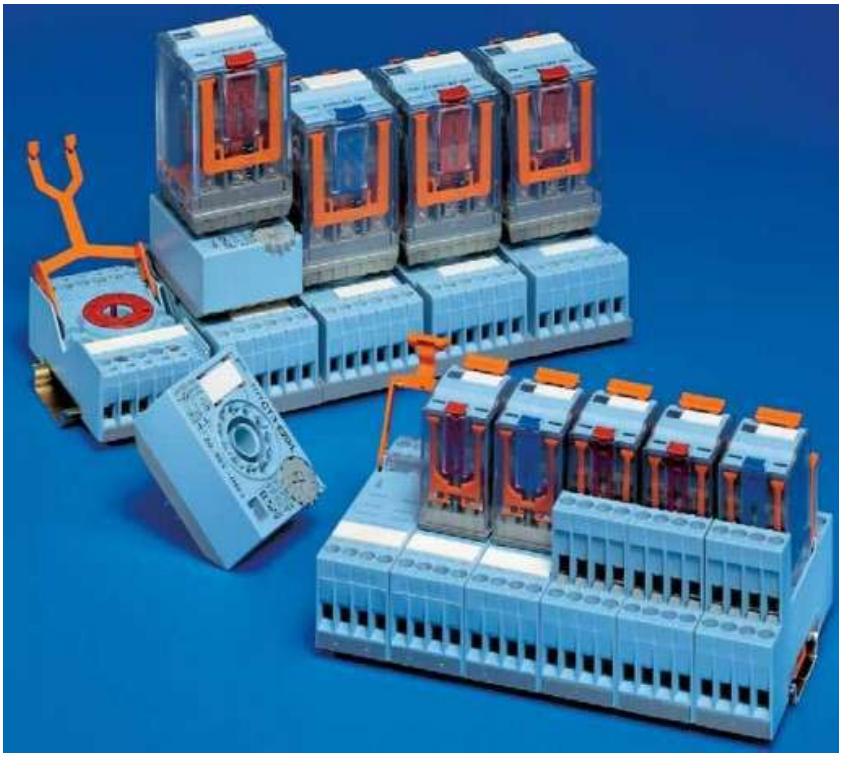


Solid State Contactor – CC3H420 (three phase)

Type: CC3H420

The CC series solid-state contactors are suitable for the contactless and non-wearing switching of ohmic and inductive AC loads at high switching frequency. They come with an operating voltage up to 600 VAC and nominal current up to 50 A with two and three phases. They come with control voltages of either 5–24 VDC or 24–230 VAC/VDC.

Output

Switching element	Thyristor
Numbers of phases	3
Nominal voltage (U_{nom})	400 VAC
Output voltage range	24 – 480 VAC
Reverse voltage	1200 Vrrm
Peak reverse voltage	1300 Vrsm
Min. load	10 mA
Max. leakage current	1 mA
Operation current AC-1/51 @ U_{nom}	20 A
Operation current AC-3 @ U_{nom}	10 A
Operation current AC-55b @ U_{nom}	10 A
Operation current AC-56a @ U_{nom}	5 A
Response/Release time	20 ms
Limit load	610 A^2s

Input

Voltage	24 – 230 VAC/VDC
Min. voltage	20,4 VAC/VDC
Max. voltage	253 VAC/VDC
Release voltage	7,2 VAC/VDC
Max. current	6 mA

General Specifications

Ambient temperature storage/operation	-20 – 80°C / -5 – 40°C
Connection terminals	Screw terminal 10 mm^2
Ingress protection degree	IP 20
Mounting	DIN rail TS35
Housing material	PPE Noryl SE1 / Aluminium
Weight	1050 g

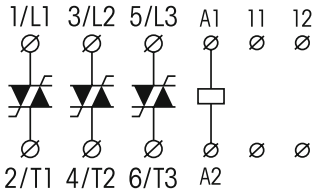
Insulation

Insulation voltage	4 kV
Dielectric strength	660 V

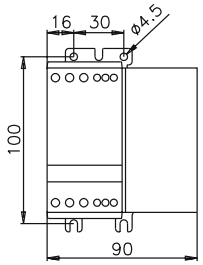
Standard type

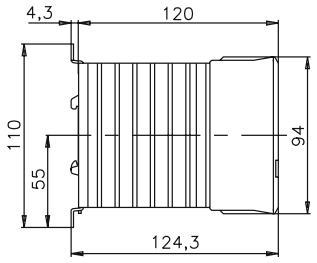
Starting Torque Limiter	**CC3H420**

Connection diagram



Dimensions [mm]





Technical approvals, conformities

Solid State Contactor – CC3H610 (three phase)

Type: CC3H610

The CC series solid-state contactors are suitable for the contactless and non-wearing switching of ohmic and inductive AC loads at high switching frequency. They come with an operating voltage up to 600 VAC and nominal current up to 50 A with two and three phases. They come with control voltages of either 5–24 VDC or 24–230 VAC/VDC.

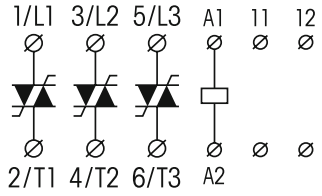
Output	
Switching element	Thyristor
Numbers of phases	3
Nominal voltage (U_{nom})	400 VAC
Output voltage range	24 – 480 VAC
Reverse voltage	1200 Vrrm
Peak reverse voltage	1300 Vrsm
Min. load	10 mA
Max. leakage current	1 mA
Operation current AC-1/51 @ U_{nom}	10 A
Operation current AC-3 @ U_{nom}	10 A
Operation current AC-55b @ U_{nom}	10 A
Operation current AC-56a @ U_{nom}	5 A
Response/Release time	20 ms
Limit load	610 A^2s

Input	
Voltage	24 – 230 VAC/VDC
Min. voltage	20,4 VAC/VDC
Max. voltage	253 VAC/VDC
Release voltage	7,2 VAC/VDC
Max. current	6 mA

General Specifications	
Ambient temperature storage/operation	-20 – 80°C / -5 – 40°C
Connection terminals	Screw terminal 6 mm^2
Ingress protection degree	IP 20
Mounting	DIN rail TS35
Housing material	PPE Noryl SE1 / Aluminium
Weight	650 g
Insulation	
Insulation voltage	4 kV
Dielectric strength	660 V

Standard type	
Starting Torque Limiter	**CC3H610**

Connection diagram



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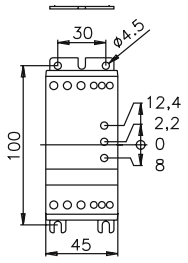

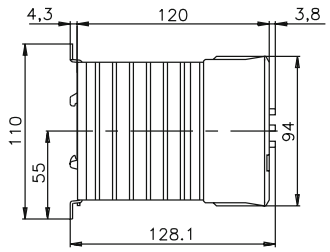

Technical approvals, conformities

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Solid State Contactor, switching of ohmic – CR11H210 (one phase)

Type: CR11H210

The CR series solid-state contactors are suitable for the contactless and non-wearing switching of ohmic and inductive AC loads at high switching frequency. They come with an operating voltage up to 400 VAC and nominal current up to 63 A with two and three phases. They come with control voltages of either 5–24 VDC or 24–230 VAC/VDC.

Output

Switching element	Thyristor
Numbers of phases	1
Nominal voltage (U_{nom})	230 VAC
Output voltage range	12 – 240 VAC
Reverse voltage	1000 Vrrm
Peak reverse voltage	1100 Vrsm
Min. load	10 mA
Max. leakage current	1 mA
Operation current AC-1/51 @ U_{nom}	10 A
Response/Release time	20 ms
Limit load	180 A^2s

Input

Voltage	24 – 230 VAC/VDC
Min. voltage	20,4 VAC/VDC
Max. voltage	253 VAC/VDC
Release voltage	7,2 VAC/VDC
Max. current	8 mA

General Specifications

Ambient temperature storage/operation	-20 – 80°C / -5 – 40°C
Connection terminals	Screw terminal 6 mm^2
Ingress protection degree	IP 20
Mounting	DIN rail TS35
Housing material	PPE Noryl SE1 / Aluminium
Weight	270 g

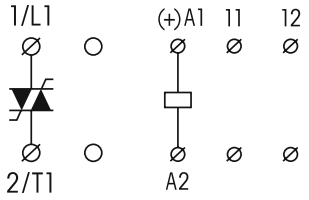
Insulation

Insulation voltage	4 kV
Dielectric strength	660 V

Standard type

Starting Torque Limiter	**CR11H210**

Connection diagram



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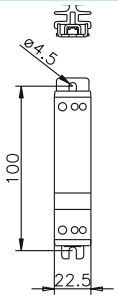
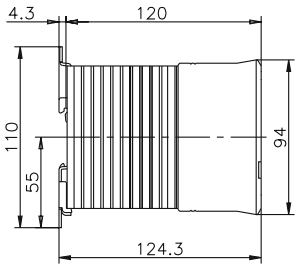




Technical approvals, conformities

CE cULus LISTED

Solid State Contactor, switching of ohmic – CR11H430 (one phase)

Type: CR11H430

The CR series solid-state contactors are suitable for the contactless and non-wearing switching of ohmic and inductive AC loads at high switching frequency. They come with an operating voltage up to 400 VAC and nominal current up to 63 A with two and three phases. They come with control voltages of either 5–24 VDC or 24–230 VAC/VDC.

Output

Switching element	Thyristor
Numbers of phases	1
Nominal voltage (U_{nom})	400 VAC
Output voltage range	24 – 480 VAC
Reverse voltage	1200 Vrrm
Peak reverse voltage	1300 Vrsm
Min. load	10 mA
Max. leakage current	1 mA
Operation current AC-1/51 @ U_{nom}	30 A
Response/Release time	20 ms
Limit load	610 A^2s

Input

Voltage	24 – 230 VAC/VDC
Min. voltage	20,4 VAC/VDC
Max. voltage	253 VAC/VDC
Release voltage	7,2 VAC/VDC
Max. current	8 mA

General Specifications

Ambient temperature storage/operation	-20 – 80°C / -5 – 40°C
Connection terminals	Screw terminal 10 mm^2
Ingress protection degree	IP 20
Mounting	DIN rail TS35
Housing material	PPE Noryl SE1 / Aluminium
Weight	650 g

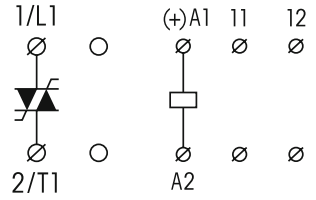
Insulation

Insulation voltage	4 kV
Dielectric strength	660 V

Standard type

Starting Torque Limiter	**CR11H430**

Connection diagram



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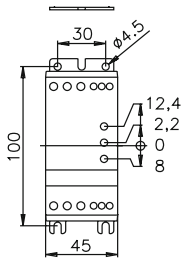

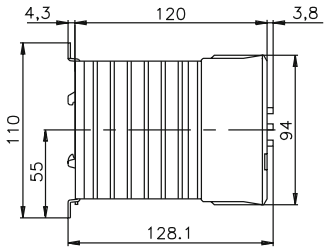

Technical approvals, conformities

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Solid State Contactor, switching of ohmic – CR11H480 (one phase)

Type: CR11H480

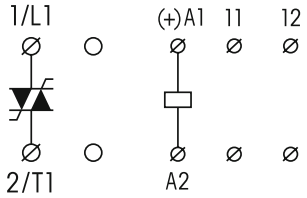
The CR series solid-state contactors are suitable for the contactless and non-wearing switching of ohmic and inductive AC loads at high switching frequency. They come with an operating voltage up to 400 VAC and nominal current up to 63 A with two and three phases. They come with control voltages of either 5–24 VDC or 24–230 VAC/VDC.

Output	
Switching element	Thyristor
Numbers of phases	1
Nominal voltage (U_{nom})	400 VAC
Output voltage range	24 – 480 VAC
Reverse voltage	1200 Vrrm
Peak reverse voltage	1300 Vrsm
Min. load	10 mA
Max. leakage current	1 mA
Operation current AC-1/51 @ U_{nom}	80 A
Response/Release time	20 ms
Limit load	25300 A^2s
Input	
Voltage	24 – 230 VAC/VDC
Min. voltage	20,4 VAC/VDC
Max. voltage	253 VAC/VDC
Release voltage	7,2 VAC/VDC
Max. current	8 mA
General Specifications	
Ambient temperature storage/operation	-20 – 80°C / -5 – 40°C
Connection terminals	Screw terminal 35 mm^2
Ingress protection degree	IP 20
Mounting	DIN rail TS35
Housing material	PPE Noryl SE1 / Aluminium
Weight	1050 g
Insulation	
Insulation voltage	4 kV
Dielectric strength	660 V

Standard type

Starting Torque Limiter	**CR11H480**

Connection diagram



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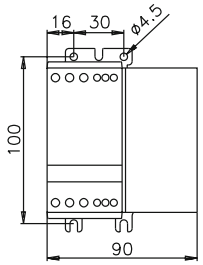
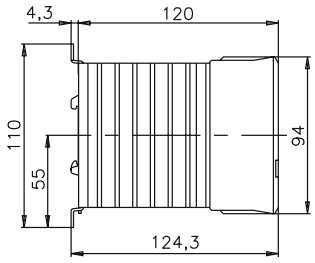




Technical approvals, conformities

Solid State Contactor, switching of ohmic – CR11H4125 (one phase)

Type: CR11H4125

The CR series solid-state contactors are suitable for the contactless and non-wearing switching of ohmic and inductive AC loads at high switching frequency. They come with an operating voltage up to 400 VAC and nominal current up to 63 A with two and three phases. They come with control voltages of either 5–24 VDC or 24–230 VAC/VDC.

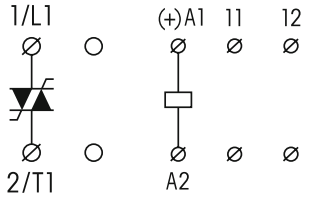
Output	
Switching element	Thyristor
Numbers of phases	1
Nominal voltage (U_{nom})	400 VAC
Output voltage range	24 – 480 VAC
Reverse voltage	1200 Vrrm
Peak reverse voltage	1300 Vrsm
Min. load	10 mA
Max. leakage current	1 mA
Operation current AC-1/51 @ U_{nom}	125 A
Response/Release time	20 ms
Limit load	25300 A^2s

Input	
Voltage	24 – 230 VAC/VDC
Min. voltage	20,4 VAC/VDC
Max. voltage	253 VAC/VDC
Release voltage	7,2 VAC/VDC
Max. current	8 mA

General Specifications	
Ambient temperature storage/operation	-20 – 80°C / -5 – 40°C
Connection terminals	Screw terminal 35 mm^2
Ingress protection degree	IP 20
Mounting	DIN rail TS35
Housing material	PPE Noryl SE1 / Aluminium
Weight	1050 g
Insulation	
Insulation voltage	4 kV
Dielectric strength	660 V

Standard type	
Starting Torque Limiter	**CR11H4125**

Connection diagram



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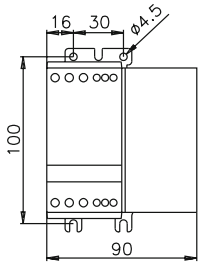
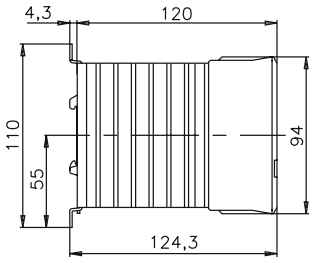




Technical approvals, conformities

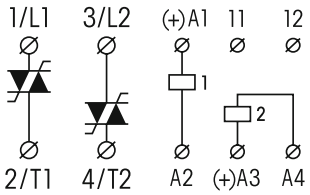
Solid State Contactor, switching of ohmic – CR22H430 (two phase)

Type: CR22H430

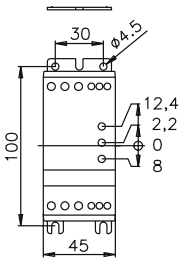
The CR series solid-state contactors are suitable for the contactless and non-wearing switching of ohmic and inductive AC loads at high switching frequency. They come with an operating voltage up to 400 VAC and nominal current up to 63 A with two and three phases. They come with control voltages of either 5–24 VDC or 24–230 VAC/VDC.

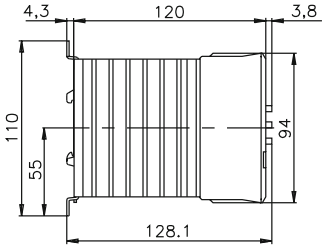
Output	
Switching element	Thyristor
Numbers of phases	2
Nominal voltage (U_{nom})	400 VAC
Output voltage range	24 – 480 VAC
Reverse voltage	1200 Vrrm
Peak reverse voltage	1300 Vrsm
Min. load	10 mA
Max. leakage current	1 mA
Operation current AC-1/51 @ U_{nom}	max. 30 A accumulated
Response/Release time	20 ms
Limit load	610 A^2s
Input	
Voltage	24 – 230 VAC/VDC
Min. voltage	20,4 VAC/VDC
Max. voltage	253 VAC/VDC
Release voltage	7,2 VAC/VDC
Max. current	8 mA
General Specifications	
Ambient temperature storage/operation	-20 – 80°C / -5 – 40°C
Connection terminals	Screw terminal 10 mm^2
Ingress protection degree	IP 20
Mounting	DIN rail TS35
Housing material	PPE Noryl SE1 / Aluminium
Weight	650 g
Insulation	
Insulation voltage	4 kV
Dielectric strength	660 V
Standard type	
Starting Torque Limiter	**CR22H430**

Connection diagram



Dimensions [mm]





Technical approvals, conformities

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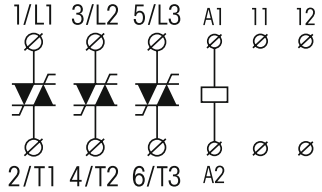
Solid State Contactor, switching of ohmic – CR33H420 (three phase)

Type: CR33H420

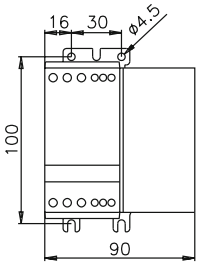
The CR series solid-state contactors are suitable for the contactless and non-wearing switching of ohmic and inductive AC loads at high switching frequency. They come with an operating voltage up to 400 VAC and nominal current up to 63 A with two and three phases. They come with control voltages of either 5–24 VDC or 24–230 VAC/VDC.

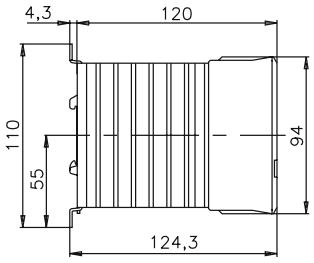
Output	
Switching element	Thyristor
Numbers of phases	3
Nominal voltage (U_{nom})	400 VAC
Output voltage range	24 – 480 VAC
Reverse voltage	1200 Vrrm
Peak reverse voltage	1300 Vrsm
Min. load	10 mA
Max. leakage current	1 mA
Operation current AC-1/51 @ U_{nom}	20 A
Response/Release time	20 ms
Limit load	610 A^2s
Input	
Voltage	24 – 230 VAC/VDC
Min. voltage	20,4 VAC/VDC
Max. voltage	253 VAC/VDC
Release voltage	7,2 VAC/VDC
Max. current	8 mA
General Specifications	
Ambient temperature storage/operation	-20 – 80°C / -5 – 40°C
Connection terminals	Screw terminal 10 mm^2
Ingress protection degree	IP 20
Mounting	DIN rail TS35
Housing material	PPE Noryl SE1 / Aluminium
Weight	1050 g
Insulation	
Insulation voltage	4 kV
Dielectric strength	660 V
Standard type	
Starting Torque Limiter	**CR33H420**

Connection diagram



Dimensions [mm]





Technical approvals, conformities

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Reversing Contactor – CCR3H410 (three phase)

Type: CCR3H410

The CCR is a reversing contactor for asynchronous motors up to 10 A / 400 VAC. It has two separate electric control inputs for right and left motion that are interlocked. It comes with control voltages of either 5–24 VDC or 24–230 VAC/VDC.

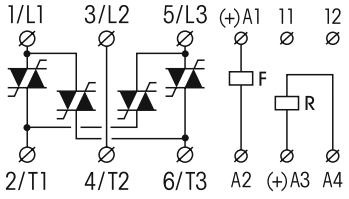
Output	
Switching element	Thyristor
Numbers of phases	3
Nominal voltage (U_{nom})	400 VAC
Output voltage range	24 – 480 VAC
Reverse voltage	1200 Vrrm
Peak reverse voltage	1300 Vrsm
Min. load	50 mA
Max. leakage current	5 mA
Operation current AC-1/51 @ U_{nom}	10 A
Operation current AC-53 @ U_{nom}	10 A
Response/Release time	20 ms
Limit load	610 A^2s

Input	
Voltage	24 – 230 VAC/VDC
Min. voltage	20,4 VAC/VDC
Max. voltage	253 VAC/VDC
Release voltage	7,2 VAC/VDC
Max. current	6 mA

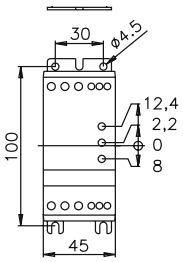
General Specifications	
Ambient temperature storage/operation	-20 – 80°C / -5 – 40°C
Connection terminals	Screw terminal 6 mm^2
Ingress protection degree	IP 20
Mounting	DIN rail TS35
Housing material	PPE Noryl SE1 / Aluminium
Weight	650 g
Insulation	
Insulation voltage	4 kV
Dielectric strength	660 V

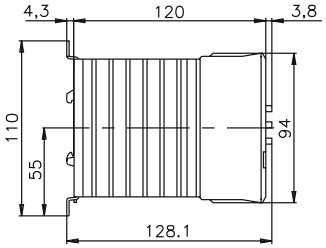
Standard type	
Starting Torque Limiter	**CCR3H410**

Connection diagram



Dimensions [mm]





Technical approvals, conformities

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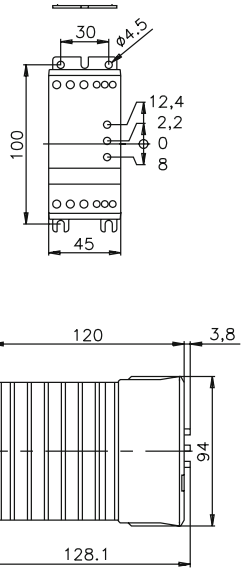
Performance Regulator – CPC1230 (one phase)

Type: CPC1230

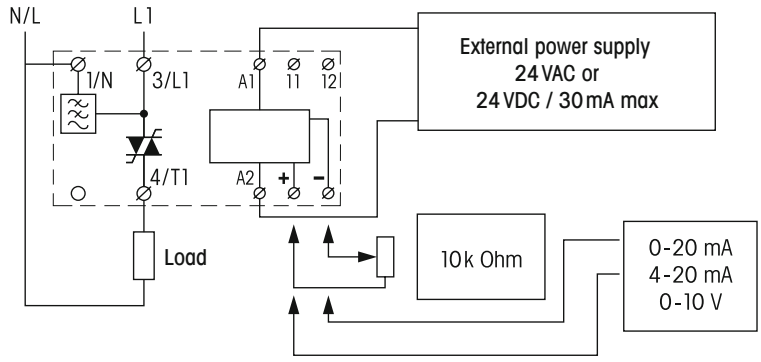
The one-phase solid-state performance regulator CPC is suitable for triggering heating elements, lamps and transformers up to 50 A. Performance is controlled through a potentiometer or analogue standard signal. It has a 24 VDC voltage supply.

Output	
Switching element	Thyristor
Numbers of phases	1
Nominal voltage (U_{nom})	230 VAC
Output voltage range	380 – 480 VAC
Reverse voltage	1000 Vrrm
Peak reverse voltage	1100 Vrsm
Min. load	10 mA
Max. leakage current	1 mA
Operation current AC-1/51 @ U_{nom}	30 A
Operation current AC-53 @ U_{nom}	30 (non uL)
Response/Release time	20 ms
Limit load	1800 A^2s
Input	
Voltage	24 VAC/VDC
Control signal	0 – 10 V, 10 – 0 V 0 – 20 mA, 20 – 0 mA 4 – 20 mA, 20 – 4 mA
Potentiometer	0 – 10 kΩ, 10 – 0 kΩ
General Specifications	
Ambient temperature storage/operation	-20 – 80°C / -5 – 40°C
Connection terminals	Screw terminal 2.5 mm^2
Ingress protection degree	IP 20
Mounting	DIN rail TS35
Housing material	PPE Noryl SE1 / Aluminium
Weight	650 g
Insulation	
Insulation voltage	4 kV
Dielectric strength	660 V
Standard type	
Starting Torque Limiter	**CPC1230**

Dimensions [mm]



Connection diagram



Technical approvals, conformities

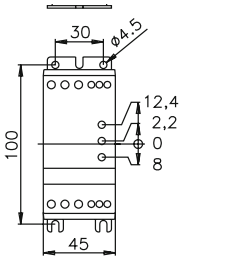
Performance Regulator – CPC1430 (one phase)

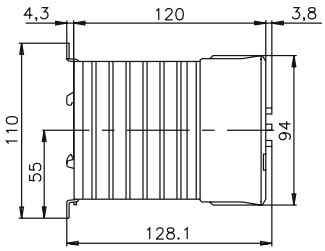
Type: CPC1430

The one-phase solid-state performance regulator CPC is suitable for triggering heating elements, lamps and transformers up to 50 A. Performance is controlled through a potentiometer or analogue standard signal. It has a 24 VDC voltage supply.

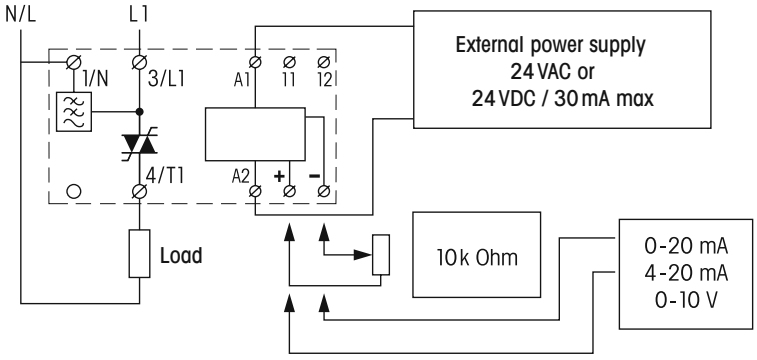
Output	
Switching element	Thyristor
Numbers of phases	1
Nominal voltage (U_{nom})	400 VAC
Output voltage range	380 – 480 VAC
Reverse voltage	1200 Vrrm
Peak reverse voltage	1300 Vrsm
Min. load	10 mA
Max. leakage current	1 mA
Operation current AC-1/51 @ U_{nom}	30 A
Operation current AC-53 @ U_{nom}	30 (non uL)
Response/Release time	20 ms
Limit load	1800 A^2s
Input	
Voltage	24 VAC/VDC
Control signal	0 – 10 V, 10 – 0 V
	0 – 20 mA, 20 – 0 mA
	4 – 20 mA, 20 – 4 mA
Potentiometer	0 – 10 kΩ, 10 – 0 kΩ
General Specifications	
Ambient temperature storage/operation	-20 – 80°C / -5 – 40°C
Connection terminals	Screw terminal 2,5 mm^2
Ingress protection degree	IP 20
Mounting	DIN rail TS35
Housing material	PPE Noryl SE1 / Aluminium
Weight	650 g
Insulation	
Insulation voltage	4 kV
Dielectric strength	660 V
Standard type	
Starting Torque Limiter	**CPC1430**

Dimensions [mm]





Connection diagram



Technical approvals, conformities

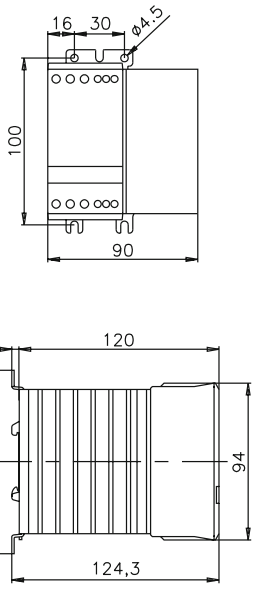
Performance Regulator – CPC1450 (one phase)

Type: CPC1450

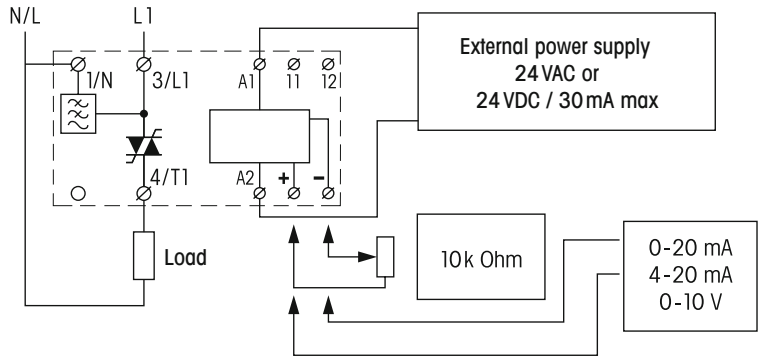
The one-phase solid-state performance regulator CPC is suitable for triggering heating elements, lamps and transformers up to 50 A. Performance is controlled through a potentiometer or analogue standard signal. It has a 24 VDC voltage supply.

