 (dynamic):
Sets timer to start condition, time runs again from beginning



Connection diagram

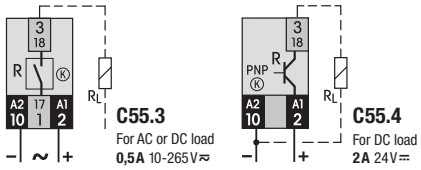
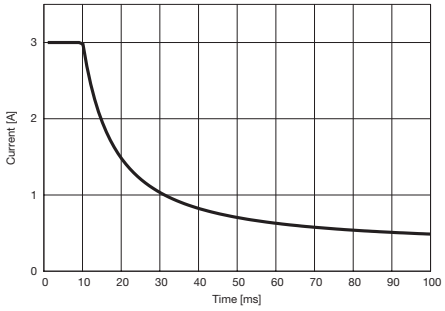
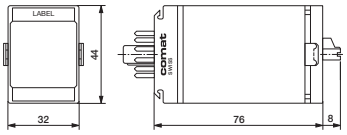


Fig.1 Inrush current



Dimensions [mm]



Time data

Time ranges seconds	0.01 s … 59.9 s	resolution 0.01 s
Time ranges minutes	0.1 s … 59 min 59.9 s	resolution 0.1 s
Time ranges hours	0.1 min … 59 h 59.9 min	resolution 0.1 min
Time ranges days	0.1 h … 59 day 23.9 h	resolution 0.1 h
Time accuracy, % from set value	0.05 %	
Repetition accuracy	0.05 % or ±10 ms	
Min. trigger pulse on B1 AC/DC	40 ms / 30 ms	
Reset time on A1 (AC/DC)	≤ 200 ms	

Outputs	**C55.3**	**C55.4**
Type	UC (AC / DC) solid state insulated to inputs	DC solid state A2 common connection
Overload and short circuit proof	Yes (6 A / 2 µs) "sc" displ.	Yes (40 A / 150 µs)
Max. switching voltage	265 V	30 V
Rated operational current	0.5 A	2 A
Max. inrush current	3 A (10 ms) Fig.1	20 A (not for continuous repetitive operation)
Max. inductive switch-off energy	0.5 Ws @ 2 s cycle time	1 Ws single pulse

Power supply- and control inputs (Start, Stop, Reset) (UC = AC / DC)

Nominal voltage	**DC 24 V**	**UC 24…60 V**	**UC 110…240 V**
Operating voltage range [V]	19 … 30	19 … 75	88 … 265
Power consumption [W]	≤ 1	≤ 2	≤ 2
Frequency range [Hz]	-	48 … 400	48 … 400
Allowed residual current AC / DC [mA]	≤ 1	≤ 1.5	≤ 1
Threshold voltage, control inputs [V]	≥ 7	≥ 11	≥ 50

Insulation	C55.3	C55.4
Test voltage between outputs and other connections	2 kVrms 1 minute	not insulatad

General specifications

Ambient temperature storage /operation	-40 … 85 °C / -25 …60 °C
Expected life @ 40 °C (MTBF)	> 150 000 h
Ingress protection degree	IP 40 when plugged in
Housing material / Weight	Lexan / 80 g

Standard types

UC (AC/DC) 48…400 Hz	**C55.3/UC24-60V R C55.3/UC110-240V R**
DC 24 V	**C55.4/DC24V R**

Accessories: Socket:	**S3-xx**
Retaining clip	**HF-50**
Transparent front cover	**FA-50**
Spare label plate	**PL-50**
Front panel mounting set	**FZ-50L** (Frame + retaining clip + socket with soldering connections)

Technical approvals, conformities

EN 60947

C56

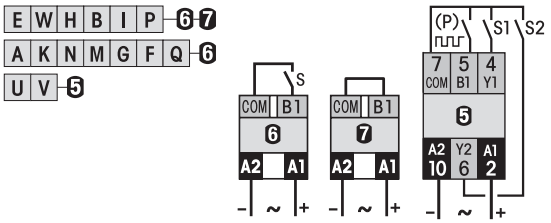
11 pin plug-in time relay according to IEC 67-I-18a, 2 change over contacts. Potential-free triggering of Start- Stop- and Reset inputs.

Type: C56/… V R

Plug-in digital time relay, 2 change over contacts, UC 24 … 60 V, UC 110 … 240 V operating voltages, 15 time functions including rotational speed monitoring or similar applications, time- STOP and RESET function inputs, Time run / function state display and interactive time setting by display, Digital setting of time until 60 days, quartz precision

Maximum contact load	**5 A / 250 V AC-1 5 A / 35 V DC-1**
Recommended minimum contact load	**10 mA / 12 V**

Time functions and related connection diagrams (Function diagrams: refer to page 114)



Stop input (static):
Stops time run

Reset input (dynamic):
Sets timer to start condition, time runs again from beginning

Time data

Time ranges seconds	0.01 s … 59.9 s	resolution 0.01s
Time ranges minutes	0.1 s … 59 min 59.9 s	resolution 0.1 s
Time ranges hours	0.1 min … 59 h 59.9 min	resolution 0.1 min
Time ranges days	0.1 h … 59 day 23.9 h	resolution 0.1 h
Time accuracy, % from set value	0.05%	
Repetition accuracy	0.05% or ±10 ms	
Min. trigger pulse on B1	30 ms	
Reset time on A1	≤ 200 ms	

Contacts

Type	2 CO, micro disconnection
Material	AgNi
Rated operational current	5 A
Max. switching voltage AC-1	250 V
Max. AC load AC-1 (Fig.1)	1250 VA
Max. DC load DC-1, 30 V / 250 V (Fig.2)	150 W / 60 W

Power supply data (UC = AC / DC)

Nominal voltage	**UC 24…60 V**	**UC 110…240 V**
Operating voltage range [V]	19 … 75	88 … 265
Power consumption [W]	≤ 2	≤ 2
Frequency range [Hz]	48 … 400	48 … 400
Control inputs		
Working voltage	10 V	
Input current	≤ 4 mA	
Max. transient voltage	1 kV, 50 µs	

Insulation

Test voltage between contacts and other connections: 2 kVrms 1 minute

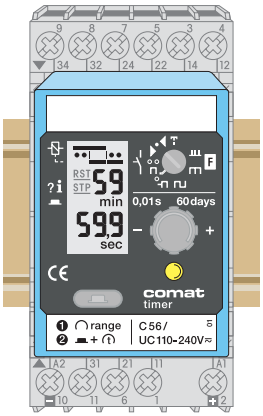
General Specifications

Ambient temperature storage /operation	-40 … 85 °C / -25 …60 °C
Mechanical life of contacts	≥ 30 x 10^6 operations
Expected life @ 40 °C (MTBF) (except contacts)	> 150 000 h
Ingress protection degree	IP 40 when plugged in
Housing material / Weight	Lexan / 80 g

Standard types

UC (AC/DC) 48…400 Hz	**C56/UC24-60V R**
UC (AC/DC) 48…400 Hz	**C56/UC110-240V R**

Accessories: Socket:	**S3-xx**	Spare label plate	**PL-50**
Retaining clip	**HF-50**	Transparent front cover	**FA-50**
Front panel mounting set	**FZ-50L** (Frame + retaining clip + socket with soldering connections)		



Connection diagram

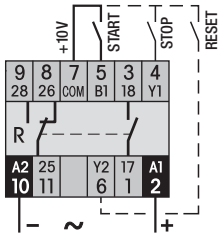


Fig.1 AC electrical endurance

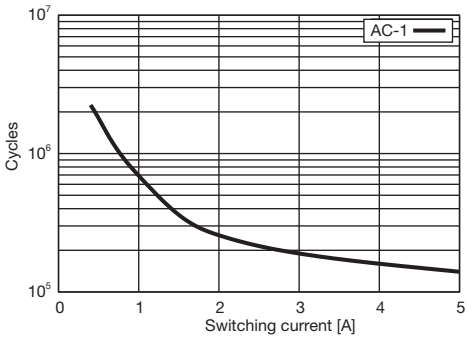
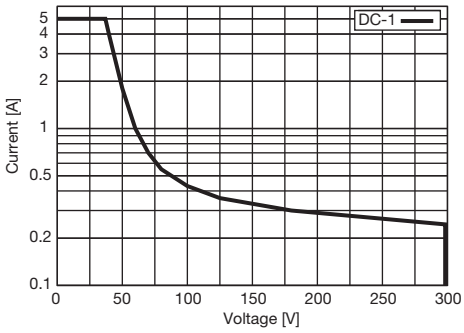
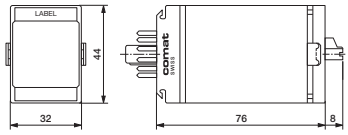


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

EN 60947

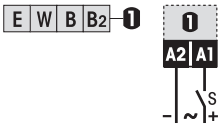
CS1

11 pin plug-in time relay according to IEC 67-I-18a, 50 ms … 60 minutes for wide band 12 … 240 V operating voltage, internal or external potentiometer operation

Type: CS1/UC 12-240V R
Plug-in time relay
1 change over contact
UC 12-240 V operating voltage
4 time functions, time ranges: 50 ms … 60 min
LED for output state indication
Option for external fine adjustment time range potentiometer

Maximum contact load	**8 A / 250 V AC-1**
Recommended minimum contact load	**10 mA / 10 V**

Time functions and related connection diagrams (Function diagrams: refer to page 114)



External potentiometer (Pins 5, 7)
1 MΩ (see accessories)
Max. potentiometer cable length
50 m, shielded, GND on pin 5 (Z1)

Time data

5 partial time ranges, t_{max} (DIP switch)	0.6, 6, 60 s / 6, 60 min
Fine adjustment range (rotary knob)	t_{min} … t_{max}, 5 … 60
Time range tolerance	t_{min}: -5 % … +0 % / t_{max}: -0 % … +5 %
Repetition accuracy	± 0.1 % or DC: 2 ms / AC: 10 ms
Reset time	≤ 30 ms
Power failure security	20 ms

Contacts

Type	1 CO, micro disconnection
Material	AgNi
Rated operational current	8 A
Max. switching voltage AC-1	250 V
Max. AC load AC-1 (Fig.1)	2000 VA
Max. DC load DC-1, 30 V / 250 V (Fig.2)	220 W / 75 W

Power supply- and control input (UC = AC / DC)

Nominal voltage (A1)	**UC 12 … 240 V**
Operating voltage range	19 … 250 V
Power consumption	≤ 1.4 W
Frequency range	45 … 63 Hz

Insulation

Test voltage open contact	1 kVrms 1 minute
Test voltage between contacts and control input	2 kVrms 1 minute

General Specifications

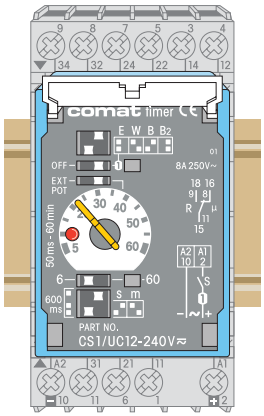
Ambient temperature storage /operation	-40 … 85 °C / -25 …60 °C
Mechanical life of contacts	≥ 30 x 10^6 operations
Ingress protection degree	IP 40 when plugged in
Housing material / Weight	Lexan / 75 g

Standard types

UC (AC/DC)	**CS1/UC12-240V R**

Accessories

External potentiometer 1 M (Panel mounting + scale)	**SP-01/1M**
Socket	**S3-xx**
Retaining clip	**HF-50**
Transparent front cover	**FA-50**
Front panel mounting set	**FZ-50L** (Frame + retaining clip + socket with soldering connections)



Option:
External
Pot.-Meter
SP-01/1M

Connection diagram

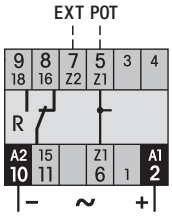


Fig.1 AC electrical endurance

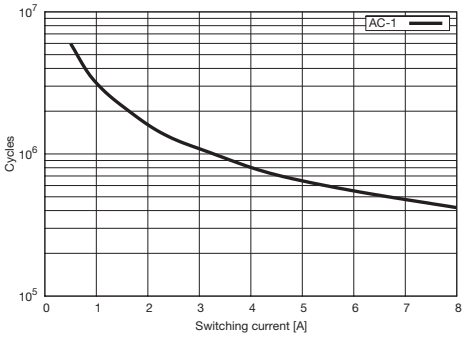
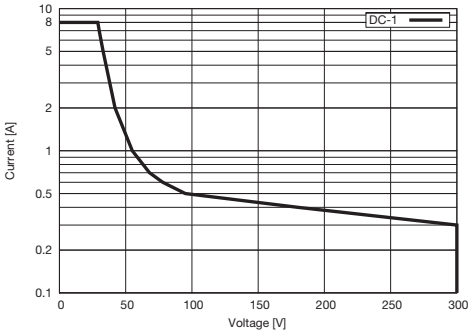
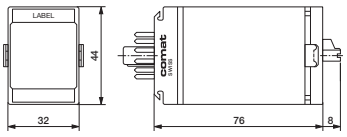


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

EN 60947

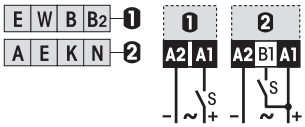
CS2

11 pin plug-in time relay according to IEC 67-I-18a, 50 ms … 60 h for wide band 12 … 240 V operating voltage, internal or external potentiometer operation

Type: CS2/UC 12-240V R
Plug-in time relay
1 change over contact
UC 12-240 V operating voltage
7 time functions, time ranges: 50 ms … 60 h
LED for output state indication
Option for external fine adjustment time range potentiometer

Maximum contact load	**8 A / 250 V AC-1**
Recommended minimum contact load	**10 mA / 10 V**

Time functions and related connection diagram (Function diagrams: refer to page 114)



External potentiometer pins 5, 7
1 MΩ (see accessories)
Max. potentiometer cable length
50 m, shielded, GND on pin5 (Z1)

Time data

7 partial time ranges, t_{max} (DIP switch)	0.6, 6, 60 s / 6, 60 min / 6, 60 h
Fine adjustment range (rotary knob)	t_{min} … t_{max}, 5 … 60
Time range tolerance	t_{min}: -5 % … +0 % / t_{max}: -0 % … +5 %
Repetition accuracy	± 0.1 % or DC: 2 ms / AC: 10 ms
Min. trigger impulse on B1	≥ 30 ms
Reset time	≤ 30 ms
Power failure security	20 ms

Contacts

Type	1 CO, micro disconnection
Material	AgNi
Rated operational current	8 A
Max. switching voltage AC-1	250 V
Max. AC load AC-1 (Fig.1)	2000 VA
Max. DC load DC-1, 30 V / 250 V (Fig.2)	220 W / 75 W

Power supply- and control input (UC = AC / DC)

Nominal voltage (A1, B1)	**UC 12 … 240 V**
Operating voltage range	19 … 250 V
Power consumption	≤ 1.4 W
Frequency range	45 … 63 Hz
Allowed residual current into B1 AC / DC	≤ 2.3 mA / 1.2 mA
Trigger threshold voltage on B1, AC / DC	6.5 V / 7 V

Insulation

Test voltage open contact	1 kVrms 1 minute
Test voltage between contacts and control input	2 kVrms 1 minute

General Specifications

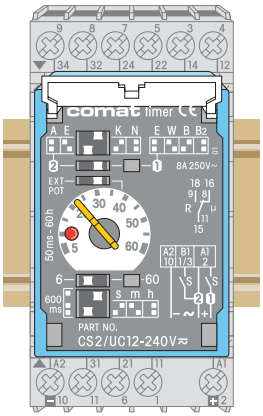
Ambient temperature storage /operation	-40 … 85 °C / -25 …60 °C
Mechanical life of contacts	≥ 30 x 10^6 operations
Ingress protection degree	IP 40 when plugged in
Housing material / Weight	Lexan / 75 g

Standard types

UC (AC/DC)	**CS2/UC12-240V R**

Accessories

External potentiometer 1 M (Panel mounting + scale)	**SP-01/1M**
Socket	**S3-xx**
Retaining clip	**HF-50**
Transparent front cover	**FA-50**
Front panel mounting set	**FZ-50L** (Frame + retaining clip + socket with soldering connections)



Option:
External
Pot.-Meter
SP-01/1M

Connection diagram

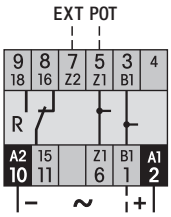


Fig.1 AC electrical endurance

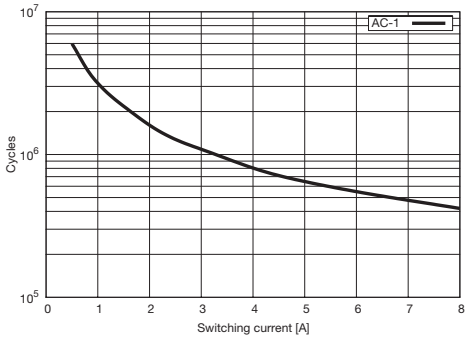
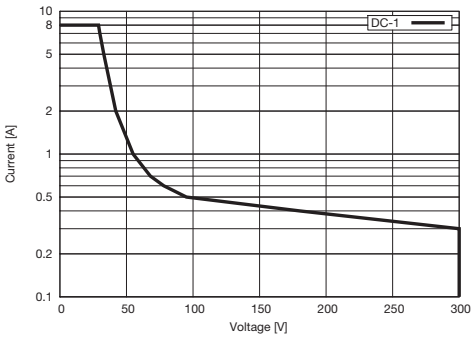
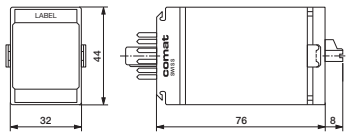


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

EN 60947

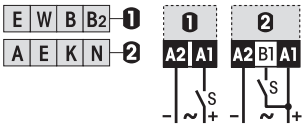
CS3

11 pin plug-in time relay according to IEC 67-I-18a, 50 ms … 60 h for wide band 12 … 240 V operating voltage, 2 change over output contacts

Type: CS3/UC 12-240V R
Plug-in time relay
2 change over contacts
UC 12-240 V operating voltage
7 time functions, time ranges: 50 ms … 60 h
LED for output state indication

Maximum contact load	**6 A / 250 V AC-1**
Recommended minimum contact load	**10 mA / 10 V**

Time functions and related connection diagrams (Function diagrams: refer to page 114)



Time data

7 partial time ranges, t_{max} (DIP switch)	0.6, 6, 60 s / 6, 60 min / 6, 60 h
Fine adjustment range (rotary knob)	t_{min} … t_{max}, 5 … 60
Time range tolerance	t_{min}: -5 % … +0 % / t_{max}: -0 % … +5 %
Repetition accuracy	± 0.1 % or DC: 2 ms / AC: 10 ms
Min. trigger start impulse on B1	≥ 30 ms
Reset time	≤ 30 ms
Power failure security	20 ms

Contacts

Type	2 CO, micro disconnection
Material	AgNi
Rated operational current	6 A
Max. switching voltage AC-1	250 V
Max. AC load AC-1 (Fig.1)	1500 VA
Max. DC load DC-1, 30 V / 250 V (Fig.2)	180 W / 60 W

Power supply- and control input (UC = AC / DC)

Nominal voltage (A1, B1)	**UC 12 … 240 V**
Operating voltage range	19 … 250 V
Power consumption	≤ 1.4 W
Frequency range	45 … 63 Hz
Allowed residual current into B1 AC / DC	≤ 2.3 mA / 1.2 mA
Trigger threshold voltage on B1, AC / DC	6.5 V / 7 V

Insulation

Test voltage open contact	1 kVrms 1 minute
Test voltage between poles	2 kVrms 1 minute
Test voltage between contacts and control input	2 kVrms 1 minute

General Specifications

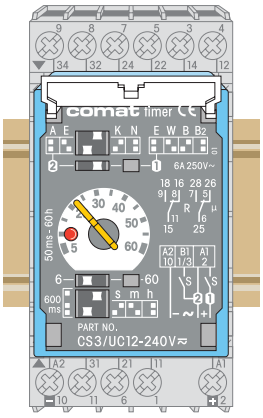
Ambient temperature storage /operation	-40 … 85 °C / -25 …60 °C
Mechanical life of contacts	≥ 30 x 10^6 operations
Ingress protection degree	IP 40 when plugged in
Housing material / Weight	Lexan / 75 g

Standard types

UC (AC/DC)	**CS3/UC12-240V R**

Accessories

Socket:	**S3-xx**
Retaining clip	**HF-50**
Transparent front cover	**FA-50**
Front panel mounting set	**FZ-50L** (Frame + retaining clip + socket with soldering connections)



Connection diagram

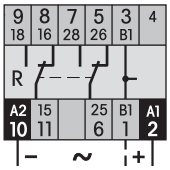


Fig.1 AC electrical endurance

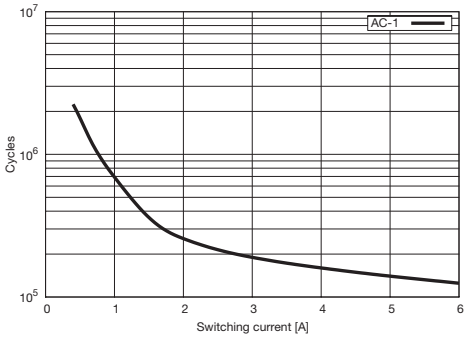
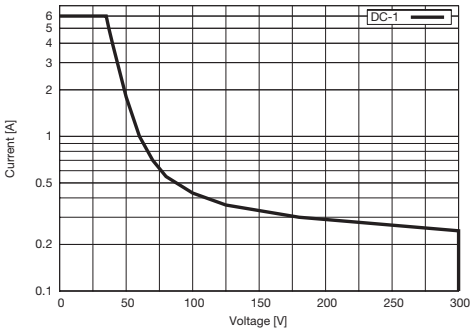
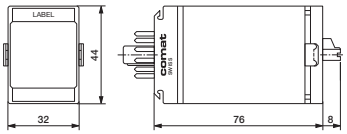


Fig. 2 DC load limit curve



Dimensions [mm]

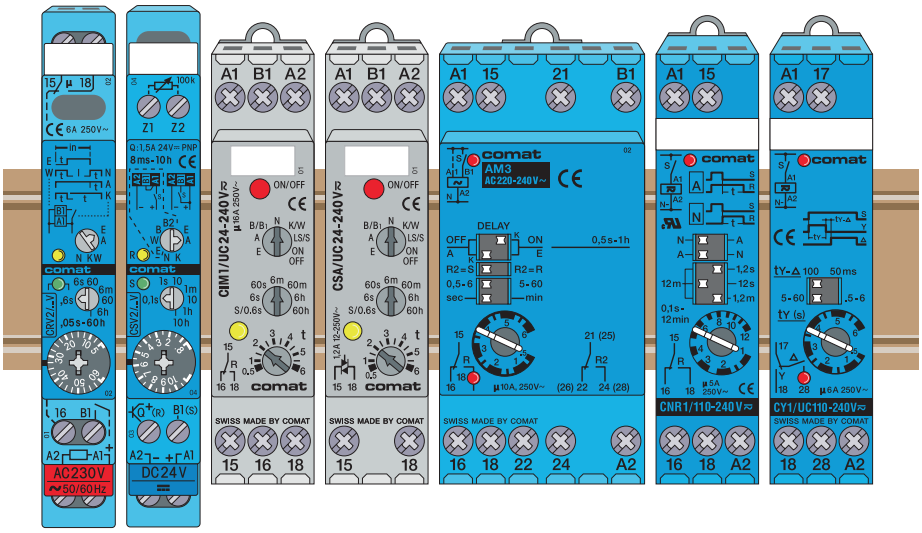


Technical approvals, conformities

EN 60947

2.4 DIN Time Relays

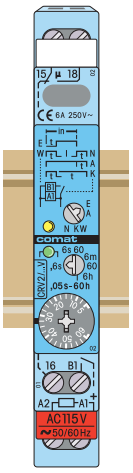
DIN Time Relays



Application	Types	Functions	Min. time	Max. time	Contact rating	Design
Multi function	CRV2	E, W, A, K, N	0.05 s	60 h	6 A / 250 V	13 mm
Double time relay	CRV3	F, Q	2x 50 ms	2x 60 h	6 A / 250 V	13 mm
Multi function, external potentiometer, solid state output	CSV2	E, W, B, B2, E, A, K, N	8 ms	10 h	1.5 A / 30 V	13 mm
Universal relay, 8 time functions & step-on/step-off function, ON/OFF switch,	CIM1	E, B, W, A, K, N, B1, S, LS	50 ms	60 h	16 A / 250 V	17.5 mm
Universal relay, 8 time functions & step-on/step-off function, ON/OFF switch, AC solid state output	CSA	E, B, W, A, K, N, B1, S, LS	50 ms	60 h	2 A / 250 V	17.5 mm
Universal relay, 8 time functions & step-on/step-off function, ON/OFF switch, DC solid state output	CSD	E, B, W, A, K, N, B1, S, LS	50 ms	60 h	5 A / 24 V DC	17.5 mm
Universal timer, ON-OFF switch, 2 CO contacts	CM3	E, A, K, N, B1, B, W	50 ms	60 h	5 A / 250 V	17.5 mm
Multifunction time relay	AM2	E, A, K, W	0.5 s	60 min	10 A / 250 V	17.5 mm
Time run without auxiliary voltage	CNR1	A, N	0.1 s	12 min	5 A / 250 V	17.5 mm
Pulse shaper	CPF11	K, L, A	5 ms	600 ms	0.8 A / 24 V	17.5 mm
Universal timer with instantaneous contact	AM3	E, A, K, W	0.5 s	60 min	10 A / 250 V	35 mm
Star-Delta time relay	CY1	Y	0.5 s	60 s	6 A / 250 V	17.5 mm

CRV2

Multifunction time relay with mechanical change over output contact
5 time functions, 50 ms … 60 h
DIN Rail mounting according to DIN 43 880

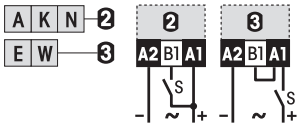


Type: CRV2/… V R

Multifunction time relay, 1 change over contact, UC 24 V, AC 230 V operating voltages, 5 time functions, LED state indicator for output and control input

Maximum contact load	**6 A / 250 V AC-1 180 W DC-1**
Recommended minimum contact load	**10 mA / 10 V**

Time functions and related connection diagrams (Function diagrams: refer to page 114)



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}, 5 … 60
Time range tolerance	t_{min}: -30 % … +0 % / t_{max}: -0 % … +30 %
Repetition accuracy	± 0.3 % or DC: 15 ms / AC: 25 ms
Response time, power on, on A1	≤ 30 ms
Min. trigger pulse on B1	35 ms (AC / DC)
Reset time B1 (AC/DC)	≤ 100 ms
Power failure security	≥ 10 ms

Contacts

Type	1 CO, micro disconnection
Material	AgNi
Rated operational current	6 A
Max. inrush current (10 ms)	30 A
Max. switching voltage AC-1	250 V
Max. AC load AC-1 (Fig.1)	1500 VA
Max. DC load DC-1, 30 V / 250 V (Fig.2)	180 W / 75 W

Power supply and control input

Nominal voltage	**UC 24 V**	**AC 230 V**
Operating voltage range	20 … 28 V	195 … 265 V
Power consumption	≤ 1.2 W	≤ 1.4 W
Frequency range	50 / 60 Hz	50 / 60 Hz
Inrush current A1	-	2 A, τ = 50 µs
Input current into B1 typ.	2.5 mA	3.6 mA
Allowed residual current into B1	≤ 1 mA	≤ 1 mA
Trigger threshold voltage on B1 AC / DC typ.	15 V / 17 V	100 V

Insulation

Test voltage open contact	1 kVrms 1 minute
Test voltage between contacts and control input	2 kVrms 1 minute

General Specifications

Ambient temperature storage /operation	-40 … 80 °C / -25 …55 °C
Mechanical life of contacts	30 x 10^6 operations
Conductor cross section	Stranded wire 2.5 mm^2, 2 x 1 mm^2
Ingress Protection degree	Housing: IP 40, terminals: IP 20
Max. Screw torque	0.4 Nm
Housing material / Weight	Lexan / 60 g

Standard types

UC, 50 / 60 Hz	**CRV2/UC24V R**
AC, 50 / 60 Hz	**CRV2/AC230V R**

Accessories

Marking strip:	Large	**BS-13G**
	Small	**BS-13K**

Connection diagram

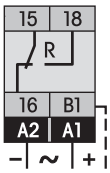


Fig.1 AC electrical endurance

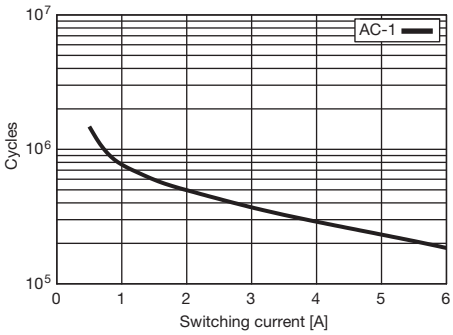
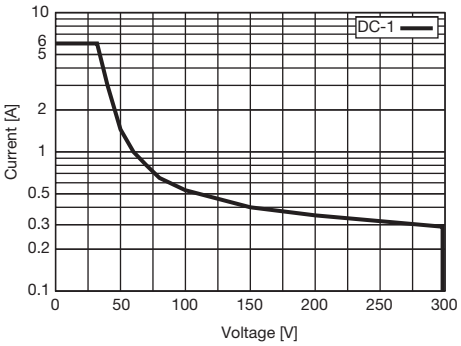
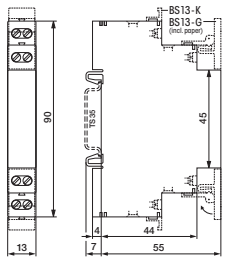


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

CRV3

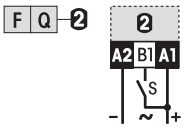
Time relay with 2 time elapses, mechanical change over output contact
2 time functions, 2 x 50 ms … 60 h
DIN Rail mounting according to DIN 43 880

Type: CRV3/… V R

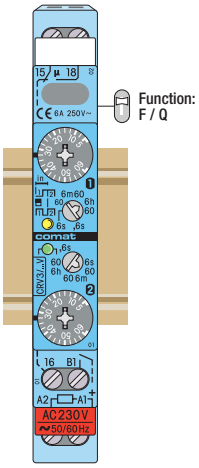
Time relay with 7 time ranges, 1 change over contact, UC 24 V, AC 230 V operating voltages, 2 time functions, 2 x 50 ms … 60 h, LED state indicator for output and control input

Maximum contact load	**6 A / 250 V AC-1 180 W DC-1**
Recommended minimum contact load	**10 mA / 10 V**

Time functions and related connection diagrams (Function diagrams: refer to page 114)



The function selector switch is on the right side



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}, 5 … 60
Time range tolerance	t_{min}: -30 % … +0 % / t_{max}: -0 % … +30 %
Repetition accuracy	± 0.3 % or DC: 15 ms / AC: 25 ms
Response time, power on, on A1	≤ 100 ms
Min. trigger pulse on B1	35 ms (AC / DC)
Reset time B1 (AC/DC)	≤ 60 ms
Power failure security	≥ 20 ms

Contacts

Type	1 CO, micro disconnection
Material	AgNi
Rated operational current	6 A
Max. inrush current (10 ms)	30 A
Max. switching voltage AC-1	250 V
Max. AC load AC-1 (Fig.1)	1500 VA
Max. DC load DC-1, 30 V / 250 V (Fig.2)	180 W / 75 W

Power supply and control input

Nominal voltage	**UC 24 V**	**AC 230 V**
Operating voltage range	19 … 27.6 V	195 … 265 V
Power consumption	≤ 1.2 W	≤ 1.4 W
Frequency range	50 / 60 Hz	50 / 60 Hz
Inrush current A1	-	2 A, τ = 50 µs
Input current into B1 typ.	5.8 mA	3.6 mA
Allowed residual current into B1	≤ 2 mA	≤ 1 mA
Trigger threshold voltage on B1 , AC / DC	12 V / 15 V	100 V

Insulation

Test voltage open contact	1 kVrms 1 minute
Test voltage between contacts and control input	2 kVrms 1 minute

General Specifications

Ambient temperature storage /operation	-40 … 80 °C / -25 …55 °C
Mechanical life of contacts	30 x 10^6 operations
Conductor cross section	Stranded wire 2.5 mm^2, 2 x 1 mm^2
Ingress Protection degree	Housing: IP 40, terminals: IP 20
Max. Screw torque	0.4 Nm
Housing material / Weight	Lexan / 60 g

Standard types

UC, 50 / 60 Hz	**CRV3/UC24V R**
AC, 50 / 60 Hz	**CRV3/AC230V R**

Accessories

Marking strip:	Large	**BS-13G**
	Small	**BS-13K**

Connection diagram

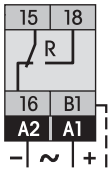


Fig.1 AC electrical endurance

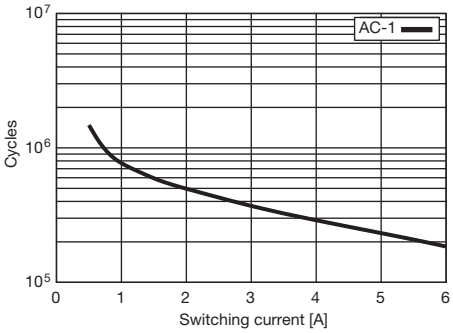
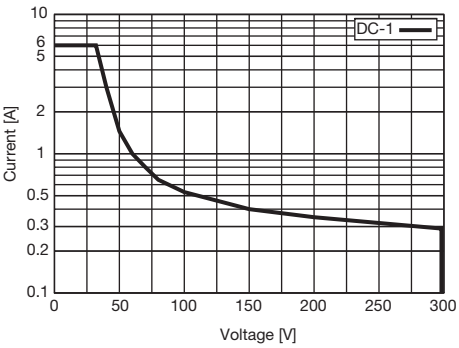
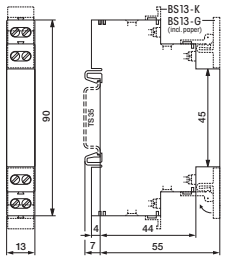


Fig. 2 DC load limit curve



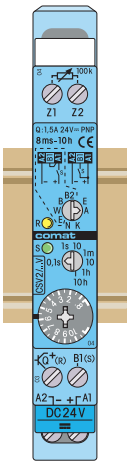
Dimensions [mm]



Technical approvals, conformities

CSV2

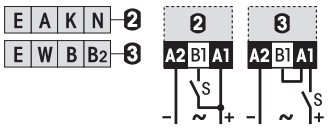
Multifunction time relay, internal or external potentiometer operation, DC solid state output, 8 ms … 10 h, DIN Rail mounting according to DIN 43 880



Type: CSV2/DC24V R
Multifunction time relay
DC solid state output
DC 24 V operating voltage
Option for external fine adjustment time range potentiometer
LED state indicators for output and control input

Maximum output load	**1.5 A / 30 V**

Time functions and related connection diagrams (Function diagrams: refer to page 114)



Time data

7 partial time ranges, t_{max} (rotary switch)	0.1 , 1, 10 s / 1, 10 min / 1, 10 h
Fine adjustment range (rotary knob)	t_{min} … t_{max}, 0.8 … 10
Time range tolerance	t_{min}: -30 % … +0 % / t_{max}: -0 % … +30 %
Repetition accuracy	± 0.3 % or 10 ms
Response time, power on, on A1	≤ 10 ms
Min. trigger pulse on B1	20 ms
Reset time B1 (AC/DC)	≤ 10 ms
Power failure security	≥ 10 ms

Output

Type: Power MOS FET	High side switch
Rated operational current	1.5 A
Max. inrush current (100 ms)	4 A
Max. switching voltage	30 V
Leakage current	≤ 100 µA
Inductive switch-off voltage protection	Free wheeling diode + 33 Ω

Power supply and control input

Nominal voltage	**DC 24 V**
Operating voltage range	15 … 30 V
Power consumption	≤ 0.7 W
Control current into B1	≤ 9 mA
Allowed residual current into B1	≤ 1.5 mA
Trigger threshold voltage on B1 typ.	9 V

General Specifications

Ambient temperature storage /operation	-40 … 80 °C / -25 …55 °C
Ambient temperature, mounted side by side	-25 …45 °C
Conductor cross section	Stranded wire 2.5 mm², 2 x 1 mm²
Ingress Protection degree	Housing: IP 40, terminals: IP 20
Max. Screw torque	0.4 Nm
Housing material / Weight	Lexan / 50 g

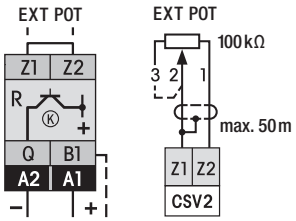
Standard types	**CSV2/DC24V R**

Accessories

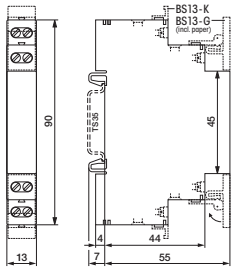
External potentiometer 100k (Panel mounting + scale):		**SP-01/100k**
Marking strip:	Large	**BS-13G**
	Small	**BS-13K**

Option: External Pot.-Meter SP-01/100k

Connection diagram



Dimensions [mm]



Technical approvals, conformities

CIM1, CIMR (Railway)

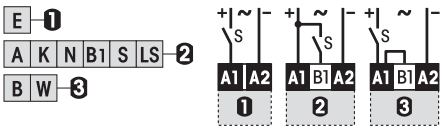
Time relay with mechanical change over output contact 8 time functions + stepping function, ON-OFF switch, 50 ms … 60 h, DIN Rail mounting according to DIN 43 880

Type: CIM1/UC24 … 240V

Sophisticated multifunction time relay, 1 change over power contact with zero crossing switching (50/60 Hz), 8 time functions and stepping function, 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 type available

Maximum contact load	**16 A / 250 V AC-1 384 W DC-1**
Recommended minimum contact load	**10 mA / 10 V**

Time functions and related connection diagrams (Function diagrams: refer to page 114)
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
Power failure security (50 / 60 Hz)	≥ 20 ms

Contacts

Material CIM1 / CIMR / Type	AgNi / 1 CO, micro disconnection
Rated operational current at 40 °C / 60 °C	16 A / 13 A
Max. inrush current	30 A
Max. switching voltage AC-1	250 V
Max. AC load AC-1 (Fig.1)	4k VA
Max. DC load DC-1 30 V / 250 V (Fig.2)	240 W / 85 W

Power supply- and control input

Nominal voltage (A1, B1)	**UC 24-240 V (UC = AC / DC)**
Operating voltage range	UC 19 … 250 V
Power consumption	approx. 1 W
Frequency range	15 … 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

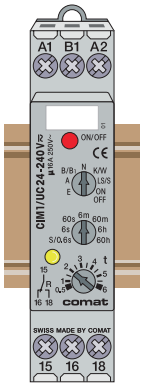
Test voltage open contact	1 kVrms 1 minute
Test voltage between contacts and control input	2.5 kVrms 1 minute

General Specifications

Ambient temperature storage /operation	-40 … 80 °C / -40 …60 °C (Railway: -46 °C)
Mechanical life of contact	30 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	**CIM1/UC24-240V**
Railway	**CIMR/UC24 -240V**



Connection diagram

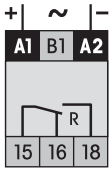


Fig.1 AC voltage endurance

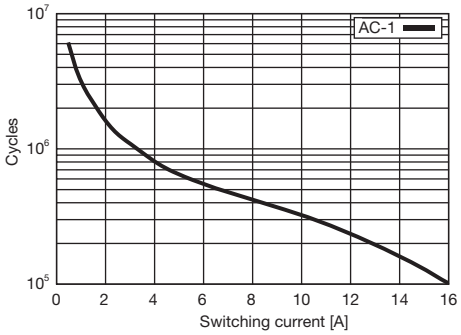
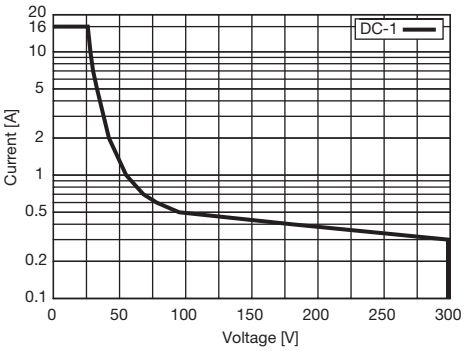
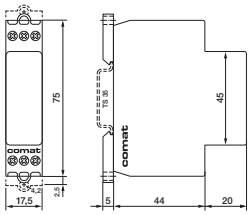


Fig. 2 DC load limit curve



Dimensions [mm]



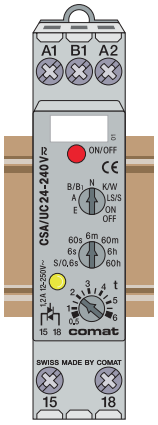
Technical approvals, conformities

EN 50155, EN 60730

CSA, CSAR (Railway)

Time relay with AC solid-state output

8 time functions + stepping function, ON-OFF switch, 50 ms … 60 h, DIN Rail mounting according to DIN 43 880



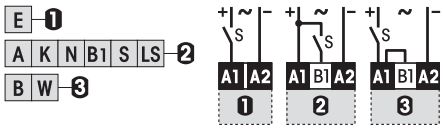
Type: CSA/UC24 … 240V

Sophisticated multifunction time relay, 1 Triac output, suitable for high frequency of operations and inductive loads, 8 time functions and stepping function, 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 applications. Railway type available

Maximum contact load	**2 A / 250 V**
Minimum contact load	**50 mA**

Time functions and related connection diagrams (Function diagrams: refer to page 114)

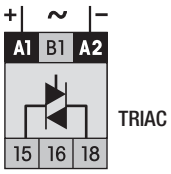
The functions are selectable by rotary switch



LED function table:

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

Connection diagram



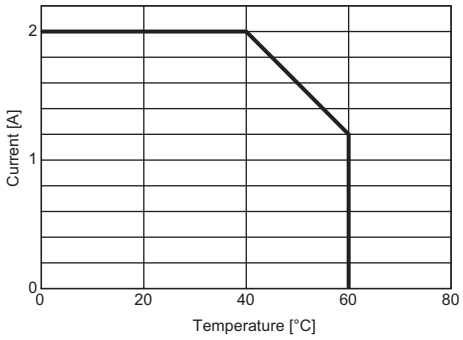
Time data

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
Power failure security (50 / 60 Hz)	≥ 20 ms

Output

Type	Triac, zero crossing
Rated operational current at 40 °C (Fig.1)	2 A
Max. inrush current (10 ms)	100 A
Max. switching voltage	250 V
Max. AC load AC-1	300 VA
I^2t value	78 A^2s
Leakage current	< 1 mA

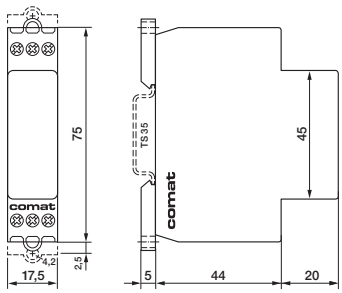
Fig. 1 Output derating curve



Power supply- and control input

Nominal voltage	**UC 24-240 V (UC = AC / DC)**
Operating voltage range	UC 19 … 250 V
Power consumption	approx. 1 W
Frequency range	15 … 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

Dimensions [mm]



Insulation

Test voltage between Output and control input	2.5 kVrms 1 minute

General Specifications

Ambient temperature storage /operation	-40 … 80 °C / -40 …60 °C (Railway: -46 °C)
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	**CSA/UC24-240V**
Railway	**CSAR/UC24 -240V**

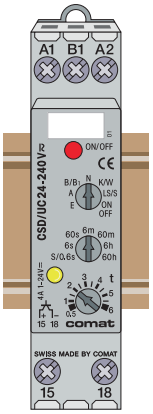
Technical approvals, conformities

EN 50155, EN 60730

CSD, CSDR (Railway)

Time relay with DC solid-state output

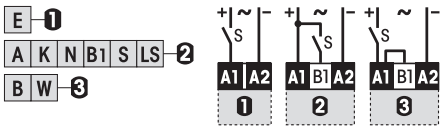
8 time functions + stepping function, ON-OFF switch, 50 ms … 60 h
DIN Rail mounting according to DIN 43 880



Type: CSD/ UC24 … 240V
Sophisticated multifunction time relay
1 Transistor output
8 time functions and stepping function, time ranges: 50 ms … 60 h
Multifunction LED state indicator
Suitable for any time-control application and also staircase-light control
Light-switch neon lamp current absorption on input B1
Manual switching function for maintenance, emergency, etc.
16.6 Hz applications. Railway type available

Maximum contact load	**4 A / 30 V**
Recommended minimum contact load	**1 mA**

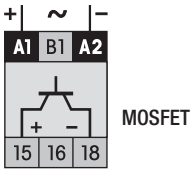
Time functions and related connection diagrams (Function diagrams: refer to page 114)
The functions are selectable by rotary switch



LED function table:

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

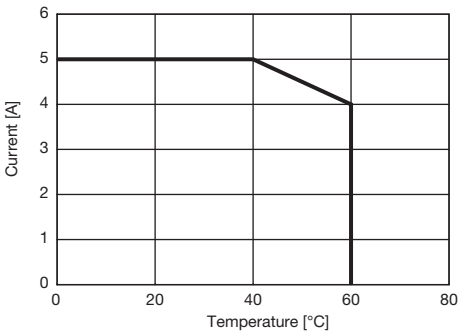
Connection diagram



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
Power failure security (50 / 60 Hz)	≥ 20 ms

Fig. 1 Output derating curve



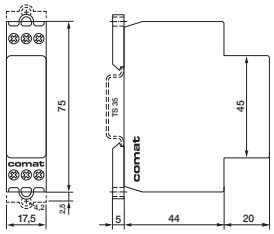
Output

Type	MOS FET
Rated operational current (Fig. 1)	4 A
Max. inrush current (10 µs)	40 A
Max. switching voltage	30 V
Leakage current	< 10 µA

Power supply- and control input

Nominal voltage (UC = AC / DC)	**UC 24-240 V**
Operating voltage range	UC 19 … 250 V
Power consumption	approx. 1 W
Frequency range	15 … 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

Dimensions [mm]



Insulation

Test voltage between Output and control input	2.5 kVrms 1 minute

General Specifications

Ambient temperature storage /operation	-40 … 80 °C / -40 …60 °C (Railway: -46 °C)
Conductor cross section	Stranded wire 2.5 mm², 2 x 1.5 mm²
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	**CSD/UC24-240V**
Railway	**CSDR/UC24 -240V**

Technical approvals, conformities

EN 50155; EN 60730

CM3

Time relay with two mechanical change over output contacts
7 time functions, ON-OFF function, 50 ms … 60 h
DIN Rail mounting according to DIN 43 880

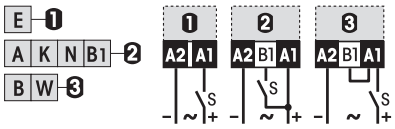
Type: CM3/… V R

Multifunction time relay, 7 time functions, time ranges: 50 ms … 60 h, Multifunction LED state indicator, ON / OFF switching function for maintenance, emergency, etc., Suitable for railway applications

Maximum contact load	**5 A / 250 V AC-1 150 W DC-1**
Recommended minimum contact load	**10 mA / 10 V**

Time functions and related connection diagrams (Function diagrams: refer to page 114)

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	≤ 25 ms
Min. trigger pulse on B1	35 ms (AC / DC)
Reset time B1 (AC/DC)	≤ 40 ms
Power failure security	≥ 15 ms

Contacts

Type	2 CO, micro disconnection
Material	AgNi
Rated operational current	5 A
Max. inrush current	25 A
Max. switching voltage AC-1	250 V
Max. AC load AC-1 (Fig.1)	1250 VA
Max. DC load DC-1, 30 V / 250 V (Fig.2)	150 W / 75 W

Power supply and control input

Nominal voltage	**DC 12-24 V**	**DC 24-48 V / AC 24-240 V**	
Operating voltage range	9.6 … 28.8 V	DC 19 … 60 V	AC 19 … 250 V
Power consumption	approx. 1.3 W	approx. 1.3 W	
Frequency range	-	-	45 … 63 Hz
Control current into B1	≤ 13.8 mA	≤ 6 mA	
Allowed residual current into B1	≤ 4.5 mA	≤ 1.5 mA	
Trigger threshold voltage on B1	5.8 … 6.5 V	DC 13 … 18 V	AC 11 … 15 V
Inrush current B1, τ = 0.4 ms	≤ 2.6 A	-	≤ 2.6 A

Insulation

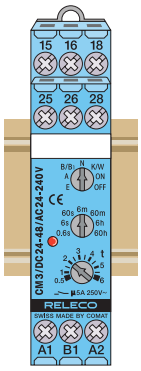
Test voltage open contact	1 kVrms 1 minute
Test voltage between poles	2.5 kVrms 1 minute
Test voltage between contacts and control input	2.5 kVrms 1 minute

General Specifications

Ambient temperature storage /operation	-40 … 80 °C / -25 …60 °C
Mechanical life of contacts	15 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 / 72 g

Standard types

DC	**CM3/DC12-24V R**
DC, AC 45…63 Hz	**CM3/DC24 -48V/AC24-240V R**



Connection diagram

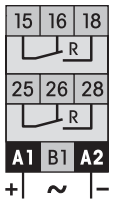


Fig.1 AC voltage endurance

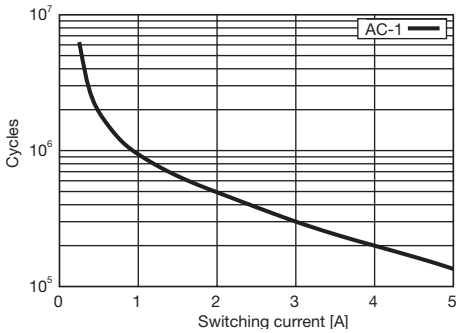
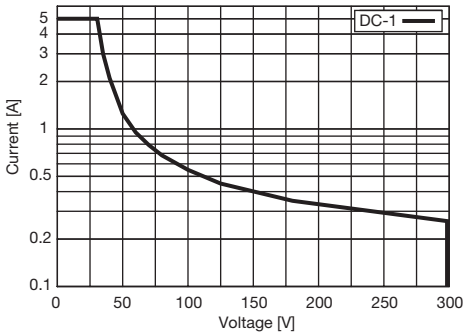
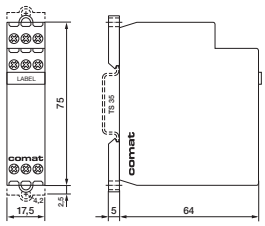


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

EN 50155, EN 60730

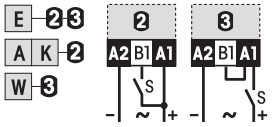
AM2

Time relay with 1 change over power contact
4 time functions, 0.5 s … 60 minutes
DIN Rail mounting according to DIN 43 880

Type: AM2/ … V
Multifunction time relay
1 CO contacts
4 time functions and ON function, time ranges: 0.5 s … 60 minutes
LED state indicator for output
Also suitable for panel mounting 2 x M4

Maximum contact load	**10 A 250 V AC-1**	**6 A 25 V DC-1**
Recommended minimum contact load	**100 mA / 12 V**	

Time functions and related connection diagrams (Function diagrams: refer to page 114)



Time data

4 partial time ranges, t_{max} (DIP switch)	6, 60 s / 6, 60 min
Fine adjustment range (rotary knob)	t_{min} … t_{max}, 0.5 … 6
Time range tolerance	t_{min}: -30 % … +0 % / t_{max}: -0 % … +30 %
Repetition accuracy	± 0.2 % or 20 ms
Response time, power on, on A1	≤ 50 ms
Min. trigger pulse width on input B1	100 ms (AC / DC)
Reset time B1 (AC/DC)	≤ 90 ms
Power failure security	≥ 5 ms

Contacts

Type	Single contact, micro disconnection
Material	$AgSnO_2$
Rated operational current	10 A
Max. inrush current (10ms)	16 A
Max. switching voltage AC-1	250 V
Max. AC load AC-1 (Fig. 1)	2500 VA AC-1
Max. DC load DC-1 24 V / 220 V (Fig. 2)	150 W / 70 W

Power supply- and control input

Nominal voltage (UC = AC / DC)	**UC 24 - 60 V**	**AC 220 - 240 V**
Operating voltage range	20 … 75 V	180 … 265 V
Power consumption	≤ 1.5 W	≤ 1.5 W
Frequency range	40 … 60 Hz	40 … 60 Hz
Input current into B1 typ.	≤ 25 mA (40 mA)	≤ 10 mA (15 mA)
Allowed residual current into B1	≤ 1.5 mA	≤ 1 mA
Trigger threshold voltage on B1 typ AC / DC	14 / 17 V	140 V

[1] B1 can be used as power supply and control input, without A1. For func. E and W.
The current is then higher, values in brackets.

Insulation

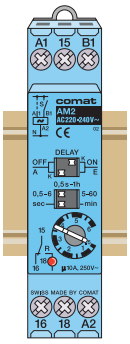
Test voltage open contact	1 kVrms 1 minute
Test voltage between contacts and control input	2 kVrms 1 minute

General Specifications

Ambient temperature storage /operation	-40 … 85 °C / -40 …60 °C
Mechanical life of contact	20 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) 40…60 Hz	**AM2/UC24-60V R** **AM2/AC220-240V R**



Connection diagram

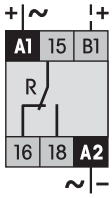


Fig.1 AC voltage endurance

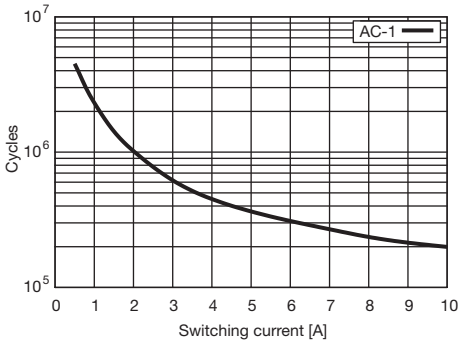
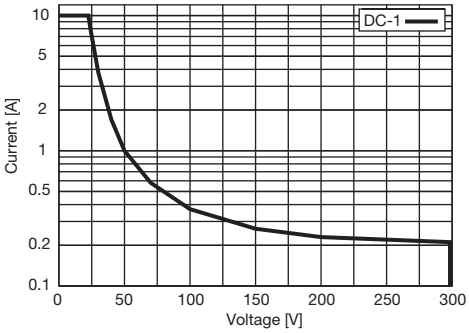
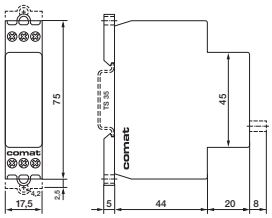


Fig. 2 DC load limit curve



Dimensions [mm]

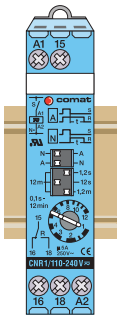


Technical approvals, conformities

EN 60947

CNR1

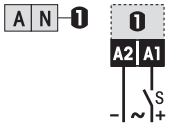
Time run without supply voltage,
mechanical change over output contact,
2 time functions, 0.1 s … 12 minutes
DIN Rail mounting according to DIN 43 880



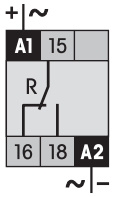
Type: CNR1/… V R
time relay
1 change over contact, 250 V
UC 24 … 60 V, UC 110 … 240 V operation voltages
2 time functions, time ranges: 0.1 s … 20 minutes
LED for supply voltage state indication
Also suitable for panel mounting 2 x M4

Maximum contact load	**5 A / 250 V AC-1 5 A / 30 V DC-1**
Recommended minimum contact load	**1 mA / 0.1 V**

Time functions and related connection diagrams (Function diagrams: refer to page 114)



Connection diagram



Time data

4 partial time ranges, t_{max} (DIP switch)	1.2 s / 12 s / 120 s / 12 minutes
Fine adjustment range (rotary knob)	t_{min} … t_{max}, 1 … 12
Time range tolerance	t_{min}: -25 % … +5 % / t_{max}: -5 % … +25 %
Repetition accuracy	± 1 %
Min. start impulse on A1	≥ 150 ms
Reset time	≥ 100 ms
Power failure security	5 … 10 ms

Contacts

Type	1 CO, micro disconnection
Material	Gold flash over silver alloy
Rated operational current	5 A
Max. switching voltage AC-1	250 V
Max. switching voltage DC-1	125 V
Max. AC load AC-1 (Fig.1)	1250 VA
Max. DC load 30 V / 125 V (Fig.2)	150 W / 25 W

Control input (UC = AC / DC)

Nominal voltage (A1)	**UC 24 - 60 V**	**UC 110 - 240 V**
Operating voltage range [V]	20 … 75	88 … 265
Input current [mA]	3 … 15	2 … 5
Inrush current (100 ms) [mA]	150	50
Frequency [Hz]	50	50
Threshold voltage AC / DC [V]	≥ 14 / ≥ 18	≥ 65 / ≥ 85

Insulation

Test voltage open contact	1 kVrms 1 minute
Test voltage between contacts and control input	2 kVrms 1 minute

General Specifications

Ambient temperature storage /operation	-40 … 85 °C / -25 …60 °C
Mechanical life of contacts	> 50 x 10^6 operations
Ingress protection degree	IP 20
Housing material / Weight	Lexan / 60 g

Standard types

UC (AC/DC) 50 Hz	**CNR1/UC24-60V R** **CNR1/UC110-240V R**

Accessories

Label plate: (replacement)	**BZS-DIN 17.5**

Fig.1 Contact endurance

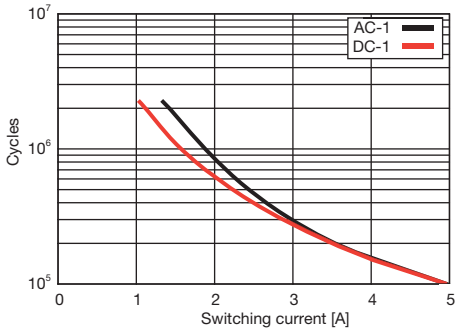
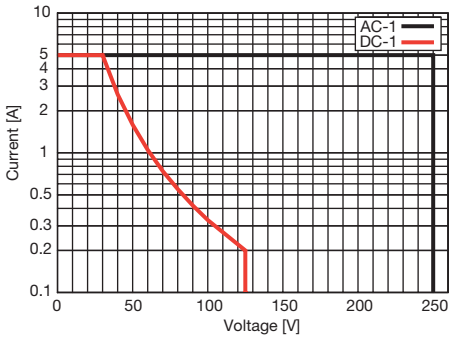
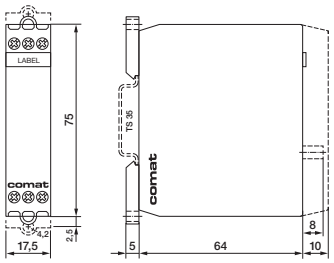


Fig. 2 Load limit curve



Dimensions [mm]



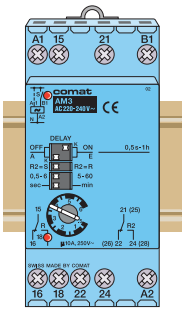
Technical approvals, conformities

EN 60947

AM3

Time relay with 2 change over output contacts, one of them selectable as instantaneous contact
4 time functions, 0.5 s … 60 minutes
DIN Rail mounting according to DIN 43 880

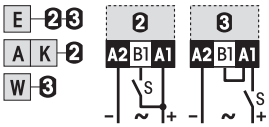
comat RELECO by comat



Type: AM3/ … V
Multifunction time relay
2 CO contacts, 1 contact selectable as instantaneously or delayed
4 time functions and ON function, time ranges: 0.5 s … 60 minutes
LED state indicators for output and control input

Maximum contact load	**10 A / 250 V AC-1 10 A / 30 V DC-1**
Recommended minimum contact load	**100 mA / 5 V**

Time functions and related connection diagrams (Function diagrams: refer to page 114)



Selection of the operation mode of the second CO contact: DIP-switch:
R2 = S: instantaneously, R2 = R: Delayed.