Output	
Switching element	Thyristor
Numbers of phases	1
Nominal voltage (U_{nom})	400 VAC
Output voltage range	380 – 480 VAC
Reverse voltage	1200 Vrrm
Peak reverse voltage	1300 Vrsm
Min. load	10 mA
Max. leakage current	1 mA
Operation current AC-1/51 @ U_{nom}	50 A
Operation current AC-53 @ U_{nom}	30 (non uL)
Response/Release time	20 ms
Limit load	1800 A^2s
Input	
Voltage	24 VAC/VDC
Control signal	0 – 10 V, 10 – 0 V 0 – 20 mA, 20 – 0 mA 4 – 20 mA, 20 – 4 mA
Potentiometer	0 – 10 kΩ, 10 – 0 kΩ
General Specifications	
Ambient temperature storage/operation	-20 – 80°C / -5 – 40°C
Connection terminals	Screw terminal 2,5 mm^2
Ingress protection degree	IP 20
Mounting	DIN rail TS35
Housing material	PPE Noryl SE1 / Aluminium
Weight	1050 g
Insulation	
Insulation voltage	4 kV
Dielectric strength	660 V
Standard type	
Starting Torque Limiter	**CPC1450**

Dimensions [mm]



Connection diagram



Technical approvals, conformities

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Notes

2.0 Time Relays

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**

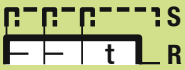
S ⇒ R on with delay (t1)
S OFF ⇒ R off with delay (t2)

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)



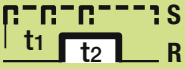
S (pulse or continuous contact)
⇒ R on for t
S on for t = tRESET

M **Puls shaping**

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

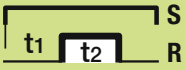
Delayed pulse

G **On delay single shot**



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

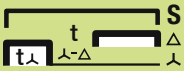
H **On delay single shot**



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

Special functions

Y **Star-delta timer**



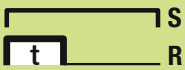
S ⇒ 人 on for t人
人OFF ⇒ △ on with delay for t人-△
S OFF ⇒ △ off

X1 **Restart delay**

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

Shot timing modes

W **One shot leading edge**



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

N **One shot trailing edge**

S OFF ⇒ R on for t
S on for t ⇒ R off

Q **One shot leading and trailing edge**

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

Blinker functions

B **Blinker,** pulse start

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

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

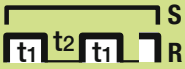
S ⇒ R on/off periodically
according to t
S OFF: last pulse = t

B2 **Blinker,** interval start

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

Repeat cycle timer

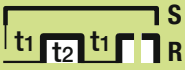
I **Repeat cycle timer,** pulse start



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

P **Repeat cycle timer,** interval start

C55, CT1: t2 / t1



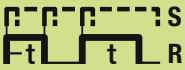
S ⇒ R after t1 (t2) on/off periodically according to t2 and t1
S OFF ⇒ R off

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 — S STOP interrupts t (t-addition)

t RESET — S RESET reset t; t restarts immediately

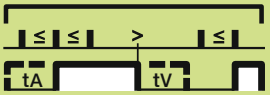
T — t is stopped ⇒ R on/off

T — Test

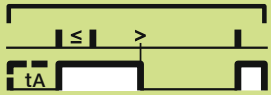
S = Triggering
R = Output circuit
⇒ = switches…
ON OFF

Pulse sequence monitoring

U



V



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

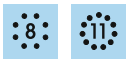
≤: Pulse separation is **smaller** than the time tP
>: Pulse separation is **larger** than the time tP

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

tV = settable alarm delay
delay (tA = tV)

01.2016e

Time Cubes



Type	Function																				t-Stop	t-Reset	Ext. Poti	t max.				
	E	A	F	W	N	Q	K	L	M	B	B_1	B_2	G	H	I	P	S	LS	X_1	U	V				sec	min	h	d	Page
CT..-E 30	●																									30			185
CT..-A 30		●																								30			185
CT..-K 30				●			●																			30			185
CT..-W 30				●																						30			185
CT..-B 30										●																30			185

Modular plug-in Time Relays (CT-System)

Type	Function																				t-Stop	t-Reset	Ext. Poti	t max.				
	E	A	F	W	N	Q	K	L	M	B	B_1	B_2	G	H	I	P	S	LS	X_1	U	V				sec	min	h	d	Page
CT30…	●			●						●																30			189
CT32…	●	●		●	●		●			●	●															60*			189
CT33…	●	●	△	●	●	△	●	●		●	●		▲	▲													60*		189
CT36…															●	●											60*		189

Plug-in Time Relays

Type	Function																				t-Stop	t-Reset	Ext. Poti	t max.				
	E	A	F	W	N	Q	K	L	M	B	B_1	B_2	G	H	I	P	S	LS	X_1	U	V				sec	min	h	d	Page
CS1	●			●						●		●											●		60*			180
CS2	●	●		●	●		●			●		●											●			60*		181
CS3	●	●		●	●		●			●		●														60*		182

DIN Time Relays

DIN

Type	Function																				t-Stop	t-Reset	Ext. Poti	t max.				
	E	A	F	W	N	Q	K	L	M	B	B_1	B_2	G	H	I	P	S	LS	Y	U	V				sec	min	h	d	Page
CMD11	●	●																								60			156
CIM1	●	●		●	●		●			●	●						●	●									60*		163
CIM12	●	●		●	●		●			●	●						●	●									60*		164
CIM13	●	●		●	●		●			●	●						●	●									60*		165
CIM14	●	●		●	●		●			●	●						●	●									60*		166
CIM2	●	●						●	●			●	●	●													60*		167
CIM22	●	●						●	●			●	●	●													60*		168
CIM23	●	●						●	●			●	●	●													60*		169
CIM3			●			●							●	●	●	●											60*		170
CIM32			●			●							●	●	●	●											60*		171
CIM33			●			●							●	●	●	●											60*		172
CM3	●	●		●	●		●			●	●																60*		173
CRV4	●	●	△	●	●	△	●	●	●	●	●	●	●	●			●	●						●			60*		174
CSV4	●	●	△	●	●	△	●	●	●	●	●	●	●	●			●	●						●			10*		175
CPF11		●					●	●																	0,6				176

*** TF-60 Setting of long times**

The TF60 time setting methode permits short examination of long delay time settings. Elapsing times of hours can be monitored in the sec. range.

Example for a delay time of 38h:

1. Set range switch to 60sec
2. Set 38sec on the potentiometer (e.g. check 38sec by chronometer)
3. Set range switch to 60h

The delay time now amounts to 38h.

[1] alternatively with instantaneous contact
■ without auxiliary voltage (relay bistable)
□ without auxiliary voltage (relay monostable)
△ t2 = t1
▲ t2 = 0,5s

Notes

2.1 Monofunction Time Relays

Application	Types	Functions*	Min. time	Max. time	contact rating	Socket
Monofunction Time Relay	CMD	A, E	50 ms	60 min	10 A / 250 V	DIN

*(Function diagrams: refer to page 152)

CMD11-A/UC12V, CMD11-E/UC12V

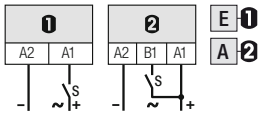
Monofunction Time Relay
On delay (E) or Off delay (A), 0.5 s ... 60 minutes
DIN Rail mounting according to DIN 43 880

Type: CMD11-.../UC12V

The CMD is a cost-efficient timing relay supporting timing functions such as on-delay or off-delay and five time ranges from 50 ms to 60 minutes. It comes with an 8 A change-over contact and with four separate supplies (UC12V, UC24V, AC115V und AC230V). The output state is displayed by LED. The relay may be manually operated and blocked by ON/OFF switch.

Maximum contact load	**8 A 250 V AC-1 8 A 30 V DC-1**
Recommended minimum contact load	**100 mA / 12 V**

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



Time data

5 partial time ranges, t_{max} (DIP switch)	0,6 s / 6 s / 60 s / 6 min / 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
Voltage failure buffering	≥ 5 ms

Contacts

Type	Single contact, CO
Material	AgNi
Rated operational current	10 A
Max. inrush current (10ms)	15 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	**CMD11-.../UC12V**
Nominal voltage (UC = AC / DC)	12 V AC/DC
Operating voltage range	9.6 ... 14.4 V AC/DC
Power consumption DC typ.	32 mA
Power consumption AC typ.	50 mA
Frequency range	48 ... 62 Hz
Input current into B1 typ. AC / DC	2.7 / 4.3 mA
Trigger threshold voltage on B1 typ AC / DC	5.2 / 8.8 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 / -40 ...60 °C
Life time of contacts 8 A, 250 V AC-1	75 x 10^3
Conductor cross section	Stranded wire 2.5 mm^2, 2 x 1.5 mm^2
Ingress protection degree	IP 20
Max. Screw torque	0.5 Nm
Housing material / Weight	Polyamide PA-66 (UL94-V0) / 48 g

Standard types

Monofunction Time Relay (Off delay)	**CMD11-A/UC12V**
Monofunction Time Relay (On delay)	**CMD11-E/UC12V**

Connection diagram

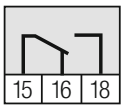


Fig.1 AC voltage endurance

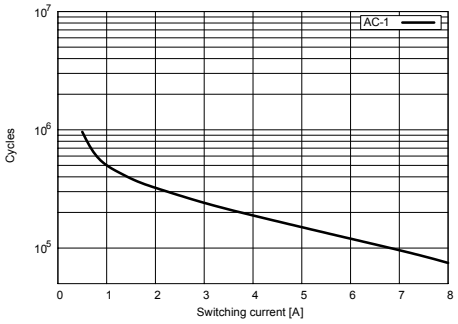
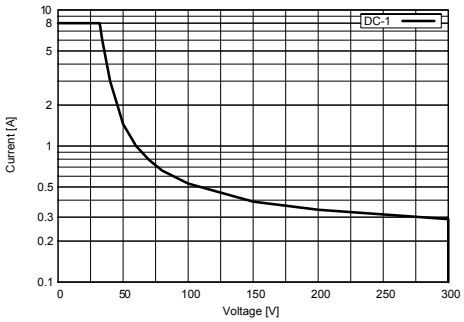
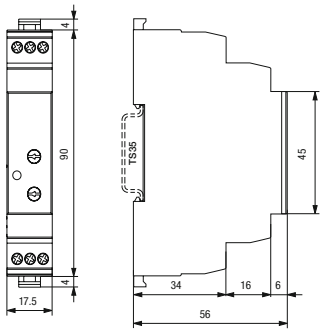


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

EN 60947

CMD11-A/UC24V, CMD11-E/UC24V

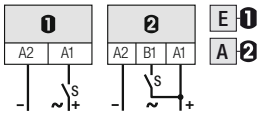
Monofunction Time Relay
On delay (E) or Off delay (A), 0.5 s ... 60 minutes
DIN Rail mounting according to DIN 43 880

Type: CMD11-.../UC12V

The CMD is a cost-efficient timing relay supporting timing functions such as on-delay or off-delay and five time ranges from 50 ms to 60 minutes. It comes with an 8 A change-over contact and with four separate supplies (UC12V, UC24V, AC115V und AC230V). The output state is displayed by LED. The relay may be manually operated and blocked by ON/OFF switch.

Maximum contact load	**8 A 250 V AC-1 8 A 30 V DC-1**
Recommended minimum contact load	**100 mA / 12 V**

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



Time data

5 partial time ranges, t_{max} (DIP switch)	0,6 s / 6 s / 60 s / 6 min / 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
Voltage failure buffering	≥ 5 ms

Contacts

Type	Single contact, CO
Material	AgNi
Rated operational current	10 A
Max. inrush current (10ms)	15 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	**CMD11-.../UC24V**
Nominal voltage (UC = AC / DC)	24 V AC/DC
Operating voltage range	19.2 ... 28.8 V AC/DC
Power consumption DC typ.	12 mA
Power consumption AC typ.	21 mA
Frequency range	48 ... 62 Hz
Input current into B1 typ. AC / DC	11.6. / 9.5 mA
Trigger threshold voltage on B1 typ AC / DC	9.5 / 14 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 / -40 ...60 °C
Life time of contacts 8 A, 250 V AC-1	75 x 10^3
Conductor cross section	Stranded wire 2.5 mm^2, 2 x 1.5 mm^2
Ingress protection degree	IP 20
Max. Screw torque	0.5 Nm
Housing material / Weight	Polyamide PA-66 (UL94-V0) / 48 g

Standard types

Monofunction Time Relay (Off delay)	**CMD11-A/UC24V**
Monofunction Time Relay (On delay)	**CMD11-E/UC24V**

Connection diagram

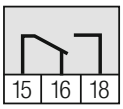


Fig.1 AC voltage endurance

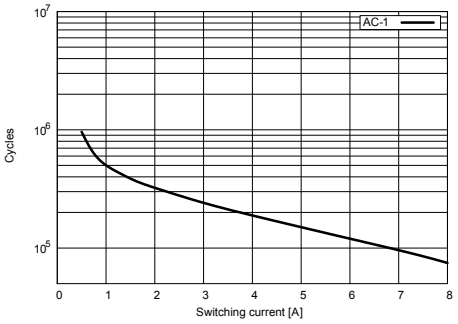
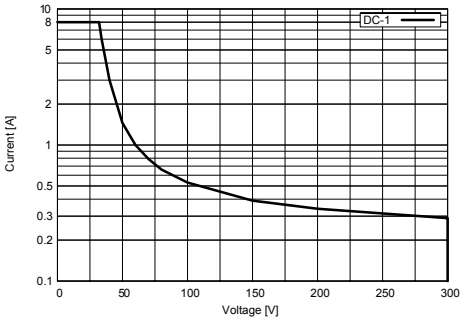
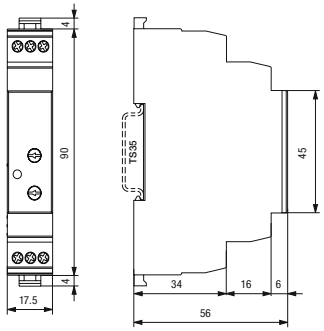


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

EN 60947

CMD11-A/AC115V, CMD11-E/AC115V

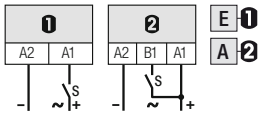
Monofunction Time Relay
On delay (E) or Off delay (A), 0.5 s ... 60 minutes
DIN Rail mounting according to DIN 43 880

Type: CMD11-.../UC12V

The CMD is a cost-efficient timing relay supporting timing functions such as on-delay or off-delay and five time ranges from 50 ms to 60 minutes. It comes with an 8 A change-over contact and with four separate supplies (UC12V, UC24V, AC115V und AC230V). The output state is displayed by LED. The relay may be manually operated and blocked by ON/OFF switch.

Maximum contact load	**8 A 250 V AC-1 8 A 30 V DC-1**
Recommended minimum contact load	**100 mA / 12 V**

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



Time data

5 partial time ranges, t_{max} (DIP switch)	0,6 s / 6 s / 60 s / 6 min / 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
Voltage failure buffering	≥ 5 ms

Contacts

Type	Single contact, CO
Material	AgNi
Rated operational current	10 A
Max. inrush current (10ms)	15 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	**CMD11-.../AC115V**
Nominal voltage	115 V AC
Operating voltage range	92 ... 138 V AC
Power consumption AC typ.	47 mA
Frequency range	48 ... 62 Hz
Input current into B1 typ. AC	1.7 mA
Trigger threshold voltage on B1 typ AC	42 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 / -40 ...60 °C
Life time of contacts 8 A, 250 V AC-1	75 x 10^3
Conductor cross section	Stranded wire 2.5 mm^2, 2 x 1.5 mm^2
Ingress protection degree	IP 20
Max. Screw torque	0.5 Nm
Housing material / Weight	Polyamide PA-66 (UL94-V0) / 48 g

Standard types

Monofunction Time Relay (Off delay)	**CMD11-A/AC115V**
Monofunction Time Relay (On delay)	**CMD11-E/AC115V**

Connection diagram

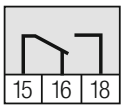


Fig.1 AC voltage endurance

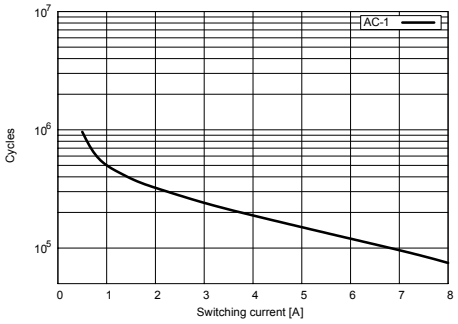
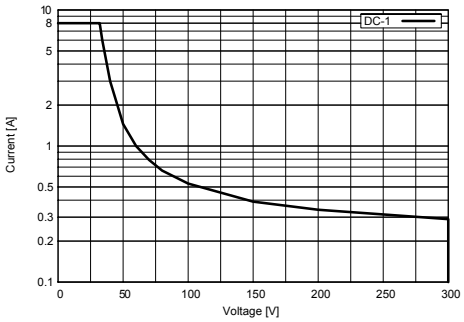
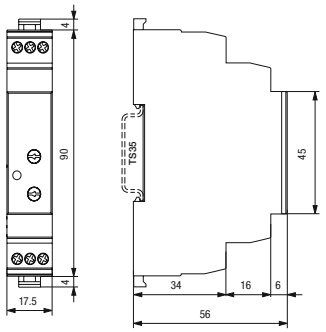


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

EN 60947

CMD11-A/AC230V, CMD11-E/AC230V

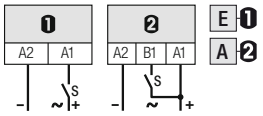
Monofunction Time Relay
On delay (E) or Off delay (A), 0.5 s ... 60 minutes
DIN Rail mounting according to DIN 43 880

Type: CMD11-.../AC230V

The CMD is a cost-efficient timing relay supporting timing functions such as on-delay or off-delay and five time ranges from 50 ms to 60 minutes. It comes with an 8 A change-over contact and with four separate supplies (UC12V, UC24V, AC115V und AC230V). The output state is displayed by LED. The relay may be manually operated and blocked by ON/OFF switch.

Maximum contact load	**8 A 250 V AC-1 8 A 30 V DC-1**
Recommended minimum contact load	**100 mA / 12 V**

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



Time data

5 partial time ranges, t_{max} (DIP switch)	0,6 s / 6 s / 60 s / 6 min / 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
Voltage failure buffering	≥ 5 ms

Contacts

Type	Single contact, CO
Material	AgNi
Rated operational current	10 A
Max. inrush current (10ms)	15 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	**CMD11-.../AC230V**
Nominal voltage	230 V AC
Operating voltage range	184 ... 255 V AC
Power consumption AC typ.	60 mA
Frequency range	48 ... 62 Hz
Input current into B1 typ. AC	1.9 mA
Trigger threshold voltage on B1 typ AC	80 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 / -40 ...60 °C
Life time of contacts 8 A, 250 V AC-1	75 x 10^3
Conductor cross section	Stranded wire 2.5 mm^2, 2 x 1.5 mm^2
Ingress protection degree	IP 20
Max. Screw torque	0.5 Nm
Housing material / Weight	Polyamide PA-66 (UL94-V0) / 48 g

Standard types

Monofunction Time Relay (Off delay)	**CMD11-A/AC230V**
Monofunction Time Relay (On delay)	**CMD11-E/AC230V**

Connection diagram

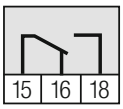


Fig.1 AC voltage endurance

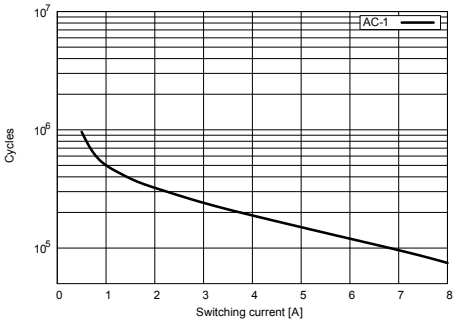
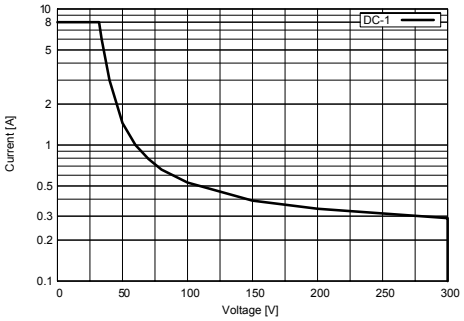
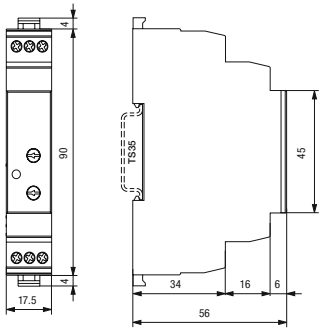


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

EN 60947

Notes

2.2 Multifunction Time Relays

Application	Types	Functions	Min. time	Max. time	Contact rating	Design
Universal time relay, 8 time functions & stepping function, ON/OFF switch, service function	CIM1	E, B, W, A, K, N, B1, S, LS	50 ms	60 h	16 A / 250 V	17.5 mm
Universal time relay, 8 time functions & stepping function, ON/OFF switch, AC solid state output	CIM12	E, B, W, A, K, N, B1, S, LS	50 ms	60 h	2 A / 250 V	17.5 mm
Universal time relay, 8 time functions & stepping function, ON/OFF switch, DC solid state output	CIM13	E, B, W, A, K, N, B1, S, LS	50 ms	60 h	5 A / 24 V DC	17.5 mm
Universal time relay for high inrush currents 8 time functions & stepping function, ON/OFF switch, service function	CIM14	E, B, W, A, K, N, B1, S, LS	50 ms	60 h	16 A / 250 V	17.5 mm
Universal time relay, 7 time functions, ON/OFF switch, service function	CIM2	E, A, L, M, G, B2, H	50 ms	60 h	16 A / 250 V	17.5 mm
Universal time relay, 7 time functions, ON/OFF switch, service function, AC solid state output	CIM22	E, A, L, M, G, B2, H	50 ms	60 h	2 A / 250 V	17.5 mm
Universal time relay, 7 time functions, ON/OFF switch, service function, DC solid state output	CIM23	E, A, L, M, G, B2, H	50 ms	60 h	5 A / 24 V DC	17.5 mm
Universal time relay, 6 time functions, ON/OFF switch, service function	CIM3	F, Q, G, H, I, P	50 ms	60 h	16 A / 250 V	17.5 mm
Universal time relay, 6 time functions, ON/OFF switch, service function, AC solid state output	CIM32	F, Q, G, H, I, P	50 ms	60 h	2 A / 250 V	17.5 mm
Universal time relay, 6 time functions, ON/OFF switch, service function, DC solid state output	CIM33	F, Q, G, H, I, P	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
Multi function time relay, 16 time functions	CRV4	E1, W, B, B2, H, E2, K, A L, N, M, B1, G, F, Q, LS, S	0.6 s	60 h	6 A / 250 V	13 mm
Multi function time relay, 16 time functions	CSV4	E1, W, B, B2, H, E2, K, A L, N, M, B1, G, F, Q, LS, S	8 ms	10 h	1.5 A / 30 V	13 mm
Pulse shaper	CPF11	K, L, A	5 ms	600 ms	0.8 A / 24 V	17.5 mm

(Function diagrams: refer to page 152)

CIM1, CIM1R (Railway)

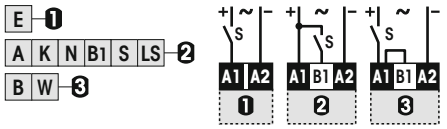
Time relay with mechanical changeover output contact
8 time functions + stepping function, ON-OFF switch, 50 ms ... 60 h, DIN Rail mounting according to DIN 43 880

Type: CIM1/UC24-240V

Sophisticated multifunction time relay, 1 changeover power contact with zero crossing switching (50/60 Hz), 8 time functions, stepping function and service function ON/OFF, time ranges: 50 ms … 60 h, multifunction LED state indicator, suitable for any time-control application and also staircase lighting, Light-switch neon lamp current absorption on input B1, Manual switching function for maintenance, emergency, etc., 16.6 Hz power supply applications. Railway version available.

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

Time functions and related connection diagrams (Function diagrams: refer to page 152)
The functions are selectable by rotary switch



LED function table:

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

Time data

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

Contacts

Material CIM1 / CIM1R / 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)	4 kVA
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 … 85 °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	**CIM1R/UC24-240V**

Connection diagram

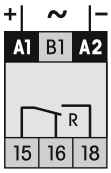


Fig.1 AC voltage endurance

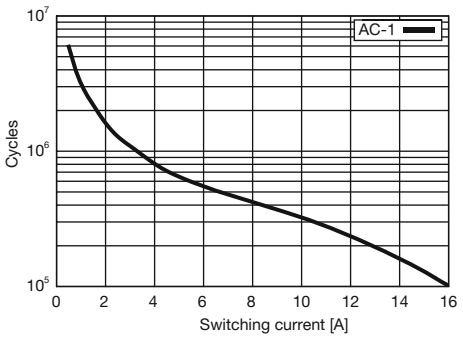
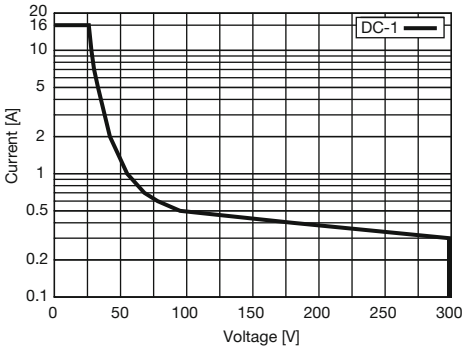
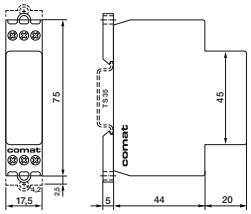


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

EN 50155, EN 60730

CIM12, CIM12R (Railway)

Time relay with AC solid-state output
8 time functions and stepping function, ON-OFF switch, 50 ms ... 60 h, DIN Rail mounting according to DIN 43 880

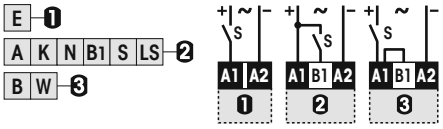
Type: CIM12/UC24-240V

Sophisticated multifunction time relay, 1 triac output, suitable for high frequency of operations and inductive loads, 8 time functions, stepping function and service function ON/OFF, time ranges: 50 ms … 60 h, multifunction LED state indicator, suitable for any time-control application and also staircase lighting, Light-switch neon lamp current absorption on input B1, manual switching function for maintenance, emergency, etc., 16.6 Hz applications. Railway version available.

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

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

The functions are selectable by rotary switch



LED function table:

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

Time data

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

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

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

Insulation

Test voltage between output and control input	2.5 kVrms 1 minute

General Specifications

Ambient temperature storage /operation	-40 … 85 °C / -40 …60 °C (Railway: -70 °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	**CIM12/UC24-240V**
Railway	**CIM12R/UC24-240V**

Connection diagram

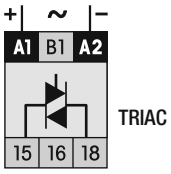
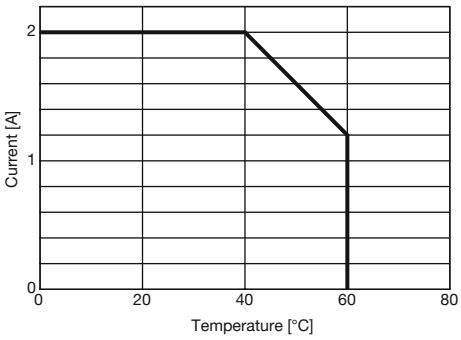
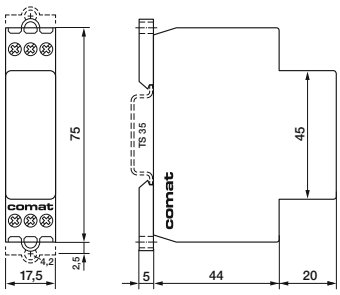


Fig. 1 Output derating curve



Dimensions [mm]



Technical approvals, conformities

EN 50155, EN 60730

CIM13, CIM13R (Railway)

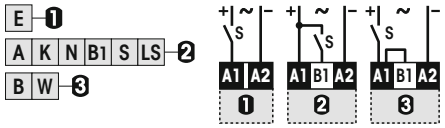
Time relay with DC solid-state output
8 time functions and stepping function, ON-OFF switch, 50 ms ... 60 h
DIN Rail mounting according to DIN 43 880

Type: CIM13/UC24-240V

Sophisticated multifunction time relay, 1 transistor output, 8 time functions, stepping function and service function ON/OFF, time ranges from 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 version 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 152)
The functions are selectable by rotary switch



LED function table:

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

Time data

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

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 (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 between output and control input	2.5 kVrms 1 minute

General Specifications

Ambient temperature storage /operation	-40 … 85 °C / -40 …60 °C (Railway: -70 °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	**CIM13/UC24-240V**
Railway	**CIM13R/UC24-240V**

Connection diagram

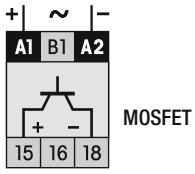
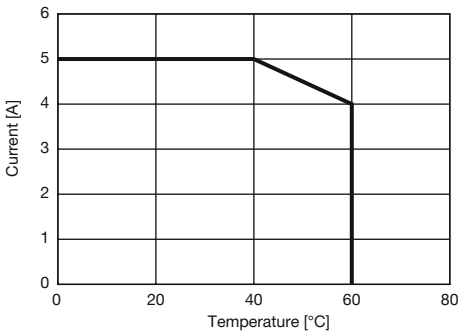
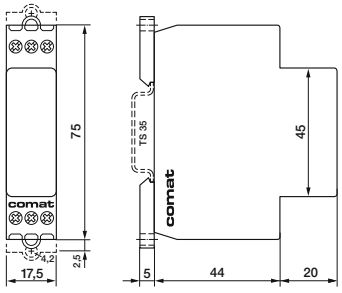


Fig. 1 Output derating curve



Dimensions [mm]



Technical approvals, conformities

EN 50155; EN 60730

CIM14

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

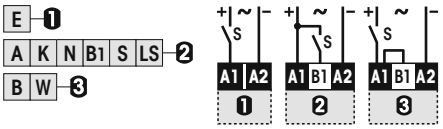
Type: CIM14/UC24-240V

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

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

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

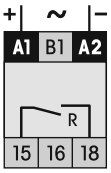
The functions are selectable by rotary switch



LED function table:

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

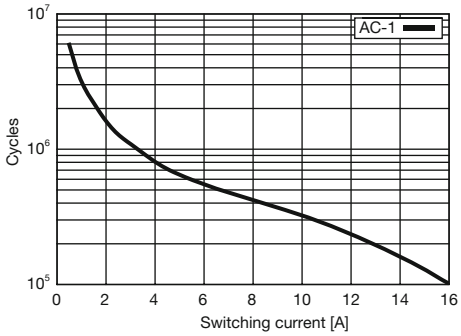
Connection diagram



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
Voltage failure buffering (50 / 60 Hz)	≥ 20 ms

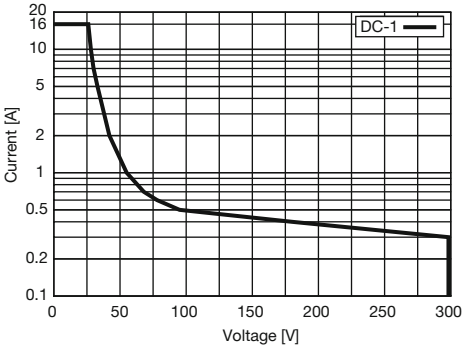
Fig.1 AC voltage endurance



Contacts

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

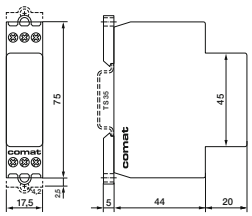
Fig. 2 DC load limit curve



Power supply- and control input

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

Dimensions [mm]



Insulation

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

General Specifications

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

Technical approvals, conformities

EN 50155, EN 60730

Standard types

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

CIM2, CIM2R (Railway)

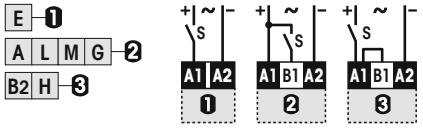
Time relay with mechanical changeover output contact 7 time functions and 7 time ranges from 50 ms ... 60 h, DIN Rail mounting according to DIN 43 880

Type: CIM2/UC24-240V

Sophisticated multifunction time relay, 1 changeover power contact switching in zero crossing (50/60 Hz), 7 time functions and service function ON/OFF, 7 time ranges from 50 ms to 60 h, multifunction LED state indicator, suitable for any time-control application, light-switch neon lamp current absorption on input B1, manual switching function for maintenance, emergency, etc., 16.6 Hz power supply applications. Railway version available.

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

Time functions and related connection diagrams (Function diagrams: refer to page 152)
The functions are selectable by rotary switch



LED function table:

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

Time data

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

Contacts

Material CIM2 / CIM2R / 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)	4 kVA
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 ... 85 °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	**CIM2/UC24-240V**
Railway	**CIM2R/UC24-240V**

Connection diagram

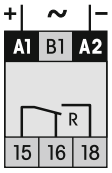


Fig.1 AC voltage endurance

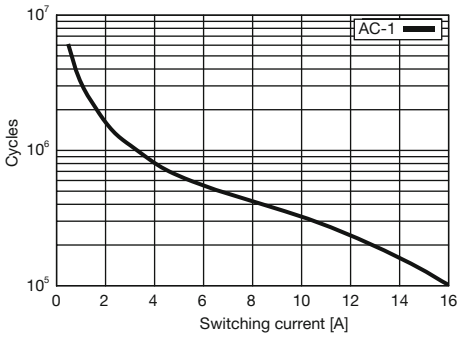
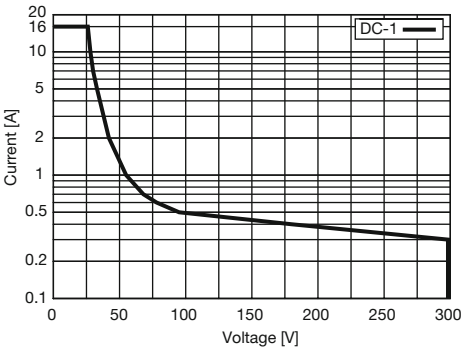
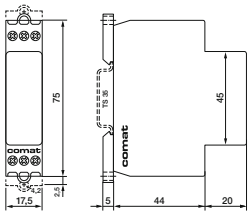


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

EN 50155, EN 60730

CIM22, CIM22R (Railway)

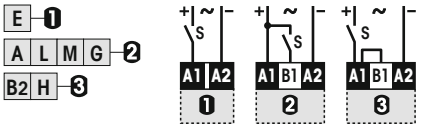
Time relay with AC solid-state output
7 time functions and 7 time ranges 50 ms ... 60 h,
DIN Rail mounting according to DIN 43 880

Type: CIM22/UC24-240V

Sophisticated multifunction time relay, 1 triac output, suitable for high frequency of operations and inductive loads, 7 time functions and service function ON/OFF, 7 time ranges from 50 ms … 60 h, multifunction LED state indicator, suitable for any time-control application light-switch neon lamp current absorption on input B1, manual switching function for maintenance, emergency, etc., 16.6 Hz applications. Railway version available.

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

Time functions and related connection diagrams (Function diagrams: refer to page 152)
The functions are selectable by rotary switch



LED function table:

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

Time data

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

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

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

Insulation

Test voltage between output and control input	2.5 kVrms 1 minute

General Specifications

Ambient temperature storage /operation	-40 … 85 °C / -40 …60 °C (Railway: -70 °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	**CIM22/UC24-240V**
Railway	**CIM22R/UC24-240V**

Connection diagram

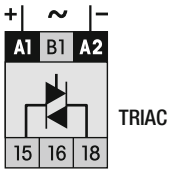
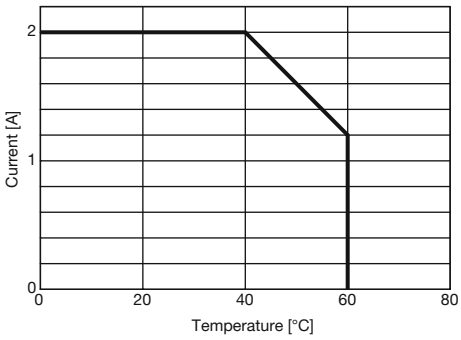
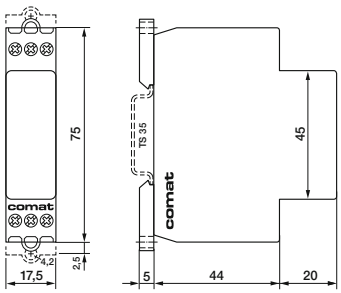


Fig. 1 Output derating curve



Dimensions [mm]



Technical approvals, conformities

EN 50155, EN 60730

CIM23, CIM23R (Railway)

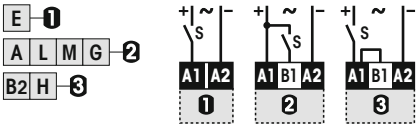
Time relay with DC solid-state output
7 time functions and 7 time ranges from 50 ms ... 60 h
DIN Rail mounting according to DIN 43 880

Type: CIM23/UC24-240V

Sophisticated multifunction time relay, 1 transistor output, 7 time functions and service function ON/OFF, 7 time ranges from 50 ms … 60 h, multifunction LED state indicator suitable for any time-control application, light-switch neon lamp current absorption on input B1, manual switching function for maintenance, emergency, etc., 16.6 Hz applications. Railway version 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 152)
The functions are selectable by rotary switch



LED function table:

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

Time data

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

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 (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 between output and control input	2.5 kVrms 1 minute

General Specifications

Ambient temperature storage /operation	-40 … 85 °C / -40 …60 °C (Railway: -70 °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	**CIM23/UC24-240V**
Railway	**CIM23R/UC24-240V**

Connection diagram

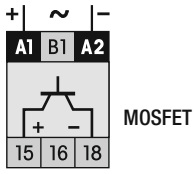
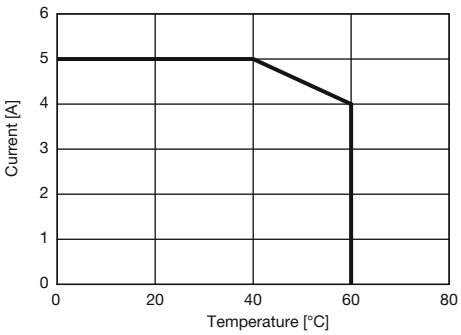
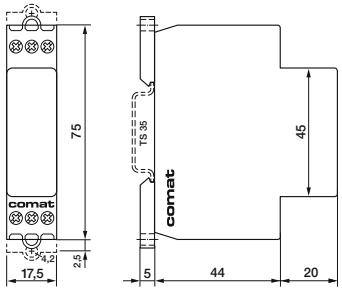


Fig. 1 Output derating curve



Dimensions [mm]



Technical approvals, conformities

EN 50155; EN 60730

CIM3, CIM3R (Railway)

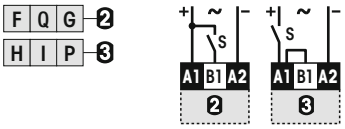
Time relay with mechanical changeover output contact
6 time functions and service function, 7 time ranges from 50 ms...60 h, DIN Rail mounting according to DIN 43 880

Type: CIM3/UC24-240V

Sophisticated multifunction time relay, 1 changeover power contact switching in zero crossing (50/60 Hz), 6 time functions and service function ON/OFF, 7 time ranges from 50 ms to 60 h, multifunction LED state indicator, suitable for any time-control application, light-switch neon lamp current absorption on input B1, manual switching function for maintenance, emergency, etc., 16.6 Hz power supply applications. Railway version available.

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

Time functions and related connection diagrams (Function diagrams: refer to page 152)
The functions are selectable by rotary switch



LED function table:

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

Time data

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

Contacts

Material CIM3 / CIM3R / 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)	4 kVA
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 ... 85 °C / -40 ...60 °C (Railway: -46 °C)
Mechanical life of contact	30 x 10^6 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 / 70 g

Standard types

UC (AC/DC) 15...60 Hz	**CIM3/UC24-240V**
Railway	**CIM3R/UC24-240V**

Connection diagram

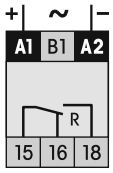


Fig.1 AC voltage endurance

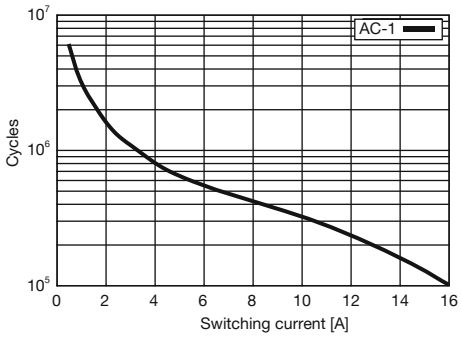
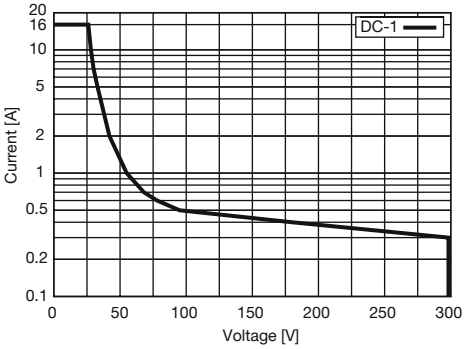
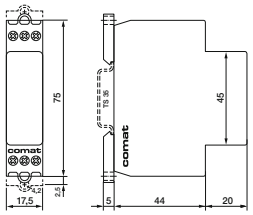


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

EN 50155, EN 60730

CIM32, CIM32R (Railway)

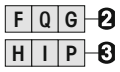
Time relay with AC solid-state output
6 time functions and service function, 7 time ranges from 50 ms...60 h, DIN Rail mounting according to DIN 43 880

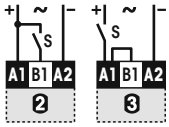
Type: CIM32/UC24-240V

Sophisticated multifunction time relay, 1 triac output, suitable for high frequency of operations and inductive loads, 6 time functions and service function ON/OFF, 7 time ranges from 50 ms … 60 h, multifunction LED state indicator, suitable for any time-control application light-switch neon lamp current absorption on input B1, manual switching function for maintenance, emergency, etc., 16.6 Hz applications. Railway version available.

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

Time functions and related connection diagrams (Function diagrams: refer to page 152)
The functions are selectable by rotary switch





LED function table:

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

Time data

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

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

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

Insulation

Test voltage between output and control input	2.5 kVrms 1 minute

General Specifications

Ambient temperature storage /operation	-40 … 85 °C / -40 …60 °C (Railway: -70 °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	**CIM32/UC24-240V**
Railway	**CIM32R/UC24-240V**

Connection diagram

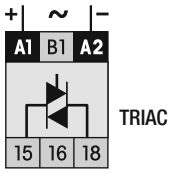
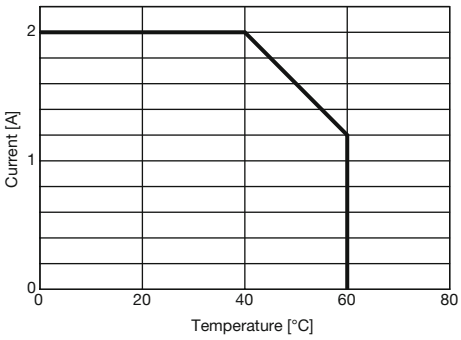
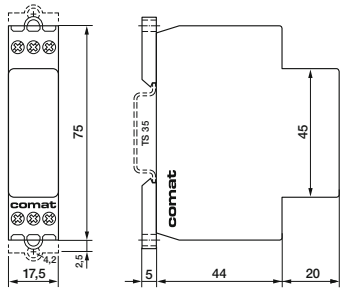


Fig. 1 Output derating curve



Dimensions [mm]



Technical approvals, conformities

EN 50155, EN 60730

CIM33, CIM33R (Railway)

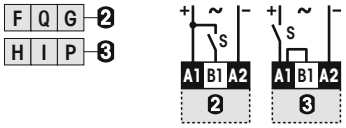
Time relay with DC solid-state output
6 time functions and service function, 7 time ranges from 50 ms…60 h, DIN Rail mounting according to DIN 43 880

Type: CIM33/UC24-240V

Sophisticated multifunction time relay, 1 transistor output, 6 time functions and service function ON/OFF, 7 time ranges from 50 ms … 60 h, Multifunction LED state indicator, suitable for any time-control application, light-switch neon lamp current absorption on input B1, manual switching function for maintenance emergency, etc., 16.6 Hz applications. Railway version 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 152)
The functions are selectable by rotary switch



LED function table:

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

Time data

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

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 (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 between output and control input	2.5 kVrms 1 minute

General Specifications

Ambient temperature storage / operation	-40 … 85 °C / -40 …60 °C (Railway: -70 °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	**CIM33/UC24-240V**
Railway	**CIM33R/UC24-240V**

Connection diagram

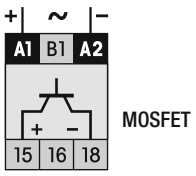
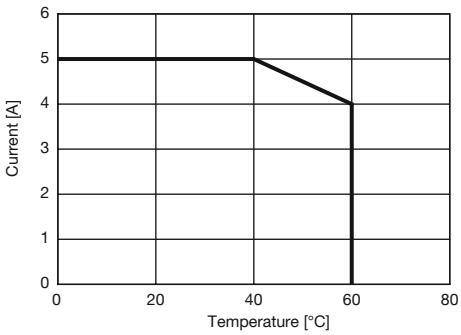
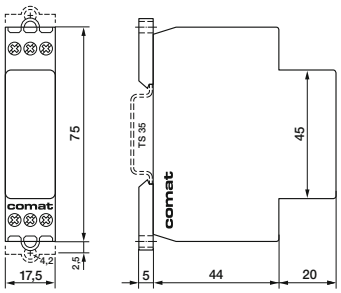


Fig. 1 Output derating curve



Dimensions [mm]



Technical approvals, conformities

EN 50155; EN 60730

CM3

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

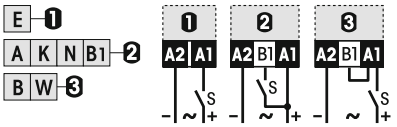
Type: CM3/… V R

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 152)

The functions are selectable by rotary switch



LED function table:

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

Time data

7 partial time ranges, t_{max} (rotary switch)	0.6, 6, 60 s / 6, 60 min / 6, 60 h
Fine adjustment range (rotary knob)	t_{min} … t_{max}, 0.5 … 6
Time range tolerance	t_{min}: -5 % … +0 % / t_{max}: -0 % … +5 %
Repetition accuracy	± 0.1 % or DC: 2 ms / AC: 10 ms
Response time, power on, on A1	≤ 25 ms
Min. trigger pulse on B1	35 ms (AC / DC)
Reset time B1 (AC/DC)	≤ 40 ms
Voltage failure buffering	≥ 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

	DC 12-24 V	**DC 24-48 V / AC 24-240 V**	
Nominal voltage			
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

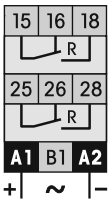


Fig.1 AC voltage endurance

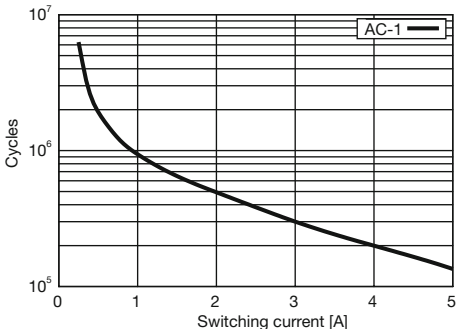
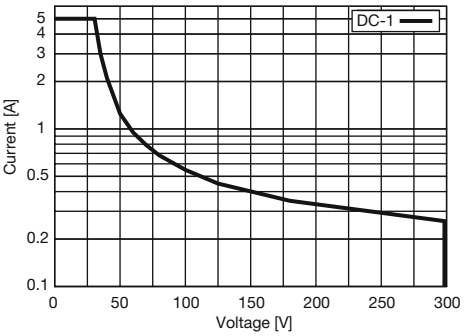
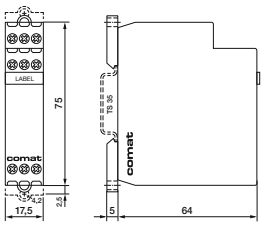


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

EN 50155, EN 60730

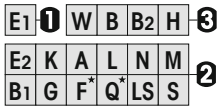
CRV4

Multifunction time relay with 16 functions and 7 time ranges 50 ms ... 60 h
DIN Rail mounting according to DIN 43 880

Type: CRV4/UC24-240V
16 timing functions
6 A C.O. relay output
Power supply UC 24 ... 240 V
Option for external fine adjustment time range potentiometer
LED state indicators for output and control input

Maximum output load	**6 A / 250 V**

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



Time data	
7 partial time ranges, t_{max} (rotary switch)	0,6 s / 6 s / 60 s / 6 m / 60 m / 6 h / 60 h
Time range tolerance	t_{min}: -5 % … +0 % / t_{max}: -0 % … +5 %
Repetition accuracy	± 0.1 % or 2 ms
Response time, power on, on A1	20 ms
Min. trigger pulse on B1	25 ms
Reset time B1 (AC/DC)	30 ms
Voltage failure buffering	10 ms

Output	
Type	1 CO, micro disconnection
Material	AgNi
Rated operational current	6 A
Max. inrush current (10 ms)	15 A
Max. switching voltage AC-1	250 V
Max. AC load AC-1	1500 VA
Max. DC load DC-1 30 V / 250 V	180 W / 75 W

Power supply and control input	
Nominal voltage	**UC 24 – 240 V**
Operating voltage range	19,2 ... 250 V
Power consumption max.	550 mW
Control current into B1 max.	7 mA
Allowed residual current into B1 max.	1,2 mA
Trigger threshold voltage on B1 typ. AC / DC	14,5 V / 17,5 V

General Specifications	
Ambient temperature storage /operation	-40 … 85 °C / -40 …70 °C
Conductor cross section	Stranded wire 2.5 mm², 2 x 1 mm²
Ingress Protection degree	IP 20
Max. Screw torque	0.6 Nm
Housing material / Weight	Lexan / 50 g

Standard types	**CRV4/UC24-240V**

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

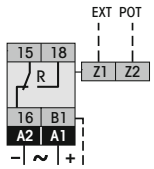


Fig.1 AC electrical endurance

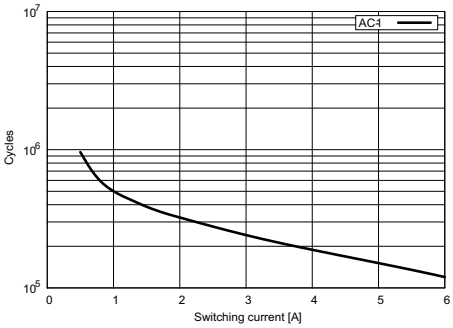
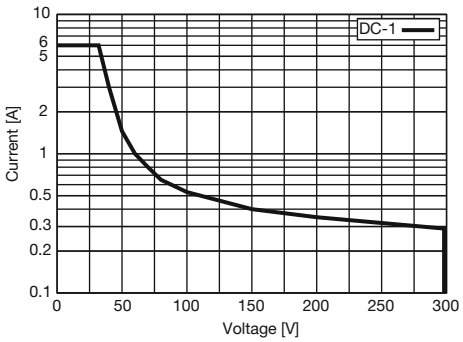
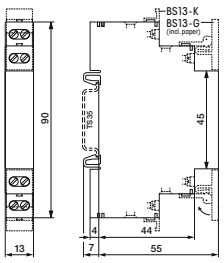


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

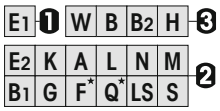
CSV4

Multifunction time relay with 16 functions and 8 time ranges 0.8 ms ... 60 h
DIN Rail mounting according to DIN 43 880

Type: CSV4/DC12-36V
16 timing functions
6 A C.O. relay output
Power supply DC 12 ... 36 V
Option for external fine adjustment time range potentiometer
LED state indicators for output and control input

Maximum output load	**1.5 A / 24 V**

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



Time data

8 partial time ranges, t_{max} (rotary switch)	10 ms / 0,1 s / 1 s / 10 s / 1 m / 10 m / 1 h / 10 h
Time range tolerance	t_{min}: -5 % … +0 % / t_{max}: -0 % … +5 %
Repetition accuracy	± 0.1 % or 0,2 ms
Response time, power on, on A1	0,7 ms
Min. trigger pulse on B1	0,15 ms
Reset time B1 (AC/DC)	0,05 ms
Voltage failure buffering	10 ms

Output

Type	MOSFET, PNP
Rated operational current	1.5 A
Max. inrush current (100 ms)	4 A
Max. switching voltage	30 V
Leakage current	10 µA
Inductive switch-off voltage protection	Yes

Power supply and control input

Nominal voltage	**DC 12 – 36 V**
Operating voltage range	10,2 ... 45 V
Power consumption	200 mW
Control current into B1	4 mA
Allowed residual current into B1	1 mA
Trigger threshold voltage on B1 typ.	7,3 V

General Specifications

Ambient temperature storage /operation	-40 … 85 °C / -40 …70 °C
Conductor cross section	Stranded wire 2.5 mm², 2 x 1 mm²
Ingress Protection degree	IP 20
Max. Screw torque	0.6 Nm
Housing material / Weight	Lexan / 50 g

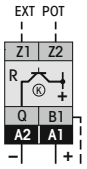
Standard types	**CSV4/DC12-36V**

Accessories

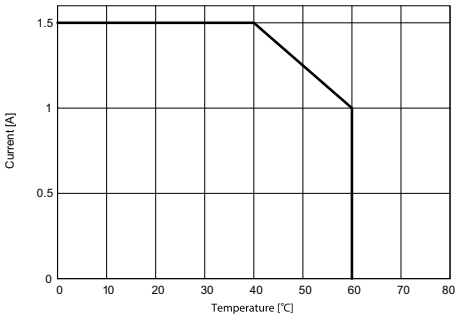
External potentiometer 100k (Panel mounting + scale):		**SP-01/100k**
Marking strip:	Large	**BS-13G**
	Small	**BS-13K**

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

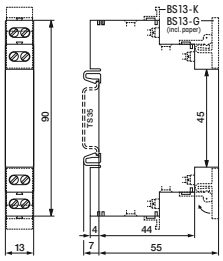
Connection diagram



Output current



Dimensions [mm]



Technical approvals, conformities

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

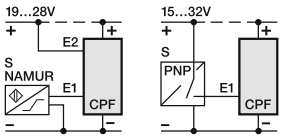
Type: CPF11/DC24V R

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 152)

K L A



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

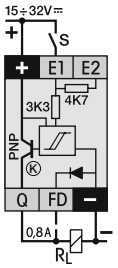


Fig. 1 Derating Curve

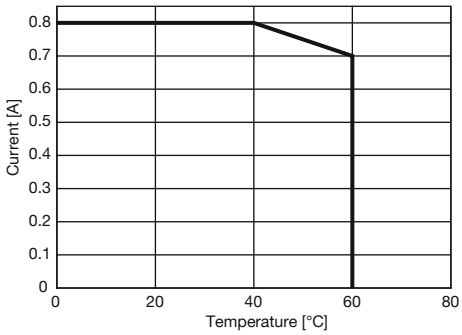
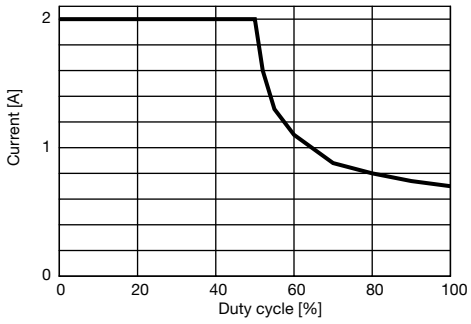
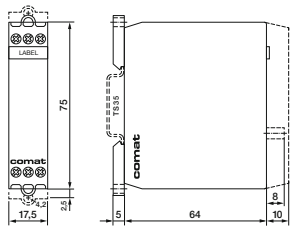