Time data

4 partial time ranges, t_{max} (DIP switch)	6, 60 s / 6, 60 min
Fine adjustment range (rotary knob)	t_{min} … t_{max}, 0.5 … 6
Time range tolerance	t_{min}: -30 % … +0 % / t_{max}: -0 % … +30 %
Repetition accuracy	± 0.25 % or 20 ms
Response time, power on, on A1	≤ 50 ms
Min. trigger pulse on B1	100 ms (AC / DC)
Reset time B1 (AC/DC)	≤ 90 ms
Power failure security	≥ 3 ms

Contacts

Type / Material	2 CO, micro disconnection / AgNi
Rated operational current	10 A
Sum current of both contacts	12 A @ Ta = 45 °C, 100 % duty cycle
Max. inrush current (20 ms)	16 A
Max. switching voltage AC-1	250 V
Max. AC load AC-1 (Fig.1)	2500 VA
Max. DC load DC-1, 30 V / 100 V (Fig. 2)	300 W / 60 W

Power supply- and control input

Nominal voltage (UC = AC / DC)	**UC 24 - 60 V**	**AC 220 - 240 V**
Operating voltage range	19 … 75 V	195 … 265 V
Power consumption	≤ 1.8 W	≤ 1.8 W
Frequency range	40 … 400 Hz	40 … 60 Hz
Input current into B1 typ.	≤ 20 mA (50 mA)	≤ 5 mA (15 mA)
Allowed residual current into B1	≤ 1.5 mA	≤ 1 mA
Trigger threshold voltage on B1 typ AC / DC	14 / 17 V	140 V

Insulation

Test voltage open contact	1 kVrms 1 minute
Test voltage between contacts and control input	2 kVrms 1 minute

General Specifications

Ambient temperature storage /operation	-40 … 80 °C / -40 …50 °C
Mechanical life of contact	10^7 operations
Conductor cross section	Stranded wire 2.5 mm², 2 x 1.5 mm²
Ingress protection degree	IP 20
Max. Screw torque	0.4 Nm
Housing material / Weight	Lexan / 110 g

Standard types

UC (AC/DC) 40…400 Hz	**AM3/UC24-60V R**
AC 50 / 60 Hz	**AM3/AC220 -240V R**

Connection diagram

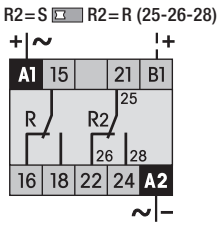


Fig.1 Contact endurance

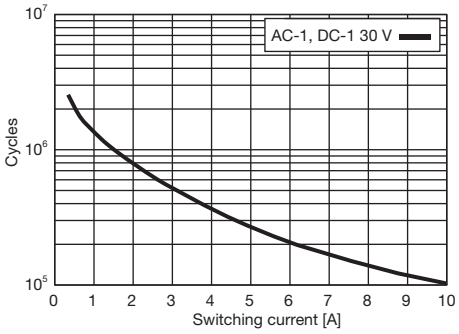
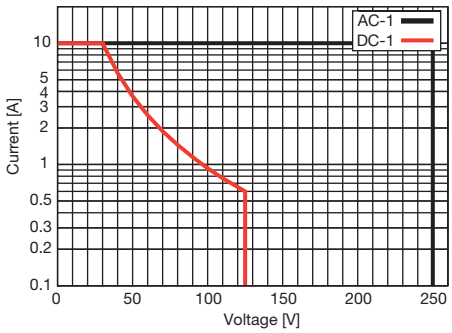
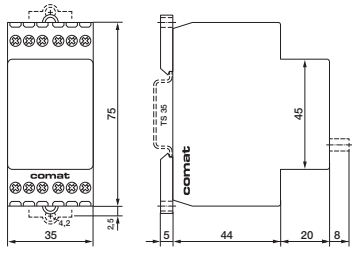


Fig. 2 Load limit curve



Dimensions [mm]



Technical approvals, conformities

EN 60947

CPF11

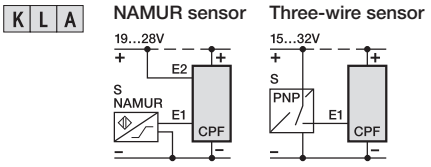
Versatile time relay with DC solid state output, 3 time functions for pulse shaping applications, 5 … 600 ms DIN Rail mounting according to DIN 43 880

Type: CPF11/DC24V R

Pulse shaper. DC solid state output, short circuit proof. DC 24 V operating voltage. Very suitable as PLC-interface for contact- and sensor signals (NAMUR, 3 – wire) but also for inductive- or lamp loads. Selectable free wheeling diode built in. Adjustable input filter time. LED state indicators for output and control input. Also suitable for panel mounting 2 x M4

Maximum output load	**2 A / 32 V**

Time functions and related connection diagrams (Function diagrams: refer to page 114)



Logical input setting E, Ē: With Ē the output becomes high when the input is low.

When set the shortest time and function A, the device can be used as a switching amplifier.

Time data

2 partial time ranges, t_{max} (DIP switch)	60 , 600 ms
Fine adjustment range (rotary knob)	t_{min} … t_{max}, 0.5 … 6
Time range tolerance	t_{min}: -30 % … +0 % / t_{max}: -0 % … +30 %
Repetition accuracy	± 0.5 % or 2 ms
Min. trigger pulse width on input B1	1 ms / 5 ms selectable
Reset time B1	≤ 5 ms / ≤ 25 ms

Output

Type: Power MOS FET	High side switch
Rated operational current, Ta = 60 °C	0.7 A 100% duty cycle
Rated operational current, Ta = 50 °C	0.8 A 100% duty cycle
Operational pulse current	2 A when tON ≤ tOFF , tON ≤ 5 s
Short circuit current	≤ 7 A
Max. switching voltage	32 V
Leakage current (without free wheeling diode)	≤ 1 µA
Inductive switch-off voltage protection	Selectable free wheeling diode

Power supply and control input

Nominal voltage	**DC 24 V**
Operating voltage range normal operation	15 … 32 V
Operating voltage range NAMUR operation (DIN 19234)	19 … 28 V
Power consumption	≤ 0.6 W
Trigger threshold voltage E1	≤ 10 V
Trigger threshold voltage E2	≤ 15 V

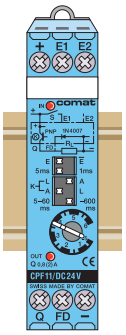
General Specifications

Ambient temperature storage /operation	-40 … 80 °C / -25 …60 °C
Conductor cross section	Stranded wire 2.5 mm², 2 x 1 mm²
Ingress Protection degree	Housing: IP 40, terminals: IP 20
Max. Screw torque	0.4 Nm
Housing material / Weight	Lexan / 60 g

Standard types	**CPF11/DC24V R**

Accessories

Label plate: (replacement)	**BZS-DIN 17.5**



Connection diagram

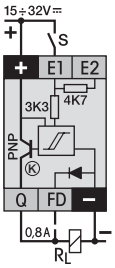


Fig. 1 Derating Curve

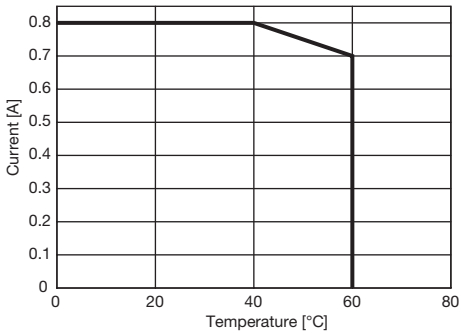
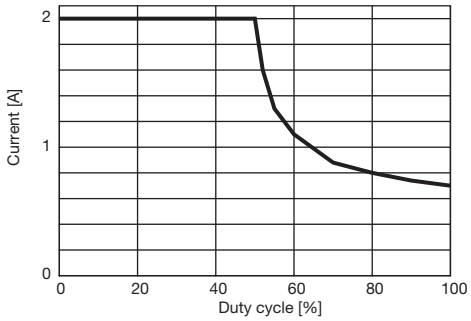
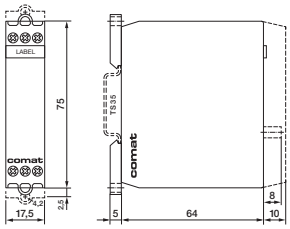


Fig. 2 Current vs. duty cycle



Dimensions [mm]



Technical approvals, conformities

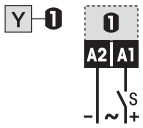
CY1

Star - Delta starting time relay. 0.5 … 60 s
DIN Rail mounting according to DIN 43 880

Type: CY1/… V R
Star-Delta starting time relay
Adjustable star starting time until 60 s
2 switch over delay times, 50 ms, 100 ms
LED state indicators for control input and delta-run
Also suitable for panel mounting 2 x M4

Maximum contact load	**6 A / 250 V AC-1 180 W DC-1**
Recommended minimum contact load	**10 mA / 10 V**

Time functions and related connection diagrams (Function diagrams: refer to page 114)



Time data

2 partial time ranges, t_{max} (DIP switch)	0.5 … 6 s / 5 … 60 s
Fine adjustment range (rotary knob)	t_{min} … t_{max}, 0.5 … 6
Time range tolerance	t_{min}: -20 % … +0 % / t_{max}: -0 % … +20 %
Repetition accuracy	± 0.1 %
Switch over delay time (DIP switch)	50 ms / 100 ms (-0 / + 40 %)
Power failure security	≥ 25 ms

Contacts

Type	2 CO, micro disconnection
Material	AgNi
Rated operational current	6 A
Max. inrush current (10 ms)	30 A
Max. switching voltage AC-1	250 V
Max. AC load AC-1 (Fig.1)	1500 VA
Max. DC load DC-1, 30 V / 250 V (Fig.2)	180 W / 75 W

Control input

Nominal voltage	**UC 24-60 V**	**UC 110-240 V**
Operating voltage range	20 … 75 V	90 … 265 V
Power consumption	≤ 1 W	≤ 1 W
Frequency range	50 Hz / 60 Hz	50 Hz / 60 Hz
Threshold voltage AC / DC	≤ 17 V / ≤ 19	≤ 60 V / ≤ 85 V
Max. Inrush current	1.5 A / 100 µs	0.6 A / 100 µs

Insulation

Test voltage open contact	1 kVrms 1 minute
Test voltage between contacts and control input	2 kVrms 1 minute

General Specifications

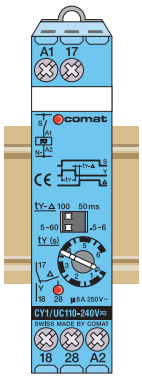
Ambient temperature storage /operation	-40 … 80 °C / -25 …60 °C
Mechanical life of contacts	30 x 10^6 operations
Conductor cross section	Stranded wire 2.5 mm^2, 2 x 1.5 mm^2
Ingress protection degree	IP 20
Max. Screw torque	0.4 Nm
Housing material / Weight	Lexan / 76 g

Standard types

UC 50 Hz /60 HZ	**CY1/UC24-60V R** **CY1/UC110-240V R**

Accessories

Label plate: (replacement)	**BZS-DIN 17.5**



Connection diagram

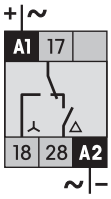


Fig.1 AC electrical endurance

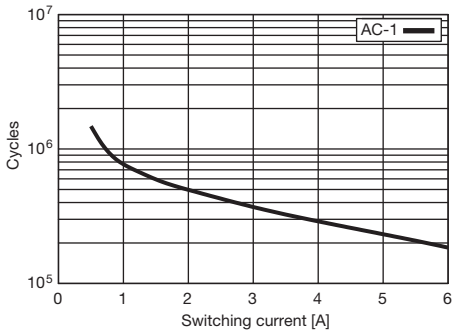
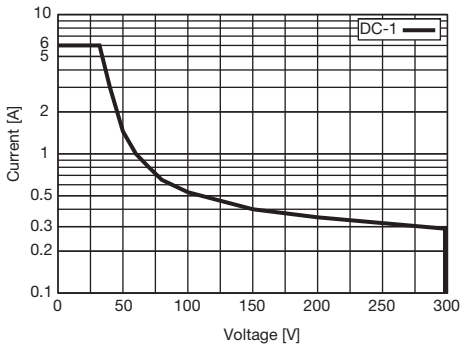
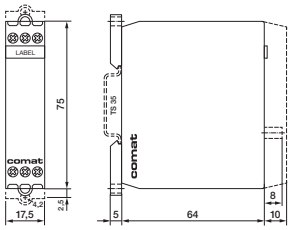


Fig. 2 DC load limit curve



Dimensions [mm]

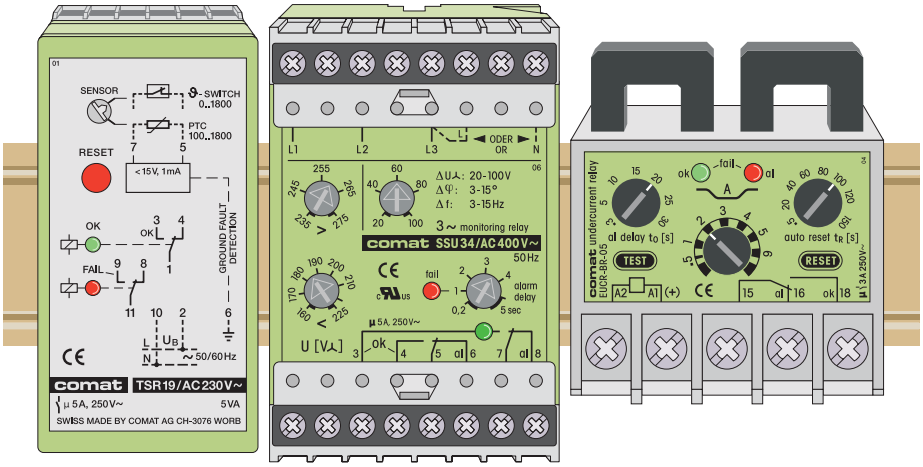


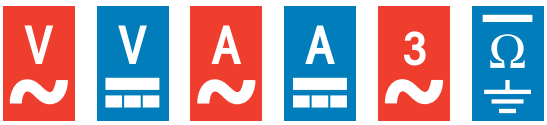
Technical approvals, conformities

EN 60 947

Notes

Monitoring Relays

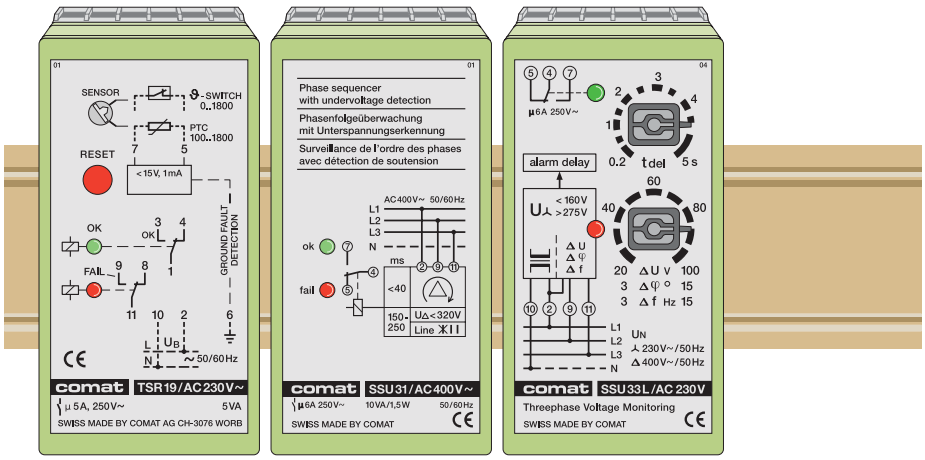




Notes

3.1 Plug-in Monitoring Relays

Plug-in Monitoring Relays



Application	Types	Monitoring	Monitoring ratings	Output contacts	Design
3.1 Plug-in Monitoring Relays					
Thermo protection	TSR19	°C	Th.sens. 0 … 1800 Ω	2 CO	11 pin
Phase sequence monitoring	SSU31	3	Δ 208 V, 400 V	1 CO	11 pin
3 Phase monitoring	SSU33L		⅄ 230 V, Δ 400 V	1 CO	11 pin

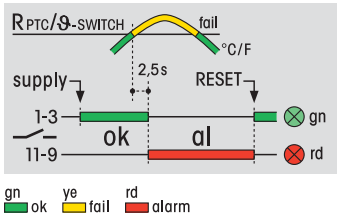
TSR 19

11 pin plug-in thermal motor protection relay according to IEC 67-I-18a

Type: TSR19/…V

Plug-in monitoring relay for temperature of coils of motors, transformers etc.
1 CO contact for OK state, 1 CO contact for alarm state.

Monitoring function



The TSR19 monitors the temperature of motor coils, generators and transfomers.
It detects the temperature of the windings by the change of the PTC thermistors resistances ① or by the state of the thermo switches ②. The circuit detects a sensor line interruption or a ground fault of the sensor lines.
Reset after failure detection: Press reset button or interrupt the supply voltage for > 200 ms.

Measuring circuit data

Sensor resistance, OK range	100 … 1800 Ω
Thermo switch, OK range	0 … 1800 Ω
Fail ranges	≤ 50 Ω, ≥ 2250 Ω, ≤ 1 kΩ ground fault
Max. sensor conductor resistance	20 Ω
Sensor supply voltage, idle state	15 V @ $R_{Sens} = \infty$

Time data

Constant alarm delay time	2.5 s ± 20 %
Power failure security	100 ms

Contacts

Type / material	2 CO, micro disconnection / Ag Ni
Rated operational current	5 A
Inrush current (10 ms)	30 A
Max. switching voltage AC-1, DC-1	250 V
Max. AC load AC-1 (Fig 1.)	1250 VA
Max. DC load 30 V / 250 V (Fig 2.)	120 W / 50 W
Recommended min. contact load	10 mA / 12 V

Power supply

Nominal voltage (UC = AC / DC)	**UC 24 – 48 V**	**AC 230 V**
Operating voltage range	UC 19 … 60 V	AC 190 … 250 V
Power consumption	1.5 W	1.5 W
Frequency range	50 / 60 Hz	50 / 60 Hz

Insulation

Test voltage between contacts and other circuits	2 kV 1 minute
Test voltage between Power supply inputs and other circuits	2 kV 1 minute

General specifications

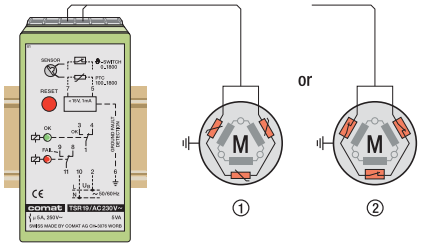
Ambient temperature storage /operation	-40 … 85 °C / -10 … 60 °C
Mechanical life of contacts	≥ 30 x 10^6
Ingress protection degree	IP 40 when plugged in
Housing material	Lexan, alu front plate
Weight	210 g

Standard types

AC 230 (50/60Hz)	**TSR19/AC230V**
UC 24-48	**TSR19/UC24-48V**

Accessories

Socket:	**S-3B**
Retention clip:	**HF-24**
Front panel mounting set:	**FZ-23**



Connection diagram

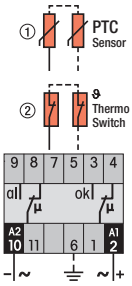


Fig.1 AC voltage endurance

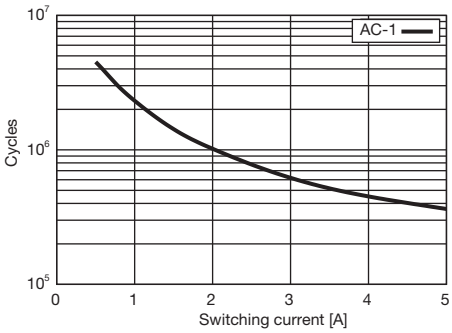
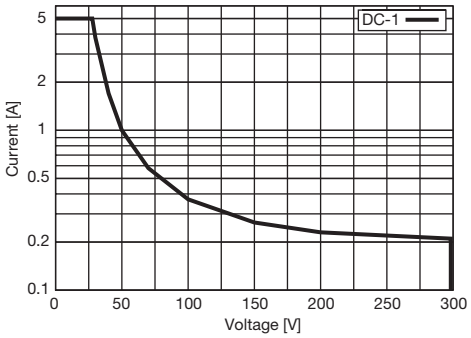
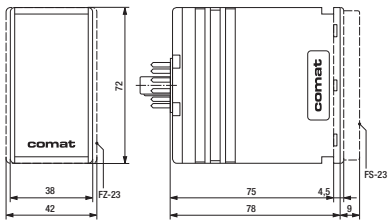


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

EN 61010; EN 60947

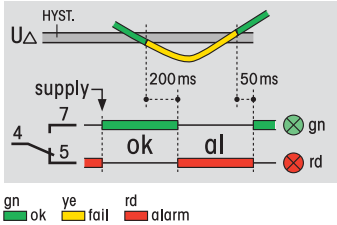
SSU31

11 pin plug-in phase sequence monitoring relay according to IEC 67-I-18a

Type: SSU31/… V

1 change over alarm contact 6 A 250V

Monitoring function



The SSU31 serves as a phase-sequence, three-phase undervoltage and phase failure monitor.
The monitoring function helps to ensure the correct rotation direction of pumps, motors and conveyors in mobile devices with connection to different power outlets.
The defined undervoltage and phase failure protects against malfunction and damage caused by overheating.

Measuring circuit data

Nominal delta connection mains voltage	**208 V**	**400 V**
Under voltage threshold	≤ 166 V ± 5 %	≤ 320 V ± 5 %
Hysteresis	5 V	10 V
Phase sequence	L1-L2-L3	L1-L2-L3
Phase loss	One or several	One or several

Time data

Alarm delay for phase sequence	30 ms / +0 % … -25 %
Alarm delay for phase loss	150 - 250 ms
Alarm delay for under voltage	150 - 250 ms
Reset time	50 ms

Contacts

Type / Material	1 CO, micro disconnection /AgNi
Rated operational current	6 A
Max. inrush current (10 ms)	30 A
Max. switching voltage	250 V
Max. AC load AC-1 (Fig.1)	1500 VA
Max. DC load DC-1, 30 V / 250 V (Fig.2)	180 W / 75 W
Recommended min. contact load	10 mA / 12 V

Power supply data

Nominal delta connection mains voltage	**208 V**	**400 V**
Operating voltage range	176 … 235 V	340 … 460 V
Power consumption	1.5 W	1.5 W
Input current	≤ 25 mA	≤ 25 mA
Frequency range	45 … 65 Hz	45 … 65 Hz

Insulation

Test voltage between contacts and supply	2 kVrms, 1 minute (basic insulation)

General specifications

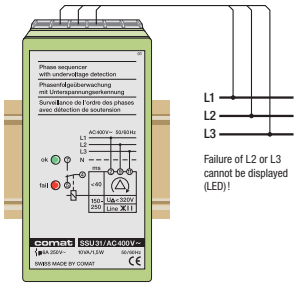
Ambient temperature storage /operation	-40 … +85 °C / -25 …+60 °C
Mechanical life of contacts	30 x 10^6 operations
Ingress protection degree	IP 40 when plugged in
Weight	300 g

Standard types

AC 208 50 / 60Hz	**SSU31/AC208V**
AC 400 50 / 60Hz	**SSU31/AC400V**

Accessories

Socket:	**S-3B**
Retention clip:	**HF-24**
Front panel mounting set:	**FZ-23**



Connection diagram

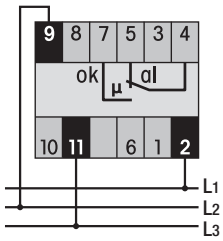


Fig.1 AC voltage endurance

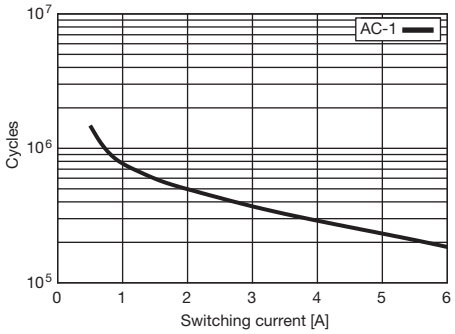
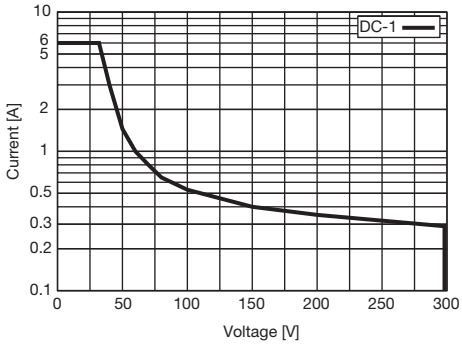
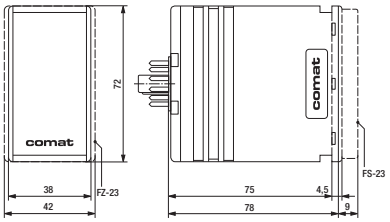


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

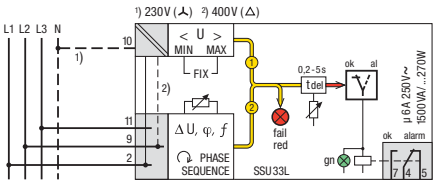
EN 60947

SSU33L

11 pin plug-in 3 phase monitoring relay according to IEC 67-I-18a

Type: SSU33L/… V
1 change over alarm contact 6 A 250 V

Monitoring function



In case of a power failure the alarm is activated without delay!

The SSU33 (50Hz) provides comprehensive monitoring of three-phase mains supplies with or without neutral.
The following mains faults are monitored:
Error signal ① U (V⅄, VΔ):
Exceeding or dropping below the fixed voltage values Umin/Umax for L1-N or L1-L2 (no differential voltage, phase position or frequency fault).

Error signal ② U, Δ φ, Δ f:
One or more of the three voltages, phase positions, phase sequence or the mains frequency are diverging from the required value.
Depending on the nature of their occurrence Δ-errors are evaluated cumulatively.
Any error is signalled by the red LED and is reported after expiry of the set alarmdelay time.
In the correct status (ok) the green LED is illuminated (4-5 open, 4-7 closed).

Measuring circuit data	**Type star with N**	**Type delta**
Nominal mains voltage	230 V	400 V
Constant under voltage threshold ± 5 %	L1 – N ≤ 160 V	L1-L2 ≤ 280 V
Constant over voltage threshold ± 5 %	L1 – N ≥ 275 V	L1-L2 ≥ 480 V
Difference voltage adjustment range [1]	20 … 100 V	20 … 100 V to N
φ adjustment range [1]	3 … 15 °	3 … 15 °
f adjustment range [1]	3 … 15 Hz	3 … 15 Hz

[1] adjustment with the same rotary knob

Time data	
Alarm delay adjustment range	0.2 … 5 s
Reset time	50 ms

Contacts	
Type / Material	1 CO, micro disconnection / AgNi
Rated operational current	6 A
Max. inrush current (10 ms)	30 A
Max. switching voltage	250 V
Max. AC load AC-1 (Fig.1)	1500 VA
Max. DC load DC-1, 30 V / 250 V (Fig.2)	180 W / 75 W
Recommended min. contact load	10 mA / 12 V

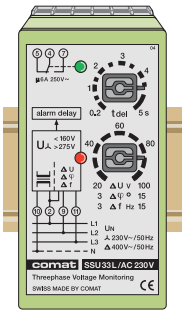
Power supply data	**Type star with N**	**Type delta**
Nominal mains voltage	230 V	400 V
Operating voltage range	160 … 275 V	280 … 470 V
Power consumption	1.5 W	1.5 W
Input current	1.5 mA	1.5 mA
Frequency	50 Hz	50 Hz

Insulation	
Test voltage between contacts and supply	2 kVrms, 1 minute (basic insulation)

General specifications	
Ambient temperature storage /operation	-40 … +85 °C / -25 …+60 °C
Mechanical life of contacts	30 x 10^6 operations
Ingress protection degree	IP 40 when plugged in
Housing material	Lexan, alu front plate
Weight	300 g

Standard types		
AC 230 50 Hz	**SSU33L/AC230V**	(Star connection)
AC 400 50 Hz	**SSU33L/AC400V**	(delta connection)

Accessories: Socket:	**S-3B**
Retention clip:	**HF-24**
Front panel mounting set:	**FZ-23**



Connection diagram

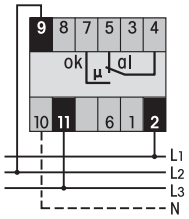


Fig.1 AC voltage endurance

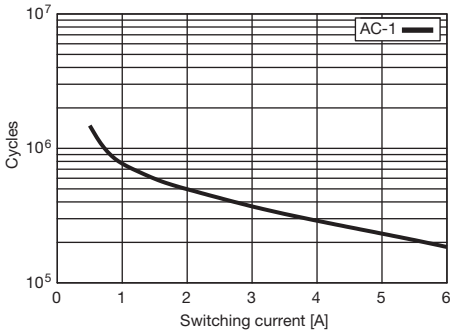
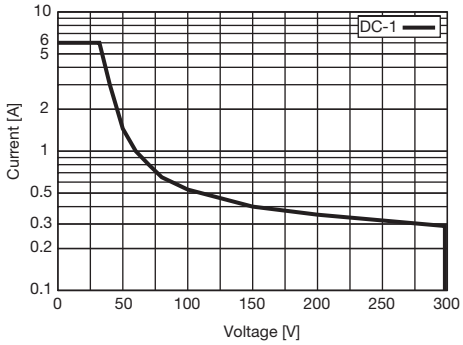
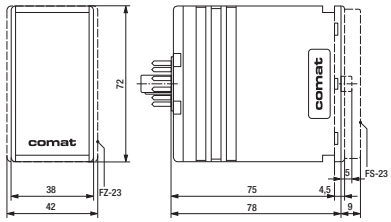


Fig. 2 DC load limit curve



Dimensions [mm]

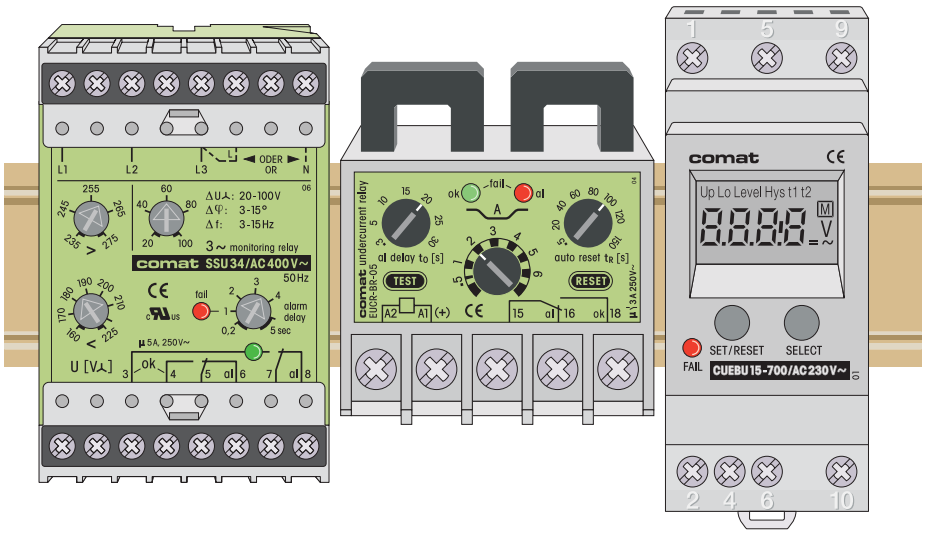


Technical approvals, conformities

EN 60947

3.2 DIN Monitoring Relays

DIN Monitoring Relays



Application	Types	Monitoring	Monitoring ratings	Output contacts	Design
3.2 DIN Monitoring Relays					
Voltage monitoring, AC 50 / 60 Hz	MV53	V ~	AC 115 V, 230 V	1 CO	22.5 mm
Voltage monitoring, AC 50 / 60 HZ / DC	CUEBU	V ~ V ⎓	15 … AC 480 V / DC 700 V	1 CO	35 mm
Current monitoring, AC 50 / 60 Hz / DC	CUEBI	A ~ A ⎓	0.1 … 10 A	1 CO	35 mm
Over- or under current Monitoring	ExCR	A ~	6 A, 30 A, 60 A	1 CO	54 mm
Over- and under current Monitoring	ECR-3D	A ~	6 A, 60 A	1 CO	70 mm
50 Hz, 3 Phase monitoring, differential voltage, phase position, frequency	SSU34	3 ~	100 V, 400 V, 500 V	2 CO	50 mm
60 Hz, 3 Phase monitoring, differential voltage, phase position, frequency	SSU36	3 ~	208 V, 460 V, 480 V	2 CO	50 mm
Isolation	ESU	Ω ⏚	1 … 50 k Ω	1 CO / 1 CO+NO	50 mm

MV53

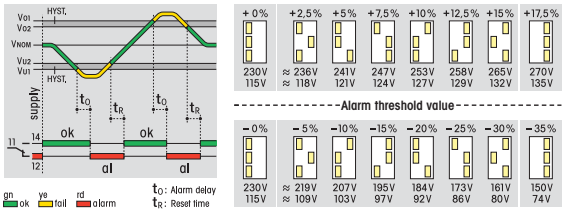
AC Voltage monitoring relay
DIN Rail mounting according to DIN 43 880

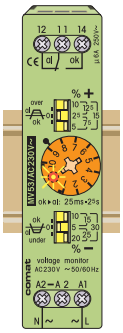
Type: MV53 /... V

Voltage monitoring relay with over- and under voltage thresholds.
Adjustable alarm delay. Alarm LED. Threshold setting by DIP switch.
1 change over alarm contact 6 A 250 V. Very suitable for protecting of contactor coils against under voltage (under voltage → low Z of coil → over current → defective).

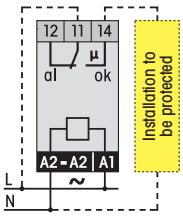
Monitoring function

Threshold settings in % of nominal voltage.
Do not set 0 % for both thresholds.





Connection diagram



Measuring circuit data

Nominal voltage V_{nom}, type	AC 115 V / AC 230 V
Over voltage setting range (2.5 % steps)	0 … 17.5 % from V_{nom}
Under voltage setting range (5 % steps)	0 … - 35 % from V_{nom}
Frequency range	45 … 65 Hz
Accuracy	± 3 %

Time data

Fault detection time	100 ms
Alarm delay adjustment range	25 ms … 2.5 s
Power failure security	≥ 10 ms

Contacts

Type / Material	1 CO, micro disconnection /AgNi
Rated operational current	6 A
Max. inrush current (10 ms)	15 A
Max. switching voltage	250 V
Max. AC load AC-1 (Fig.1)	1500 VA
Max. DC load DC-1, 24 V / 220 V (Fig.2)	120 W / 65 W
Recommended min. contact load	100 mA / 5 V

Power supply

Nominal voltage	**AC 115 V**	**AC 230 V**
Operating voltage range	65 … 135 V	130 … 270 V
Power consumption	2.2 W	2.2 W
Frequency range	45 … 65 Hz	45 … 65 Hz
Surge immunity EN 6100-4-5	2 kV	2 kV

Insulation

Test voltage open contact	1 kVrms 1 minute
Test voltage between contact and power supply	2 kVrms 1 minute

General specifications

Ambient temperature storage /operation	-40 … +85 °C / -25 …+60 °C
Mechanical life of contacts	20 x 10^6 operations
Conductor cross section	Stranded wire 2.5 mm^2, 2 x 1.5 mm^2
Ingress protection degree	Housing: IP 40, terminals: IP 20
Max. Screw torque	0.4 Nm
Housing material	Lexan
Weight	80 g

Standard types

AC 115 50 / 60 Hz	**MV53/AC115V**
AC 230 50 / 60 Hz	**MV53/AC230V**

Fig.1 Contact endurance

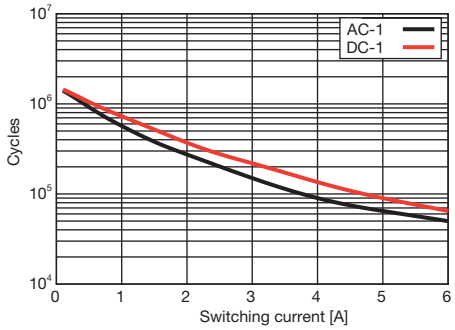
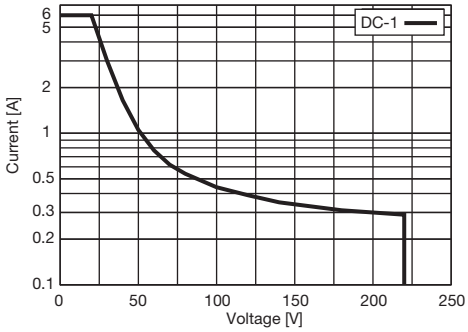
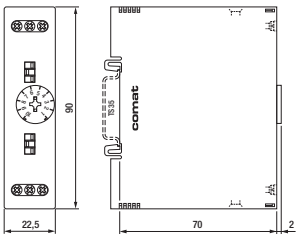


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

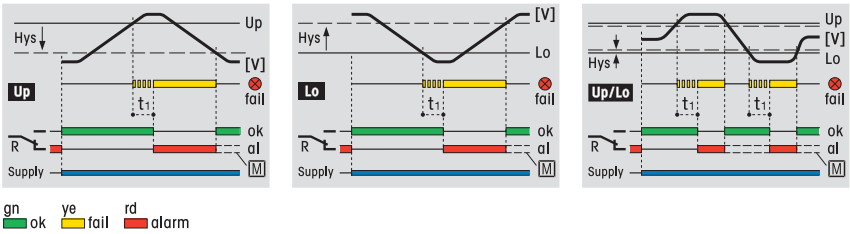
CUEBU15-700

Voltage monitoring relay AC/DC
DIN Rail mounting according to DIN 43 880

Type: CUEBU15-700/AC230V

Voltage monitoring relay with over- and under voltage thresholds, up to 700 V. Alarm delay setting. Alarm LED. Display for voltmeter function, alarm signal and interactive parameter setting. Selectable memory function.
1 change over alarm contact 8 A 250 V. Uncomplicated parameter setting.

Monitoring function



Measuring circuit data

Over-under voltage setting ranges AC / DC	15 … 480 V / 15 … 700 V
Frequency	50 / 60 Hz
Resolution	1 V
Accuracy	2 % + ± 1digit
Input resistance	1 MΩ

Time data

Alarm delay time setting range	0.1-12 s
Reset time	0.2 s
Power failure security	≥ 200 ms

Contacts

Type / Material	1 CO, micro disconnection /AgSnO2
Rated operational current	8 A
Max. inrush current (10 ms)	15 A
Max. switching voltage	250 V
Max. AC load AC-1 (Fig.1)	2000 VA
Max. DC load DC-1, 24 V / 220 V (Fig.2)	190 W / 35 W
Recommended min. contact load	5 mA / 5 V

Power supply

Nominal voltage	AC 230 V
AC operation voltage range	180 … 260 V
Frequency	50 / 60 Hz
Power consumption	1.5 W

Insulation

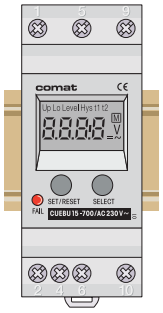
Test voltage open contact	1 kVrms 1 minute
Test voltage between contacts and power supply	3 kVrms 1 minute
Test voltage between measuring inp. and other circuits	3 kVrms 1 minute

General specifications

Ambient temperature storage /operation	-40 … +70 °C / -20 …+55 °C
Mechanical life of contacts	10 x 10^6 operations
Conductor cross section	Stranded wire 2.5 mm^2, 2 x 1.5 mm^2
Ingress protection degree	Housing: IP 40, terminals: IP 20
Max. Screw torque	0.5 Nm
Weight	172 g

Standard types

AC 230, 50/60Hz	**CUEBU15-700/AC230V**



Connection diagram

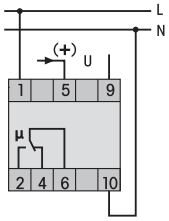


Fig.1 AC voltage endurance

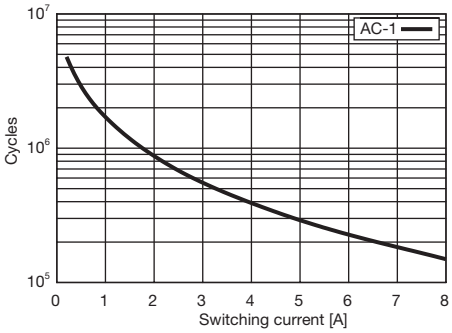
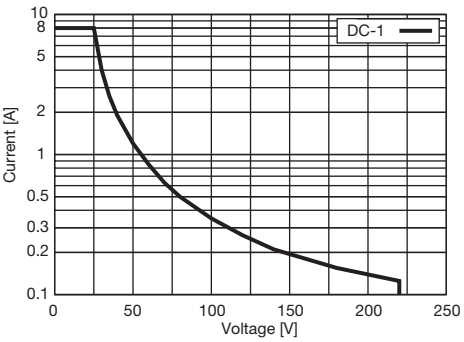
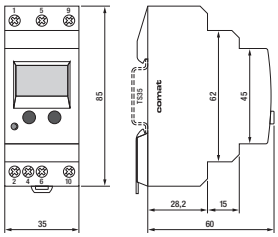


Fig. 2 DC load limit curve



Dimensions [mm]



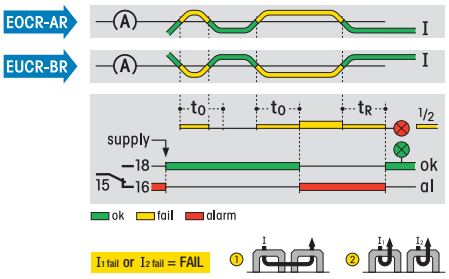
Technical approvals, conformities

EOCR, EUCR

Current monitoring relay with 2 current inputs
DIN Rail mounting according to DIN 43 880

Type: EOCR-AR-… / … V (Over current), EUCR-BR-… / … V (Under current)
AC current monitoring relay for 1 or 3 phase lines, 1 change over alarm contact 3 A / 250 V
Integrated current transformer coupling system, 6 A, 30 A, 60 A types

Monitoring function



The EOCR-AR and the EUCR-BR monitor overcurrent and undercurrent on AC power circuits.
One or two current paths can be monitored directly up to 60 (75) A, by means of the integrated current loop transformers.
The adjustable alarm delay (t0) and the automatic alarm resetting (tR) permit universal usage in motor and transformer protection systems, monitoring of electrical heating elements and in the control of pumps, ventilation systems, suction and feed devices.

Measuring circuit data

Setting ranges	0.5 … 6 A / 3 … 30 A / 5 … 60 A
Frequency range	48 … 62 Hz
Accuracy	2.5 %
Hysteresis	3 % from set value
Max. continuous current 6 / 30 / 60 A type	60 A / 90 A / 120 A
Peak current (1 sec) 6 / 30 / 60 A type	3 kA / 5 kA / 5 kA
1) Expansion of the current ranges:	
Lower currents (see table at right):	Two or more loops through the current transformer.
Higher currents:	External current transformer. See accessories.

Time data

Alarm delay time adjustment range	0.3 … 30 s
Reset time adjustment range	0.5 … 150 s
Response time, power on, on A1	80 … 150 ms

Contacts

Type / Material	1 CO, micro disconnection / AgNi
Rated operational current	3 A
Max. switching voltage, AC-1	250 V
Max. AC load	750 VA
Max. DC load	90 W

Power supply

Nominal voltage (UC = AC/DC)	**UC 24 V**	**AC 115 V**	**AC 230 V**
Operation voltage range [V]	19 … 30	88 … 130	184 … 264
Power consumption [W]	1.5	1.5	1.5
Frequency [Hz]	50 / 60	50 / 60	50 / 60

Insulation

Test voltage between contacts and supply inp.	2 kVrms 1 minute
Test voltage between curr. transf. and other circuits	4 kVrms 1 minute

General specifications

Ambient temperature storage /operation	-25 … 85 °C / -20 … 60 °C
Ingress protection degree	Housing: IP 40, terminals: IP 20
Max. screw torque	0.8 Nm
Weight	120 g

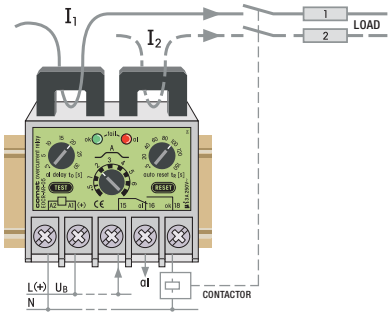
Standard types

Current [x] 05/30/60

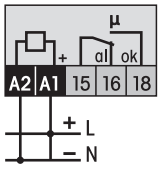
Over current	Under current
EOCR-AR- x /UC24V	**EUCR-BR-x /UC24V**
EOCR-AR- x /AC115V	**EUCR-BR-x /AC115V**
EOCR-AR- x/AC230V	**EUCR-BR-x /AC230V**

Accessories

Current transformer for expanded current values, 50, 100, 250, 500 A **SRCT-35-…/5A**



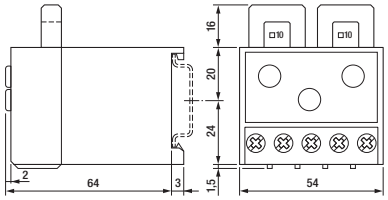
Connection diagram



Expansion of current ranges

[A]	1x	2x	3x	4x	5x
-05	0,5-6	0,25-3	0,17-2	0,13-1,5	0,1-1,2
-30	2,5-30	1,25-15	0,83-10	0,62-7,5	0,5-6
-60	5-60	2,5-30	1,7-20	1,25-15	1-12

Dimensions [mm]



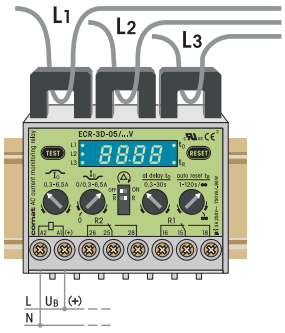
Technical approvals, conformities

ECR-3D

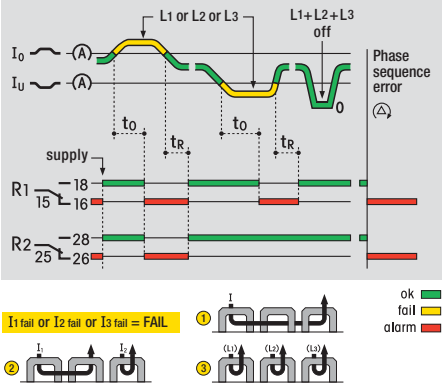
Current monitoring relay with 3 phase current inputs, interactive display for settings and amperemeter, DIN Rail mounting according to DIN 43 880

Type: ECR-3D-… / … V

AC current monitoring relay for 3 phase lines, 2 change over alarm contacts 3 A / 250 V
Integrated current transformer coupling system, 5 A, 60 A types

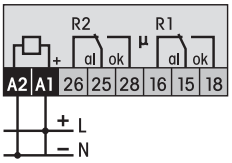


Monitoring function



The ECR-3D monitors overcurrent (I0) and undercurrent (IU) on AC power circuits.
Three current paths of up to 60 (75) A can be monitored directly by means of the inte-grated current loop transformers.
The integrated phase sequence monitoring, which can be switched off is extending applications in 3 phases mains.
A failure or switch off of all 3 phases will be recognized as an intended switch off and does not trigger an alarm.
The adjustable alarm delay (t0) and the automatic alarm resetting (tR) permit universal usage in automation and protection techniques. The set values are displayed automatically by setting the respective parameters. The output relay function can be inverted with the DIP switch «R».

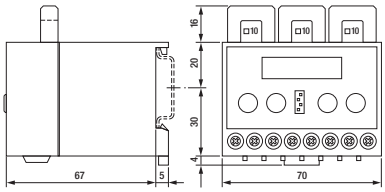
Connection diagram



Expansion of current ranges

[A]	1x	2x	3x	4x	5x
-05	0,5-6,5	0,25-3,2	0,17-2,1	0,13-1,63	0,1-1,3
-60	5-75	2,5-38	1,7-25	1,25-18,8	1-15

Dimensions [mm]



Measuring circuit data

Setting ranges	0.5 … 6.5 A / 5 … 75 A
Frequency range	50 / 60 Hz
Accuracy @ 50 Hz	3 % + 2 digits
Hysteresis	2 % from set value
Max. continuous current 5 / 60 A type	60 A / 120 A
Peak current (1 sec) 5 / 60 A type	3 kA / 5 kA

Time data

Alarm delay time adjustment range	0.3 … 30 s
Auto Reset time adjustment range	1 … 120 s or ∞ (manual reset)
Response time, power on, on A1	≤ 200 ms

Contacts

Type / Material	1 CO, micro disconnection /AgNi
Rated operational current	3 A
Max. switching voltage, AC-1	250 V
Max. AC load AC-1	750 VA
Max. DC load DC-1	125 V 0.2 A

Power supply

Nominal voltage (UC = AC/DC)	**UC 24 V**	**UC 110 … 240 V**
Operation voltage range [V]	19 … 30	85 … 264
Power consumption [W]	1.5	1.5
Frequency [Hz]	50 / 60	50 / 60

Insulation

Test voltage between contacts and supply inp.	2 kVrms 1 minute
Test voltage between curr. transf. and other circuits	4 kVrms 1 minute

General specifications

Ambient temperature storage /operation	-40 … 85 °C / -20 … 60 °C
Ingress protection degree	Housing: IP 40, terminals: IP 20
Max. screw torque	0.8 Nm
Weight	165 g

Standard types

Current [x] 05/60	**ECR-3D- x /UC24V**
	ECR-3D- x /UC110-240V

Accessories

Current transformer for expanded current values, 50, 100, 250, 500 A **SRCT-35-…/5A**

Technical approvals, conformities

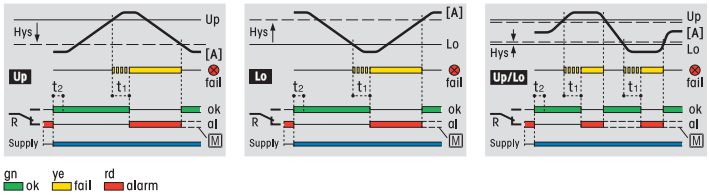
CUEBI01-10

Current monitoring relay AC/DC
DIN Rail mounting according to DIN 43 880

Type: CUEBI01-10/AC230V

Current monitoring relay with over- and under current thresholds 0.1 … 10 A.
Alarm delay setting. Alarm LED. Display for ampere meter function, alarm signal and interactive parameter setting. Selectable memory function.
1 change over alarm contact 8 A 250 V. Uncomplicated parameter setting.

Monitoring function



Measuring circuit data

Over-under current setting ranges AC / DC	0.1 … 10 A
Frequency	50 / 60 Hz
Resolution	0.1 A
Accuracy	2 % + ± 1digit
Internal resistance	5 mΩ

Time data

Alarm delay time setting range	0.1-12 s
Reset time	0.2 s
Power failure security	≥ 200 ms

Contacts

Type / Material	1 CO, micro disconnection /AgSnO2
Rated operational current	8 A
Max. inrush current (10 ms)	15 A
Max. switching voltage	250 V
Max. AC load AC-1 (Fig.1)	2000 VA
Max. DC load DC-1, 24 V / 220 V (Fig.2)	190 W / 35 W
Recommended min. contact load	5 mA / 5 V

Power supply

Nominal voltage	**AC 230 V**
AC operation voltage range	180 … 260 V
Frequency	50 / 60 Hz
Power consumption	1.5 W

Insulation

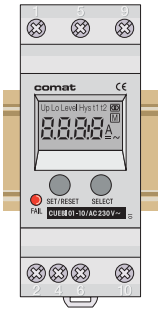
Test voltage open contact	1 kVrms 1 minute
Test voltage between contacts and power supply	3 kVrms 1 minute
Test voltage between measuring inp. and other circuits	3 kVrms 1 minute

General specifications

Ambient temperature storage /operation	-40 … +70 °C / -20 …+55 °C
Mechanical life of contacts	10 x 10^6 operations
Conductor cross section	Stranded wire 2.5 mm^2, 2 x 1.5 mm^2
Ingress protection degree	Housing: IP 40, terminals: IP 20
Max. Screw torque	0.5 Nm
Weight	172 g

Standard types

AC 230, 50/60Hz	**CUEBI01-10/AC230V**



Connection diagram

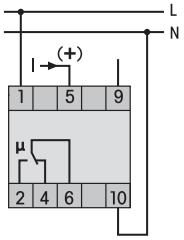


Fig.1 AC voltage endurance

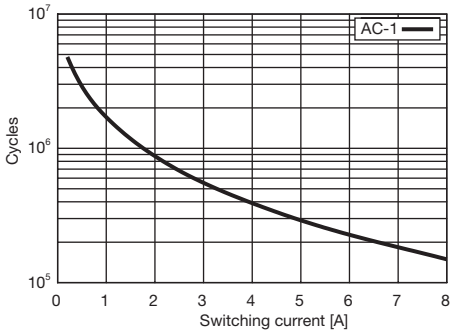
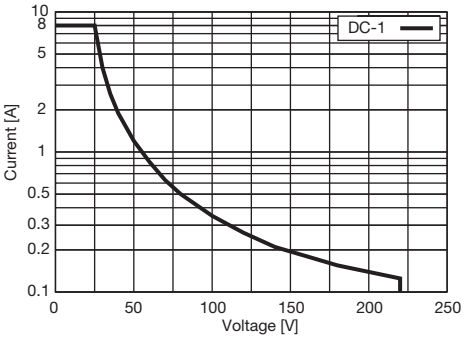
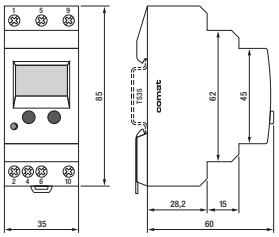


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

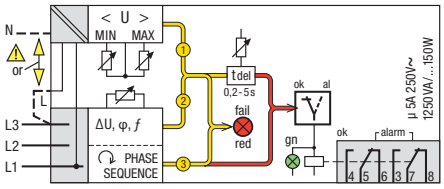
SSU34

50 Hz, 3 phase monitoring relay
DIN Rail mounting according to DIN 43 880

Type: SSU34/… V

Monitoring relay for under / over voltage, phase sequence, phase loss, phase angle, frequency, asymmetry. Star or delta operation. 2 change over alarm contacts 6 A 250V

Monitoring function



In case of power failure the alarm is activated without delay!

The SSU34 (50Hz) provide comprehensive monitoring of three-phase mains supplies with or without neutral.
The following mains faults are monitored:
Error signal ① U (V∆, V⅄):
Exceeding or dropping below the set voltage values Umin/Umax for L1-N or L1-L3,L (no differential voltage, phase position or frequency fault).

Error signal ② ΔU, Δφ, Δf:
One or more of the three voltages, phase positions, or the mains frequency are diverging from the required value. Depending on the nature of their occurrence Δ-errors are evaluated cumulatively.
Error signal ③:
Connection polarity reversal (wrong phase-sequence). Any error is signalled by the red LED "fail" and is reported after expiry of the set alarm-delay time (for error signal ③ undelayed) via 5-6 and 7-8.
In the correct status (ok) the green LED is illuminated (5-6 and 7-8 open, 5-4 and 7-3 closed).