Fig. 2 Current vs. duty cycle



Dimensions [mm]



Technical approvals, conformities

Notes

Notes

2.3 Plug-in Time Relays

Application	Types	Functions*	Min. time	Max. time	contact rating	Socket
Timing and blinking relay	CS1	E, W, B, B2	50 ms	60 min	8 A / 250 V	S3-xx
Timing 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 152)

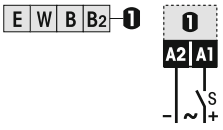
CS1

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 152)



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

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

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
Voltage failure buffering	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	10.2 … 265 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)

Connection diagram

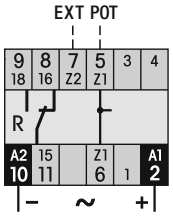


Fig.1 AC electrical endurance

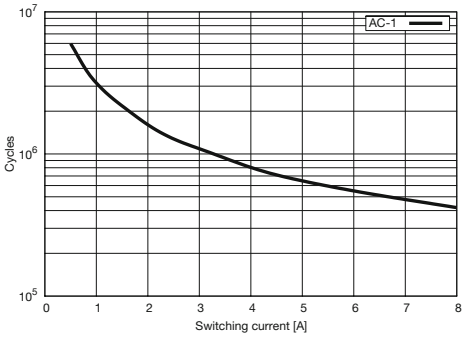
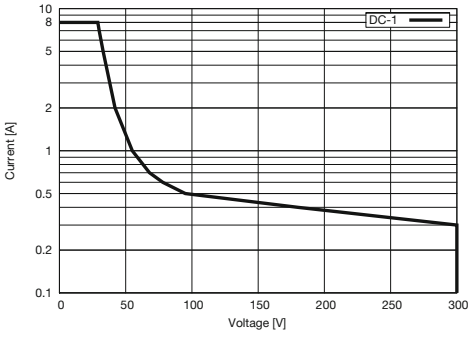
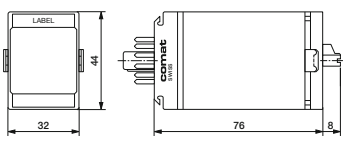


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

EN 60947

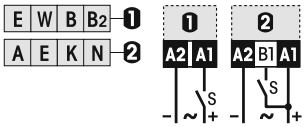
CS2

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 152)



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
Voltage failure buffering	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	10.2 … 265 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

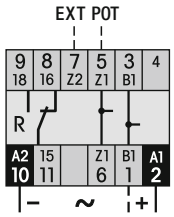


Fig.1 AC electrical endurance

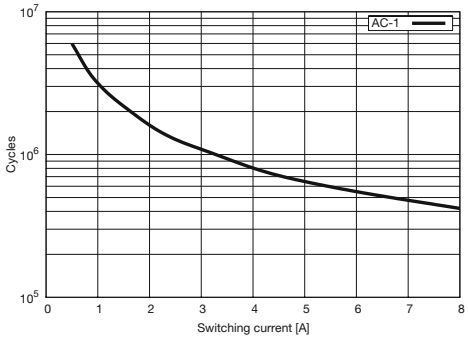
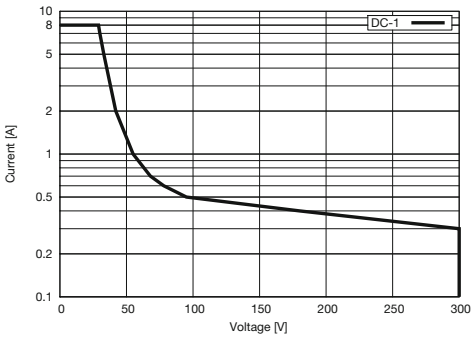
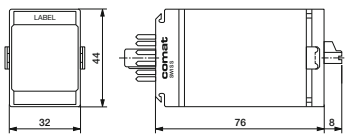


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

EN 60947

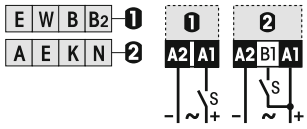
CS3

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 152)



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
Voltage failure buffering	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	10.2 … 265 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

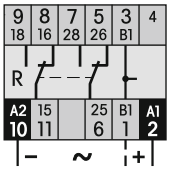


Fig.1 AC electrical endurance

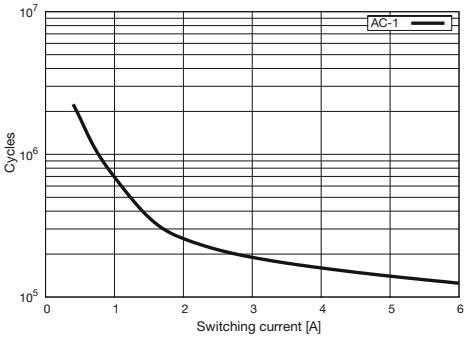
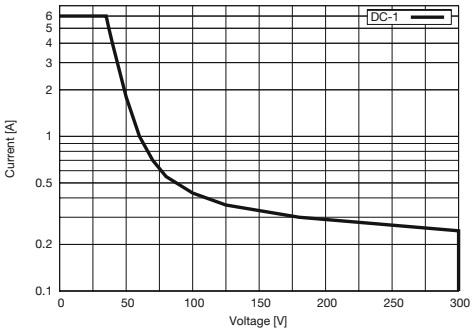
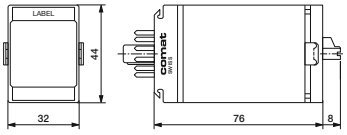


Fig. 2 DC load limit curve



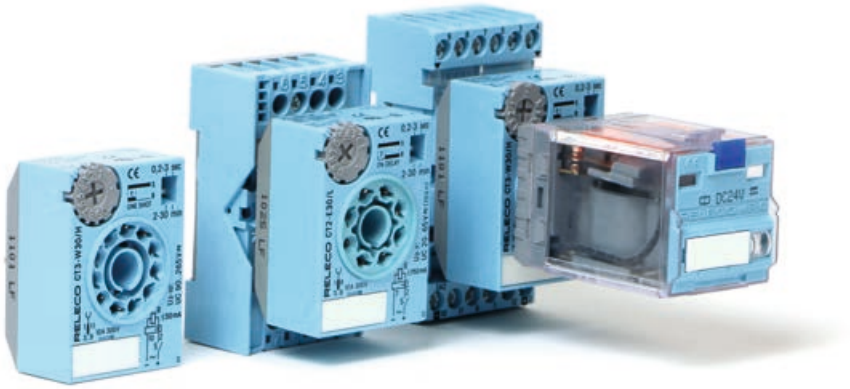
Dimensions [mm]



Technical approvals, conformities

EN 60947

2.4 Time Cubes



Notes

CT2, CT3

8-pin and 11-pin Timecube®

Type: CT2: 8 pole, CT3: 11 pole

The CT2 or CT3 Timecube® is an electronic timer that is inserted between the plug-in industrial relay and the socket. This combination is a modular complete time relay without additional space requirement. It offers up to three changeover contacts with a variety of signal contacts and power contacts.

The Timecubes® are suitable for all 8 pin and 11 pin standard industrial relays of the C2 and C3 series according to IEC 67 and also for relays of other manufacturers.

Time functions (Function diagrams: refer to page 152)

Operating voltage controlled types	*Trigger input controlled types*
CT2- / CT3-E30: Function E, on delay	CT2- / CT3-A30, off delay
CT2- / CT3-W30: Function W, one shot	CT2- / CT3-K30, pulse shaping
CT2- / CT3-B30: Function B, blinker	

Time data

4 partial time ranges (DIP switch)

Fine adjustment time range (rotary knob)	t_{min} … t_{max}, 2 … 30
Time range tolerance	t_{min}: 0 … + 35 %
Repetition accuracy	± 0.5 % or ± 20 ms
Reset time	≤ 200 ms
Reset time B1 (trigg. inp.) A, K	≤ 80 ms
Voltage failure buffering	5 ms (except the relay)

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

CT2- / CT3- … / S	DC 9.5 … 18 V	12 mA
CT2- / CT3- … / L	UC 20 … 65 V	6 mA
CT2- / CT3- … / M	UC 90 … 150 V	2 mA
CT2- / CT3- … / U	UC 180 … 265 V	2 mA
CT2- / CT3- … / H	UC 90 … 265 V	2 mA
Residual current E, W, B	≤ 0.3 mA	
Residual current B1 (trigg. inp.) A, K	≤ 0.2 mA	

General specifications

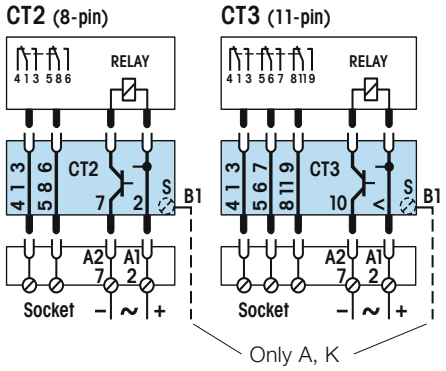
Ambient temperature storage / operation	-40 ... +70 °C / -25 ... +60 °C
Ingress protection degree	IP40
Housing material	Lexan
Weight	35 g

Standard types

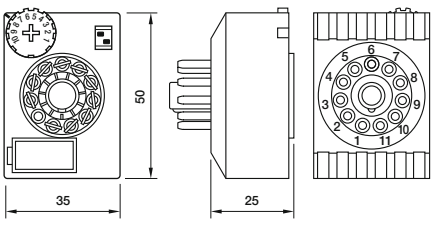
UC 50 Hz / 60 Hz: 20 … 265 V
DC 12 V

8 pole	11 pole	Voltage
CT2-E30/S CT2-W30/S CT2-B30/S CT2-A30/S CT2-K30/S	CT3-E30/S CT3-W30/S CT3-B30/S CT3-A30/S CT3-K30/S	DC 9.5…18 V
CT2-E30/L CT2-W30/L CT2-B30/L CT2-A30/L CT2-K30/L	CT3-E30/L CT3-W30/L CT3-B30/L CT3-A30/L CT3-K30/L	UC 20…65 V
CT2-A30/M CT2-K30/M	CT3-A30/M CT3-K30/M	UC 90…150 V
CT2-A30/U CT2-K30/U	CT3-A30/U CT3-K30/U	UC 180…265 V
CT2-E30/H CT2-W30/H CT2-B30/H	CT3-E30/H CT3-W30/H CT3-B30/H	UC 90…265 V

Wiring diagram



Dimensions [mm]

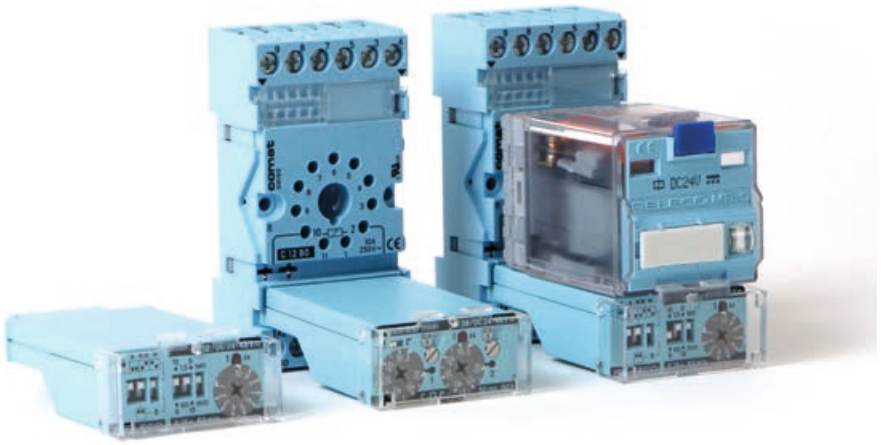


Only 11-pin version shown.
The dimension of the 8-pin version are identical

Technical approvals, conformities

Notes

2.5 Time Modules



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.

comat RELECO
WORLD OF RELAYS

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.

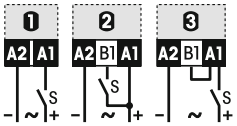
The train symbol indicates products available in a special railway execution according EN 50155.
Please refer to our special railway brochure for details.

CT30, CT32, CT33, CT36
Plug-in time modules (combined with industrial relays)

Type **CT30, CT32, CT33, CT36, /...V R**

Plug-in time modules for sockets with module slot in combination with 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 152)



	CT30 Economy	CT32 Universal	CT33 Universal	CT36 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 W H B 3 2	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
Voltage failure buffering	≥ 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 30	CT36	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

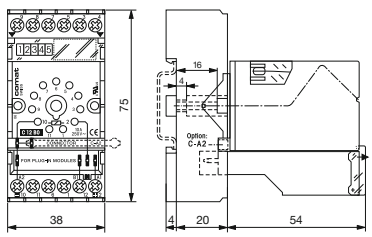
Ambient temperature storage /operation	-40 … 85 °C / -40 … 60 °C
Ingress Protection degree	IP 40 when plugged in
Housing material	Lexan
Weight	25 g

Standard types

CT30, CT32, CT33, CT36, UC24-48	**CT3x/UC24-48V R**
CT30, CT36, UC110-240	**CT3x/UC110-240V R**
CT32, CT33, UC115	**CT3x/UC115V R**
CT32, CT33, UC230	**CT3x/UC230V R**

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
WORLD OF RELAYS

11

Time Delay Relay-Set
Relay, Module and Socket

Relay data's see:
Section industrial Relays

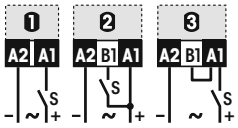
CE

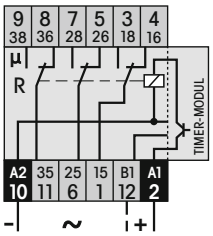
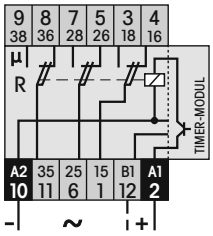
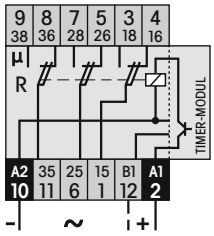
MAX
μ MIN

Timer-Modul (Function diagrams: refer to page 152)

E 1 Triggering
Function see page 152

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



	Power Relay	Control Relay	Signal Relay
			10μAu
			
	C3-A30X	**C3-T31X**	**C3-T32X**
	Universal Power Relay 10A. With 3 power changeover-contacts this is the robust relay for AC and DC circuits ranging from 10mA 10V.	**Relay with 3 twin contacts 6A** The control relay with highest switching reliablility for control and signal circuits ranging from 5mA 5V.	**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.
	10A~	**6A** 250V~	**6A** 250V~
	10mA 10V	5mA 5V	1mA 5V
			
	Set Order-Nr.:	**Set Order-Nr.:**	**Set Order-Nr.:**
	CT30.3-A30/…V R	**CT30.3-T31/…V R**	**CT30.3-T32/…V R**
	AC 24, 48, 115, 230V DC 24, 48, 110, 220V	AC 24, 48, 115, 230V DC24, 48, 110, 220V	AC 24, 48, 115, 230V DC 24, 48, 110, 220V
	Delivery includes: • Relay C3-A30X/…V R • Module CT30/…V R • Front cover FS-R • Socket C12B0 R • Retaining clip HF-32	**Delivery includes:** • Relay C3-T31X/…V R • Module CT30/...V R • Front cover FS-R • Socket C12B0 R • Retaining clip HF-32	**Delivery includes:** • Relay C3-T32X/…V R • Modul CT30/...V R • Front cover FS-R • Socket C12B0 R • Retaining clip HF-32

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

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

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

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

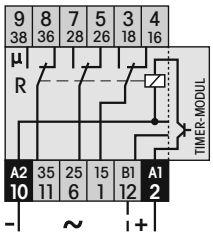
	Set Order-Nr.:	**Set Order-Nr.:**	**Set Order-Nr.:**
	CT32.3-A30/…V R	**CT32.3-T31/…V R**	**CT32.3-T32/…V R**
	AC 24, 48, 115, 230V DC 24, 48, 110, 220V	AC 24, 48, 115, 230V DC 24, 48, 110, 220V	AC 24, 48, 115, 230V DC 24, 48, 110, 220V
	Delivery includes: • Relay C3-A30X/…V R • Module CT32/…V R • Front cover FS-R • Socket C12B0 R • Retaining clip HF-32	**Delivery includes:** • Relay C3-T31X/…V R • Module CT32/…V R • Front cover FS-R • Socket C12B0 R • Retaining clip HF-32	**Delivery includes:** • Relay C3-T32X/…V R • Module CT32/…V R • Front cover FS-R • Socket C12B0 R • Retaining clip HF-32
	Set Order-Nr.:	**Set Order-Nr.:**	**Set Order-Nr.:**
	CT33.3-A30/…V R	**CT33.3-T31/…V R**	**CT33.3-T32/…V R**
	AC 24, 48, 115, 230V DC 24, 48, 110, 220V	AC 24, 48, 115, 230V DC 24, 48, 110, 220V	AC 24, 48, 115, 230V DC 24, 48, 110, 220V
	Delivery includes: • Relay C3-A30X/…V R • Module CT33/…V R • Front cover FS-R • Socket C12B0 R • Retaining clip HF-32	**Delivery includes:** • Relay C3-T31X/…V R • Module CT33/…V R • Front cover FS-R • Socket C12B0 R • Retaining clip HF-32	**Delivery includes:** • Relay C3-T32X/…V R • Module CT33/…V R • Front cover FS-R • Socket C12B0 R • Retaining clip HF-32
	Set Order-Nr.:	**Set Order-Nr.:**	**Set Order-Nr.:**
	CT36.3-A30/…V R	**CT36.3-T31/…V R**	**CT36.3-T32/…V R**
	AC 24, 48, 115, 230V DC 24, 48, 110, 220V	AC 24, 48, 115, 230V DC 24, 48, 110, 220V	AC 24, 48, 115, 230V DC 24, 48, 110, 220V
	Delivery includes: • Relay C3-A30X/…V R • Module CT36/…V R • Front cover FS-R • Socket C12B0 R • Retaining clip HF-32	**Delivery includes:** • Relay C3-T31X/…V R • Module CT36/…V R • Front cover FS-R • Socket C12B0 R • Retaining clip HF-32	**Delivery includes:** • Relay C3-T32X/…V R • Module CT36/…V R • Front cover FS-R • Socket C12B0 R • Retaining clip HF-32

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.:

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

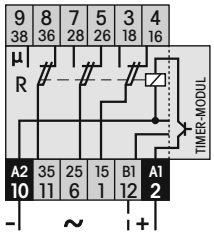
Delivery includes:
- Relay C31L/…V
- Modul CT36/…V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

Control Relay

C32L

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

6A 250V~
10mA 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

comat RELECO
WORLD OF RELAYS

Time Delay Relay-Set
Relay, Module and Socket

Relay data's see:
Section industrial Relays

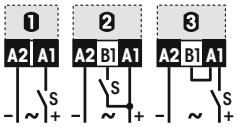
CE

MAX
MIN

Timer-Modul (Function diagrams: refer to page 152)

E 1 Triggering
Function see page 152

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

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

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 = 0,5 s

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

CT36 Repeat cycle timer

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

Function/ Triggering
I P 1

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

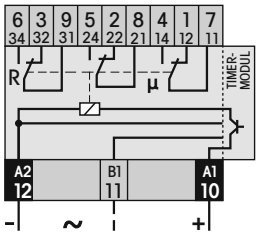
High Power Relay DC

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 10 mA 10 V.

16 A 400 V~
10 mA 10 V



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

Delivery includes:
- Relay C5-A30X/…V R
- 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, 230 V
DC 24, 110, 220 V

Delivery includes:
- Relay C5-A30X/…V R
- 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, 230 V
DC 24, 110, 220 V

Delivery includes:
- Relay C5-A30X/…V R
- 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, 230 V
DC 24, 110, 220 V

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

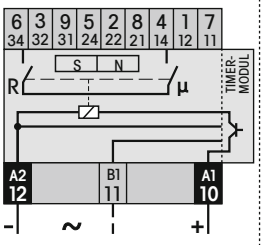
High Power Relay DC

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.

16 A 400 V~
10 mA 10 V



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

Delivery includes:
- Relay C5-M10X/…V R
- 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, 230 V
DC 24, 48, 110, 220 V

Delivery includes:
- Relay C5-M10X/…V R
- 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, 230 V
DC 24, 48, 110, 220 V

Delivery includes:
- Relay C5-M10X/…V R
- 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, 230 V
DC 24, 48, 110, 220 V

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

Notes

Notes

3.0 Monitoring Relays

Notes

3.1 Multifunction Monitoring

Application	Types	Monitoring	Monitoring ratings	Output contacts	Design
Multifunction monitoring, AC 15 … 60 Hz / DC single phase	MRM11	V V A A	U, I, P, f, cosφ	1 CO	35 mm
Multifunction monitoring, AC 15 … 60 Hz / DC three phase	MRM32	V V A A	U, I, P, f, cosφ	2 CO	35 mm

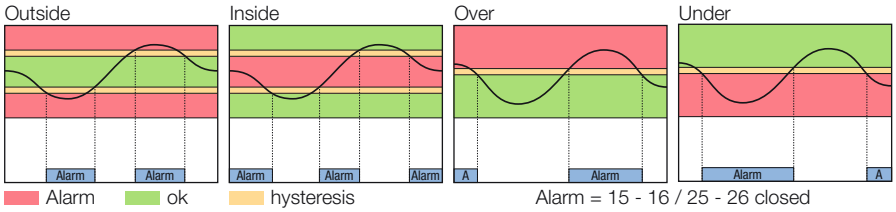
MRM11

Multifunction monitoring relay AC/DC, single phase
DIN Rail mounting according to DIN 43 880

Type: MRM11/...V

Multifunctional monitoring relay for simultaneous measurement of current and voltage and monitoring of U, I, P, cosφ and f. Alarm delay setting. Alarm LED. Display for multimeter function, alarm signal and interactive parameter setting.
1 change-over alarm contact 5 A 250 V. Comfortable parameter setting.

Monitoring function



Measuring circuit data

Voltage setting ranges AC / DC	0.1 … 480 V / ±0.1 … 690 V
Current setting ranges AC / DC	0.1 … 5 A
Frequency	AC 15 … 150 Hz
Input resistance U / I	1 MΩ / 5 MΩ
Measured variables	U, I, f, P, S, cosφ

Time data

Voltage failure buffering	ca. 30 ms

Alarm contacts

Type / Material	1 CO / AgNi 0.15
Rated operational current	6 A
Max. inrush current	15 A
Max. switching voltage	250 V
Max. AC load AC-1 (Fig.1)	1250 VA
Max. DC load DC-1, 24 V / 220 V (Fig.2)	120 W / 25 W
Recommended min. contact load	10 mA / 10 V
Alarm delay setting time	0.1 … 999.9 s (factory adjustment = 0.0 s)
Reset time setting range	0.1 … 999.9 s (factory adjustment = 0.0 s)

Power supply	**UC12-48V**	**UC110-240V**
Nominal voltage AC/DC	12 … 48 V	110 … 240 V
Operating voltage range	10 … 60 V	85 … 250 V
AC frequency	16 … 63 Hz	16 … 63 Hz
Power consumption	1.6 W / 3.2 VA	1.5 W / 2.6 VA

Insulation

Measuring input – Measuring input	1.5 kV 1 minute
Measuring input – Supply	2.0 kV 1 minute
Measuring input – Contact	2.0 kV 1 minute
Supply – Contact	2.0 kV 1 minute
Contact set – Contact set	1.5 kV 1 minute

General specifications

Ambient temperature storage /operation	-40 … +85 °C / -40 …+60 °C
	LCD: -20 ... +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	IP20, (electronics: IP40)
Max. screw torque	0.4 Nm
Housing material	Lexan EXL 9330
Weight	107 g

Standard types

AC/DC 12-48 V, 15...60 Hz	**MRM11/UC12-48V**
AC/DC 110-240 V, 15...60 Hz	**MRM11/UC110-240V**

Connection diagram

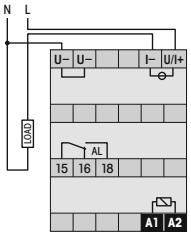


Fig.1 AC voltage endurance

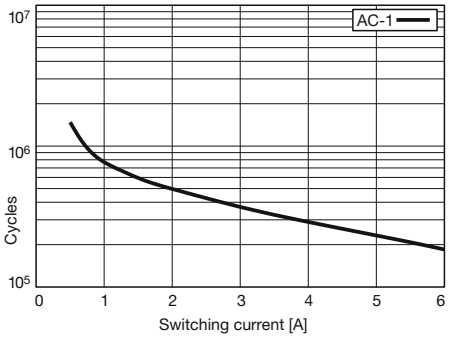
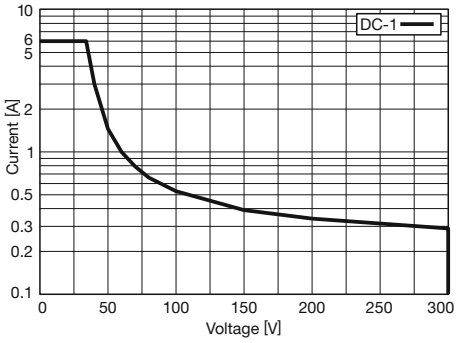
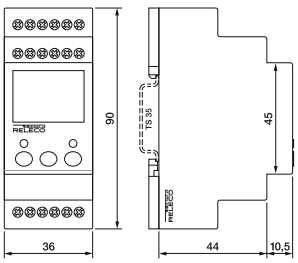


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

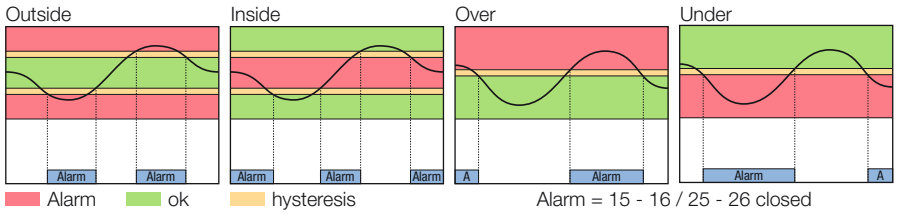
MRM32

Multifunction monitoring relay AC/DC, three phase
DIN Rail mounting according to DIN 43 880

Type: MRM32/…V

Multifunctional monitoring relay for simultaneous measurement of current and voltage and monitoring of U, I, P, cosφ and f and Δφ. Alarm delay setting. Alarm LED. Display for multimeter function, alarm signal and interactive parameter setting.
2 change-over alarm contacts 5 A 250 V. Comfortable parameter setting.