Measuring circuit data

Nominal mains voltage	100 V	400 V	500 V
Under voltage adj. range [V] 1)	40 … 55	160 … 225	200 … 280
Over voltage adj. range [V] 1)	61 … 70	235 … 275	300 … 350
Δ voltage adj. range [V] 1) 2)	5 … 25	20 … 100	20 … 100
Δϕ adjustment range [°] 2)	3 … 15	3 … 15	3 … 15
Δf adjustment range [Hz] 2)	3 … 15	3 … 15	3 … 15

1) L - N 2) adjustment with the same rotary knob

Time data

Alarm delay adjustment range	0.2 … 5 s
Reset time	100 … 400 ms

Contacts

Type / material	2 CO, micro disconnection / AgNi
Rated operational current	5 A
Max. inrush current (20 ms)	15 A
Max. AC switching voltage AC-1	250 V
Max. AC load AC-1 (Fig.1)	1250 VA
Max. DC load 30 V / 250 V DC-1	150 W / 60 W
Recommended min. contact load	10 mA / 12 V

Power supply data

Nominal mains voltage	100 V	400 V	500 V
Operating voltage range [V] 1)	35 … 70	140 … 285	180 … 360
Power consumption [W]	≤ 1.5	≤ 1.5	≤ 1.5
Input current [mA]	150	30	25
Frequency [Hz]	50	50	50

Insulation

Test voltage between contacts and supply	3 kVrms, 1 minute (basic insulation)

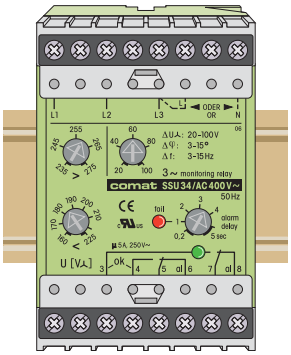
General specifications

Ambient temperature storage /operation	-40 … +85 °C/-10 …+60 °C
Mechanical life of contacts	30 x 10^6 operations
Ingress protection degree	Housing: IP 40, terminals: IP 20
Max. screw torque	0.5 Nm
Housing material / Weight	Lexan / 350 g

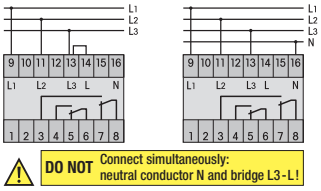
Standard types

50 Hz , AC 100, 400, 500 **SSU34/AC…V**

" …" enter the voltage for full type designation



Connection diagram



DO NOT Connect simultaneously: neutral conductor N and bridge L3-L!

Fig. 1 AC electrical endurance

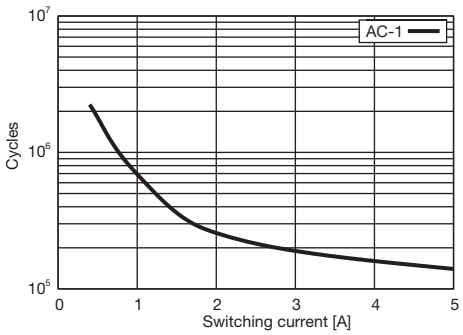
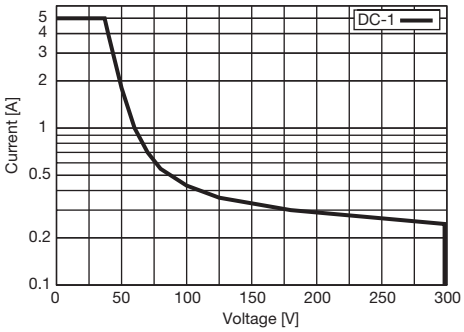
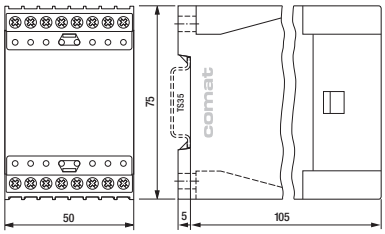


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

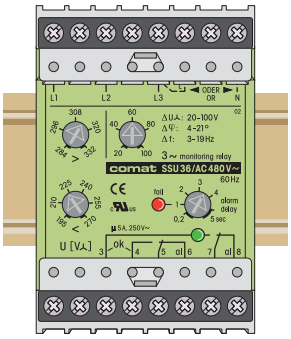
EN 60947

SSU36

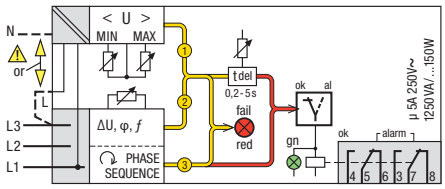
60 Hz, 3 phase monitoring relay
DIN Rail mounting according to DIN 43 880

Type: SSU36/… V

Monitoring relay for under / over voltage, phase sequence, phase loss, phase angle, frequency, asymmetry. Star or delta operation. 2 change over alarm contacts 6 A 250V



Monitoring function

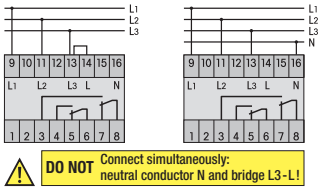


In case of power failure the alarm is activated without delay!

The SSU36 (60Hz) provide comprehensive monitoring of three-phase mains supplies with or without neutral.
The following mains faults are monitored:
Error signal ① U (V∆, V⅄):
Exceeding or dropping below the set voltage values Umin/Umax for L1-N or L1-L3,L (no differential voltage, phase position or frequency fault).

Error signal ② ΔU, Δφ, Δf:
One or more of the three voltages, phase positions, or the mains frequency are diverging from the required value. Depending on the nature of their occurrence Δ-errors are evaluated cumulatively.
Error signal ③:
Connection polarity reversal (wrong phase-sequence). Any error is signalled by the red LED "fail" and is reported after expiry of the set alarm-delay time (for error signal ③ undelayed) via 5-6 and 7-8.
In the correct status (ok) the green LED is illuminated (5-6 and 7-8 open, 5-4 and 7-3 closed).

Connection diagram



DO NOT Connect simultaneously: neutral conductor N and bridge L3-L!

Measuring circuit data

Nominal mains voltage	208 V	460 V	480 V
Under voltage adj. range [V] 1)	85 … 115	186 … 260	194 … 270
Over voltage adj. range [V] 1)	125 … 145	270 … 318	284 … 332
Δ voltage adj. range [V] 1) 2)	10 … 50	20 … 100	20 … 100
Δϕ adjustment range [°] 2)	5 … 24	4 … 21	4 … 21
Δf adjustment range [Hz] 2)	3 … 22	3 … 19	3 … 19

1) L - N 2) adjustment with the same rotary knob

Time data

Alarm delay adjustment range	0.2 … 5 s
Reset time	100 … 400 ms

Contacts

Type / material	2 CO, micro disconnection / AgNi
Rated operational current	5 A
Max. inrush current (20 ms)	15 A
Max. AC switching voltage AC-1	250 V
Max. AC load AC-1 (Fig.1)	1250 VA
Max. DC load 30 V / 250 V DC-1	150 W / 60 W
Recommended min. contact load	10 mA / 12 V

Power supply data

Nominal mains voltage	208 V	460 V	480 V
Operating voltage range [V] 1)	75 … 150	160 … 331	170 … 346
Power consumption [W]	≤ 1.5	≤ 1.5	≤ 1.5
Input current [mA]	70	25	25
Frequency [Hz]	60	60	60

Insulation

Test voltage between contacts and supply	3 kVrms, 1 minute (basic insulation)

General specifications

Ambient temperature storage /operation	-40 … +85 °C / -10 …+60 °C
Mechanical life of contacts	30 x 10^6 operations
Ingress protection degree	Housing: IP 40, terminals: IP 20
Max. screw torque	0.5 Nm
Housing material / Weight	Lexan / 350 g

Standard types

60 Hz , AC 208, 460, 480 **SSU36/AC…V**

" …" enter the voltage for full type designation

Fig. 1 AC electrical endurance

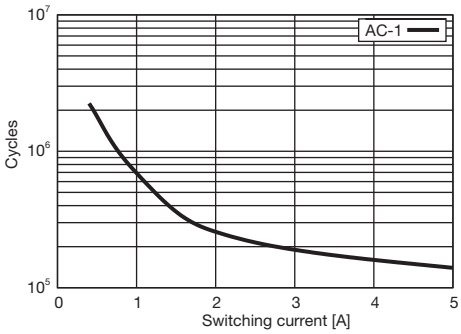
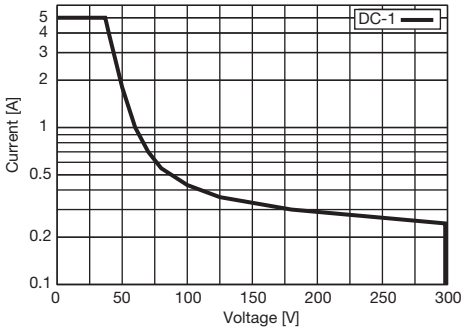
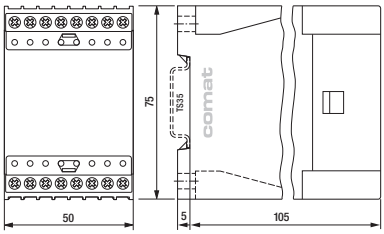


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

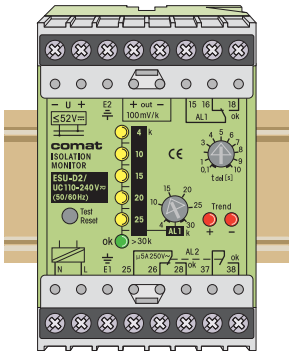
EN 60947

ESU-D2

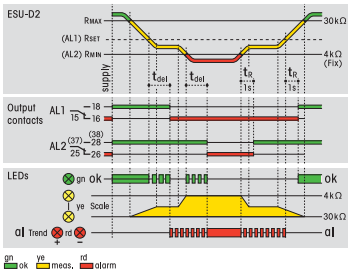
Insulation monitoring relay for unearthed DC-networks
DIN Rail mounting according to DIN 43 880

Type: ESU-D2/… V

Earth insulation resistance monitoring relay
Pre alarm 1 CO and main alarm 1 NO + 1 CO contact outputs 5 A / 250 V
UC 24 … 48 V, UC 110 … 240 V operating voltages, monitoring of
DC 12 … 48 V power supply networks. Monitoring of earth interruption on the device.
The device measures single or combined resistances occurring against + or – pole of the DC network. Adjustable alarm delay. Proved reliability in rolling stock applications.

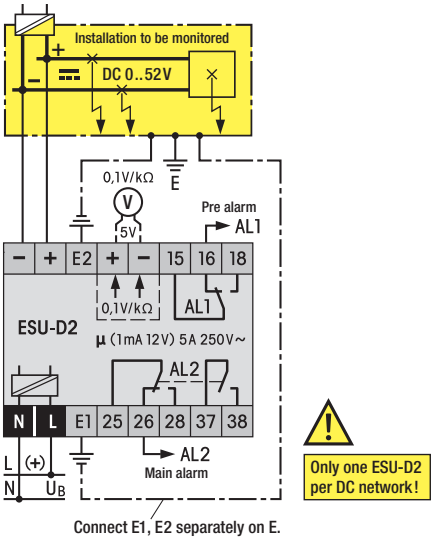


Monitoring function



The ESU-D2 monitors the isolation resistance in non-grounded DC-networks (24 – 48 V).
Two alarm steps (prealarm AL1 and main alarm AL2) are indicated via separate output contacts.
Displays: bargraph-display of the measured earthing resistance (green = ok). Two red LEDs show the ground tendency towards plus (+) or minus (–).
Output terminals 5 V for the external display of the earthing resistance (0,1 V/kΩ).
Test functions: Periodic automatic check, also with key "Test".
Environmental failures: monitoring of AC-short circuit, overvoltage, ground interruption.

Connection diagram

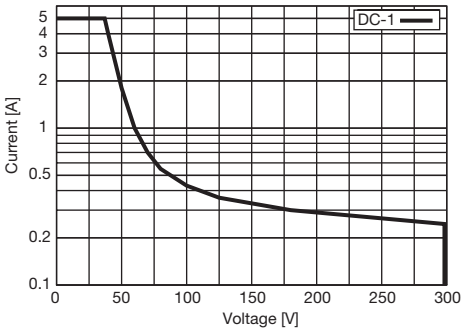


Measuring circuit data

Measuring / setting range for pre alarm	1 … 50 kΩ / 4 … 30 kΩ
Constant value for main alarm	4 kΩ
Tolerance	≤ 10 %
Overvoltage alarm level of DC network	60 V
Input current + → -	≤ 5 mA
Sampling current pulses +/- → earth	0.2 mA
Overvoltage safety from earth to +/- poles	AC 250 V
Max. capacity +/- → earth	1.5 µF [1)]

[1)] Types for capacitances until 60 µF on request

Fig. 1 DC load limit curve



Time data

Alarm delay time adjustment range	0.1 … 10 s
Fault detection time	800 ms
Auto reset time, fail to OK	1 s

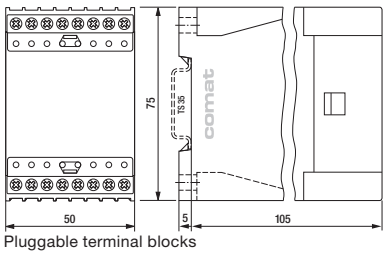
Contacts

Type / Material	2 CO, 1 NO micro disconnection / AgNi
Rated operational current / min. contact load	5 A / 1 mA 12 V
Max. switching voltage (Fig. 1)	250 V

Power supply

Nominal voltage	**UC 24-48 V**	**UC 110 – 240 V**
Operation voltage range	18 … 60 V	88 … 265 V
Power consumption	2 W	2 W
Power failure security	≥ 50 ms	≥ 50 ms

Dimensions [mm]



Pluggable terminal blocks

Insulation

Test voltage contacts to other circuits	2 kVrms 1 minute

General specifications

Ambient temperature storage /operation	-40 … 85 °C / -10 … 60 °C
Ingress protection degree	Housing: IP 40, terminals: IP 20
Max. screw torque	0.5 Nm
Weight	250 g

Technical approvals, conformities

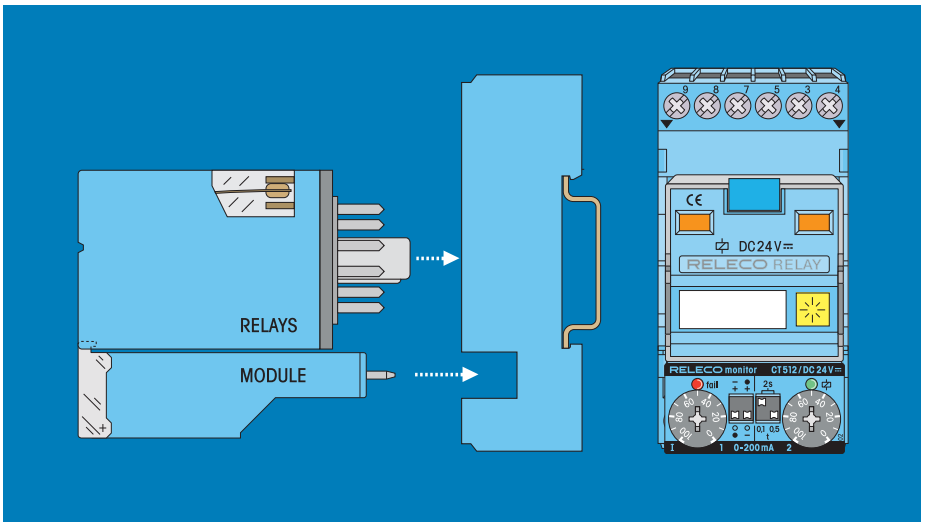
EN 60947

Standard types

UC 110-240	**ESU-D2/UC110-240V**
UC24-48	**ESU-D2/UC24-48V**

Notes

Modular plug-in Monitoring Relays



The modular monitoring system consists of individual plug-in monitoring modules with front cover, an 11-pole plug-in relay and a system socket with retaining spring.
The individual combination allows an optimal device selection for the foreseen application.
Later modifications as for example an exchange of relay from mechanical contacts to a relay with solid-state outputs are possible at any time.
The user profits of a universal system of worldwide unique flexibility.

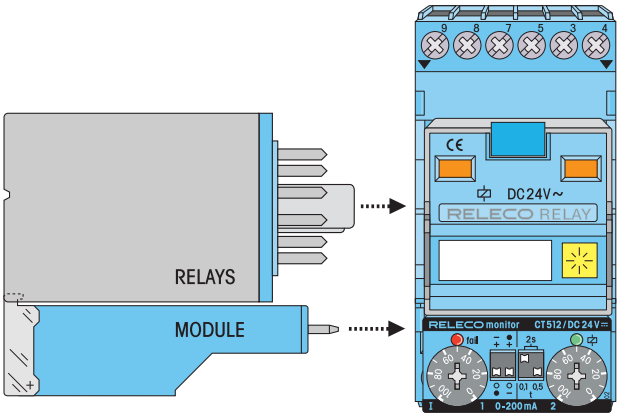
Notes

The modular Comat monitoring CT System

The monitoring relays consist of plug-in CT electronic modules and 11-pole output relays. Both system components can be combined in a variety of combinations. This allows adapting the system for the specific application.

Subsequent modifications, for example a change from mechanical contacts to solid-state outputs, are possible at any time just by replacing the relay.

This system provides the user a complete universal system with worldwide unmatched flexibility.



The system sockets C12B0 or CS-155 serve as a basis for the secure reception of the electronic modules. The sockets have a 4-pole module slot in which the CT modules lock firmly and vibration proof also without the output relay. Contact is made with reliable twin knife contacts.

With the A2 connector bridge "C-A2", the neutral conductor (N/-) can be connected from socket to socket. It reduces wiring work considerably.

Robust terminals for wires up to 4mm^2 and spacious labeling are other advantages of this practical Comat modular system.

Clear markings close to the terminal connections on the sockets make it easy to identify the connections for wiring and servicing.

The CT modules are proof of the practical oriented experiences of Comat in the field of industrial electronics. All control and display elements are arranged easy accessible at all times on the front side of the modules. The functions and settings are self-explanatory schematically illustrated on the front and allow to review the set values also during operation.

A transparent cover over the module setting components provides protection from unintentional settings and additionally links the module to the output relay.

Triggering is performed with the operating voltage. (L1 or +). No potential-free contacts are therefore required. The triggering complies to machine standards. Parallel connection to B1 is admissible.

The output relays show the connection diagram and the technical values on the front side, (exception C3 and C5 relays). A color code indicates an AC coil with red and a DC coil with blue color. Most of the relays have a lockable test button for manual operation.

The standard contacts have proven its reliability for high switching current applications over many years. The contact material AgNi permits a wide switching range and due to the large dimensioning they are designed for a high number of switching cycles. The high breaking capacity of up to 10A/400V and a low load switching capability of 12V/10mA makes the contact suitable for the use in main circuits as well as for low voltage applications.

The twin contacts are switching the load circuit with 2 independent contact tongues. The switching safety for low currents is therefore 100 times higher compared to a single contact relay. Despite the high switching capacity of up to 6A/250V, these contacts are very suitable to switch low currants and voltages up to 1mA/6V.

The solid-state relays are an alternative to mechanical relays. In the standard version, the relay has a potential-free universal semiconductor output for AC or DC loads. The advantage is a bouncing- and wear- free, overload resistant, short circuit protected output with a practical unlimited life cycle.

Solid-state relays are specially recommended for applications of high switching cycles, for example for repeat cycle timers, flushing lights, but also for high inductive switching loads of solenoid valves, couplings, motors, etc. The solid state relays are also suitable for capacitive loads, for example long power lines, or compensated lighting circuits.

Additional protection circuits of the output or of the load are not necessary in any application for this type of Comat relays.

The solid-sate relays are insensitive in any aggressive environment such as chemical plants, sewage plants etc. and are therefore an excellent choice for the employment in such environments.

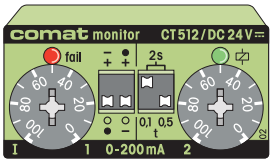
The train symbol indicates products available in a special railway execution according EN 50155.
Please refer to our special railway brochure for details.

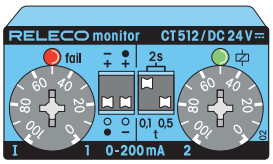
CT512, CT515, CT516

Plug-in current monitoring modules (combined with industrial relays)
0.2 A, 2 A, 6 A. DC 24 V operation

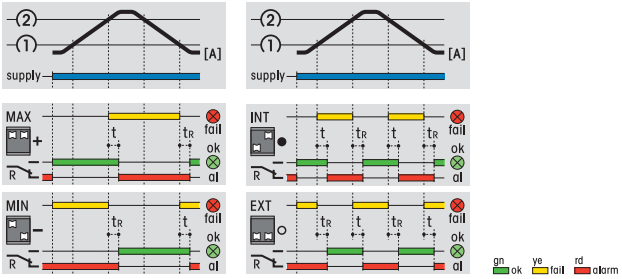
Type	**Blue:**	**CT512, CT515, CT516, /24V R**
	Green:	**CT512, CT515, CT516, /24V**

Plug-in current monitoring modules for sockets with module slot in combination with 11p plug-in relays. DC 24 V operation. LED alarm state indicators for OK and fail. Separate adjustment of upper and lower level.



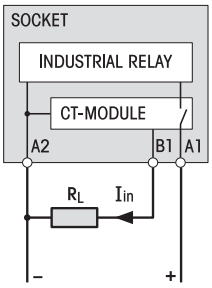


Monitoring functions



Over / under voltage internal / external range

Connection diagram



Measuring circuit data

Type	CT512	CT515	CT516
Measuring and setting ranges (rotary knobs)	0 … 200 mA	0 … 2 A	0 … 6 A
Max. current 100% duty cycle	300 mA	3 A	7 A
Voltage drop on internal shunt res. @ I_{max}	300 mV	200 mV	100 mV
Temperature drift -25 … 60 °C	≤ 3 %	≤ 3 %	≤ 3 %

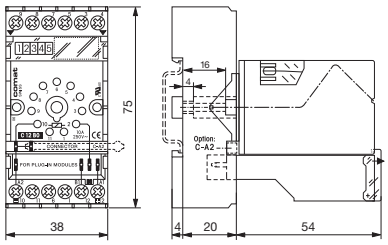
Time data

Alarm delay time settings	100 ms, 500 ms, 2 s
Reset time	100 ms

Power supply

Nominal voltage	**DC 24 V**
Operation voltage range	18 … 30
Supply current	3 … 7 mA
Polarity reversal protection	- 30 V

Dimensions [mm]



General specifications

Ambient temperature storage/operation	-40 … 85 °C / -25 … 60 °C
Ingress Protection degree	IP 40 when plugged in
Housing material	Lexan
Weight	25 g

Standard types

CT512, CT515, CT516, DC24	Blue	Green
	CT51x/DC24V R	**CT51x/DC24V**
	CT51x/DC36V R	**CT51x/DC36V**

Available

CT512, CT515, CT516, DC36V

Remark: This module is part of several ready for connection units consisting of socket, relay and module.
A wide range of suitable relays are available.

Technical approvals, conformities

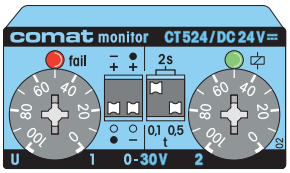
CT524

Plug-in DC voltage monitoring module. DC 24 V operation.

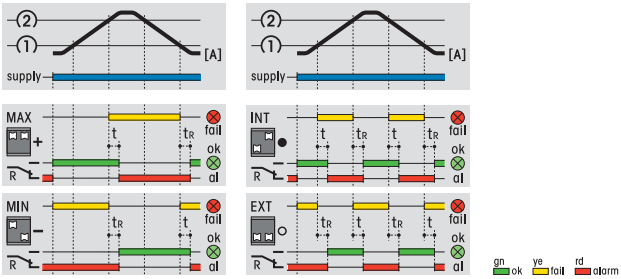
(combined with industrial relays)

Type	Blue:	CT524/24V R
	Green:	CT524/24V

Plug-in DC voltage monitoring module for sockets with module slot in combination with 11p plug-in relays. DC 24 V operation. LED alarm state indicators for OK and fail. Separate adjustment of upper and lower level.

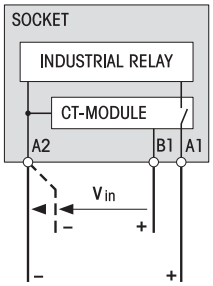


Monitoring functions



Over / under voltage internal / external range

Connection diagram



Measuring circuit data

Type	**CT524**
Measuring and setting ranges (rotary knobs)	0 … 30 V
Over voltage (10 ms)	± 150 V
Input resistance	106 kΩ
Temperature drift -25 … 60 °C	≤ 2 %

Time data

Alarm delay time settings	100 ms, 500 ms, 2 s
Reset time	100 ms

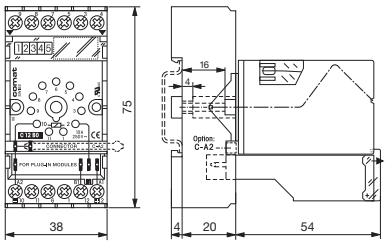
Power supply

Nominal voltage	**DC 24 V**
Operation voltage range	18 … 30 V
Supply current	8 … 13 mA
Polarity reversal protection (1 minute)	- 30 V

General specifications

Ambient temperature storage/operation	-40 … 85 °C / -25 … 60 °C
Ingress Protection degree	IP 40 when plugged in
Housing material	Lexan
Weight	25 g

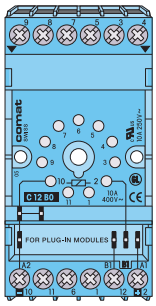
Dimensions [mm]



Standard types	Blue	Green
DC 24	**CT524/DC24V R**	**CT524/DC24V**

Remark: This module is part of several ready for connection units consisting of socket, relay and module.
A wide range of suitable relays are available.

Technical approvals, conformities



DC Voltage Monitoring-Set
DC Current Monitoring-Set

Set-Delivery includes:
- Relay
- Module
- Front cover
- Socket
- Retaining clip

CE

Monitoring Module

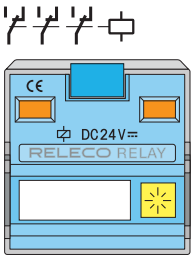
4 functions can be selected: Overvoltage/undervoltage monitoring with adjustable hysteresis or 2 range monitors (INT or EXT). Adjustable alarm delay. LED display for errors and ok. Contact inspection window at the top. Manual safety operation.

Relay data's see: Section industrial Relays

Data at Tamb. = 20°C

Alarm delay t	0,1/0,5/2s
Reset time tR	100ms
Voltage tolerance	0,8-1,2UN
Power consumption	≤0,5W
Ambient temperature	–25…+60°C

Power Relay

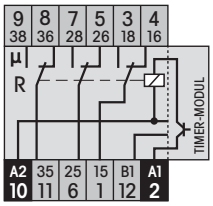


C3-A30X

Universal
Power Relay 10A.
With 3 power changeover-contacts this is the robust relay for AC and DC circuits ranging from 10mA 10V.

10A 250V~

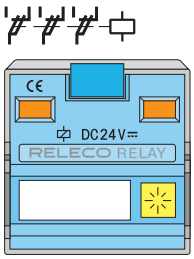
10mA 10V



Set Order-Nr.: CT524.3-A30/DC24V R

Delivery includes:
- Relay C3-A30X/DC24V
- Module CT524/DC24V R
- Front cover FS-R
- Socket C12B0 R
- Retaining clip S3-C

Control Relay

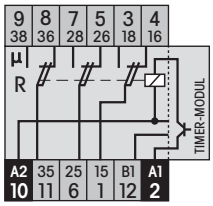


C3-T31X

Relay with 3 twin contacts 6A
The control relay with highest switching reliablility for control and signal circuits ranging from 5mA 5V.

6A 250V~

5mA 5V

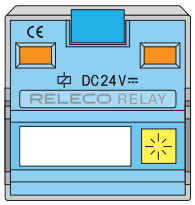


Set Order-Nr.: CT524.3-T31/DC24V R

Delivery includes:
- Relay C3-T31X/DC24V
- Module CT524/DC24V R
- Front cover FS-R
- Socket C12B0 R
- Retaining clip S3-C

Signal Relay

10µAu

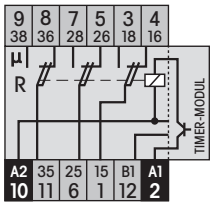


C3-T32X

Relay with 3 twin contacts, 10µ gold flush
The twin contact relay with highest switching reliability for signal circuits ranging from 1mA 5V. Recommend. upto 0,2A 30V.

6A 250V~

1mA 5V

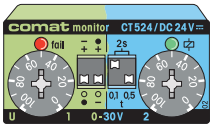


Set Order-Nr.: CT524.3-T32/DC24V R

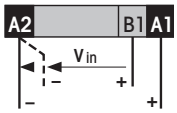
Delivery includes:
- Relay C3-T32X/DC24V
- Module CT524/DC24V R
- Front cover FS-R
- Socket C12B0 R
- Retaining clip S3-C

CT524
DC Voltage Monitoring

Range: 0-30V
Umax: 40V



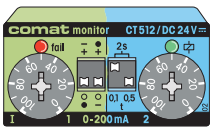
Triggering



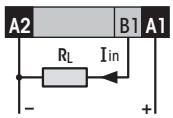
Input resistance
B1 → A2: 100kΩ

CT512
DC Current Monitoring

Range: 0-200mA
Imax: 300mA



Triggering



Voltage drop
A1 → B1 ≤300mV

Set Order-Nr.: CT512.3-A30/DC24V R

Delivery includes:
- Relay C3-A30X/DC24V
- Module CT512/DC24V R
- Front cover FS-R
- Socket C12B0 R
- Retaining clip S3-C

Set Order-Nr.: CT512.3-T31/DC24V R

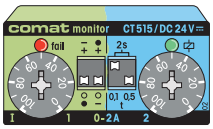
Delivery includes:
- Relay C3-T31X/DC24V
- Module CT512/DC24V R
- Front cover FS-R
- Socket C12B0 R
- Retaining clip S3-C

Set Order-Nr.: CT512.3-T32/DC24V R

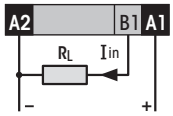
Delivery includes:
- Relay C3-T32X/DC24V
- Module CT512/DC24V R
- Front cover FS-R
- Socket C12B0 R
- Retaining clip S3-C

CT515
DC Current Monitoring

Range: 0-2A
Imax: 3A



Triggering



Voltage drop
A1 → B1 ≤200mV

Set Order-Nr.: CT515.3-A30/DC24V R

Delivery includes:
- Relay C3-A30X/DC24V
- Module CT515/DC24V R
- Front cover FS-R
- Socket C12B0 R
- Retaining clip S3-C

Set Order-Nr.: CT515.3-T31/DC24V R

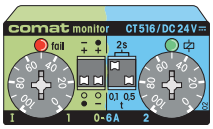
Delivery includes:
- Relay C3-T31X/DC24V
- Module CT515/DC24V R
- Front cover FS-R
- Socket C12B0 R
- Retaining clip S3-C

Set Order-Nr.: CT515.3-T32/DC24V R

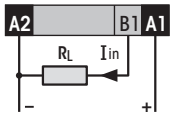
Delivery includes:
- Relay C3-T32X/DC24V
- Module CT515/DC24V R
- Front cover FS-R
- Socket C12B0 R
- Retaining clip S3-C

CT516
DC Current Monitoring

Range: 0-6A
Imax: 7A



Triggering



Voltage drop
A1 → B1 ≤100mV

Set Order-Nr.: CT516.3-A30/DC24V R

Delivery includes:
- Relay C3-A30X/DC24V
- Module CT516/DC24V R
- Front cover FS-R
- Socket C12B0 R
- Retaining clip S3-C

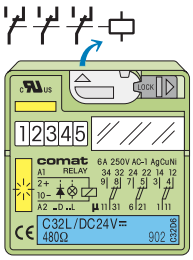
Set Order-Nr.: CT516.3-T31/DC24V R

Delivery includes:
- Relay C3-T31X/DC24V
- Module CT516/DC24V R
- Front cover FS-R
- Socket C12B0 R
- Retaining clip S3-C

Set Order-Nr.: CT516.3-T32/DC24V R

Delivery includes:
- Relay C3-T32X/DC24V
- Module CT516/DC24V R
- Front cover FS-R
- Socket C12B0 R
- Retaining clip S3-C

Power Relay

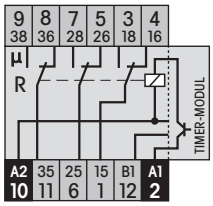


C31L

Universal Power Relay 10A
with 3 power changeover-contacts this is the robust relay for AC and DC circuits ranging from 50mA 10V.

10A 250V~

50mA 10V



Set Order-Nr.:
CT524.31/DC24V

Delivery includes:
- Relay C31L/DC24V
- Module CT524/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

Set Order-Nr.:
CT512.31/DC24V

Delivery includes:
- Relay C31L/DC24V
- Module CT512/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

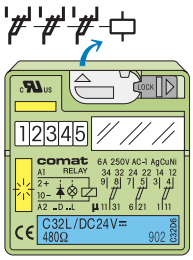
Set Order-Nr.:
CT515.31/DC24V

Delivery includes:
- Relay C31L/24V
- Module CT515/24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

Set Order-Nr.:
CT516.31/DC24V

Delivery includes:
- Relay C31L/DC24V
- Module CT516/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

Control Relay

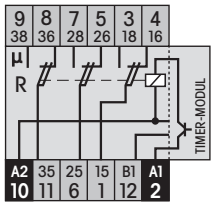


C32L

Relay with 3 twin contacts 6A
The control relay with highest switching reliablility for control and signal circuits ranging from 10mA 5V.

6A 250V~

10mA 5V



Set Order-Nr.:
CT524.32/DC24V

Delivery includes:
- Relay C32L/DC24V
- Module CT524/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

Set Order-Nr.:
CT512.32/DC24V

Delivery includes:
- Relay C32L/DC24V
- Module CT512/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

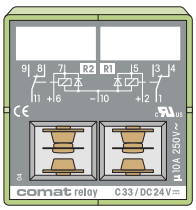
Set Order-Nr.:
CT515.32/DC24V

Delivery includes:
- Relay C32L/24V
- Module CT515/24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

Set Order-Nr.:
CT516.32/DC24V

Delivery includes:
- Relay C32L/DC24V
- Module CT516/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

Power Relay

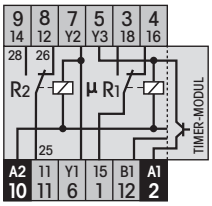


C33

Double-channel Power Relay 10A
With 2x1 power changeover-contacts this is a robust relay for AC and DC circuits ranging from 10mA 12V.

10A 250V~

10mA 12V



Set Order-Nr.:
CT524.33/DC24V

Delivery includes:
- Relay C33/DC24V
- Module CT524/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

Set Order-Nr.:
CT512.33/DC24V

Delivery includes:
- Relay C33/DC24V
- Module CT512/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

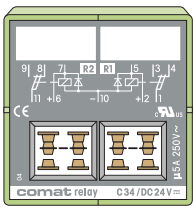
Set Order-Nr.:
CT515.33/DC24V

Delivery includes:
- Relay C33/DC24V
- Module CT515/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

Set Order-Nr.:
CT516.33/DC24V

Delivery includes:
- Relay C33/DC24V
- Module CT516/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

Control Relay

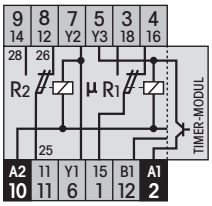


C34

Double-channel Control Relay 5A
With 2x1 changeover-contact. The control relay with increased switching reliablility for control and signal circuits from 1mA 6V.

5A 250V~

1mA 6V



Set Order-Nr.:
CT524.34/DC24V

Delivery includes:
- Relay C34/DC24V
- Module CT524/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

Set Order-Nr.:
CT512.34/DC24V

Delivery includes:
- Relay C34/DC24V
- Module CT512/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

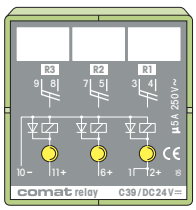
Set Order-Nr.:
CT515.34/DC24V

Delivery includes:
- Relay C34/DC24V
- Module CT515/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

Set Order-Nr.:
CT516.34/DC24V

Delivery includes:
- Relay C34/DC24V
- Module CT516/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

Power- and Signal Relay

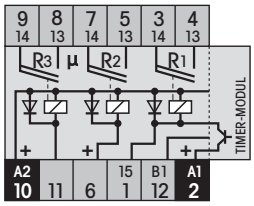


C39

Triple-channel Twin Contact Relay 5A
with 3x1 NO contact. Ideal for interface applications ranging from 1mA 100mV.
LED display for each channel.

5A 250V~

1mA 100mV



Set Order-Nr.:
CT524.39/DC24V

Delivery includes:
- Relay C39/DC24V
- Module CT524/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

Set Order-Nr.:
CT512.39/DC24V

Delivery includes:
- Relay C39/DC24V
- Module CT512/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

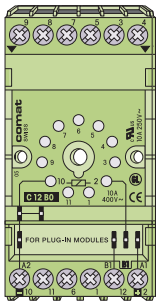
Set Order-Nr.:
CT515.39/DC24V

Delivery includes:
- Relay C39/DC24V
- Module CT515/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

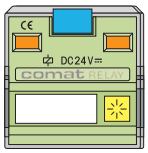
Set Order-Nr.:
CT516.39/DC24V

Delivery includes:
- Relay C39/DC24V
- Module CT516/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

comat RELECO by comat



DC Voltage Monitoring-Set
DC Current Monitoring-Set



Set-Delivery includes:
- Relay
- Module
- Front cover
- Socket
- Retaining clip

Monitoring Module

4 functions can be selected: Overvoltage/undervoltage monitoring with adjustable hysteresis or 2 range monitors (INT or EXT). Adjustable alarm delay. LED display for errors and ok. Contact inspection window at the top. Manual safety operation.

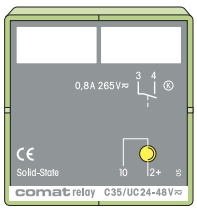
Relay data's see: Section industrial Relays

Data at Tamb. = 20°C

Alarm delay t	0,1/0,5/2 s
Reset time t_R	100 ms
Voltage tolerance	0,8-1,2 U_N
Power consumption	≤ 0,5 W
Ambient temperature	−25…+60°C

UC Solid-State Relay

1x

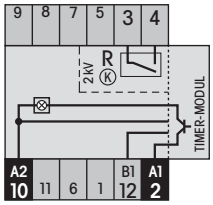


C35

Universal Solid-State Relay for AC or DC load
Highest switching frequency for virtually limitless life cycle due to solid-state operation. No external protective wiring required.

0,8 A 10…265 V≈

1mA 10V

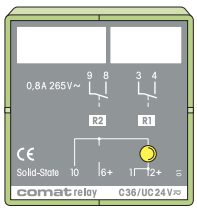


Set Order-Nr.:
CT524.35/DC24V

Delivery includes:
- Relay C35/DC24V
- Module CT524/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

AC Solid-State Relay

2x

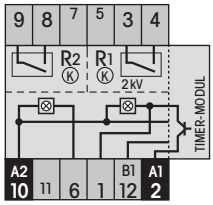


C36

AC SS double-channel
Triac output, crossover switch. Built-in RC wiring protection. Specially designed for frequent switching cycles and inductive loads. Minimum load: 30mA

0,8 A 20…265 V~

30mA 20V

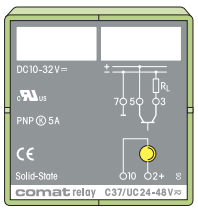


Set Order-Nr.:
CT524.36/DC24V

Delivery includes:
- Relay C36/DC24V
- Module CT524/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

DC Solid-State Relay

1x

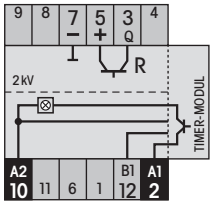


C37

DC SS single-channel
Bounce- and wearing- free for DC loads(inductive/capacitive). Short-circuit/overload proof. No external wiring protection required.

5 A 10…32 V⎓

1mA 10V

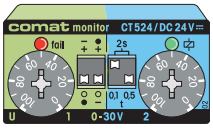


Set Order-Nr.:
CT524.37/DC24V

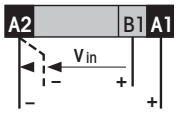
Delivery includes:
- Relay C37/DC24V
- Module CT524/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

CT524
DC Voltage Monitoring

Range: 0-30V
Umax: 40V



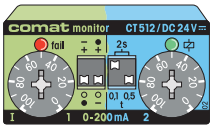
Triggering



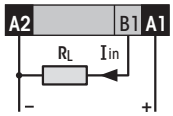
Input resistance
B1 → A2: 100kΩ

CT512
DC Current Monitoring

Range: 0-200mA
Imax: 300mA



Triggering



Voltage drop
A1 → B1 ≤ 300mV

Set Order-Nr.:
CT512.35/DC24V

Delivery includes:
- Relay C35/DC24V
- Module CT512/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

Set Order-Nr.:
CT512.36/DC24V

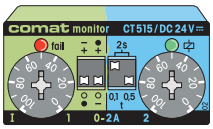
Delivery includes:
- Relay C36/DC24V
- Module CT512/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

Set Order-Nr.:
CT512.37/DC24V

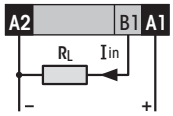
Delivery includes:
- Relay C37/DC24V
- Module CT512/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

CT515
DC Current Monitoring

Range: 0-2A
Imax: 3A



Triggering



Voltage drop
A1 → B1 ≤ 200mV

Set Order-Nr.:
CT515.35/DC24V

Delivery includes:
- Relay C35/DC24V
- Module CT515/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

Set Order-Nr.:
CT515.36/DC24V

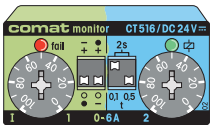
Delivery includes:
- Relay C36/DC24V
- Module CT515/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

Set Order-Nr.:
CT515.37/DC24V

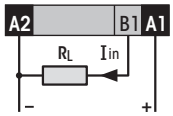
Delivery includes:
- Relay C37/DC24V
- Module CT515/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

CT516
DC Current Monitoring

Range: 0-6A
Imax: 7A



Triggering



Voltage drop
A1 → B1 ≤ 100mV

Set Order-Nr.:
CT516.35/DC24V

Delivery includes:
- Relay C35/DC24V
- Module CT516/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

Set Order-Nr.:
CT516.36/DC24V

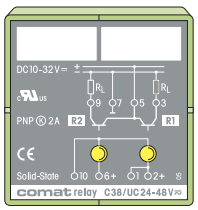
Delivery includes:
- Relay C36/DC24V
- Module CT516/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

Set Order-Nr.:
CT516.37/DC24V

Delivery includes:
- Relay C37/DC24V
- Module CT516/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

DC Solid-State Relay

2x

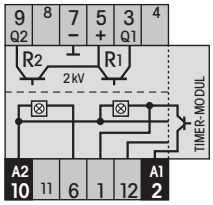


C38

DC SS Relay double-channel
Bounce- and wearing- free for DC loads(inductive/capacitive). Short-circuit/overload proof. No external wiring protection required. 2A constant current per channel.

2A 10…32V⎓

1mA 10V



Set Order-Nr.:
CT524.38/DC24V

Delivery includes:
- Relay C38/DC24V
- Module CT524/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

Set Order-Nr.:
CT512. 38/DC24V

Delivery includes:
- Relay C38/DC24V
- Module CT512/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

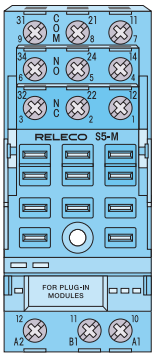
Set Order-Nr.:
CT515.38/DC24V

Delivery includes:
- Relay C38/DC24V
- Module CT515/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

Set Order-Nr.:
CT516.38/DC24V

Delivery includes:
- Relay C38/DC24V
- Module CT516/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

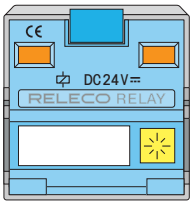
DC Voltage Monitoring-Set
DC Current Monitoring-Set



Set-Delivery includes:
- Relay
- Module
- Front cover
- Socket
- Retaining clip

High Power Relay DC

16A 400V~

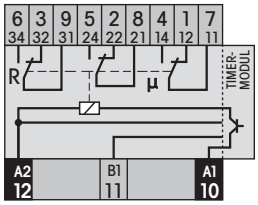


C5-A30X

Universal Power Relay 16A
With 3 power changeover-contacts this is the robust relay for AC and DC circuits ranging from 10mA 10V.

16A 400V~

10mA 10V



Set Order-Nr.:
CT524.5-A30/DC24V R

Delivery includes:
- Relay C5-A30/DC24V
- Module CT524/DC24V R
- Front cover FS-C5
- Socket S-5M
- Retaining clip S3-C

Set Order-Nr.:
CT512.5-A30/DC24V R

Delivery includes:
- Relay C5-A30/DC24V
- Module CT512/DC24V R
- Front cover FS-C5
- Socket S-5M
- Retaining clip S3-C

Set Order-Nr.:
CT515.5-A30/DC24V R

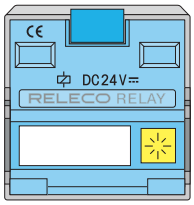
Delivery includes:
- Relay C5-A30/DC24V
- Module CT515/DC24V R
- Front cover FS-C5
- Socket S-5M
- Retaining clip S3-C

Set Order-Nr.:
CT516.5-A30/DC24V R

Delivery includes:
- Relay C5-A30/DC24V
- Module CT516/DC24V R
- Front cover FS-C5
- Socket S-5M
- Retaining clip S3-C

High Power Relay DC

10A @220V⎓

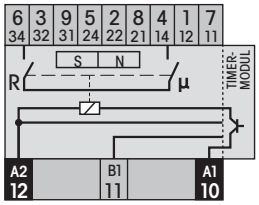


C5-M10X

Highpower Relay, in particular for DC loads upto 10A 220V⎓ (DC1)
With 2 NO contacts in series and a blow magnet for safe arc extinguishing.

16A 400V~

10mA 10V



Set Order-Nr.:
CT524.5-M10/DC24V R

Delivery includes:
- Relay C5-M10/DC24V
- Module CT524/DC24V R
- Front cover FS-C5
- Socket S-5M
- Retaining clip S3-C

Set Order-Nr.:
CT512.5-M10/DC24V R

Delivery includes:
- Relay C5-M10/DC24V
- Module CT512/DC24V R
- Front cover FS-C5
- Socket S-5M
- Retaining clip S3-C

Set Order-Nr.:
CT515.5-M10/DC24V R

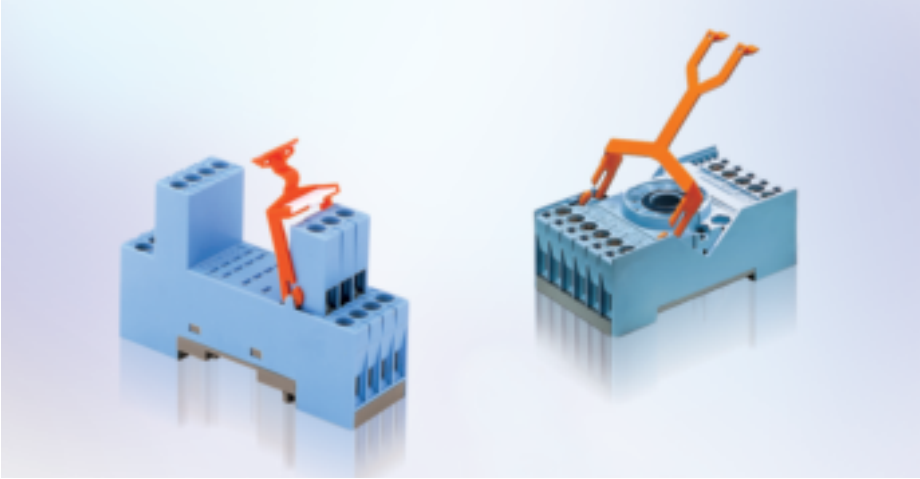
Delivery includes:
- Relay C5-M10/DC24V
- Module CT515/DC24V R
- Front cover FS-C5
- Socket S-5M
- Retaining clip S3-C

Set Order-Nr.:
CT516.5-M10/DC24V R

Delivery includes:
- Relay C5-M10/DC24V
- Module CT516/DC24V R
- Front cover FS-C5
- Socket S-5M
- Retaining clip S3-C

Notes

Sockets



S2-B

Socket for 8-pin standard relay according to IEC 67-I-5B

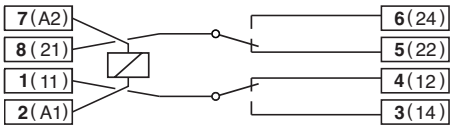
Type	**S2-B** 2-pole, 1 connection level Coding ring optional Integrated retaining clip and labelling space
Rated current	**10 A**

Specifications	
Rated load	10 A / 300 V
Insulation	Test voltage V rms / 1 min
– All terminals/DIN rail	2,5 kV
– Terminal/terminal	2,5 kV
Cross-section of connecting wire	
– Single-wire	4 mm^2 or 2 x 2,5 mm^2
– Multi-wire	22 - 14 AWG
Max. screw torque	1,2 Nm
Screw dimensions	M3, Pozi, slot
Integrated retaining clip/plastic	for relay series C2
Labelling space	detachable
Connection label	1...8; DIN/EN
Mounting	DIN rail T35 or mounting plate
Ambient temperature operation/storage	-40 (no ice)….60 °C /-40 ... 80 °C

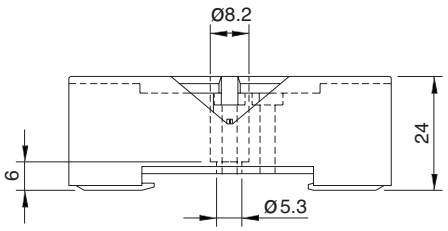
Associated, plug-in 8-pin MRC relays Suitable for holding the Releco coding ring For coding the relay and the socket.	**C2-A, C2-G, C2-T**

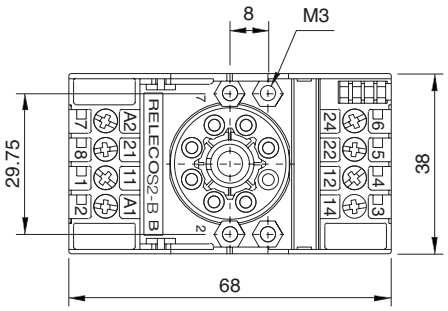
Accessories	
Coding ring, blue set:	**S2-BC** Packaging unit: 5 pcs
Retaining spring, steel	**S3-C, S3-CT** (with Timecube)

Connection diagram



Dimensions [mm]





Technical approvals, conformities

Lloyd´s

EN 60947-1, EN 61810-1

S2-S

Socket for 8-pin standard relay according to IEC 67-I-5B

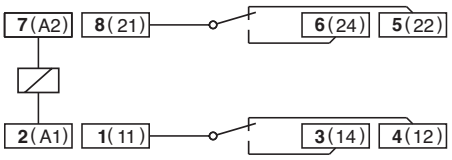
Type	**S2-S** 2-pole, 2 connection level Coding ring optional Integrated retaining clip and labelling space
Rated current	**10 A**

Specifications	
Rated load	10 A / 300 V
Insulation	Test voltage V rms / 1 min
– All terminals/DIN rail	2,5 kV
– Terminal/terminal	2,5 kV
Cross-section of connecting wire	
– Single-wire	4 mm^2 or 2 x 2,5 mm^2
– Multi-wire	22 - 14 AWG
Max. screw torque	1,2 Nm
Screw dimensions	M3, Pozi, slot
Integrated retaining clip/plastic	for relay series C2
Labelling space	detachable
Connection label	1...8; DIN/EN
Mounting	DIN rail T35 or mounting plate
Ambient temperature operation/storage	-40 (no ice)....60 °C /-40 ... 80 °C

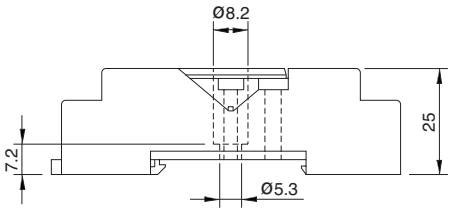
Associated, plug-in 8-pin MRC relays	**C2-A, C2-G, C2-T**
Suitable for holding the Releco coding ring	
For coding the relay and the socket.	

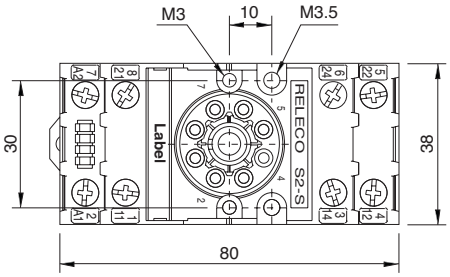
Accessories	
Coding ring, blue set:	**S2-BC** Packaging unit: 5 pcs
Retaining spring, steel	**S3-C, S3-CT** (with Timecube)

Connection diagram



Dimensions [mm]





Technical approvals, conformities

EN 60947-1, EN 61810-1

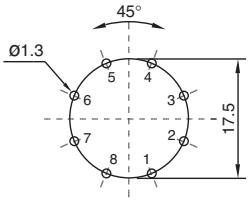
S2-L, S2-P, S2-PO

Socket for PCB and soldering according to IEC 67-I-5b for relays C2-...

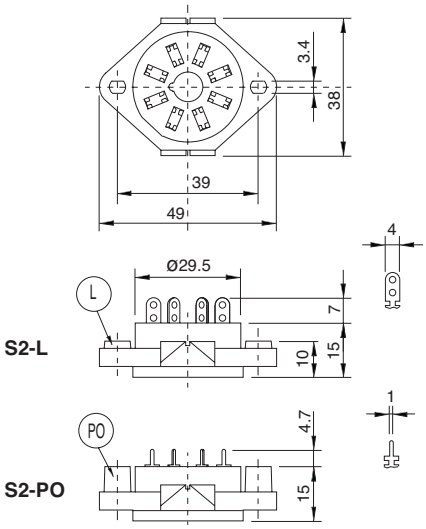
Type	**S2-L** 2-pole, flange panel mountable **S2-P** 2-pole, printed circuit **S2-PO** 2-pole, printed circuit with flange
Rated current	**10 A**

Specifications	
Rated load	10 A / 300 V
Insulation	test voltage Vrms / 1min
Between terminals	2,5 kV
Connection label	1...8; DIN/EN
Ambient temperature operation/storage	-40 (no ice)....60 °C /-40 ... 80 °C
Accessories	
Retaining spring, steel	**S3-C**

Printed cicuit lay-out [mm]



Dimensions [mm]



Technical approvals, conformities

EN 60947-1, EN 61810-1

MRC series

S3-B

Socket for 11-pin standard relay according to IEC 67-I-18b

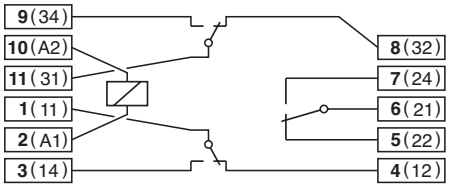
Type	**S3-B** 3-pole, 1 connection level Coding ring optional Integrated retaining clip and labelling space
Rated current	**10 A**

Specifications	
Rated load	10 A / 250 V
Insulation	Test voltage V rms / 1 min
All terminals/DIN rail	2,5 kV
– Terminal/terminal	2,5 kV
Cross-section of connecting wire	
– Single-wire	4 mm^2 or 2 x 2,5 mm^2
– Multi-wire	22 - 14 AWG
Max. screw torque	1,2 Nm
Screw dimensions	M3, Pozi, slot
Integrated retaining clip/plastic	for relay series C3
Labelling space	detachable
Connection label	1… 11; DIN/EN
Mounting	DIN rail T35 or mounting plate
Ambient temperature	-40 (no ice)….60 °C /-40 ... 80 °C

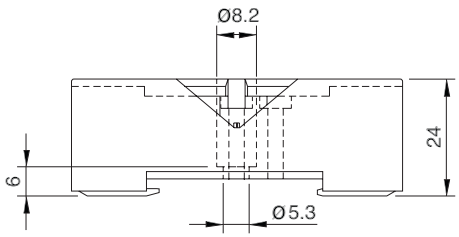
Associated, plug-in 11-pin MRC relays Suitable for holding the Releco coding ring For coding the relay and the socket.	**C3-A, C3-G, C3-T, C3-X, C3-M, C3-R, C3-E, C3-N, C3-S**

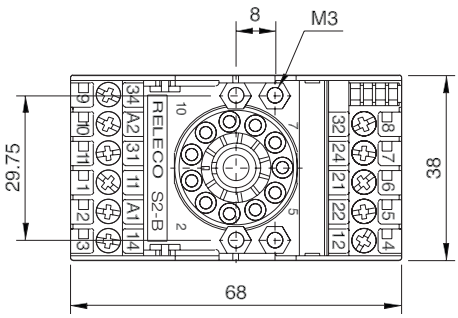
Accessories	
Coding ring, blue set:	**S3-BC** Packaging unit: 5 pcs
Retaining spring, steel	**S3-C, S3-CT** (with Timecube)

Connection diagram



Dimensions [mm]





Technical approvals, conformities

Lloyd´s

EN 60947-1, EN 61810-1

Sockets

4

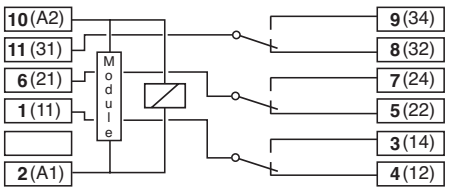
S3-MP

Socket for 11-pin standard relay according to IEC 67-I-18b

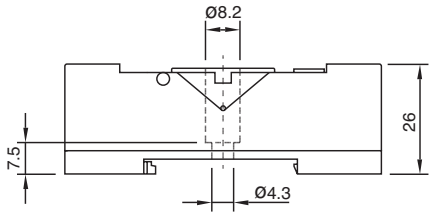
Type	**S3-MP** 3-pole, 1 connection level Integrated retaining clip and labelling space Accepts plug-in modules M3P in parallel with the coil
Rated current	**10 A**