Monitoring function



Measuring circuit data

Voltage setting ranges AC / DC	0.1 … 480 V / ±0.1 … 690 V
Current setting ranges AC / DC	0.1 … 5 A
Frequency	AC 15 … 150 Hz
Input resistance U / I	1 MΩ / 5 MΩ
Measured variables	U, I, f, P, S, cosφ und Δφ (phase sequence)

Time data

Voltage failure buffering	ca. 30 ms

Contacts

Type / Material	2 CO / AgNi 0.15
Rated operational current	6 A
Max. inrush current	15 A
Max. switching voltage	250 V
Max. AC load AC-1 (Fig.1)	1250 VA
Max. DC load DC-1, 24 V / 220 V (Fig.2)	120 W / 25 W
Recommended min. contact load	10 mA / 10 V
Alarm delay setting time	0.1 … 999.9 s (factory adjustment = 0.0 s)
Reset time setting range	0.1 … 999.9 s (factory adjustment = 0.0 s)

Power supply	**UC12-48V**	**UC110-240V**
Nominal voltage AC/DC	12 … 48 V	110 … 240 V
Operating voltage range	10 … 60 V	85 … 250 V
AC frequency	16 … 63 Hz	16 … 63 Hz
Power consumption	1.6 W / 3.2 VA	1.5 W / 2.6 VA

Insulation

Measuring input – Measuring input	1.5 kV 1 minute
Measuring input – Supply	2.0 kV 1 minute
Measuring input – Contact	2.0 kV 1 minute
Supply – Contact	2.0 kV 1 minute
Contact set – Contact set	1.5 kV 1 minute

General specifications

Ambient temperature storage /operation	-40 … +85 °C / -40 …+60 °C LCD: -20 ... +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	IP20, (electronics: IP40)
Max. screw torque	0.4 Nm
Housing material	Lexan EXL 9330
Weight	125 g

Standard types

AC/DC 12-48 V, 15…60 Hz	**MRM32/UC12-48V**
AC/DC 110-240 V, 15…60 Hz	**MRM32/UC110-240V**

Connection diagram

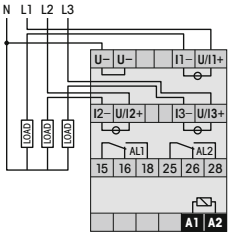


Fig.1 AC voltage endurance

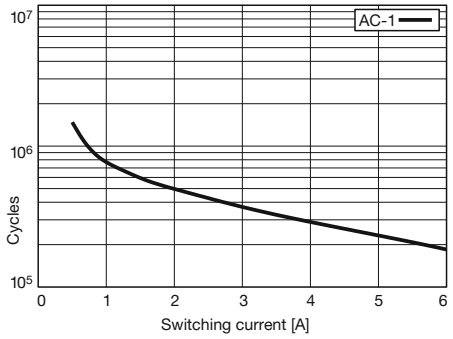
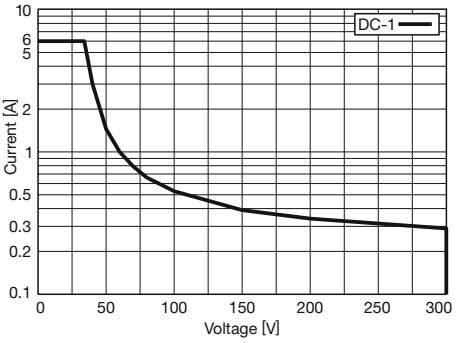
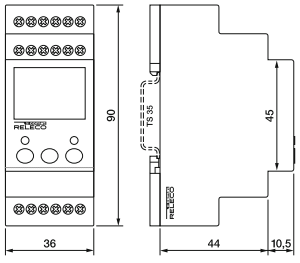


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

CE cULus RoHS

Notes

3.2 Voltage Monitoring

Application	Types	Monitoring	Monitoring ratings	Output contacts	Design
Voltage monitoring, AC 15 … 60 Hz / DC single phase	MRU11	V V	0.1 … AC 480 V / DC 690 V	1 CO	35 mm
Voltage monitoring, AC 15 … 60 Hz / DC three phase	MRU32	V V	0.1 … AC 480 V / DC 690 V	2 CO	35 mm

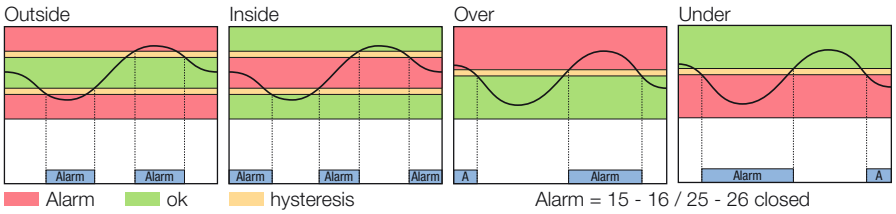
MRU11

Voltage monitoring relay AC/DC, single phase
DIN Rail mounting according to DIN 43 880

Type: MRU11/...V

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.
1 change-over alarm contact 5 A 250 V. Comfortable parameter setting.

Monitoring function



Measuring circuit data

Voltage setting ranges AC / DC	0.1 … 480 V / ±0.1 … 690 V
Frequency	AC 15 … 150 Hz
Input resistance U / I	1 MΩ
Measured variables	U, f

Time data

Voltage failure buffering	ca. 30 ms

Alarm contacts

Type / Material	1 CO / AgNi 0.15
Rated operational current	6 A
Max. inrush current	15 A
Max. switching voltage	250 V
Max. AC load AC-1 (Fig.1)	1250 VA
Max. DC load DC-1, 24 V / 220 V (Fig.2)	120 W / 25 W
Recommended min. contact load	10 mA / 10 V
Alarm delay setting time	0.1 … 999.9 s (factory adjustment = 0.0 s)
Reset time setting range	0.1 … 999.9 s (factory adjustment = 0.0 s)

Power supply	**UC12-48V**	**UC110-240V**
Nominal voltage AC/DC	12 … 48 V	110 … 240 V
Operating voltage range	10 … 60 V	85 … 250 V
AC frequency	16 … 63 Hz	16 … 63 Hz
Power consumption	1.6 W / 3.2 VA	1.5 W / 2.6 VA

Insulation

Measuring input – Measuring input	1.5 kV 1 minute
Measuring input – Supply	2.0 kV 1 minute
Measuring input – Contact	2.0 kV 1 minute
Supply – Contact	2.0 kV 1 minute
Contact set – Contact set	1.5 kV 1 minute

General specifications

Ambient temperature storage /operation	-40 … +85 °C / -40 …+60 °C LCD: -20 ... +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	IP20, (electronics: IP40)
Max. screw torque	0.4 Nm
Housing material	Lexan EXL 9330
Weight	107 g

Standard types

AC/DC 12-48 V, 15...60 Hz	**MRU11/UC12-48V**
AC/DC 110-240 V, 15...60 Hz	**MRU11/UC110-240V**

Connection diagram

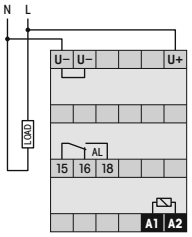


Fig.1 AC voltage endurance

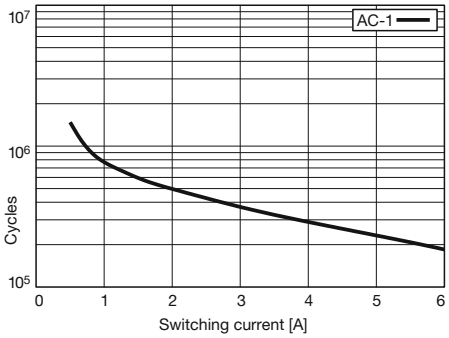
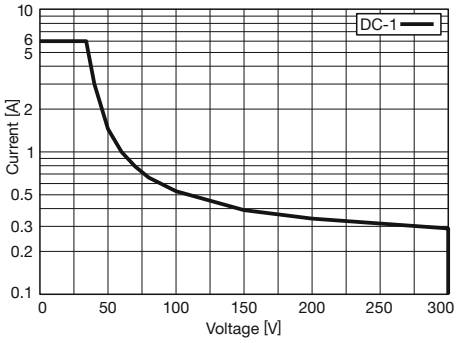
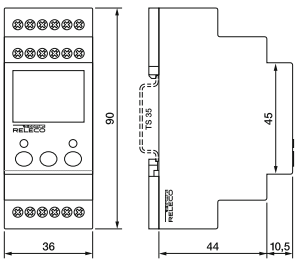


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

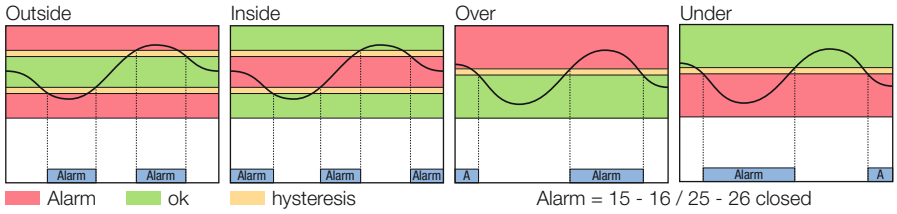
MRU32

Voltage monitoring relay AC/DC, three phase
DIN Rail mounting according to DIN 43 880

Type: MRU32/...V

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.
2 change-over alarm contacts 5 A 250 V. Comfortable parameter setting.

Monitoring function



Measuring circuit data

Voltage setting ranges AC / DC	0.1 … 480 V / ±0.1 … 690 V
Frequency	AC 15 … 150 Hz
Input resistance U / I	1 MΩ
Measured variables	U, f, Δφ (phase sequence)

Time data

Voltage failure buffering	ca. 30 ms

Alarm contacts

Type / Material	2 CO / AgNi 0.15
Rated operational current	6 A
Max. inrush current	15 A
Max. switching voltage	250 V
Max. AC load AC-1 (Fig.1)	1250 VA
Max. DC load DC-1, 24 V / 220 V (Fig.2)	120 W / 25 W
Recommended min. contact load	10 mA / 10 V
Alarm delay setting time	0.1 … 999.9 s (factory adjustment = 0.0 s)
Reset time setting range	0.1 … 999.9 s (factory adjustment = 0.0 s)

Power supply	**UC12-48V**	**UC110-240V**
Nominal voltage AC/DC	12 … 48 V	110 … 240 V
Operating voltage range	10 … 60 V	85 … 250 V
AC frequency	16 … 63 Hz	16 … 63 Hz
Power consumption	1.6 W / 3.2 VA	1.5 W / 2.6 VA

Insulation

Measuring input – Measuring input	1.5 kV 1 minute
Measuring input – Supply	2.0 kV 1 minute
Measuring input – Contact	2.0 kV 1 minute
Supply – Contact	2.0 kV 1 minute
Contact set – Contact set	1.5 kV 1 minute

General specifications

Ambient temperature storage /operation	-40 … +85 °C / -40 …+60 °C
	LCD: -20 ... +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	IP20, (electronics: IP40)
Max. screw torque	0.4 Nm
Housing material	Lexan EXL 9330
Weight	125 g

Standard types

AC/DC 12-48 V, 15...60 Hz	**MRU32/UC12-48V**
AC/DC 110-240 V, 15...60 Hz	**MRU32/UC110-240V**

Connection diagram

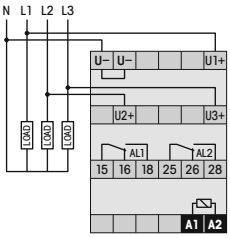


Fig.1 AC voltage endurance

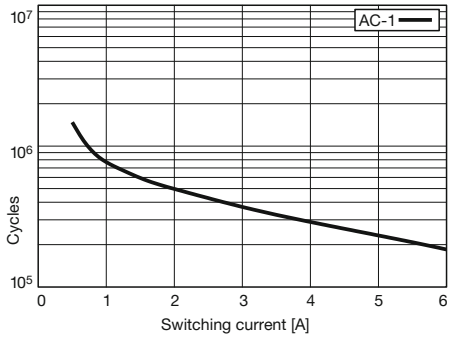
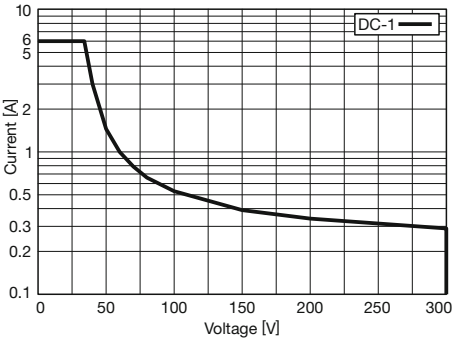
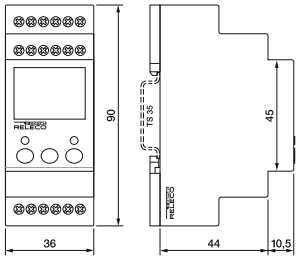


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

CE cULus RoHS

Notes

3.3 Current Monitoring

Application	Types	Monitoring	Monitoring ratings	Output contacts	Design
Current monitoring, AC 15 … 60 Hz / DC single phase	MRI11	A A	0.1 … 5 A	1 CO	35 mm
Current monitoring, AC 15 … 60 Hz / DC three phase	MRI32	A A	0.1 … 5 A	2 CO	35 mm
Over-current monitoring, 48 … 62 Hz	EOCR	A	0.5 … 6 A / 3 … 30 A / 5 … 60 A	1 CO	54 mm
Under-current monitoring, 48 … 62 Hz	EUCR	A	0.5 … 6 A / 3 … 30 A / 5 … 60 A	1 CO	54 mm

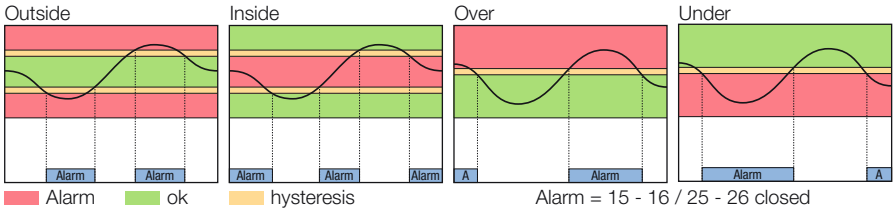
MRI11

Current monitoring relay AC/DC, single phase
DIN Rail mounting according to DIN 43 880

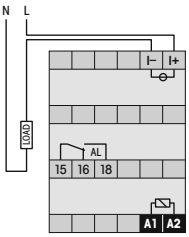
Type: MRI11/...V

Current monitoring relay with over- and under voltage thresholds up to 5 A. Alarm delay setting. Alarm LED. Display for voltmeter function, alarm signal and interactive parameter setting.
1 change-over alarm contact 5 A 250 V. Comfortable parameter setting.

Monitoring function



Connection diagram



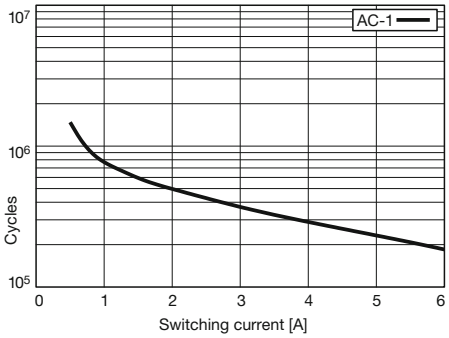
Measuring circuit data

Current setting ranges AC / DC	0.1 … 5 A
Frequency	AC 15 … 150 Hz
Input resistance U / I	5 MΩ
Measured variables	I, f

Time data

Voltage failure buffering	ca. 30 ms

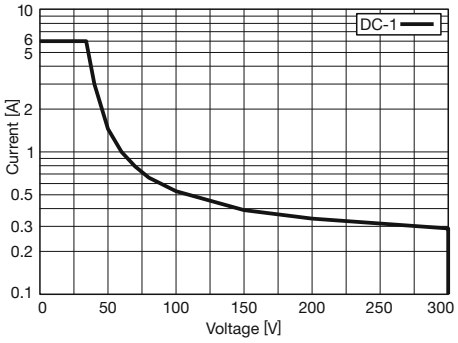
Fig.1 AC voltage endurance



Alarm contacts

Type / Material	1 CO / AgNi 0.15
Rated operational current	6 A
Max. inrush current	15 A
Max. switching voltage	250 V
Max. AC load AC-1 (Fig.1)	1250 VA
Max. DC load DC-1, 24 V / 220 V (Fig.2)	120 W / 25 W
Recommended min. contact load	10 mA / 10 V
Alarm delay setting time	0.1 … 999.9 s (factory adjustment = 0.0 s)
Reset time setting range	0.1 … 999.9 s (factory adjustment = 0.0 s)

Fig. 2 DC load limit curve

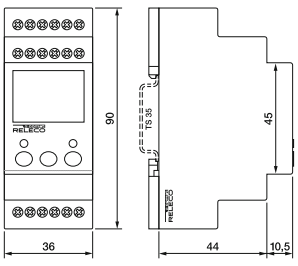


Power supply	**UC12-48V**	**UC110-240V**
Nominal voltage AC/DC	12 … 48 V	110 … 240 V
Operating voltage range	10 … 60 V	85 … 250 V
AC frequency	16 … 63 Hz	16 … 63 Hz
Power consumption	1.6 W / 3.2 VA	1.5 W / 2.6 VA

Insulation

Measuring input – Measuring input	1.5 kV 1 minute
Measuring input – Supply	2.0 kV 1 minute
Measuring input – Contact	2.0 kV 1 minute
Supply – Contact	2.0 kV 1 minute
Contact set – Contact set	1.5 kV 1 minute

Dimensions [mm]



General specifications

Ambient temperature storage /operation	-40 … +85 °C / -40 …+60 °C LCD: -20 ... +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	IP20, (electronics: IP40)
Max. screw torque	0.4 Nm
Housing material	Lexan EXL 9330
Weight	107 g

Technical approvals, conformities

Standard types

AC/DC 12-48 V, 15...60 Hz	**MRI11/UC12-48V**
AC/DC 110-240 V, 15...60 Hz	**MRI11/UC110-240V**

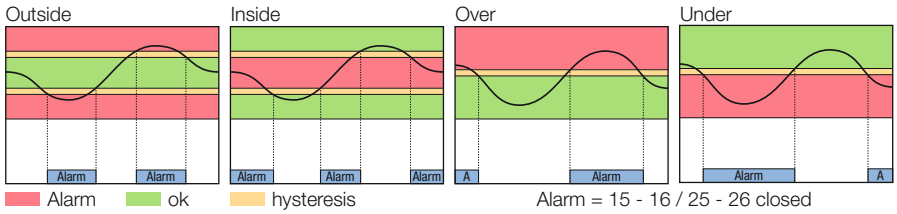
MRI32

Current monitoring relay AC/DC, three phase
DIN Rail mounting according to DIN 43 880

Type: MRI32/...V

Current monitoring relay with over- and under current thresholds up to 5 A. Alarm delay setting. Alarm LED. Display for voltmeter function, alarm signal and interactive parameter setting.
2 change-over alarm contacts 5 A 250 V. Comfortable parameter setting.

Monitoring function



Measuring circuit data

Current setting ranges AC / DC	0.1 ... 5 A
Frequency	AC 15 ... 150 Hz
Input resistance U / I	5 MΩ
Measured variables	I, f

Time data

Voltage failure buffering	ca. 30 ms

Contacts

Type / Material	2 CO / AgNi 0.15
Rated operational current	6 A
Max. inrush current	15 A
Max. switching voltage	250 V
Max. AC load AC-1 (Fig.1)	1250 VA
Max. DC load DC-1, 24 V / 220 V (Fig.2)	120 W / 25 W
Recommended min. contact load	10 mA / 10 V
Alarm delay setting time	0.1 ... 999.9 s (factory adjustment = 0.0 s)
Reset time setting range	0.1 ... 999.9 s (factory adjustment = 0.0 s)

Power supply	**UC12-48V**	**UC110-240V**
Nominal voltage AC/DC	12 ... 48 V	110 ... 240 V
Operating voltage range	10 ... 60 V	85 ... 250 V
AC frequency	16 ... 63 Hz	16 ... 63 Hz
Power consumption	1.6 W / 3.2 VA	1.5 W / 2.6 VA

Insulation

Measuring input – Measuring input	1.5 kV 1 minute
Measuring input – Supply	2.0 kV 1 minute
Measuring input – Contact	2.0 kV 1 minute
Supply – Contact	2.0 kV 1 minute
Contact set – Contact set	1.5 kV 1 minute

General specifications

Ambient temperature storage /operation	-40 ... +85 °C / -40 ...+60 °C LCD: -20 ... +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	IP20, (electronics: IP40)
Max. screw torque	0.4 Nm
Housing material	Lexan EXL 9330
Weight	125 g

Standard types

AC/DC 12-48 V, 15...60 Hz	**MRI32/UC12-48V**
AC/DC 110-240 V, 15...60 Hz	**MRI32/UC110-240V**

Connection diagram

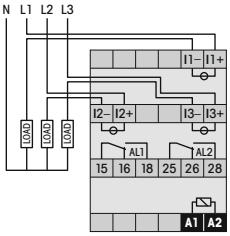


Fig.1 AC voltage endurance

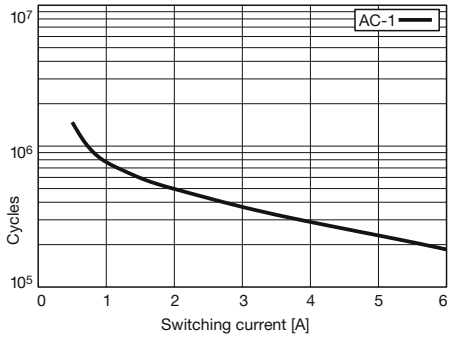
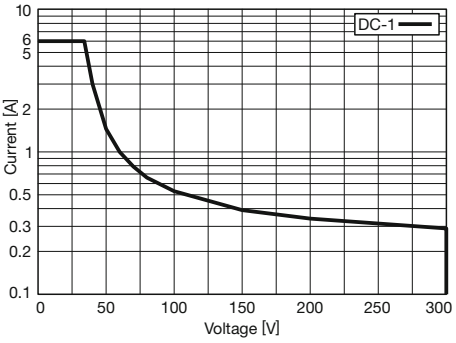
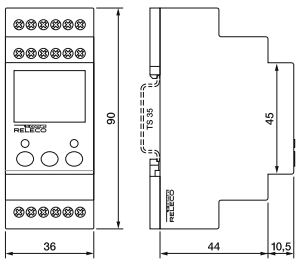


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

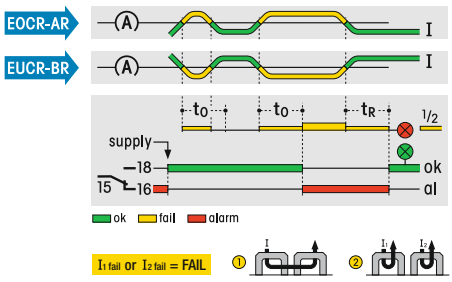
CE cULus RoHS

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

	UC 24 V	**AC 115 V**	**AC 230 V**
Nominal voltage (UC = AC/DC)			
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

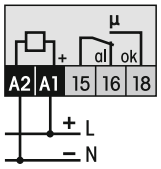
Standard types

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**

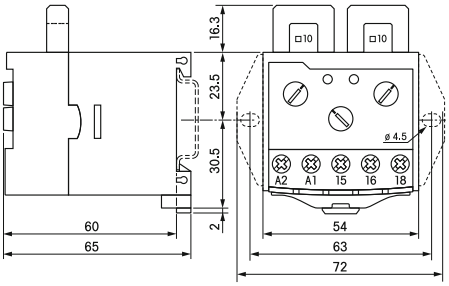
Connection diagram



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

3.4 3-Phase Monitoring

Application	Types	Monitoring	Monitoring ratings	Output contacts	Design
3 Phase monitoring	SSU33L		⅄ 230 V, ∆ 400 V	1 CO	11 pin
Mains monitoring relay, 50 Hz	SSU34		100 V, 400 V, 500 V	2 CO	50 mm
Mains monitoring relay, 60 Hz	SSU36		208 V, 460 V, 480 V	2 CO	50 mm

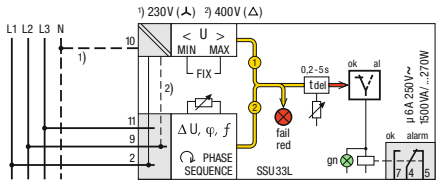
SSU33L

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 ƒ:
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

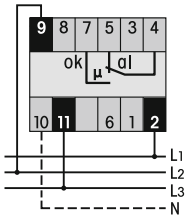


Fig.1 AC voltage endurance

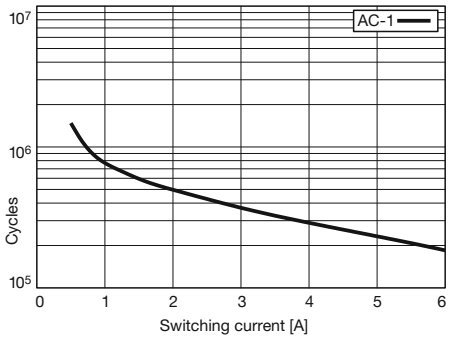
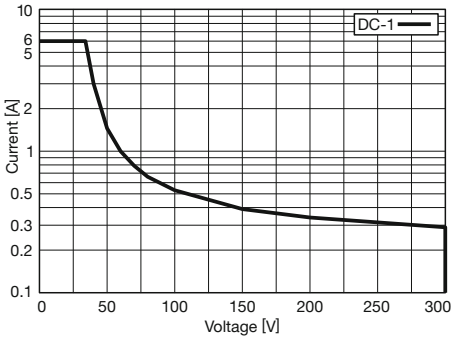
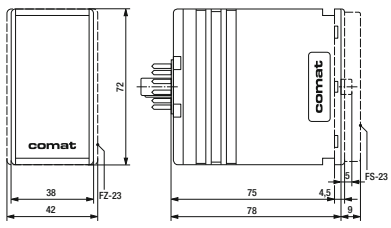


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

EN 60947

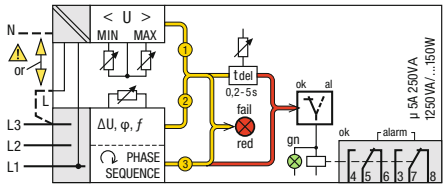
SSU34

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

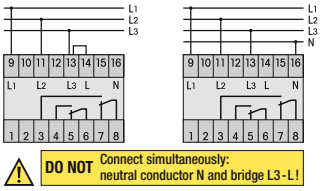


Fig. 1 AC electrical endurance

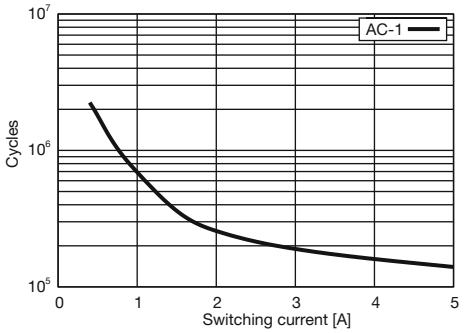
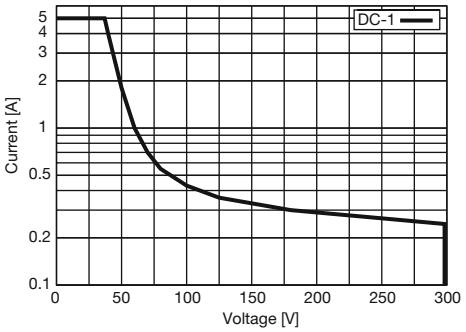
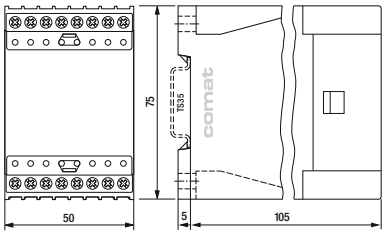


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

EN 60947

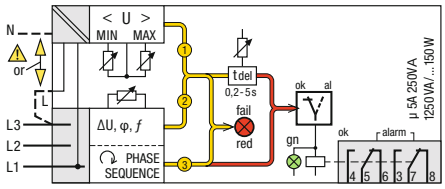
SSU36

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).

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

Connection diagram

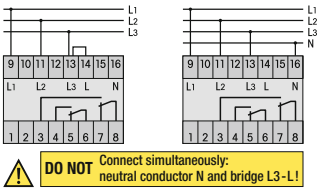


Fig. 1 AC electrical endurance

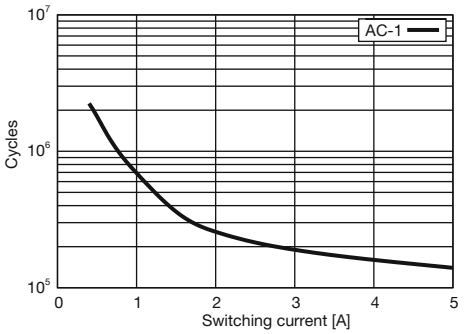
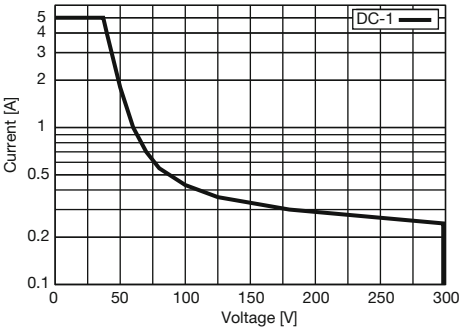
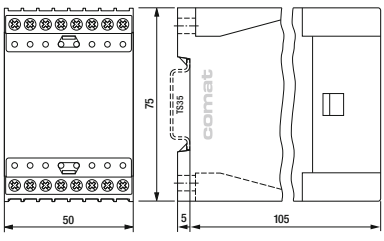


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

EN 60947

3.5 Isolation Monitoring

Application	Types	Monitoring	Monitoring ratings	Output contacts	Design
Isolation monitoring, DC networks	ESU-D2	Ω	1 … 50 kΩ	1 CO / 1 CO+NO	50 mm

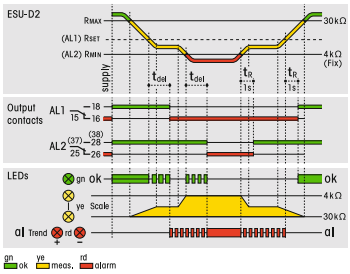
ESU-D2

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.