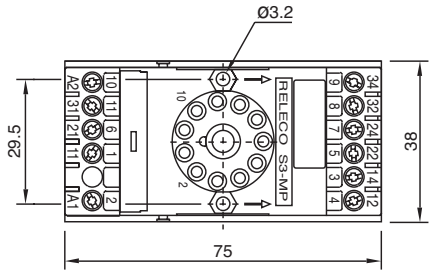
Specifications	
Rated load	10 A / 250 V
Insulation	Test voltage V rms / 1 min
– All terminals/DIN rail	2,5 kV
– Terminal/terminal	2,5 kV
Cross-section of connecting wire	
– Single-wire	4 mm^2 or 2 x 2,5 mm^2
– Multi-wire	22 - 14 AWG
Max. screw torque	1,2 Nm
Screw dimensions	M3, Pozi, slot
Integrated retaining clip/plastic	for relay series C3
Labelling space	detachable
Connection label	1...11; DIN/EN
Mounting	DIN rail T35 or mounting plate
Ambient temperature operation/storage	-40 (no ice)….60 °C /-40 ... 80 °C
Associated, plug-in 11-pin MRC relays Suitable for holding the Releco coding ring For coding the relay and the socket.	**C3-A, C3-G, C3-T, C3-X, C3-M, C3-R, C3-E, C3-N, C3-S**
Accessories	
Coding ring, blue set:	**S3-BC** Packaging unit: 5 pcs
Paralel module	**M3P**
Retaining spring, steel	**S3-C, S3-CT** (with Timecube)

Connection diagram



Dimensions [mm]



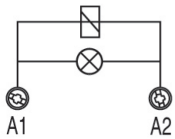


M3P Plug in modules for S3-MP

In parallel with the coil

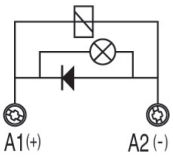
Signaling LED

M3P-X / 24 Vac/dc
M3P-X / 48 Vac/dc
M3P-X / 110 ... 125 Vac/dc
M3P-X / 200 ... 230 Vac/dc



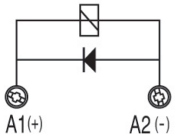
Free wheeling diode and LED

M3P-DX / 24 Vdc
M3P-DX / 48 Vdc
M3P-DX / 110 ... 125 Vdc
M3P-DX / 200 ... 230 Vdc



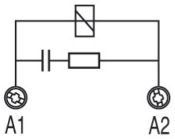
Free wheeling diode

M3P-DL / 12 ... 60 Vdc
M3P-DH / 12 ... 250 Vdc



RC suppressor
(LED not available)

M3P-RC / 20 ... 50 Vac
M3P-RC / 110 ... 120 Vac
M3P-RC / 220 ... 240 Vac



Technical approvals, conformities

EN 60947-1, EN 61810-1

S3-MS

Socket for 11-pin standard relay according to IEC 67-I-18b

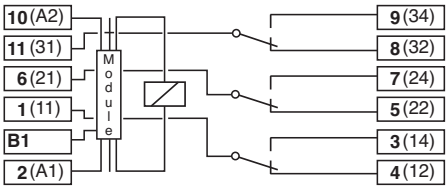
Type	**S3-MS** 3-pole, 1 connection level Integrated retaining clip and labelling space Accepts plug-in modules M3-S in serie with the coil
Rated current	**10 A**

Specifications	
Rated load	10 A / 250 V
Insulation	Test voltage V rms / 1 min
– All terminals/DIN rail	2,5 kV
– Terminal/terminal	2,5 kV
Cross-section of connecting wire	
– Single-wire	4 mm^2 or 2 x 2,5 mm^2
– Multi-wire	22 - 14 AWG
Max. screw torque	1,2 Nm
Screw dimensions	M3, Pozi, slot
Integrated retaining clip/plastic	for relay series C3
Labelling space	detachable
Connection label	1...11; DIN/EN
Mounting	DIN rail T35 or mounting plate
Ambient temperature operation/storage	-40 (no ice)....60 °C /-40 ... 80 °C
BI Terminal for further applications	

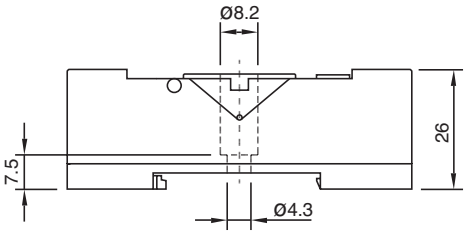
Associated, plug-in 11-pin-MRC-Relais Suitable for holding the Releco coding ring For coding the relay and the socket.	**C3-A, C3-G, C3-T, C3-X, C3-M, C3-R, C3-E, C3-N, C3-S**

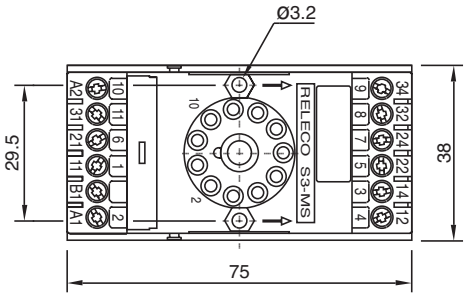
Accessories	
Coding ring, blue set:	**S3-BC** Packaging unit: 5 pcs
Parallel module	**M3-S**
Retaining spring, steel	**S3-C, S3-CT** (with Timecube)

Connection diagram



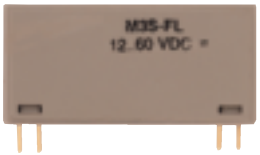
Dimensions [mm]





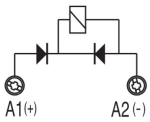
M3S Plug in modules for S3-MS

In series with the coil



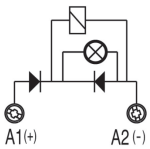
Free wheeling and polarity

M3S-FL / 12 ... 60 Vdc
M3S-FH /12 ... 250 Vdc



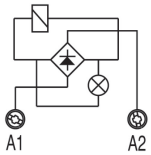
Free wheeling, polarity and LED

M3S-FX / 24 Vdc
M3S-FX / 48 Vdc
M3S-FX / 110 ... 125 Vdc
M3S-FX / 200 ... 230 Vdc



Rectifier bridge and LED

M3S-B / 12 ... 48 Vac/dc
M3S-BX / 12 Vac/dc
M3S-BX / 24 Vac/dc
M3S-BX / 48 Vac/dc



Technical approvals, conformities

EN 60947-1, EN 61810-1

S3-S

Socket for 11-pin standard relay according to IEC 67-I-18b

Type	**S3-S** 3-pole, 2 connection level Coding ring optional Integrated retaining clip and labelling space
Rated current	**10 A**

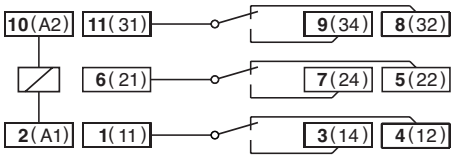
Specifications	
Rated load	10 A / 250 V
Insulation	Test voltage V rms / 1 min
– All terminals/DIN rail	2,5 kV
– Terminal/terminal	2,5 kV
Cross-section of connecting wire	
– Single-wire	4 mm^2 or 2 x 2,5 mm^2
– Multi-wire	22 - 14 AWG
Max. screw torque	1,2 Nm
Screw dimensions	M3, Pozi, slot
Integrated retaining clip/plastic	for relay series C3
Labelling space	detachable
Connection label	1...11; DIN/EN
Mounting	DIN rail T35 or mounting plate
Ambient temperature operation/storage	-40 (no ice)....60 °C /-40 ... 80 °C

Associated, plug-in 11-pin MRC relays Suitable for holding the Releco coding ring For coding the relay and the socket.	**C3-A, C3-G, C3-T, C3-X, C3-M, C3-R, C3-E, C3-N, C3-S**

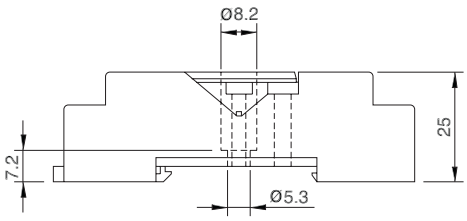
DIN rail or panel mounting. Removable label.
EN /DIN and sequencial numbering. According to EN 60947.1 and IEC 61810.1

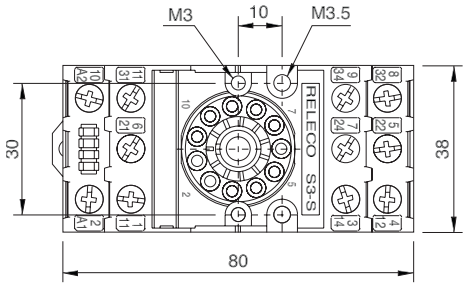
Accessories	
Coding ring, Set red:	**S3-BC** Packaging unit: 5 pcs
Retaining spring, steel	**S3-C, S3-CT** (with Timecube)

Connection diagram



Dimensions [mm]





Technical approvals, conformities

EN 60947-1, EN 61810-1

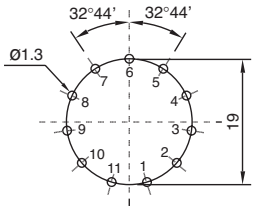
MRC series

S3-L, S3-P, S3-PO

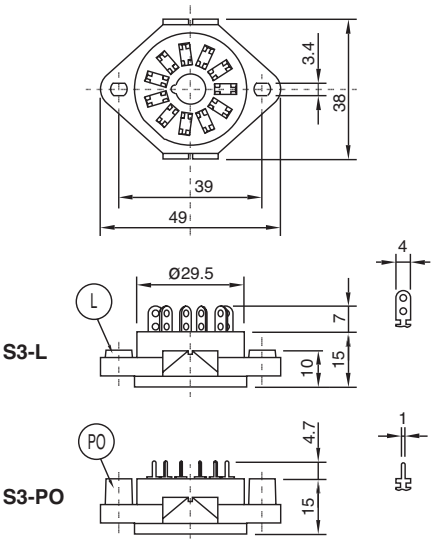
Socket for PCB and soldering, according to IEC 67-I-5b for relays C3-...

Type	**S3-L** 3-pole, flange panel mountable **S3-P** 3-pole, printed circuit **S3-PO** 3-pole, printed circuit with flange
Rated current	**10 A**
Specifications	
Rated load	10 A / 250 V
Dielectric strength adjacent pin	2.5 kV
Accessories	
Retaining spring, steel	**S3-C**

Printed cicuit lay-out [mm]



Dimensions [mm]



Technical approvals, conformities

EN 60947-1, EN 61810-1

Sockets

4

C12B0

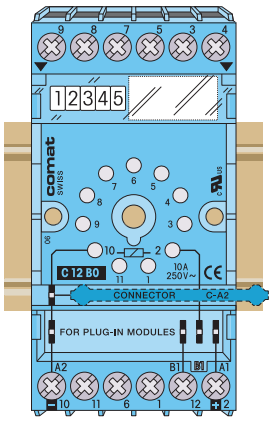
Socket for 11 pin plug-in relays C31, C32 and plug-in control modules

Type:	**C12B0 R** 3-pole, 1 level Module slot for timer- and monitoring modules, over voltage suppressing- and LED indicator modules coil bridge bus bar to connect in A2
Rated current	**10 A**

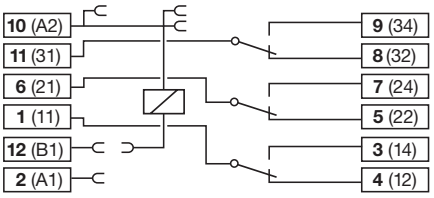
Specifications	
Rated load	10 A / 400 V (cURus: 250 V)
Insulation	Test voltage Vrms / 1 min
– All terminals/DIN rail	2,5 kV
– Terminal/terminal	2,5 kV
Cross-section of connecting wire	
– Single-wire	1 x 6 mm^2, 2 x 1,5 mm^2
– Multi-wire	1 x 4 mm^2/AWG12, 2 x 1,5 mm^2/AWG16
Max. screw torque	0,7 Nm
Screw dimensions	M3, Pozi, slot
Labelling space	detachable
Connection label	1...12; DIN/EN
Mounting	DIN rail TS35 or panel mounting 1 x M4
Ambient temperature operation/storage	-25 (no ice)....60 °C /-40 ... 80 °C

Associated plug-in 11-pin relays	**C31, C32**

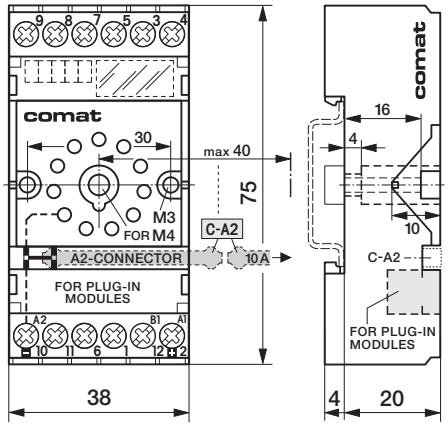
Accessories	
Coil bridge bus bar	**C-A2**
Retaining spring, steel	**HF-32, S3-CT**
Marking strip cardboard white 8 x 16	**L-16/1** (under transp. plastic cover)



Connection diagram



Dimensions [mm]



Technical approvals, conformities

S4-J

Socket for 14-pin standard relay according to IEC 67-I-18b

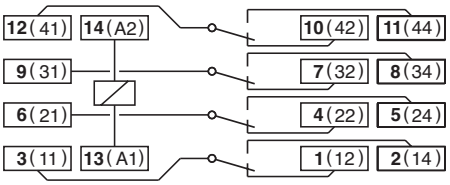
Type	**S4-J** 4-pole, 2 connection level Logic wiring Integrated retaining clip and labelling space
Rated current	**10 A**

Specifications	
Rated load	10 A / 250 V
Insulation	Test voltage V rms / 1 min
– All terminals/DIN rail	2,5 kV
– Terminal/terminal	2,5 kV
Cross-section of connecting wire	
– Single-wire	4 mm^2 or 2 x 2,5 mm^2
– Multi-wire	22 - 14 AWG
Max. screw torque	1,2 Nm
Screw dimensions	M3,5, Philips-slot (combo)
Integrated retaining clip/plastic	for relay series C4
Labelling space	detachable
Connection label	1...14; DIN/EN
Mounting	DIN rail TS35 or mounting plate
Ambient temperature	-40 (no ice)....60 °C /-40 ... 80 °C

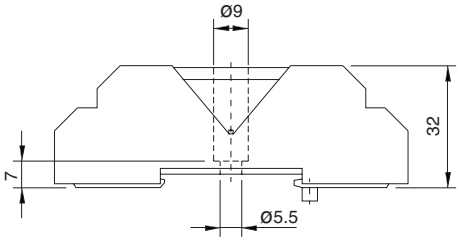
Associated, plug-in 11-pin MRC relays	**C4-A, C4-X, C4-R**

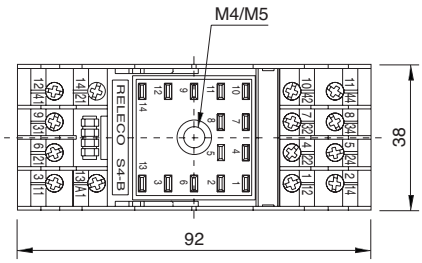
Accessories	
Retaining spring, steel	**S4-C**

Connection diagram



Dimensions [mm]





Technical approvals, conformities

CE Lloyd´s RoHS

EN 60947, EN 61810

Sockets

4

S4-L, S4-P, S4-PO

Socket for soldering and printed circuit for relays C4-...

Type	**S4-L** 4-pole, flange panel mountable **S4-P** 4-pole, printed circuit **S4-PO** 4-pole, printed circuit with flange
Rated current	**10 A**

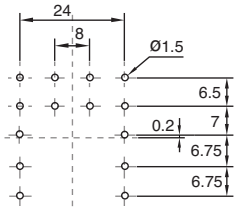
Specifications

Rated load	10 A / 250 V
Test voltage benachbarte Pole	2.5 kV rms 1 min
Ambient temperature	-30 °C ... +60 °C

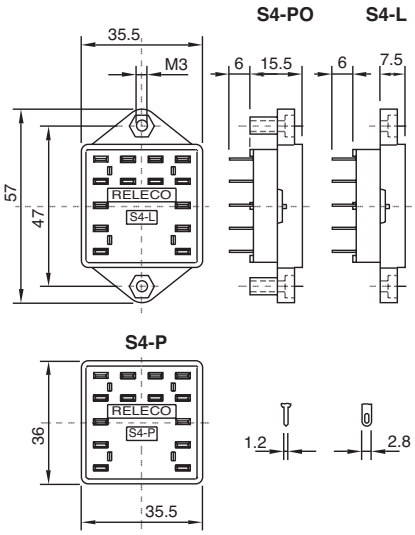
Accessories

Retaining spring, steel	**S4-CL**

Printed cicuit lay-out [mm]



Dimensions [mm]



Technical approvals, conformities

EN 60947-1, EN 61810-1

S5-S

Socket for square base relay C5-...

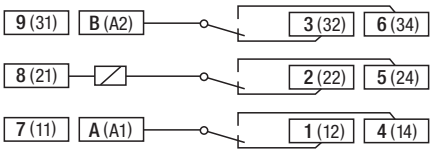
Type	**S5-S** 3-pole, 2 level Logic wiring Integrated retaining clip and labelling space
Rated current	**16 A**

Specifications	
Rated load	16 A / 400 V
Insulation	Test voltage V rms / 1 min
– All terminals/DIN rail	4 kV
– Terminal/terminal	4 kV
Cross-section of connecting wire	
– Single-wire	4 mm^2 or 2 x 2,5 mm^2
– Multi-wire	22 - 14 AWG
Max. screw torque	1,2 Nm
Screw dimensions	M3,5, Pozi, slot
Integrated retaining clip/plastic	for relay series C5
Labelling space	detachable
Connection label	1...9, A, B; DIN/EN
Mounting	DIN rail TS35 or mounting plate
Ambient temperature operation/storage	-40 (no ice)....60 °C /-40 ... 80 °C
Associated, plug-in 11-pin MRC relays	**C5-A, C5-G, C5-X, C5-M, C5-R**

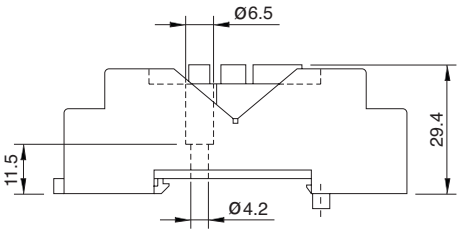
Mounting in DIN rail TS35 or mounting plate. Labelling space.
According to EN 60947 and IEC 61810

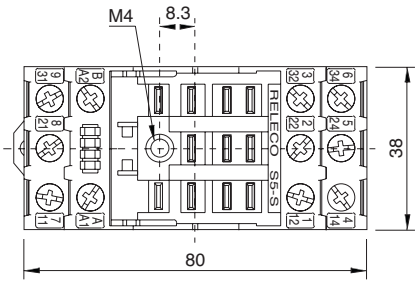
Accessories	
Retaining spring, steel	**S4-C**

Connection diagram



Dimensions [mm]





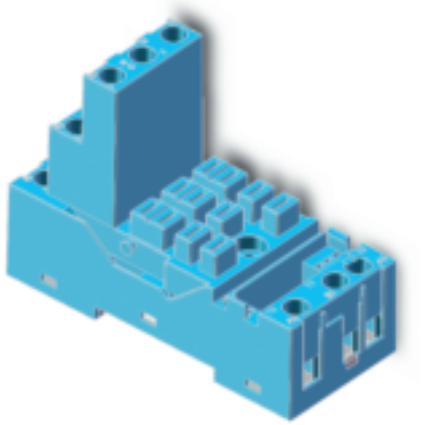
Technical approvals, conformities

EN 60947-1, EN 61810-1

S5-M

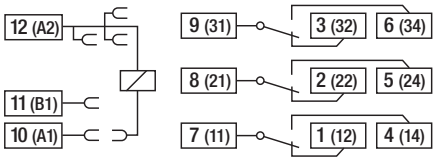
Socket for square base relay C5-...

Type:	**S5-M** 3-pole, 3 level Module slot for timer- and monitoring modules, over voltage suppressing- and LED indicator modules coil bridge bus bar to connect in A2
Rated current	**16 A**

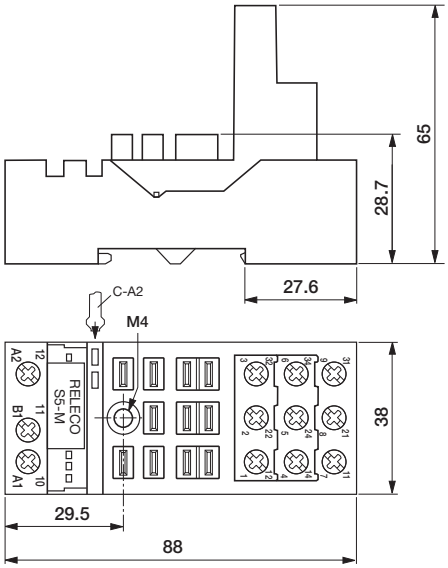


Specifications	
Rated load	16 A / 400 V
Insulation	Test voltage Vrms / 1 min
– All terminal/DIN rail	4 kV
– Terminal/terminal	4 kV
Cross section of connecting wire	
– Single wire	1 x 6 mm^2, 2 x 2,5 mm^2
– Multi wire	1 x 6 mm^2/AWG10, 2 x 1,5 mm^2/AWG16
Max. screw torque	1,2 Nm
Screw dimensions	M3,5, Pozi, slot
Labelling space	detachable
Connection label	1 … 12, DIN/EN
Mounting	DIN rail TS35 or panel mounting 1 x M4
Ambient temperature operation / storage	-40 (no ice) … 60° C/-40 … 80° C
Associated, plug-in 11-pin MRC relays	**C5-A, C5-G, C5-X, C5-M, C5-R**
Accessories	
Coil bridge bus bar	**C-A2**
Retaining spring, steel	**HF-32**

Connection diagram



Dimensions [mm]



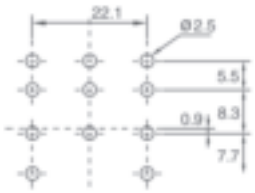
Technical approvals, conformities

S5-L, S5-P, S5-PO

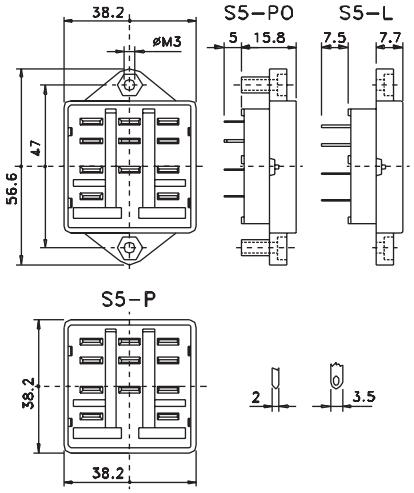
Socket for soldering and printed circuit for relays C5-...

Type	**S5-L** 3-pole, flange panel mountable **S5-P** 3-pole, printed circuit **S5-PO** 3-pole, printed circuit with flange
Rated current	**16 A**
Specifications	
Rated load	16 A / 400 V
Ambient temperature operation/storage	-40 (no ice)....60 °C / -40 ... 80 °C
Accessories	
Retaining spring, steel	**S4-L**

Printed cicuit lay-out [mm]



Dimensions [mm]



Technical approvals, conformities

EN 60947-1, EN 61810-1

S7-C

Socket for miniature relays C7-... and C80 series time relays

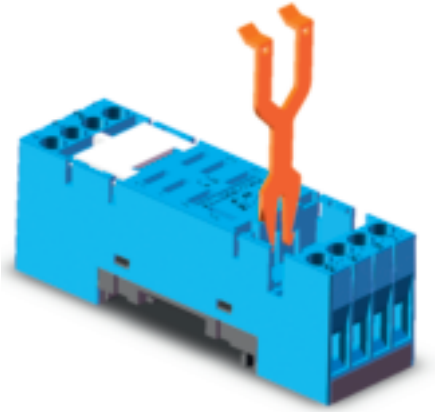
Type:	**S7-C** 2-pole, 1 level integrated clip and marking label suitable for clips C80 series time relays coil bridge bus bar to connect in A2 plug-in slot for overvoltage suppressing units
Rated current	**10 A**

Specifications	
Rated load	10 A / 250 V
Insulation	Test voltage Vrms / 1 min
– All terminal/DIN rail	2.5 kV
– Terminal/terminal	2.5 kV
Cross section of connecting wire	
– Single wire	4 mm^2, 2 x 1,5 mm^2
– Multi wire	2,5 mm^2 / AWG 16, 2 x 1 mm^2 / AWG 18
Max. screw torque	1,2 Nm
Screw dimensions	M3, Pozi, slot
Integrated retaining clip/plastic	for relays C7
Labelling space	detachable
Connection label	1 … 8, DIN/EN
Mounting	DIN rail TS35 or mounting plate
Ambient temperature operation/storage	-40 (no ice) … 60 °C / -40 … 80 °C

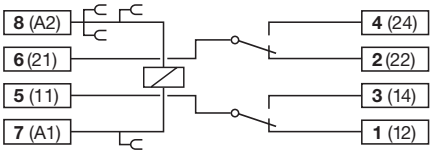
Associated plug-in 8-pin QRC relays	**C7-A2x, C7-T, C7-G, C7-X, C7-W, C7-H**
Associated C80 time relays	**C83, C85, 84**

Accessories	
Coil bridge bus bar	**S7-B**

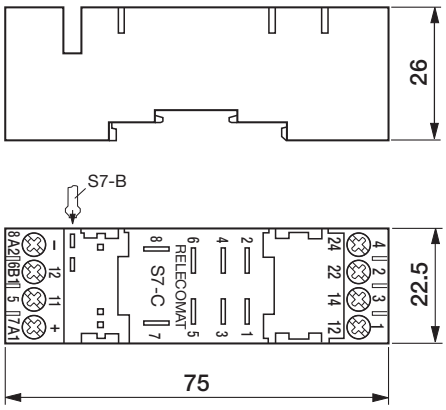
Please note:
This socket replaces former socket S7-M
frilly compatible



Connection diagram



Dimensions [mm]



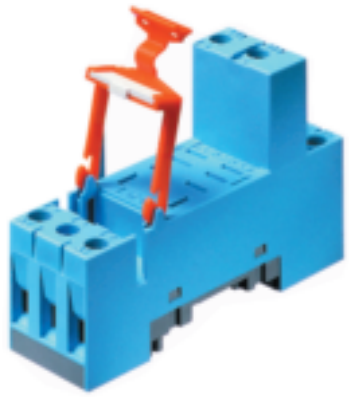
Technical approvals, conformities

Lloyd's

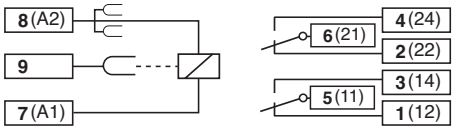
S7-I/O

Socket for miniature relays C7-...

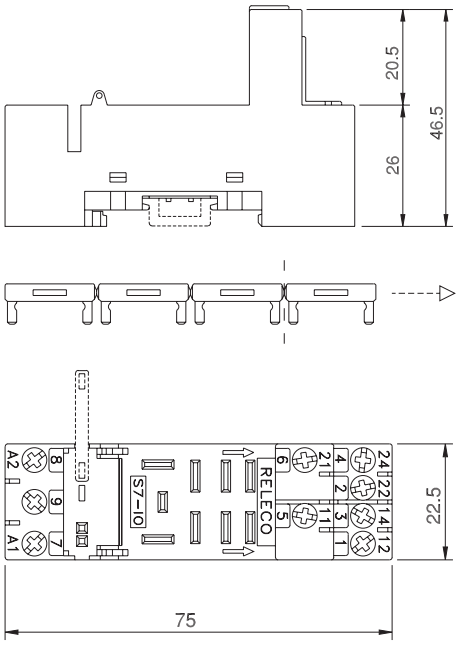
Type	**S7-I/O** 2-pole, 2 level Integrated clip and marking label Coil bridge bus bar to connect in A2 Logic wiring
Rated current	**10 A**
Specifications	
Rated load	10 A / 250 V
Insulation	Test voltage V rms / 1 min
– All terminals/DIN rail	2,5 kV
– Terminal/terminal	2,5 kV
Cross-section of connecting wire	
– Single-wire	4 mm^2 or 2 x 2,5 mm^2
– Multi-wire	22 - 14 AWG
Max. screw torque	1,2 Nm
Screw dimensions	M3, Pozi, slot
Integrated retaining clip/plastic	for relay series C7
Labelling space	detachable
Connection label	1...8; DIN/EN
Mounting	DIN rail TS35 or mounting plate
Ambient temperature operation/storage	-40 (no ice)…60 °C / -40 ... 80 °C
Associated, plug-in 8-pin QRC relays	**C7-A2x, C7-T, C7-G, C7-X, C7-W, C7-H**
Accessories	
Coil bridge bus bar	**S7-B**



Connection diagram



Dimensions [mm]



Technical approvals, conformities

Lloyd´s

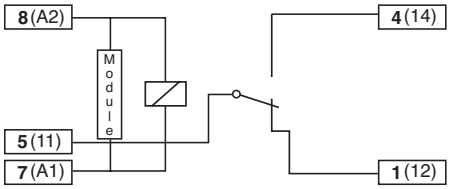
EN 60947-1, EN 61810-1

S7-16

Socket for miniature relays C7-A10...

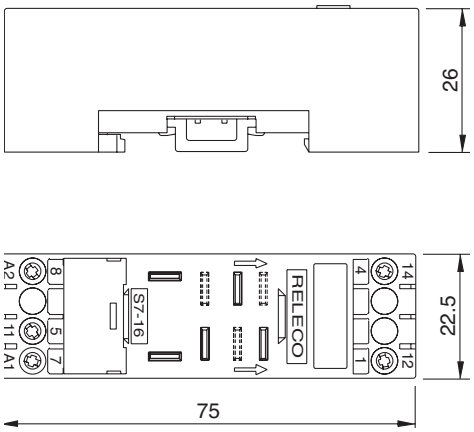
Type	**S7-16** 1-pole, 1 level Integrated retaining clip and labelling space
Rated current	**16 A**
Specifications	
Rated load	16 A / 250 V
Insulation	Test voltage V rms / 1 min
– All terminals/DIN rail	2,5 kV
– Terminal/terminal	2,5 kV
Cross-section of connecting wire	
– Single-wire	4 mm^2 or 2 x 2,5 mm^2
– Multi-wire	22 - 14 AWG
Max. screw torque	1,2 Nm
Screw dimensions	M3, Pozi, slot
Integrated retaining clip/plastic	for relay series C7-A10
Labelling space	detachable
Connection label	1...8; DIN/EN
Mounting	DIN rail TS35 or mounting plate
Ambient temperature operation/storage	-40 (no ice)....60 °C /-40 ... 80 °C
Associated, plug-in 5-pin QRC relays	**C7-A10**

Connection diagram



Dimensions [mm]

S7-16 for relays C7-A10 (16 A)



Technical approvals, conformities

Lloyd´s

EN 60947-1, EN 61810-1

S7-L, S7-P, S7-PO

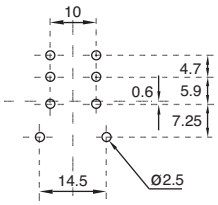
Socket for PCB and soldering for miniature relays C7

Type	**S7-L** 2-pole, flange panel mountable **S7-P** 2-pole, printed circuit **S7-PO** 2-pole, printed circuit with flange
Rated current	**10 A**

Specifications

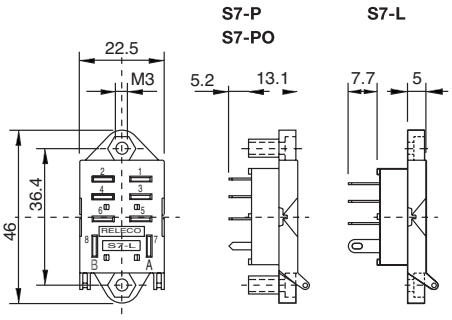
Rated load	10 A / 250 V
Dielectric strength adjacent pin	2.5 kV rms / 1 min
Connection label	1...8; DIN/EN
Integrated retaining clip/plastic	for relay series C7
Ambient temperature operation/storage	-40 (no ice)….60 ºC /-40 ... 80 °C

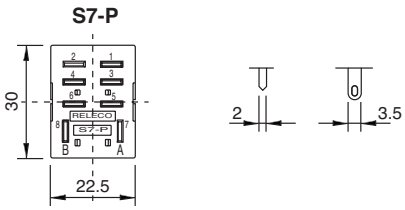
Printed cicuit lay-out [mm]



S7-P
S7-PO

Dimensions [mm]





Technical approvals, conformities

Lloyd´s

EN 60947-1, EN 61810-1

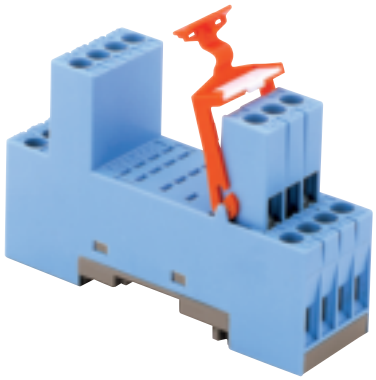
S9-M

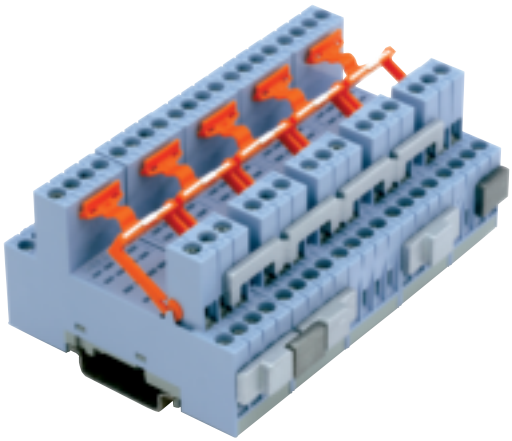
Socket for miniature 4 pole relay C9-...

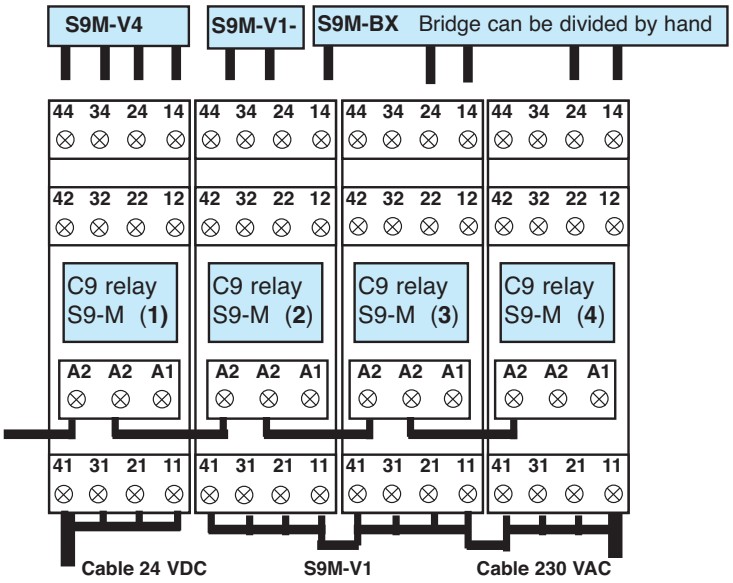
Type	**S9-M** 4-pole, 2 level Integrated clip and marking label
Rated current	**6 A**

Specifications	
Rated load	6 A / 250 V
Insulation	Test voltage V rms / 1 min
– All terminals/DIN rail	2,5 kV
– Terminal/terminal	2,5 kV
Cross-section of connecting wire	
– Single-wire	4 mm^2 or 2 x 2,5 mm^2
– Multi-wire	22 - 14 AWG
Max. screw torque	1,2 Nm
Screw dimensions	M3, Pozi, slot
Integrated retaining clip/plastic	for relay series C9
Labelling space	detachable
Connection label	1...14; DIN/EN
Mounting	DIN rail TS35 or mounting plate
Ambient temperature operation/storage	-40 (no ice)....60 °C /-40 ... 80 °C

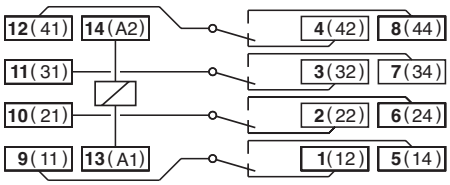
Socket for 4 poles, QRC relays	**C9-A, C9-E, C9-R**



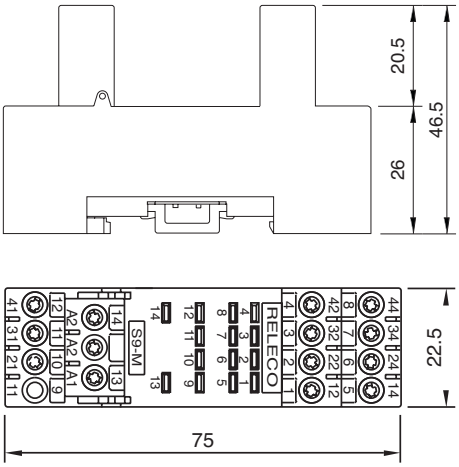




Connection diagram



Dimensions [mm]



Technical approvals, conformities

Lloyd´s

EN 60947-1, EN 61810-1

S9-L, S9-P, S9-PO

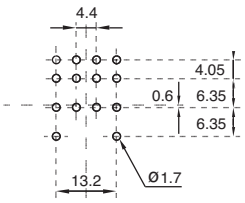
Socket for PCB and soldering for miniature relays C9

Type	**S9-L** 4-pole, flange panel mountable **S9-P** 4-pole, printed circuit **S9-PO** 4-pole, printed circuit with flange
Rated current	**6 A**

Specifications

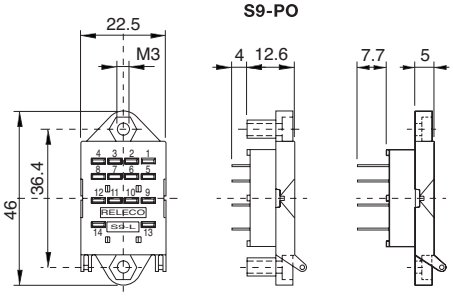
Rated load	6 A / 250 V
Dielectric strength adjacent pin	2.5 kV rms / 1 min
Connection label	1...14; DIN/EN
Integrated retaining clip/plastic	for relay series C9
Ambient temperature operation/storage	-40 (no ice)....60 °C /-40 ... 80 °C

Printed cicuit lay-out [mm]

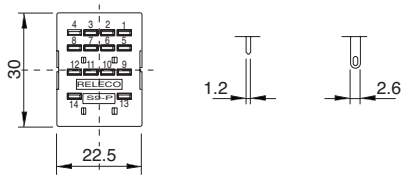


S9-P
S9-PO

Dimensions [mm]



S9-P



Technical approvals, conformities

Lloyd´s

EN 60947-1, EN 61810-1

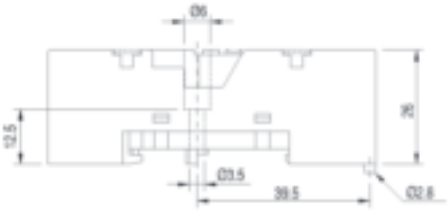
S10

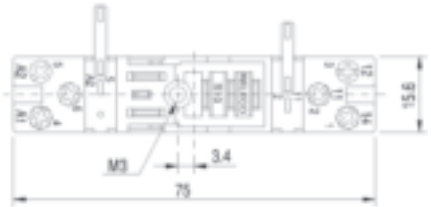
Socket for Interface relay

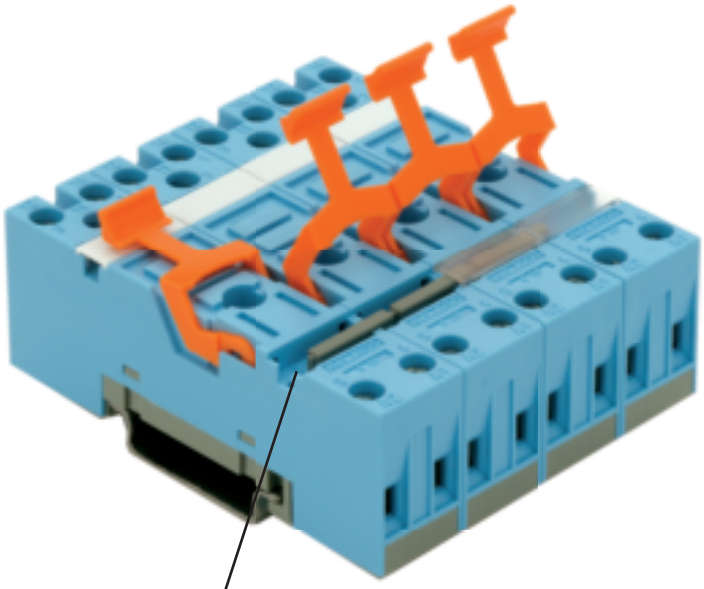
Type	**S10** 1-pole, 1 connection level Logic wiring Integrated retaining clip and labelling space Coil bridge bar for A2, 11
Rated current	**10 A**
Specifications	
Rated load	10 A / 250 V
Insulation	Test voltage V rms / 1 min
– All terminals/DIN rail	5 kV
Contact terminals	2,5 KV
Contact / Coil terminals	5 KV
Cross-section of connecting wire	
– Single-wire	4 mm^2 or 2 x 2,5 mm^2
– Multi-wire	22 - 14 AWG
Max. screw torque	1,2 Nm
Screw dimensions	M3, Pozi, slot
Integrated retaining clip/plastic	for relay series C10, CSS
Labelling space	detachable
Connection label	1...5; DIN/EN
Mounting	DIN rail TS35 or mounting plate
Ambient temperature operation/storage	-40 (no ice)….60 °C /-40 ... 80 °C
Socket for plug-in 10A IRC relays	**C10-A, C10-T, CSS, C10-G**
Accessories	
Coil bridge bars	**S10-BB**

Connection diagram

Dimensions [mm]







BRIDGE BAR

Technical approvals, conformities

EN 60947-1, EN 61810-1

S10-M

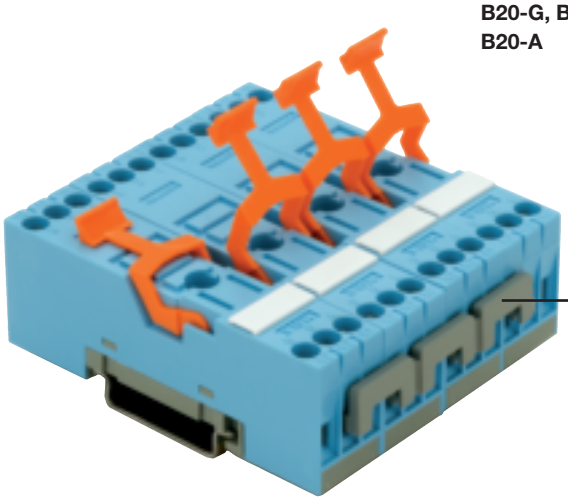
Socket for Interface relay

Type	**S10-M** I/O socket for IRC relays, 16 A Logic connection , 2 x A2
Rated current	**16 A**

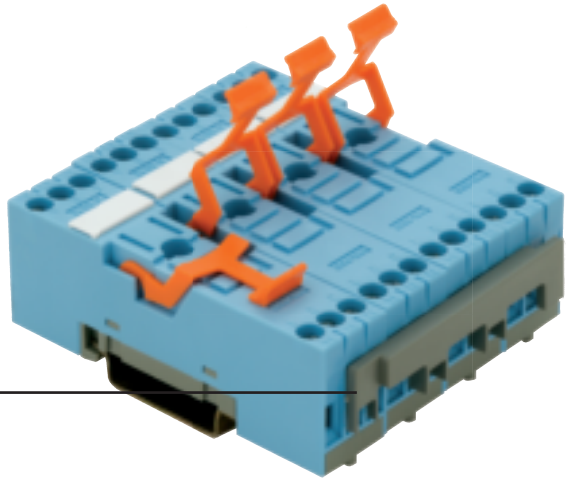
Specifications	
Rated load	16 A / 250 V
Insulation	Test voltage V rms / 1 min
– All terminals/DIN rail	5 kV
Contact / Coil terminals	5 kV
Cross-section of connecting wire	
– Single-wire	4 mm^2 or 2 x 2,5 mm^2
– Multi-wire	22 - 14 AWG
Max. screw torque	1,2 Nm
Screw dimensions	M3, Pozi, slot
Integrated retaining clip/plastic	for relay series C10, CSS
Labelling space	detachable
Connection label	1...6; DIN/EN
Mounting	DIN rail TS35 or mounting plate
Ambient temperature operation/storage	-40 (no ice)....60 °C /-40 ... 80 °C

Socket for plug-in 10A IRC relays	**C10A, C10G, C10T and CSS**

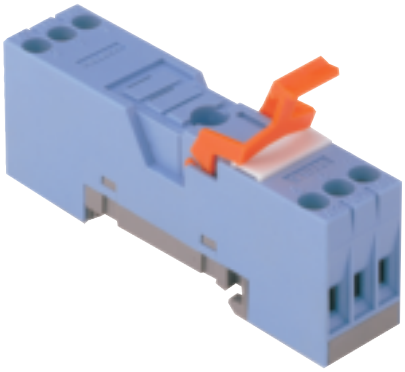
Accessories	
Coil bridge bars	**V10-G, V40-G** **V10-R, V40-R** **V10-A, V40-A** **B20-G, B20-R** **B20-A**



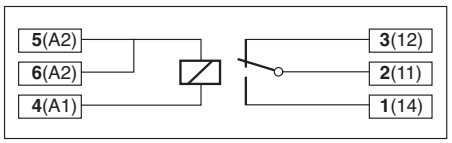
COIL BRIDGE BARS



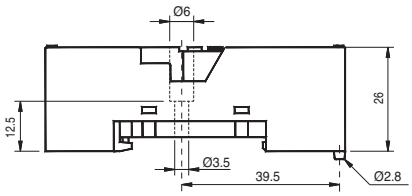
POWER BRIDGE BARS

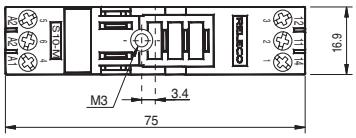


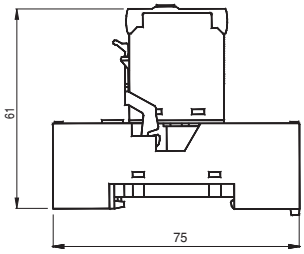
Connection diagram



Dimensions [mm]







Technical approvals, conformities

IEC 61810 EN 60947

S10-P

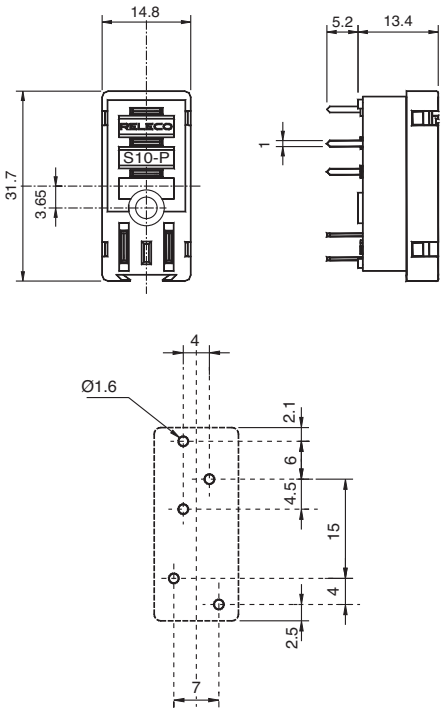
Printed circuit socket for Interface relays, C10 and CSS

Type:	**S10-P** Printed circuit socket for 1-pole IRC relay
Rated current	**10 A**

Specifications

Rated load	10 A / 250 V
Insulation	Test voltage V rms / 1 min
Coil terminals to contacts	5 kV rms
Hard Brass tin-platted terminals	0,5 x 1 mm
Integrated retaining clip/plastic	for relay series C10, CSS
Labelling space	detachable
Connection label	1...5; DIN/EN
Ambient temperature operation/storage	-40 (no ice)….60 °C /-40 ... 80 °C

Dimensions [mm]



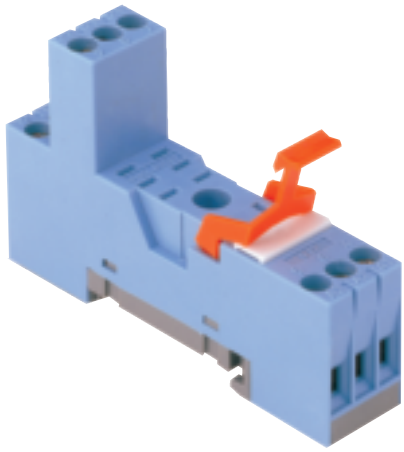
Technical approvals, conformities

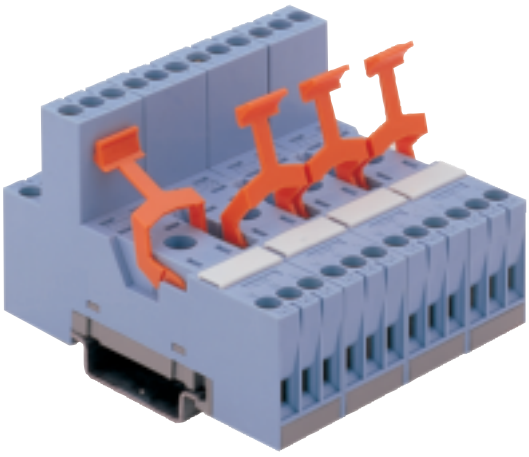
IEC 61810 EN 60947

S12

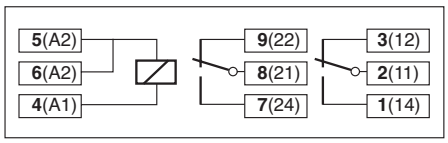
Socket for Interface relay

Type	**S12** I/O socket for C12 relays with 2 x CO Logic connection , 5 A
Rated current	**5 A**
Specifications	
Rated load	5 A / 250 V
Insulation	Test voltage V rms / 1 min
– All terminals/DIN rail	5 kV
Contacts terminals	2,5 kV
Contacts / Coil terminals	5 kV
Cross-section of connecting wire	
– Single-wire	4 mm^2 or 2 x 2,5 mm^2
– Multi-wire	22 - 14 AWG
Max. screw torque	1,2 Nm
Screw dimensions	M3, Pozi, slot
Integrated retaining clip/plastic	for relay series C12
Labelling space	detachable
Connection label	1...9; DIN/EN
Mounting	DIN rail TS35 or mounting plate
Ambient temperature operation/storage	-40 (no ice)....60 °C /-40 ... 80 °C
Socket for IRC relays	**C12, C12G**
Accessories	
Coil bridge bars	**V10-G, V40-G** **V10-R, V40-R** **V10-A, V40-A** **B20-G, B20-R** **B20-A**

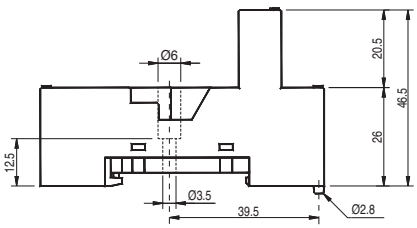


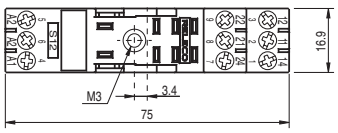


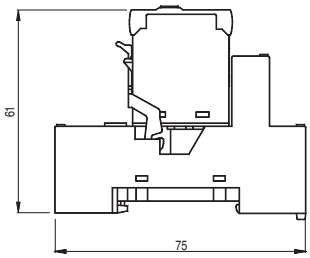
Connection diagram



Dimensions [mm]







Technical approvals, conformities

IEC 61810 EN 60947

S12-P

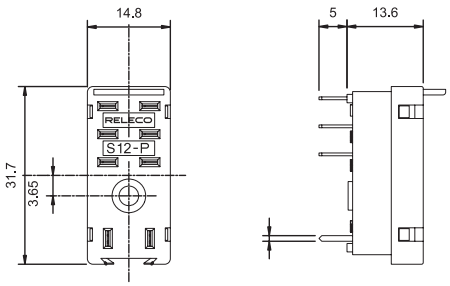
Printed circuit socket for Interface relays, C12

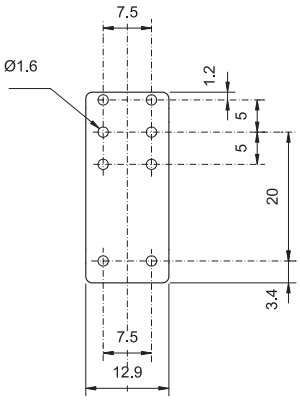
Type:	**S12-P** Printed circuit socket for 2-pole C12 relay
Rated current	**5 A**

Specifications

Rated load	5 A / 250 V
Insulation	Test voltage V rms / 1 min
– Pole / Pole	3 kV
– Coil / contact terminals	5 kV
Hard brass tin-plated terminals	0,5 x 1 mm
Integrated hold-down clip	

Dimensions [mm]





Technical approvals, conformities

IEC 61810 EN 60947

Notes

Notes

Notes

Notes

RELECO Worldwide Sales Net

comat RELECO

ARGENTINA
WINTERS INSTRUMENTS S.A.
B1640BIN Martinez - Buenos Aires
www.winters.com.ar

AUSTRALIA
RITTAL PTY. LTD.
Taren Point - NSW 2229
www.rittal.com.au

AUSTRIA
AVS SCHMERSAL VERTRIEBS GMBH
1230 Wien
www.avs-schmersal.at

BELGIUM
MULTIPROX N.V.
9300 Aalst
www.multiprox.be

BRAZIL
COMAT RELECO LTDA
09550-190 Sao Caetano/Sao Paulo
www.comatreleco.com.br

CANADA
CHARTWELL AUTOMATION INC.
Markham, Ontario L6G 1B5
www.chartwell.ca

CHILE
ELECTRÓNICA RHOMBERG LTD.
Santiago de Chile
www.rhomberg.cl

CHINA
ELCO ELECTRONICS CO. LTD.
Tianjin 300385
www.elco-holding.com

COLOMBIA
ACJ HIGH VOLTAGE LTD.
Bogota D.C. Colombia
acj@acj.com.co

CZECH REPUBLIC
EIG-OEM AUTOMATIC SPOL. S.R.O.
140 00 Praha 4
www.oem-automatic.cz

DENMARK
OEM AUTOMATIC A/S
4040 Jyllinge
www.oemautomatic.dk

ESTONIA
OEM EESTI OÜ
1137 Tallinn
www.oem.fi

ECUADOR
IANDCECONTROL S.A. (I & C)
Quito
www.iandcecontrol.com

FINLAND
OEM AUTOMATIC OY
20750 Turku
www.oem.fi

GERMANY
COMAT RELECO GMBH
22885 Barsbüttel
www.comat-online.de

GERMANY
KÜHN CONTROLS S.L.
75305 Neuenbürg
www.kuehn-controls.com

GREECE
KALAMARAKIS SAPOUNAS AUTOMATION SA.
13671 Acharnes - Athens
www.ksa.gr

INDIA
PARAMOUNT INDUSTRIES
Bangalore 560 010
www.paramount.net.in

IRAN
SEYED GHASEM RIAZI TRADING
15949 Teheran
www.sgrtrading.com

IRELAND
TCM CONTROLS LTD.
Dublin 12
www.tcmcontrols.com

ITALY
OEM AUTOMAZIONE SRL.
20090 Cesano Boscone
www.oemautomazione.it

LITHUANIA
HIDROTEKA ENGINEERING SERVICES
51333 Kaunas
www.hidroteka.lt

LITHUANIA
ELINTA UAB.
54469 Kauno raj.
www.elintosprekyba.lt

MAROCCO
MAGHREB ELECTRO-TECHNIQUE SARL.
Casablanca 20250
www.beltransfo.com

NETHERLANDS
VIERPOOL BV.
3606 AS Maarssen
www.vierpool.nl

NEW ZEALAND
LANDIS+GYR
Penrose, Auckland 1642
www.landisgyr.com

NORWAY
OEM AUTOMATIC AS
3003 Drammen
www.oem.no

PAKISTAN
GINZA INTERNATIONAL CORPORATION
Karachi – 74000
Ginza-int@cyber.net.pk

PERU
PROMOTORES ELÉCTRICOS S.A.
Lima 13
www.promelsa.com.pe

POLAND
OEM AUTOMATIC SP. Z.O.O.
02-676 Warszawa
www.oemautomatic.com.pl

RUSSIA
SENSORLINK LLC.
125080 Moscow
www.sensorlink.ru

RUSSIA
POLIGON JSC.
197376 St. Petersburg
www.poligon.info

SINGAPORE
FUTRON ELECTRONICS PTE. LTD.
Singapore 329857
www.futronelectronics.com.sg

SWEDEN
OEM INTERNATIONAL AB
573 28 Tranas
www.oem.se

SWITZERLAND
COMAT AG
3076 Worb
www.comat.ch

TAIWAN
E-SENSORS & AUTOMATION CORP.
Kaohsiung, Taiwan
www.e-sensors.com.tw

TURKEY
CERAN OTOMASYON LTD.
34384 Okmeydann/Istanbul
www.ceran.com.tr

THAILAND
ZIGMAACT CO. LTD.
Bangkok 10700
www.zigmaact.com

UNITED KINGDOM
OEM AUTOMATIC LTD.
Leicester LE8 6ZG
www.oem.co.uk

URUGUAY
ELEKTROSWEDEN S.A.
11100 Montevideo
www.elektrosweden.com.uy

USA
TURCK INC.
Plymouth MN 55441
www.turck-usa.com

U.A.E
POWER ECONOMY MIDDLE EAST CO. LLC
6072 Abu Dhabi
www.powereconomy.net

Headquarters & Sales

Comat AG
Bernstrasse 4
3076 Worb, Switzerland
Phone: +41 (0)31 838 55 77
Fax: +41 (0)31 838 55 99
E-Mail: info@comat.ch
Web: www.comat.ch

Production

RELECO, S.A.
La Laguna 30 (Pol. Urtinsa)
28923 Alcorcón (Madrid) - Spain
Phone: (+34) 91 641 60 12
Fax: (+34) 91 641 21 93
Email: export@releco.com
Web: www.releco.com

GC CR10/4.2010e