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

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

	UC 24-48 V	**UC 110 – 240 V**
Nominal voltage		
Operation voltage range	18 … 60 V	88 … 265 V
Power consumption	2 W	2 W
Voltage failure buffering	≥ 50 ms	≥ 50 ms

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

Standard types

UC 110-240	**ESU-D2/UC110-240V**
UC24-48	**ESU-D2/UC24-48V**

Connection diagram

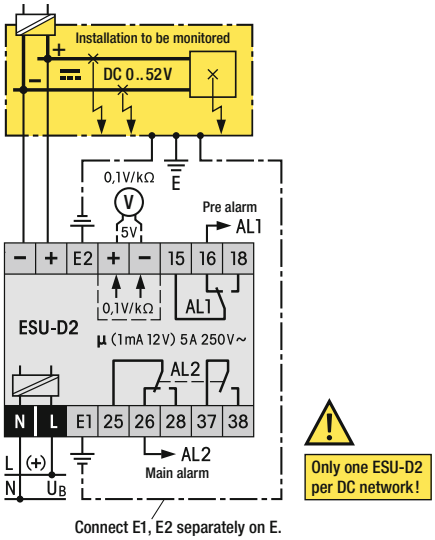
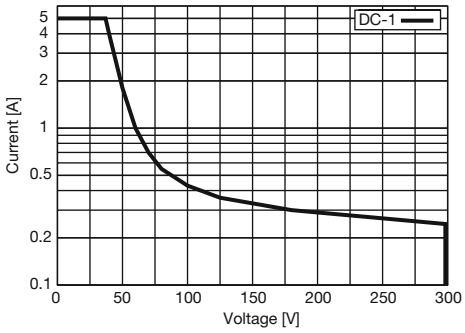
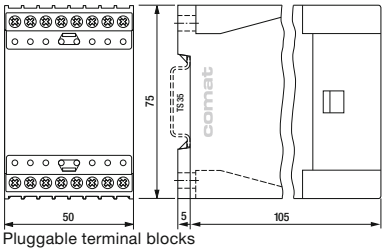


Fig. 1 DC load limit curve



Dimensions [mm]

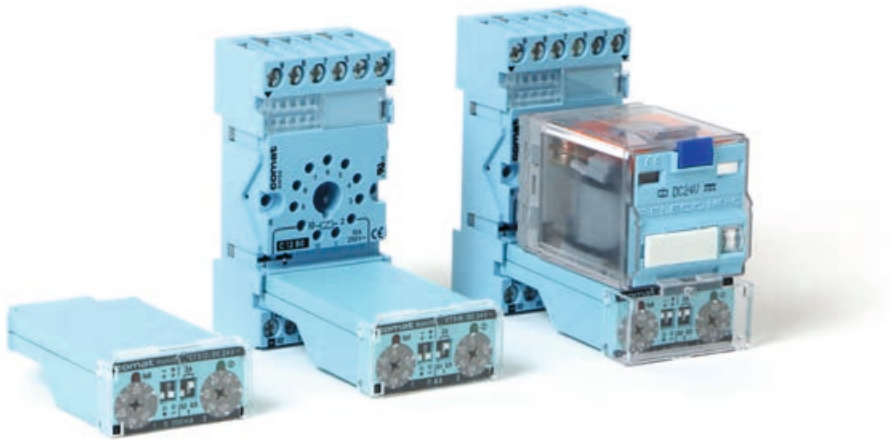


Pluggable terminal blocks

Technical approvals, conformities

EN 60947

3.6 Monitoring Modules



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.

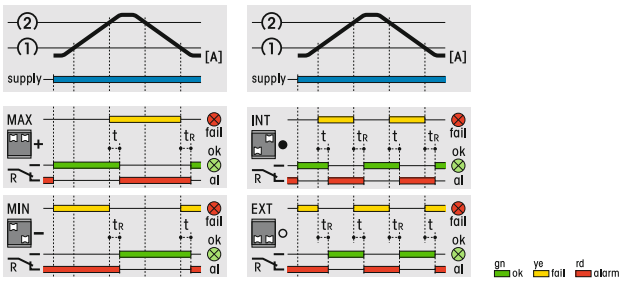
CT512, CT515, CT516

Plug-in current monitoring modules (combined with industrial relays)
0.2 A, 2 A, 6 A. DC 24 V operation

Type	**CT512, CT515, CT516 /24V R**	**CT512R, CT515R, CT516R /36V R**

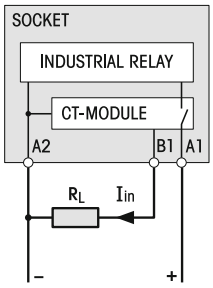
Plug-in current monitoring modules for sockets with module slot in combination with plug-in relays. DC 24 V operation. LED alarm state indicators for OK and fail.
Separate adjustment of upper and lower level.

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

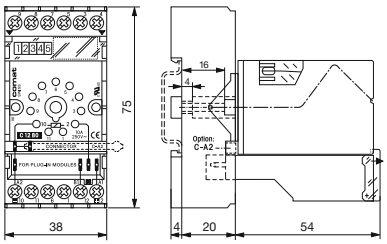
Power supply

Nominal voltage	**DC 24 V**	**DC 36 V**
Operation voltage range	18 … 30 V	18 … 45 V
Supply current	3 … 7 mA	5 mA
Polarity reversal protection	- 30 V	- 51 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

CT512/, CT515/, CT516/ DC24	**CT51x/DC24V R**

Railway types:

CT512R/, CT515R/, CT516R/ DC24	**CT51xR/DC24V**
CT512R/, CT515R/, CT516R/ DC36	**CT51xR/DC36V**

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

Technical approvals, conformities

CT524

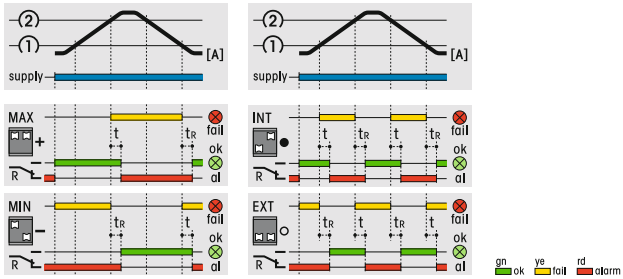
Plug-in DC voltage monitoring module. DC 24 V operation.

(combined with industrial relays)

Type **CT524/24V R**

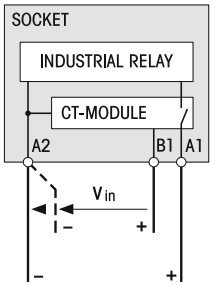
Plug-in DC voltage monitoring module for sockets with module slot in combination with 11p plug-in relays. DC 24 V operation. LED alarm state indicators for OK and fail. Separate adjustment of upper and lower level.

Monitoring functions

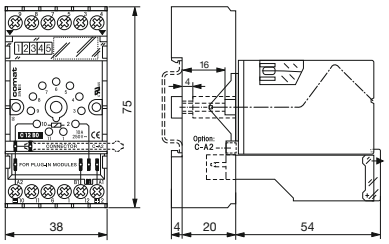


Over / under voltage internal / external range

Connection diagram



Dimensions [mm]



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

Standard types

DC 24	**CT524/DC24V R**

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

Technical approvals, conformities

comat RELECO WORLD OF RELAYS

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

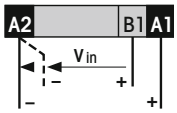
CE MAX MIN

	Data at $T_{amb.}$ = 20°C
Alarm delay t	0,1/0,5/2s
Reset time t_R	100ms
Voltage tolerance	0,8-1,2U_N
Power consumption	≤0,5W
Ambient temperature	–25…+60°C

CT524
DC Voltage Monitoring

Range: 0-30V
Umax: 40V

Triggering

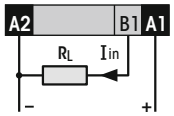


Input resistance
B1 → A2: 100kΩ

CT512
DC Current Monitoring

Range: 0-200mA
Imax: 300mA

Triggering

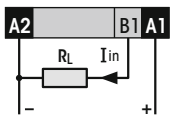


Voltage drop
A1 → B1 ≤300mV

CT515
DC Current Monitoring

Range: 0-2A
Imax: 3A

Triggering

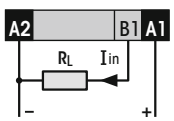


Voltage drop
A1 → B1 ≤200mV

CT516
DC Current Monitoring

Range: 0-6A
Imax: 7A

Triggering



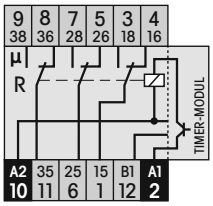
Voltage drop
A1 → B1 ≤100mV

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 R
- Module CT524/DC24V R
- Front cover FS-R
- Socket C12B0 R
- Retaining clip HF-32

Set Order-Nr.:
CT512.3-A30/DC24V R

Delivery includes:
- Relay C3-A30X/DC24V R
- Module CT512/DC24V R
- Front cover FS-R
- Socket C12B0 R
- Retaining clip HF-32

Set Order-Nr.:
CT515.3-A30/DC24V R

Delivery includes:
- Relay C3-A30X/DC24V R
- Module CT515/DC24V R
- Front cover FS-R
- Socket C12B0 R
- Retaining clip HF-32

Set Order-Nr.:
CT516.3-A30/DC24V R

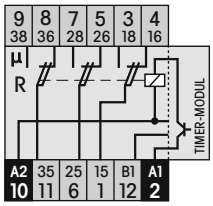
Delivery includes:
- Relay C3-A30X/DC24V R
- Module CT516/DC24V R
- Front cover FS-R
- Socket C12B0 R
- Retaining clip HF-32

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 R
- Module CT524/DC24V R
- Front cover FS-R
- Socket C12B0 R
- Retaining clip HF-32

Set Order-Nr.:
CT512.3-T31/DC24V R

Delivery includes:
- Relay C3-T31X/DC24V R
- Module CT512/DC24V R
- Front cover FS-R
- Socket C12B0 R
- Retaining clip HF-32

Set Order-Nr.:
CT515.3-T31/DC24V R

Delivery includes:
- Relay C3-T31X/DC24V R
- Module CT515/DC24V R
- Front cover FS-R
- Socket C12B0 R
- Retaining clip HF-32

Set Order-Nr.:
CT516.3-T31/DC24V R

Delivery includes:
- Relay C3-T31X/DC24V R
- Module CT516/DC24V R
- Front cover FS-R
- Socket C12B0 R
- Retaining clip HF-32

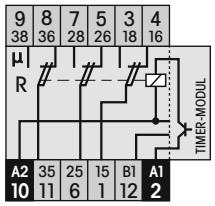
Signal Relay

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 R
- Module CT524/DC24V R
- Front cover FS-R
- Socket C12B0 R
- Retaining clip HF-32

Set Order-Nr.:
CT512.3-T32/DC24V R

Delivery includes:
- Relay C3-T32X/DC24V R
- Module CT512/DC24V R
- Front cover FS-R
- Socket C12B0 R
- Retaining clip HF-32

Set Order-Nr.:
CT515.3-T32/DC24V R

Delivery includes:
- Relay C3-T32X/DC24V R
- Module CT515/DC24V R
- Front cover FS-R
- Socket C12B0 R
- Retaining clip HF-32

Set Order-Nr.:
CT516.3-T32/DC24V R

Delivery includes:
- Relay C3-T32X/DC24V R
- Module CT516/DC24V R
- Front cover FS-R
- Socket C12B0 R
- Retaining clip HF-32

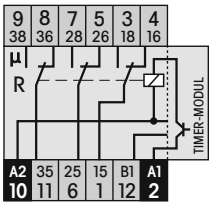
Power Relay

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 250 V~

50 mA 10 V



Set Order-Nr.:

CT524.31/DC24V

Delivery includes:
- Relay C31L/DC24V
- Module CT524/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

CT524.31R/…V

DC 24, 36V

Set Order-Nr.:

CT512.31/DC24V

Delivery includes:
- Relay C31L/DC24V
- Module CT512/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

CT512.31R/…V

DC 24, 36V

Set Order-Nr.:

CT515.31/DC24V

Delivery includes:
- Relay C31L/24V
- Module CT515/24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

CT515.31R/…V

DC 24, 36V

Set Order-Nr.:

CT516.31/DC24V

Delivery includes:
- Relay C31L/DC24V
- Module CT516/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

CT516.31R/…V

DC 24, 36V

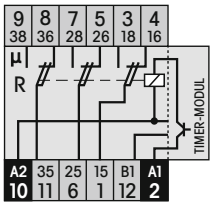
Control Relay

C32L

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

6 A 250 V~

10 mA 5 V



Set Order-Nr.:

CT524.32/DC24V

Delivery includes:
- Relay C32L/DC24V
- Module CT524/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

CT524.32R/…V

DC 24, 36V

Set Order-Nr.:

CT512.32/DC24V

Delivery includes:
- Relay C32L/DC24V
- Module CT512/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

CT512.32R/…V

DC 24, 36V

Set Order-Nr.:

CT515.32/DC24V

Delivery includes:
- Relay C32L/24V
- Module CT515/24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

CT515.32R/…V

DC 24, 36V

Set Order-Nr.:

CT516.32/DC24V

Delivery includes:
- Relay C32L/DC24V
- Module CT516/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

CT516.32R/…V

DC 24, 36V

comat RELECO
WORLD OF RELAYS

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

CE I MAX μ MIN

	Data at $T_{amb.}$ = 20°C
Alarm delay t	0,1/0,5/2s
Reset time t_R	100ms
Voltage tolerance	0,8-1,2U_N
Power consumption	≤0,5W
Ambient temperature	–25…+60°C

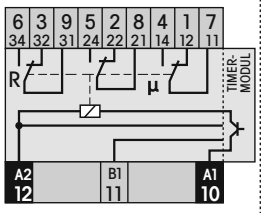
High Power Relay DC

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 R
- Module CT524/DC24V R
- Front cover FS-C5
- Socket S-5M
- Retaining clip S3-C

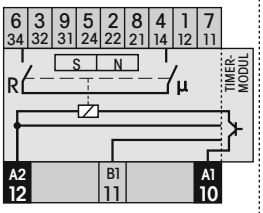
High Power Relay DC

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



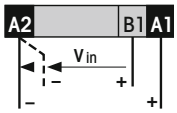
Set Order-Nr.:
CT524.5-M10/DC24V R

Delivery includes:
- Relay C5-M10/DC24V R
- Module CT524/DC24V R
- Front cover FS-C5
- Socket S-5M
- Retaining clip S3-C

CT524
DC Voltage Monitoring

Range: 0-30V
Umax: 40V

Triggering

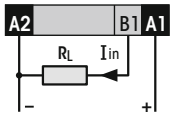


Input resistance
B1 → A2: 100kΩ

CT512
DC Current Monitoring

Range: 0-200mA
Imax: 300mA

Triggering



Voltage drop
A1 → B1 ≤300mV

Set Order-Nr.:
CT512.5-A30/DC24V R

Delivery includes:
- Relay C5-A30/DC24V R
- Module CT512/DC24V R
- Front cover FS-C5
- Socket S-5M
- Retaining clip S3-C

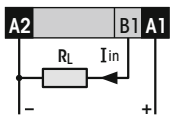
Set Order-Nr.:
CT512.5-M10/DC24V R

Delivery includes:
- Relay C5-M10/DC24V R
- Module CT512/DC24V R
- Front cover FS-C5
- Socket S-5M
- Retaining clip S3-C

CT515
DC Current Monitoring

Range: 0-2A
Imax: 3A

Triggering



Voltage drop
A1 → B1 ≤200mV

Set Order-Nr.:
CT515.5-A30/DC24V R

Delivery includes:
- Relay C5-A30/DC24V R
- Module CT515/DC24V R
- Front cover FS-C5
- Socket S-5M
- Retaining clip S3-C

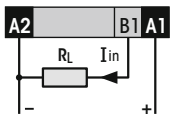
Set Order-Nr.:
CT515.5-M10/DC24V R

Delivery includes:
- Relay C5-M10/DC24V R
- Module CT515/DC24V R
- Front cover FS-C5
- Socket S-5M
- Retaining clip S3-C

CT516
DC Current Monitoring

Range: 0-6A
Imax: 7A

Triggering



Voltage drop
A1 B1 ≤100mV

Set Order-Nr.:
CT516.5-A30/DC24V R

Delivery includes:
- Relay C5-A30/DC24V R
- Module CT516/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 R
- Module CT516/DC24V R
- Front cover FS-C5
- Socket S-5M
- Retaining clip S3-C

Notes

Notes

4.0 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

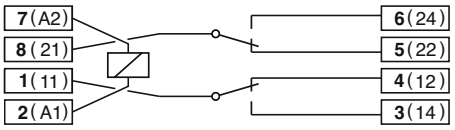
Rated load	10 A / 300 V
Insulation	Test voltage V rms / 1 min
– All terminals/DIN rail	2,5 kV
– Terminal/terminal	2,5 kV
Cross-section of connecting wire	
– Single-wire	4 mm^2 or 2 x 2,5 mm^2
– Multi-wire	22 - 14 AWG
Max. screw torque	0.7 Nm
Screw dimensions	M3, Pozi, slot
Integrated retaining clip/plastic	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
Weight	48g

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.	

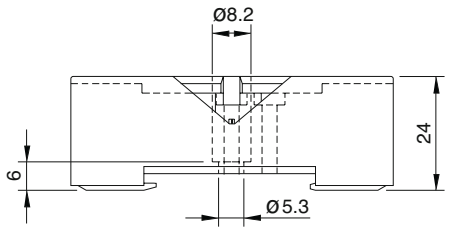
Accessories

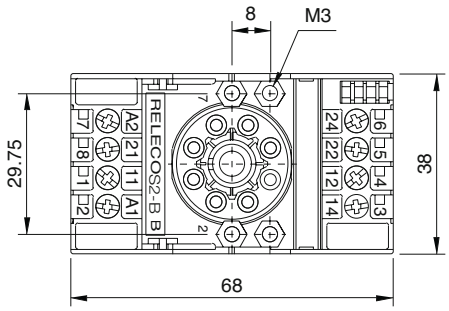
Coding ring, blue set:	**S2-BC** Packaging unit: 5 pcs
Retaining spring, steel	**HF-32, S3-CT** (with Timecube)
Retaining clip, plastic	**CP-15B**

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**

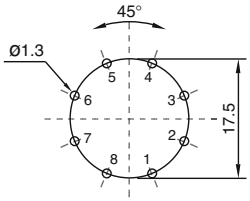
Specifications

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 ºC /-40 ... 80 °C
Weight	17g

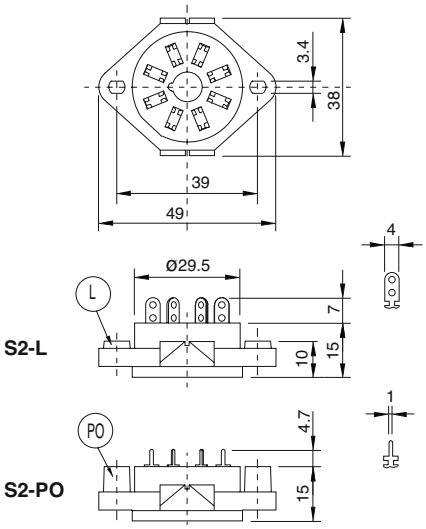
Accessories

Retaining spring, steel	**HF-32**

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

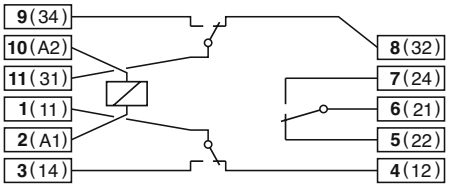
Rated load	10 A / 250 V
Insulation	Test voltage V rms / 1 min
All terminals/DIN rail	2,5 kV
– Terminal/terminal	2,5 kV
Cross-section of connecting wire	
– Single-wire	4 mm^2 or 2 x 2,5 mm^2
– Multi-wire	22 - 14 AWG
Max. screw torque	0.7 Nm
Screw dimensions	M3, Pozi, slot
Integrated retaining clip/plastic	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
Weight	55g

Associated, plug-in 11-pin MRC relays	**C3-A, C3-G, C3-T, C3-X, C3-M, C3-R, C3-N**
Suitable for holding the Releco coding ring	
For coding the relay and the socket.	

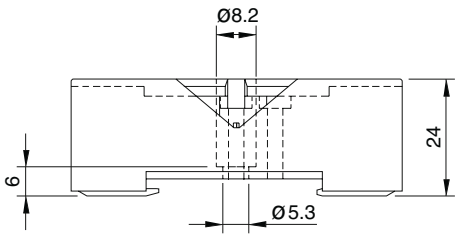
Accessories

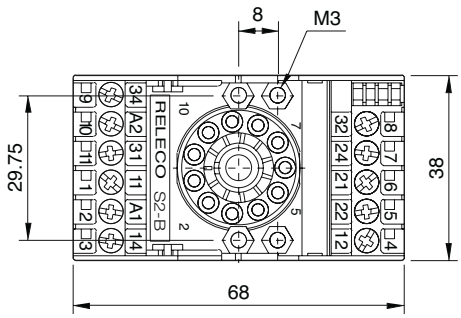
Coding ring, blue set:	**S3-BC** Packaging unit: 5 pcs
Retaining spring, steel	**HF-32, S3-CT** (with Timecube)
Retaining clip, plastic	**CP-15B**

Connection diagram



Dimensions [mm]





Technical approvals, conformities

EN 60947-1, EN 61810-1

MRC series

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

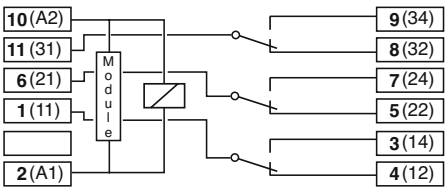
Rated load	10 A / 250 V
Insulation	Test voltage V rms / 1 min
– All terminals/DIN rail	2,5 kV
– Terminal/terminal	2,5 kV
Cross-section of connecting wire	
– Single-wire	4 mm^2 or 2 x 2,5 mm^2
– Multi-wire	22 - 14 AWG
Max. screw torque	0.7 Nm
Screw dimensions	M3, Pozi, slot
Integrated retaining clip/plastic	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
Weight	54g

Associated, plug-in 11-pin MRC relays	**C3-A, C3-G, C3-T, C3-X, C3-M, C3-R, C3-N**
Suitable for holding the Releco coding ring	
For coding the relay and the socket.	

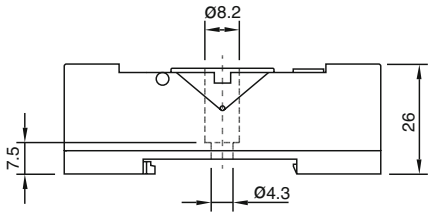
Accessories

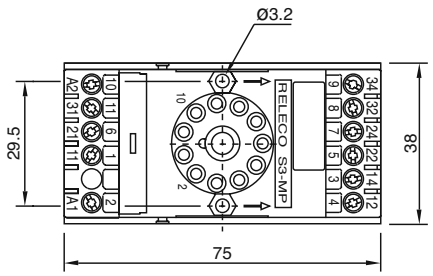
Coding ring, blue set:	**S3-BC** Packaging unit: 5 pcs
Paralel module	**M3P**
Retaining spring, steel	**HF-32, S3-CT** (with Timecube)
Retaining clip, plastic	**CP-15B**

Connection diagram



Dimensions [mm]





Technical approvals, conformities

EN 60947-1, EN 61810-1

MRC series

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
Weight	69g

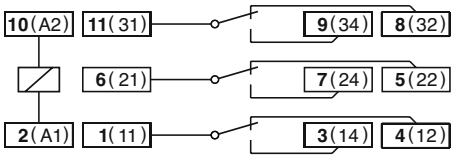
Associated, plug-in 11-pin MRC relays Suitable for holding the Releco coding ring For coding the relay and the socket.	**C3-A, C3-G, C3-T, C3-X, C3-M, C3-R, C3-N**

DIN rail or panel mounting. Removable label.
EN /DIN and sequencial numbering. According to EN 60947.1 and IEC 61810.1

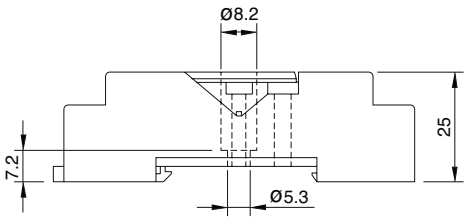
Accessories

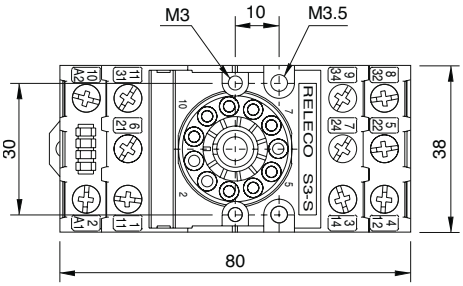
Coding ring, Set red:	**S3-BC** Packaging unit: 5 pcs
Retaining spring, steel	**HF-32, S3-CT** (with Timecube)
Retaining clip, plastic	**CP-15B**

Connection diagram



Dimensions [mm]





Technical approvals, conformities

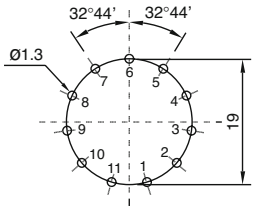
EN 60947-1, EN 61810-1

S3-L, S3-P, S3-PO

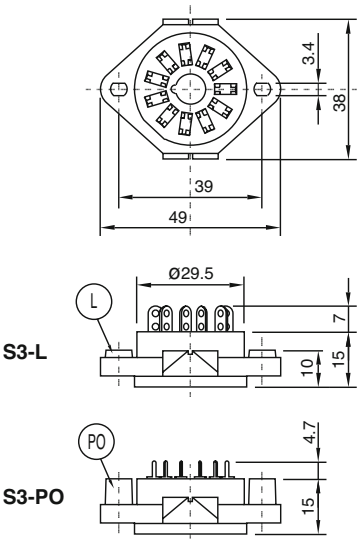
Socket for PCB and soldering, according to IEC 67-I-5b for relays C3-...

Type	**S3-L** 3-pole, flange panel mountable **S3-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
Weight	17g
Accessories	
Retaining spring, steel	**HF-32**

Printed cicuit lay-out [mm]



Dimensions [mm]



Technical approvals, conformities

EN 60947-1, EN 61810-1

C12B0

Socket for 11 pin plug-in relays C3, 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**

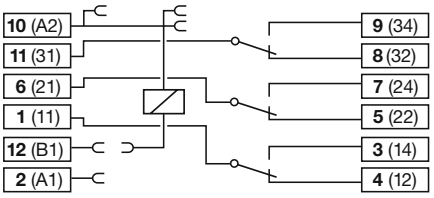
Specifications	
Rated load	10 A / 400 V (cURus: 250 V)
Insulation	Test voltage Vrms / 1 min
– All terminals/DIN rail	2,5 kV
– Terminal/terminal	2,5 kV
Cross-section of connecting wire	
– Single-wire	1 x 6 mm^2, 2 x 1,5 mm^2
– Multi-wire	1 x 4 mm^2/AWG12, 2 x 1,5 mm^2/AWG16
Max. screw torque	0.7 Nm
Screw 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
Weight	61g

Associated plug-in 11-pin relays	**C3, C31, C32**

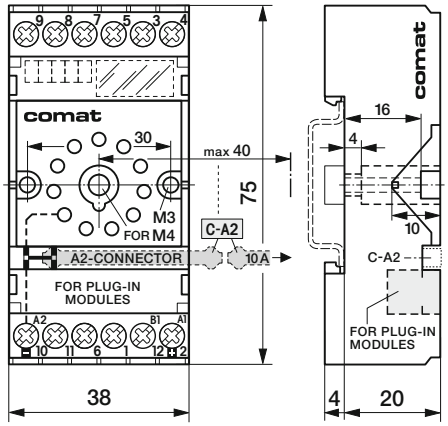
Accessories	
Retaining springs, steel	**HF-32** (Relays C3, C31, C32) **S3-CT** (Timecube + Relays C3) **HF-33** (Timecube + Relays C31, C32)
Coil bridge bus bar	**C-A2**
Marking strip cardboard white 8 x 16	**L-16/1** (under transp. plastic cover)

R-Modul	
Module LED	RL1/UC 12-24 V RL1/AC 110-240 V
Module freewheeling diode	RD1/DC 12-220 V
Module freewheeling diode + LED	RDL1/DC 12-24 V RDL1/DC 48 V
Module RC-suppressor	RC1/UC 12-48 V RC1/UC 110-240 V
Module RC-suppressor + LED	RCL1/UC 24 V RCL1/UC 48 V RCL1/AC 110-240 V

Connection diagram



Dimensions [mm]



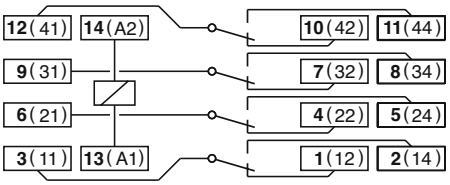
Technical approvals, conformities

S4-J

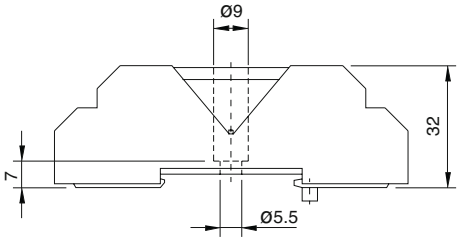
Socket for 14-pin standard relay according to IEC 67-I-18b

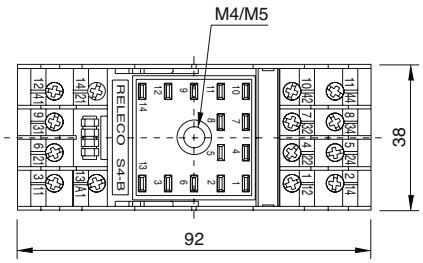
Type	**S4-J** 4-pole, 2 connection level Logic wiring Integrated retaining clip and labelling space
Rated current	**10 A**
Specifications	
Rated load	10 A / 250 V
Insulation	Test voltage V rms / 1 min
– All terminals/DIN rail	2,5 kV
– Terminal/terminal	2,5 kV
Cross-section of connecting wire	
– Single-wire	4 mm^2 or 2 x 2,5 mm^2
– Multi-wire	22 - 14 AWG
Max. screw torque	1 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
Weight	80g
Associated, plug-in 11-pin MRC relays	**C4-A, C4-X, C4-R**
Accessories	
Retaining spring, steel	**S4-C**
Retaining clip, plastic	**CP-15B**

Connection diagram



Dimensions [mm]





Technical approvals, conformities

EN 60947, EN 61810

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**

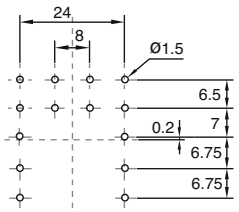
Specifications

Rated load	10 A / 250 V
Test voltage benachbarte Pole	2.5 kV rms 1 min
Ambient temperature	-30 °C ... +60 °C
Weight	21g

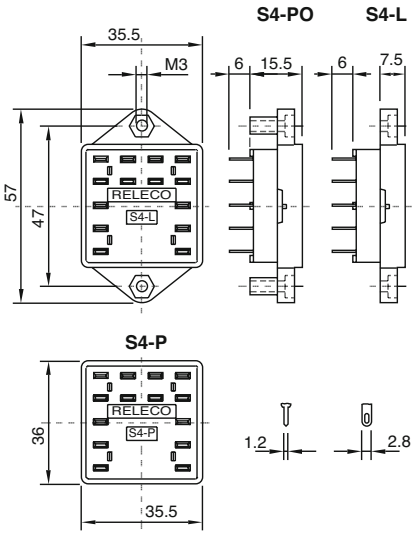
Accessories

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
Weight	81g

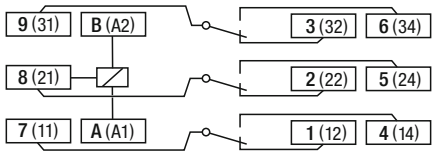
Associated, plug-in 11-pin MRC relays	**C5-A, C5-G, C5-X, C5-M, C5-R**

Mounting in DIN rail TS35 or mounting plate. Labelling space.
According to EN 60947 and IEC 61810

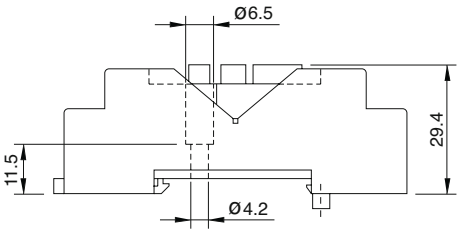
Accessories

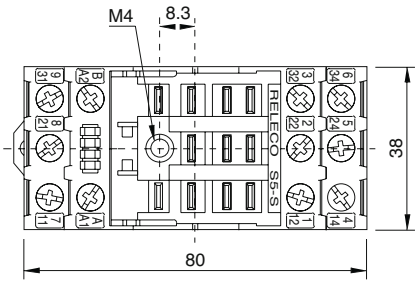
Retaining spring, steel	**S4-C**
Retaining clip, plastic	**CP-15B**

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

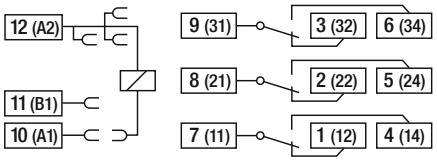
Rated load	16 A / 400 V
Insulation	Test voltage Vrms / 1 min
– All terminal/DIN rail	4 kV
– Terminal/terminal	4 kV
Cross section of connecting wire	
– Single wire	1 x 6 mm^2, 2 x 2,5 mm^2
– Multi wire	1 x 6 mm^2/AWG10, 2 x 1,5 mm^2/AWG16
Max. screw torque	1 Nm
Screw dimensions	M3,5, Pozi, slot
Integrated retaining clip/plastic	for relay series C5
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
Weight	92g

Associated, plug-in 11-pin MRC relays	**C5-A, C5-G, C5-X, C5-M, C5-R**

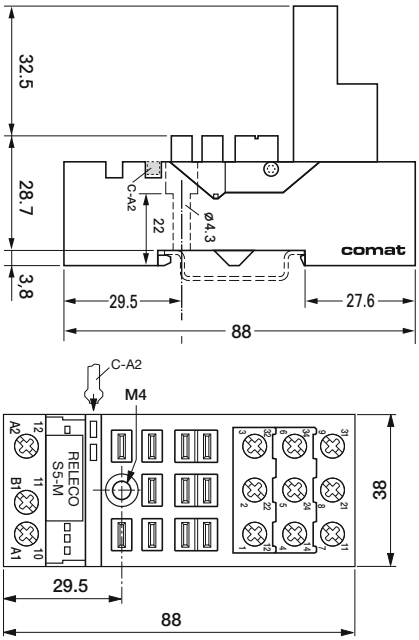
Accessories

Coil bridge bus bar	**C-A2**
Retaining clip, plastic	**S5MCP**

Connection diagram



Dimensions [mm]



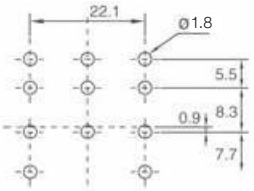
Technical approvals, conformities

S5-L, S5-P, S5-PO

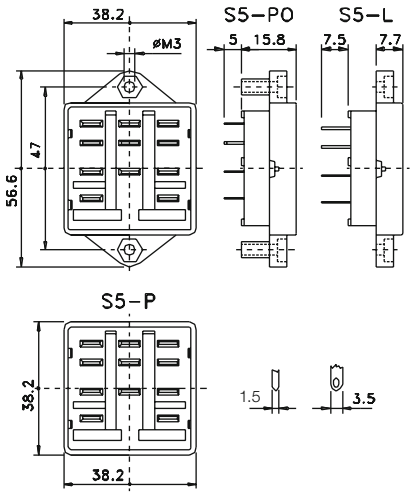
Socket for soldering and printed circuit for relays C5-...

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 (UL: 300 V)
Ambient temperature operation/storage	-40 (no ice)....60 °C / -40 ... 80 °C
Weight	20g
Accessories	
Retaining spring, steel	**S4-CL**

Printed cicuit lay-out [mm]



Dimensions [mm]



Technical approvals, conformities

(S5-P only)

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	0.7 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
Weight	37g

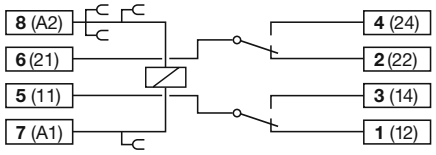
Associated plug-in 8-pin QRC relays	**C7-A2x, C7-T, C7-G, C7-X, C7-W, C7-H**
Associated C80 time relays	**C83, C85, C84**

Accessories

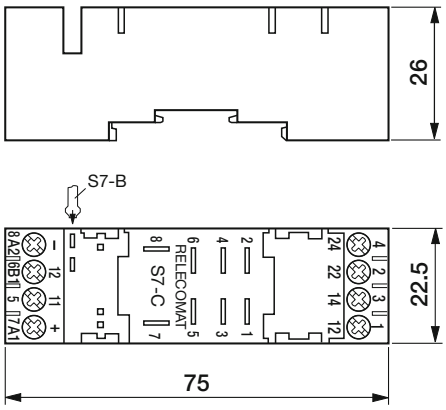
Coil bridge bus bar	**S7-BB**
Retaining clip, plastic	**CP-07B**

Please note:
This socket replaces former socket S7-M
fully compatible

Connection diagram



Dimensions [mm]

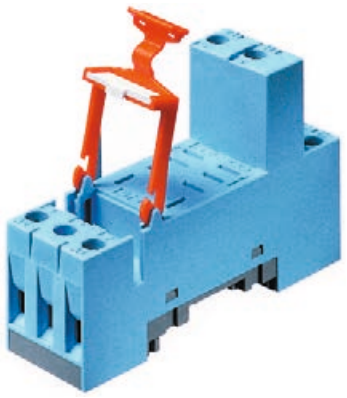


Technical approvals, conformities

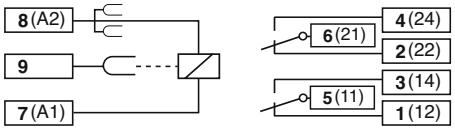
S7-I/O

Socket for miniature relays C7-...

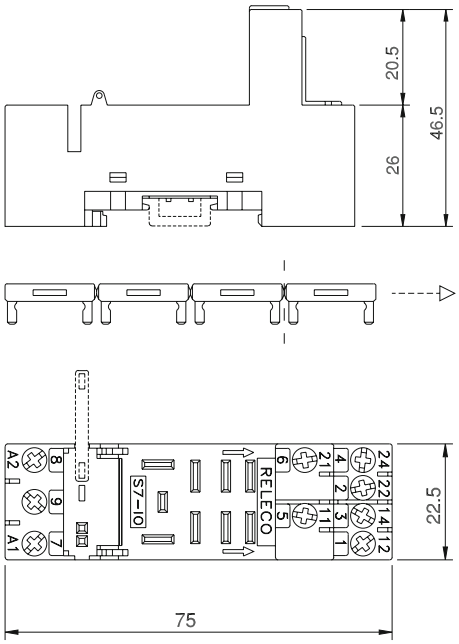
Type	**S7-I/O** 2-pole, 2 level Integrated clip and marking label Coil bridge bus bar to connect in A2 Logic wiring
Rated current	**10 A**
Specifications	
Rated load	10 A / 250 V
Insulation	Test voltage V rms / 1 min
– All terminals/DIN rail	2,5 kV
– Terminal/terminal	2,5 kV
Cross-section of connecting wire	
– Single-wire	4 mm^2 or 2 x 2,5 mm^2
– Multi-wire	22 - 14 AWG
Max. screw torque	0.7 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
Weight	38g
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-BB**
Retaining clip, plastic	**CP-01B**



Connection diagram



Dimensions [mm]



Technical approvals, conformities

EN 60947-1, EN 61810-1

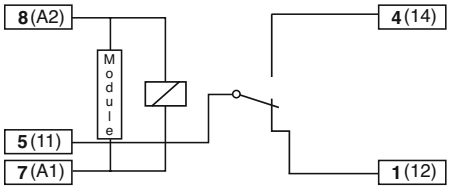
QRC series

S7-16

Socket for miniature relays C7-A10...

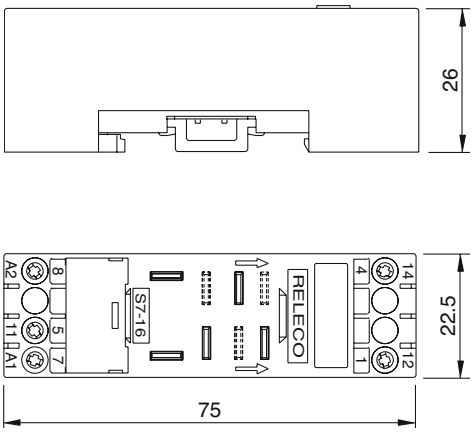
Type	**S7-16** 1-pole, 1 level Integrated retaining clip and labelling space
Rated current	**16 A**
Specifications	
Rated load	16 A / 250 V
Insulation	Test voltage V rms / 1 min
– All terminals/DIN rail	2,5 kV
– Terminal/terminal	2,5 kV
Cross-section of connecting wire	
– Single-wire	4 mm^2 or 2 x 2,5 mm^2
– Multi-wire	22 - 14 AWG
Max. screw torque	0.7 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
Weight	31g
Associated, plug-in 5-pin QRC relays	**C7-A10**
Accessories	
Retaining clip, plastic	**CP-07B**

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

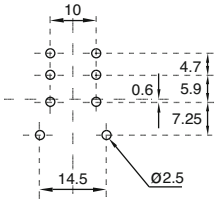
Rated load	10 A / 250 V
Dielectric strength adjacent pin	2.5 kV rms / 1 min
Connection label	1...8; DIN/EN
Integrated retaining clip/plastic	for relay series C7 S7-P: (CP-07B) S7-L + S7-PO: (CP-01B)
Ambient temperature operation/storage	-40 (no ice)....60 °C /-40 ... 80 °C
Weight	10g

Accessories

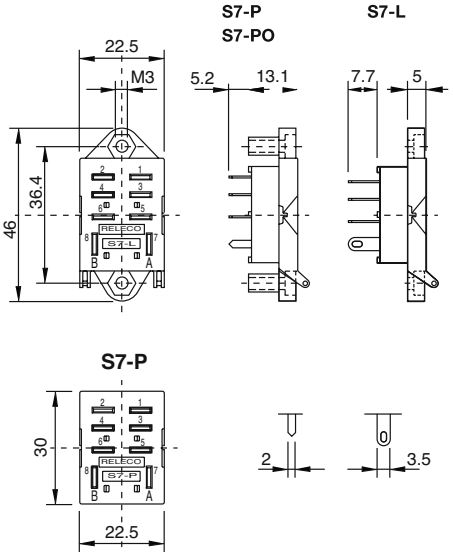
Retaining clip, plastic for S7-P	**CP-07B**
Retaining clip, plastic for S7-L + S7-PO	**CP-01B**

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**

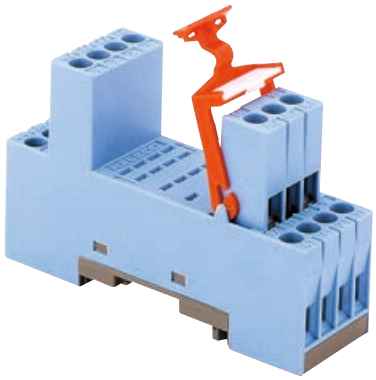
Specifications

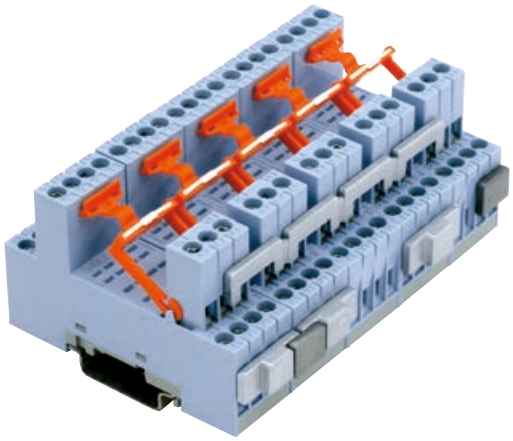
Rated load	6 A / 250 V
Insulation	Test voltage V rms / 1 min
– All terminals/DIN rail	2,5 kV
– Terminal/terminal	2,5 kV
Cross-section of connecting wire	
– Single-wire	4 mm^2 or 2 x 2,5 mm^2
– Multi-wire	22 - 14 AWG
Max. screw torque	0.7 Nm
Screw dimensions	M3, Pozi, slot
Integrated retaining clip/plastic	for relay series C9 (CP-01B)
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
Weight	54 g

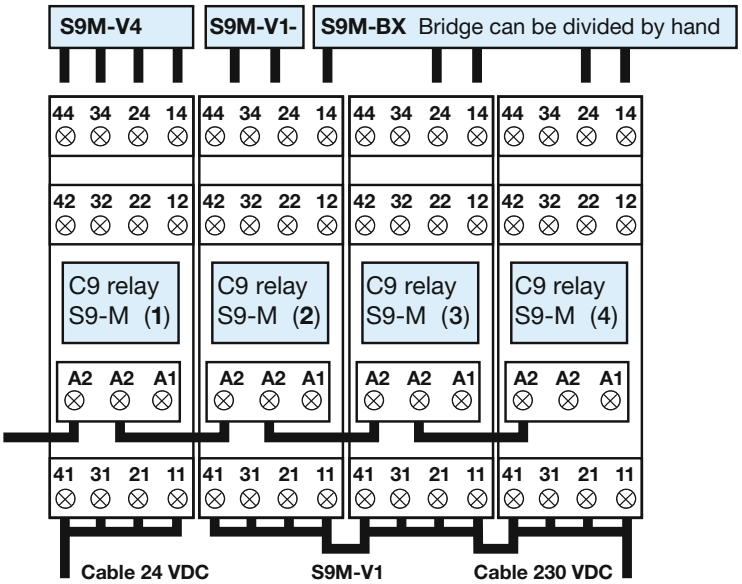
Socket for 4 poles, QRC relays	**C9-A, C9-E, C9-R**

Accessories

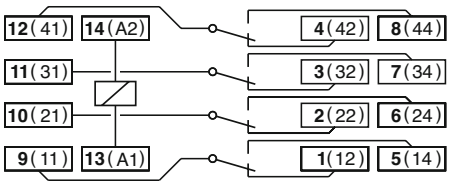
Retaining clip, plastic	**CP-01B**



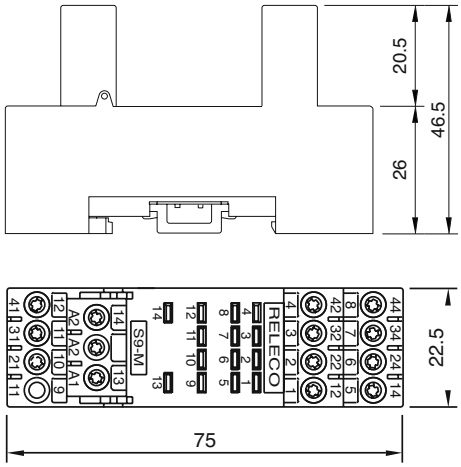




Connection diagram



Dimensions [mm]



Technical approvals, conformities

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**

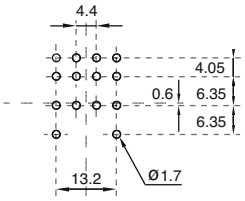
Specifications

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 S9-P: (CP-07B) S9-L + S9-PO: (CP-01B)
Ambient temperature operation/storage	-40 (no ice)....60 °C /-40 ... 80 °C
Weight	12 g

Accessories

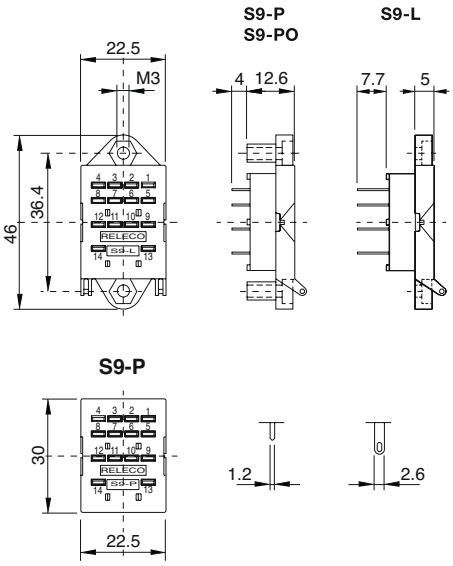
Retaining clip, plastic for S9-P	**CP-07B**
Retaining clip, plastic for S9-L + S9-PO	**CP-01B**

Printed cicuit lay-out [mm]



S9-P
S9-PO

Dimensions [mm]



Technical approvals, conformities

Lloyd´s

EN 60947-1, EN 61810-1

IRC series

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**

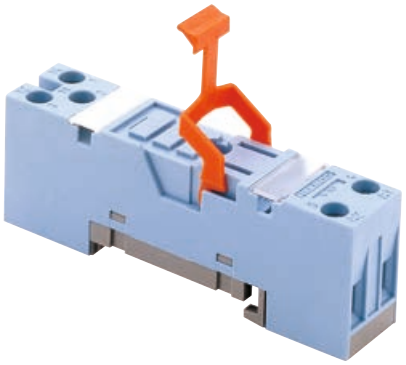
Specifications

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	0.7 Nm
Screw dimensions	M3, Pozi, slot
Integrated retaining clip/plastic	for relay series C10, CSS (CP-17B)
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
Weight	23g

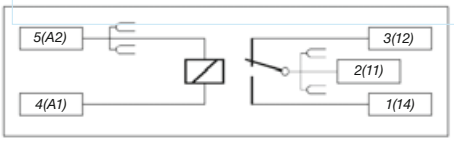
Socket for plug-in 10A IRC relays	**C10-A, C10-T, CSS, C10-G**

Accessories

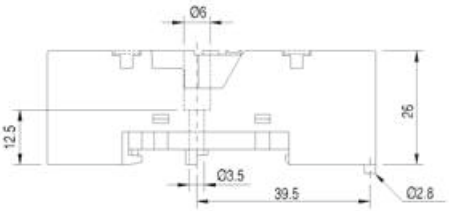
Coil bridge bars	**S10-BB**
Retaining clip, plastic	**CP-17B**

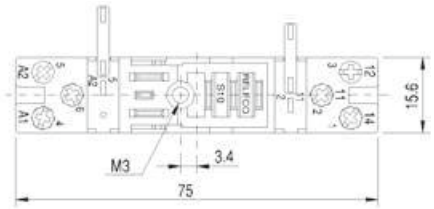


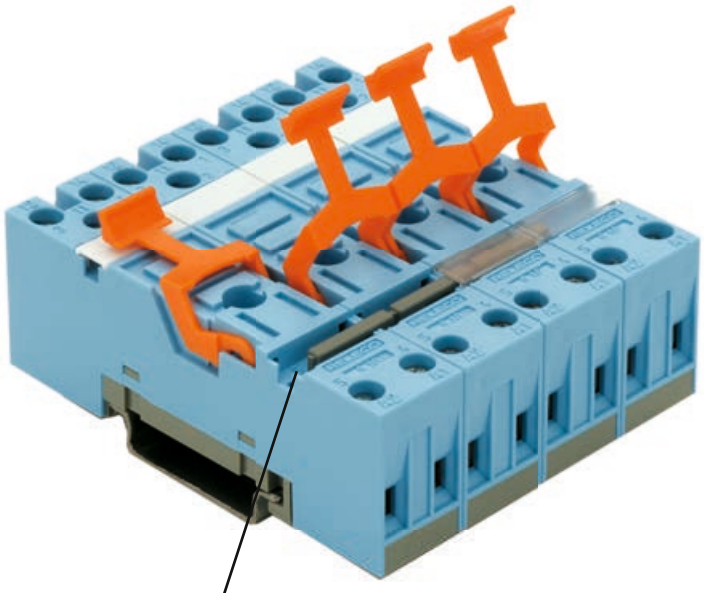
Connection diagram



Dimensions [mm]







Technical approvals, conformities

EN 60947-1, EN 61810-1

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**

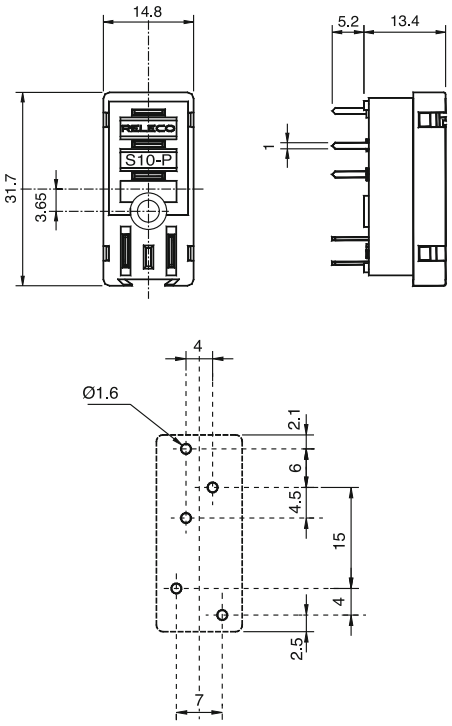
Specifications

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 (CP-24B)
Labelling space	detachable
Connection label	1...5; DIN/EN
Ambient temperature operation/storage	-40 (no ice)....60 ºC /-40 ... 80 °C
Weight	7g

Accessories

Retaining clip, plastic	**CP-24B**

Dimensions [mm]



Technical approvals, conformities

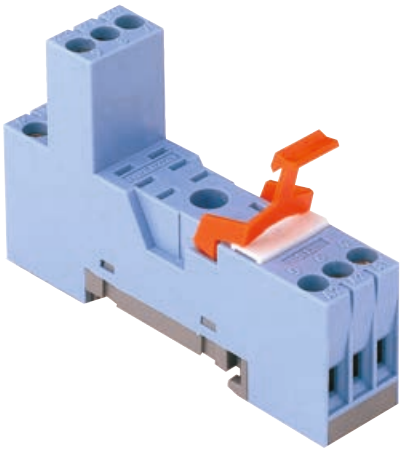
IEC 61810 EN 60947

IRC series

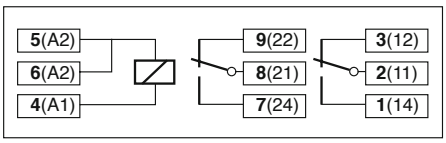
S12

Socket for Interface relay

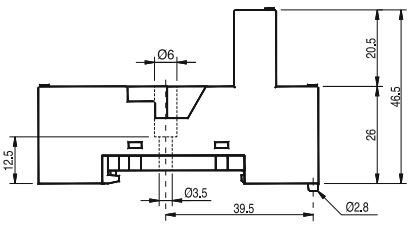
Type	**S12** I/O socket for C12 relays with 2 x CO Logic connection , 5 A
Rated current	**5 A**
Specifications	
Rated load	5 A / 250 V
Insulation	Test voltage V rms / 1 min
– All terminals/DIN rail	5 kV
Contacts terminals	2,5 kV
Contacts / Coil terminals	5 kV
Cross-section of connecting wire	
– Single-wire	4 mm^2 or 2 x 2,5 mm^2
– Multi-wire	22 - 14 AWG
Max. screw torque	0.7 Nm
Screw dimensions	M3, Pozi, slot
Integrated retaining clip/plastic	for relay series C12 (CP-17B)
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
Weight	31g
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, CP-07B**
Retaining clip, plastic	**CP-17B**

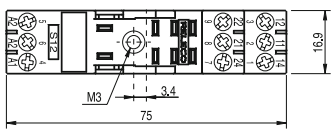


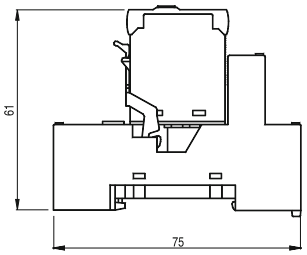
Connection diagram

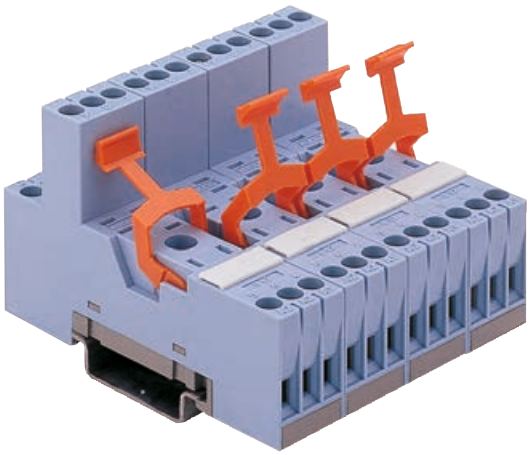


Dimensions [mm]









Technical approvals, conformities

IEC 61810 EN 60947

S12-P

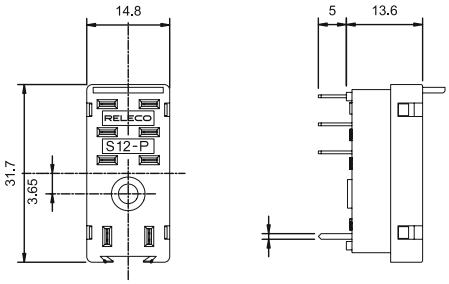
Printed circuit socket for Interface relays, C12

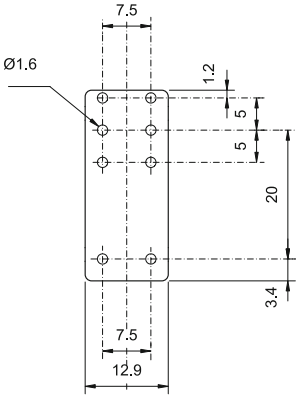
Type:	**S12-P** Printed circuit socket for 2-pole C12 relay
Rated current	**5 A**

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
Weight	7 g
Integrated retaining clip/plastic	for relay series C12, (CP-24B)

Accessories	
Retaining clip, plastic	**CP-24B**

Dimensions [mm]





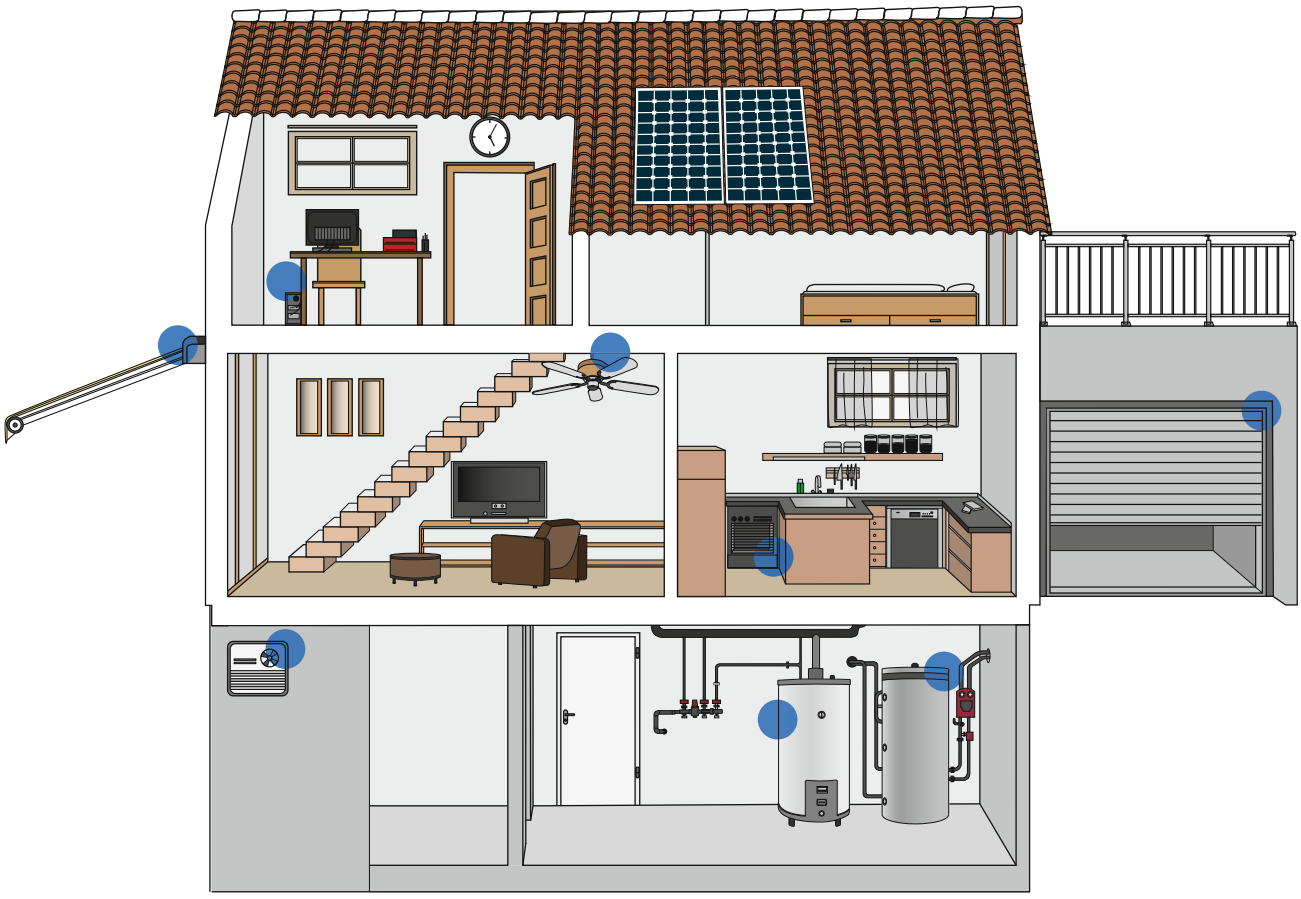
Technical approvals, conformities

IEC 61810 EN 60947

Notes

5.0 SMS Relay

- Easy configuration with PC and «FAST SMS SET™» 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
- Call-In Function
- Alarm messages by e-mail
- App for Android operated smartphones

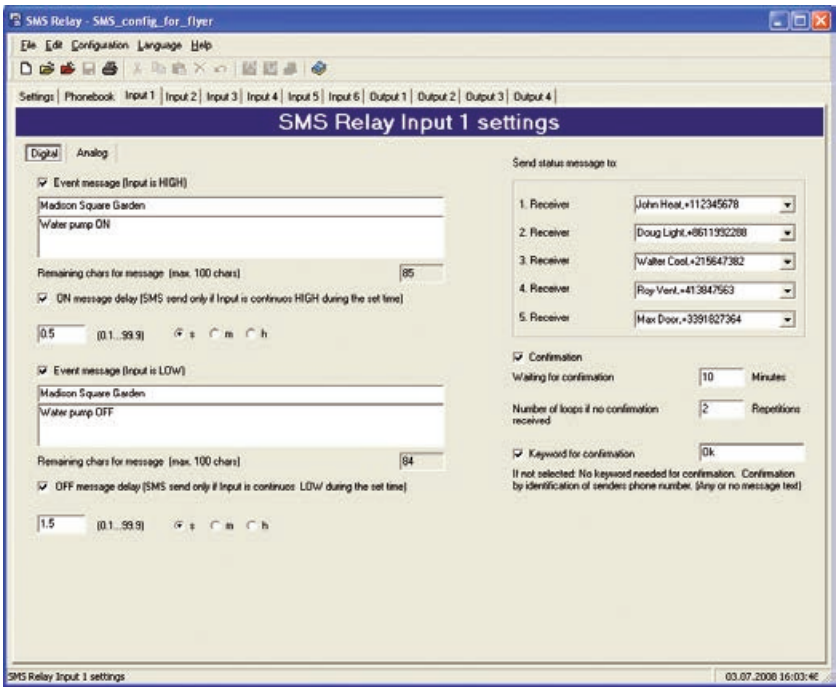


Monitoring | Alerting | Controlling

Configuration software

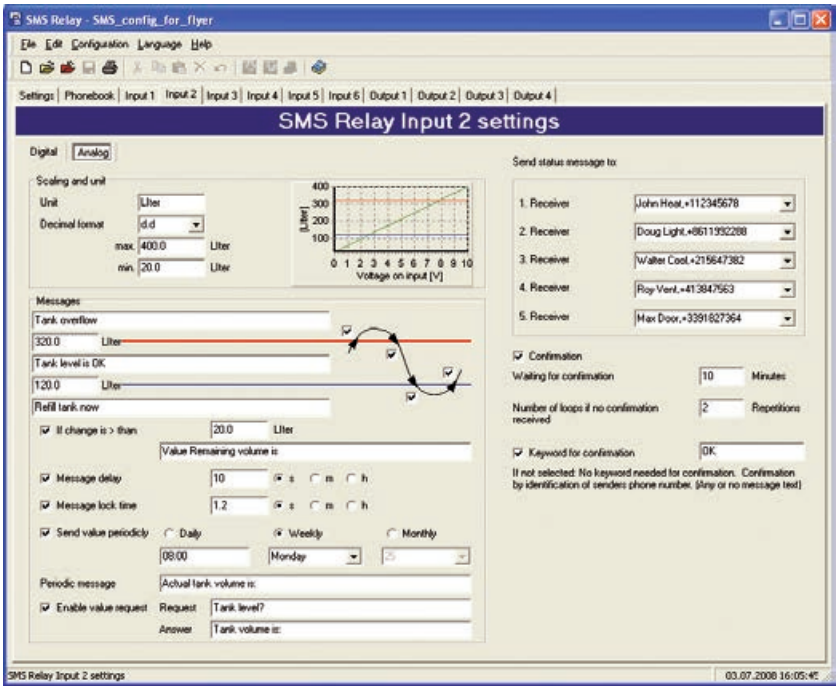
Language

Digital Inputs



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



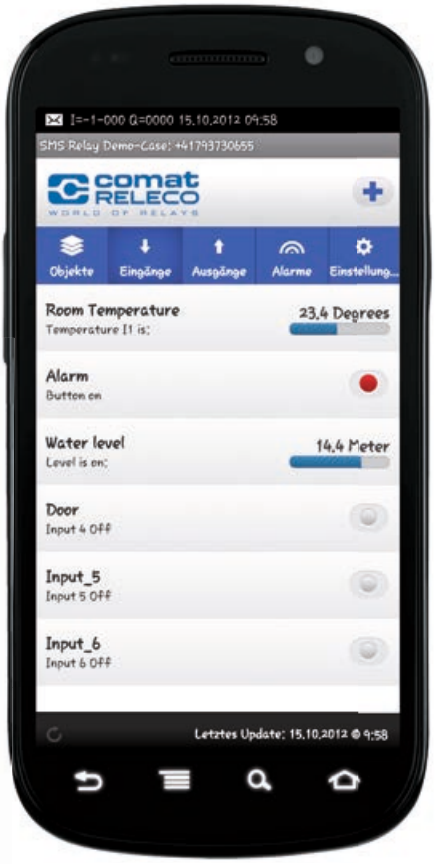
One touch to have everything under control

Comat is presenting an app making handling, controlling, monitoring and remote switching of a SMS-Relay even more easily and clearly presented. Switch on your heating, open your garage door or irrigate your lawn simply by clicking a button. Your smart phone is thereby your remote control. After installation and configuration the SMS Relay from Comat and after download and installation of the App from Google Playstore, just import the device configuration data to your smart phone, enter the phone number of the device and it is ready for use.
You will find a specific instruction on our website www.comat.ch

With the Android App the display of all input states and the switching of the outputs is simple.
It's available for download, free of charge in Google Playstore.

Characteristics

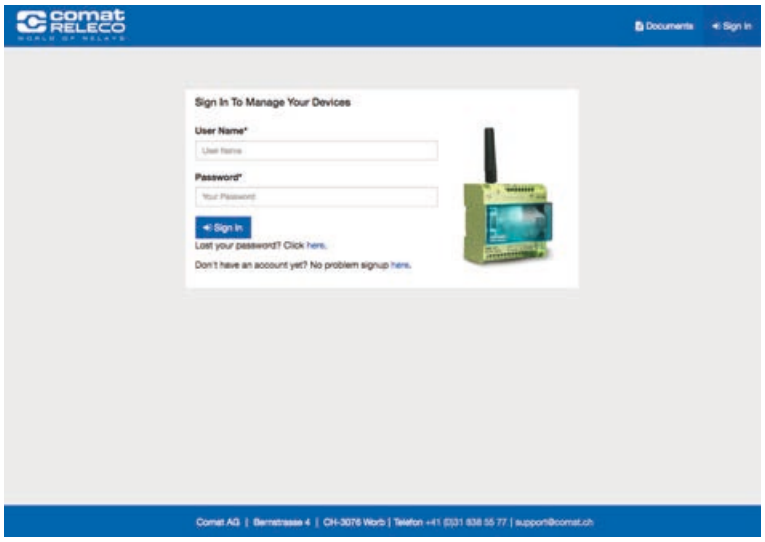
- Polling of input values
- Easy control of outputs
- Status display
- Monitoring of alarm history
- Simultaneous control of multiple SMS Relays



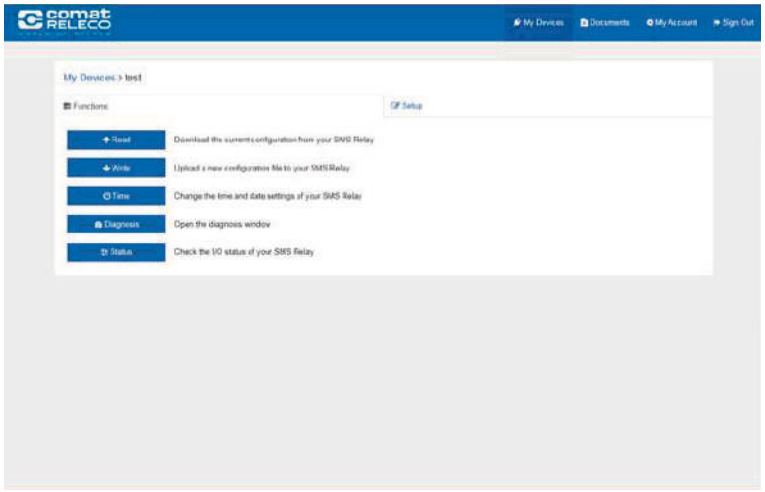
GET IT ON Google play

Attention!
The Android App simplifies the operation of the SMS Relay. The communication in the background is by chargeable text message.

Login screen



Function overview



Remote maintenance

The remote maintenance of the SMS Relay is performed via the Internet. Multiple SMS Relay can be managed from anywhere by a web access on the SMS Relay remote access portal.

- Upload / download the configuration file
- Diagnosis (signal strength, provider information, device information)
- Date / Time settings
- Monitoring inputs and switching outputs

Please find more information on our website www.comat.ch.

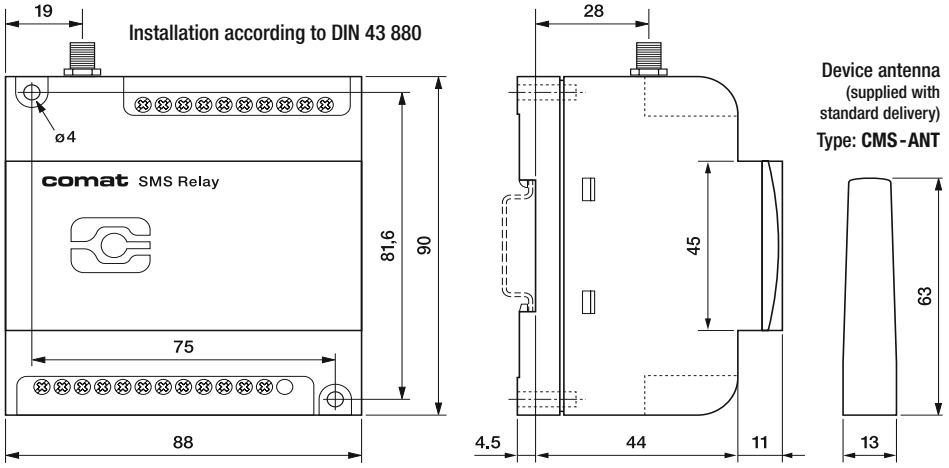
Technical Data's

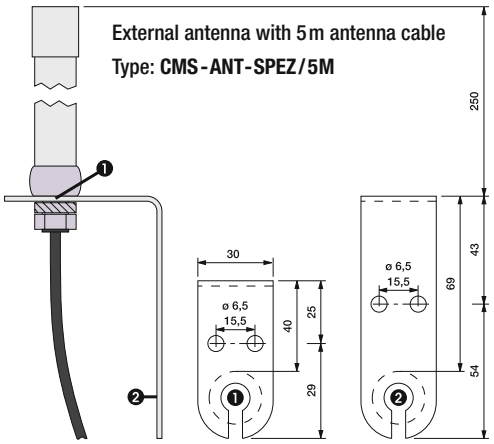
Typ	CMS-10F/AC 110-240 V	CMS-10F/DC12-48 V	CMS-10ADF/DC12-48 V	CMS-10ACDF/DC12-48 V
Operating voltage	AC 110-240 V~ 50/60 Hz	DC 12-48 V⎓ ∿ max. 10 %	DC 12-48 V⎓ ∿ max. 10 %	DC 12-48 V⎓ ∿ max. 10 %
Power consumption	8 VA / 6 W	4,2 W	4,2 W	4,2 W
Switching capacity	4 x 10 A 250 V; Sum of current max. 20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

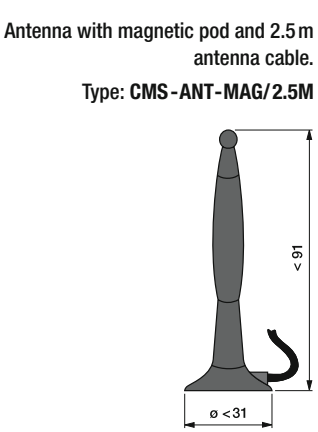
Installation note

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.

comat RELECO
WORLD OF RELAYS

Typ	Description
CMS-10F/AC110-240V	SMS Relay AC 110-240V with 6 digital inputs incl. small antenna (CMS-ANT)
CMS-10F/DC12-48V	SMS Relay DC 12-48V with 6 digital inputs incl. small antenna (CMS-ANT)
CMS-10ADF/DC12-48V	SMS Relay DC 12-48V with 6 digital and analog inputs incl. small antenna (CMS-ANT)
CMS-10ACDF/DC12-48V	SMS Relay DC 12-48V with 2 anlog current inputs and 4 analog and/or digital voltage 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 6 digital inputs (SMS Relay AC110-240V)
CMS-10FKIT/DC12-48V	Installation kit complete with 6 digital inputs (SMS Relay DC12-48V)
CMS-10ADFKIT/DC12-48V	Installation kit complete with 6 digital and/or analog inputs (SMS Relay DC12-48V)
CMS-10ACDFKIT/DC12-48V	SMS Relay Kit DC12-48V with 2 anlog current inputs and 4 analog and/or digital voltage inputs
Accessories	
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-KAB / 20M	Antenna cable 20m (extension)
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
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

Type

CMS-10F/…
CMS-10ADF/…
CMS-10ACDF/…

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/…
CMS-10ACDFKIT/…

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

comat RELECO
WORLD OF RELAYS

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

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

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

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

Accessories

comat RELECO
WORLD OF RELAYS

	Type	
	**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: 0-10V, 3-wire • Application temperature: +5 °C bis +70 °C
	**App SMSrelay**	**App for Android operated smart phones** The App is available free of charge in the Google Playstore.

Notes

Notes

Notes

6.0 Softstarters

Performance electronics on the highest level

- Reduces wear in the entire drive train through soft start-up
- Optimal starting torque through intelligent current control during start-up
- Protects the engine through integrated, adjustable motor protection with I^2t-monitoring
- Minimises wiring effort and component costs: integrated bypass and motor protection
- Safe to use: comprehensive self-monitoring

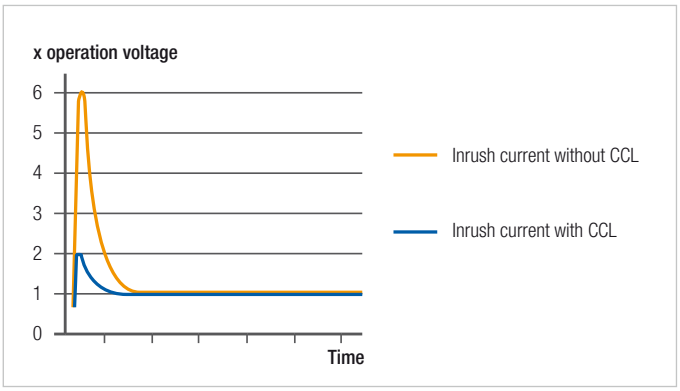
Three phase AC motors have proven themselves for the operation of pumps, conveyor belts, compressors and countless other drive technology applications. The direct start or the star-delta starter cause impact on the mechanical components in the drive train. This leads to signs of wear, damage and premature failures. On the other hand, abrupt starts lead to voltage drops which burden the power supply network and affect the surrounding components.
Softstarter by Comat Releco prevents disruptions and ensures a smooth start-up with a reduced starting torque and slow breaking sequences without loading the drive system. Thanks to modern semiconductor power amplifiers and fanless design, you can enjoy absolutely wear-free. The compact construction with integrated cooling element only requires little space in the control cabinet.

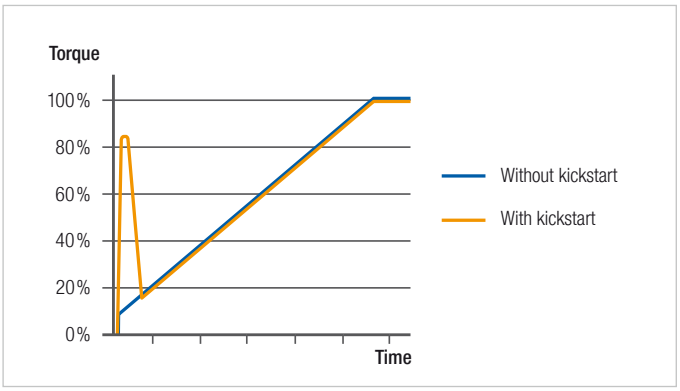
Softstarter by Comat Releco is available in four series:

The CCL range has been developed for the operation of heat pumps and compressors. Intelligent current limitation during start-up reduces the drive power by up to 65%. The integrated motor protection allows the adjustment of the nominal power and replaces an additional motor protection switch. Thanks to an integrated bypass relay, there are no additional costs for external bridging.

The CCM range is available with two or three switched phases and is designed for a large number of switching cycles per hour. The bypass is integrated in accordance with the version. Separate potentiometers allow the adjustment of start-up and breaking times, as well as the kick-start function, and the start-up torque can be limited to 0 to 85 % of the nominal value. The CCMB range also offers a dynamic break function with automatic standstill detection.

The starting torque limiters of the CTC range are activated via an upstream contactor. The start-up torque can be limited to 1 to 85 % of the nominal torque. Typical applications are blowers and smaller machinery.





Starting Torque Limiter – CTC3415

Type: CTC3415

The starting torque limiters of the CTC range are activated via an upstream contactor. The start-up torque can be limited to 1 to 85 % of the nominal torque. Typical applications are blowers and smaller machinery.

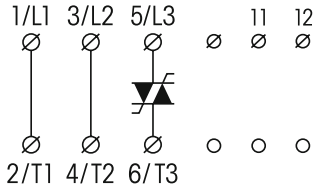
Output	
Switching element	Thyristor
Numbers of phases	1
Nominal voltage (U_{nom})	**400 VAC**
Output voltage range	208 – 480 VAC
Reverse voltage	1200 Vrrm
Peak reverse voltage	1300 Vrsm
Min. load	50 mA
Max. leakage current	5 mA
Max. inrush current	120 A
Operation current AC-53B @ U_{nom}	**15 A**
Switching cycles / h	3000 cycles / h
Startup time	0,5 – 5 s
Max. response time	1 period
Limit load	1800 A^2s

Insulation	
Insulation voltage	4 kV
Dielectric strength	660 V

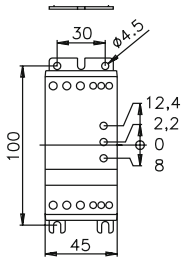
General Specifications	
Ambient temperature storage/operation	-20 – 80°C / -5 – 40°C
Connection terminals	Screw terminal 10 mm^2
Ingress protection degree	IP 20
Mounting	DIN rail TS35
Housing material	PPE Noryl SE1 / Aluminium
Weight	650 g

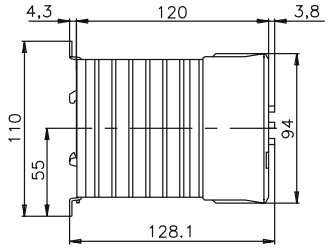
Standard type	
Starting Torque Limiter	**CTC3415**

Connection diagram



Dimensions [mm]





Technical approvals, conformities

CE cULus LISTED

Starting Torque Limiter – CTC3425

Type: CTC3425

The starting torque limiters of the CTC range are activated via an upstream contactor. The start-up torque can be limited to 1 to 85 % of the nominal torque. Typical applications are blowers and smaller machinery.

Output

Switching element	Thyristor
Numbers of phases	1
Nominal voltage (U_{nom})	**400 VAC**
Output voltage range	208 – 480 VAC
Reverse voltage	1200 Vrrm
Peak reverse voltage	1300 Vrsm
Min. load	50 mA
Max. leakage current	5 mA
Max. inrush current	200 A
Operation current AC-53B @ U_{nom}	**25 A**
Switching cycles / h	3000 cycles / h
Startup time	0,5 – 5 s
Max. response time	1 period
Limit load	6300 A^2s

Insulation

Insulation voltage	4 kV
Dielectric strength	660 V

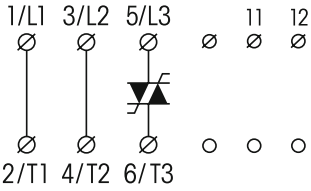
General Specifications

Ambient temperature storage/operation	-20 – 80°C / -5 – 40°C
Connection terminals	Screw terminal 10 mm^2
Ingress protection degree	IP 20
Mounting	DIN rail TS35
Housing material	PPE Noryl SE1 / Aluminium
Weight	650 g

Standard type

Starting Torque Limiter	**CTC3425**

Connection diagram



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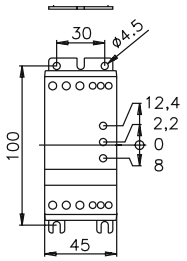
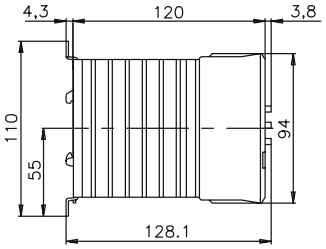




Technical approvals, conformities

CE cULus LISTED

Compressor Softstarter – CCL33H415US

Type: CCL33H415US

The CCL range has been developed for the operation of heat pumps and compressors. Intelligent current limitation during start-up reduces the drive power by up to 65%. The integrated motor protection allows the adjustment of the nominal power and replaces an additional motor protection switch Thanks to an integrated bypass relay, there are no additional costs for external bridging. Comprehensive monitoring detects over- and undercurrent, incorrect phase sequences and wiring errors. CCL Softstarter is available in three versions with a nominal current of up to 35 A. Cage clamp terminals allow quick wiring.

Output	
Switching element	Thyristor
Numbers of phases	3
Bypass	integrated
Nominal voltage (U_{nom})	**400 VAC**
Output voltage range	230 – 400 Vrms
Reverse voltage	1200 Vrrm
Peak reverse voltage	1300 Vrsm
Min. load	10 A
Max. leakage current	5 mA
Max. inrush current (t=1 s)	90 A
Operation current AC-58 @ U_{nom}	**15 A**
Switching cycles / h	max. 12 cycles / h
Response/Release time	500 ms
Limit load	610 A^2s

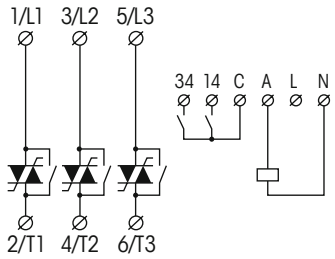
Input	
Voltage	230 VAC
Min. voltage	196 VAC
Max. voltage	264 VAC
Release voltage	110 VAC
Max. current	7 mA

Insulation	
Insulation voltage	4 kV
Dielectric strength	660 V

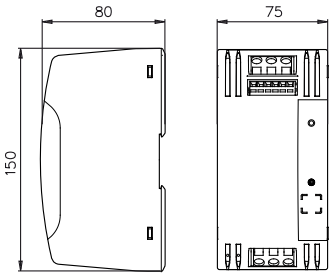
General Specifications	
Ambient temperature storage/operation	-20 – 80°C / -20 – 65°C
Connection terminals	Screw terminal 6 mm^2
Ingress protection degree	IP 20
Mounting	DIN rail TS35
Housing material	PPE Noryl SE1
Weight	470 g

Standard type	
Starting Torque Limiter	**CCL33H415US**

Connection diagram



Dimensions [mm]



Technical approvals, conformities

CE cULus LISTED

Compressor Softstarter – CCL33H425US

Type: CCL33H425US

The CCL range has been developed for the operation of heat pumps and compressors. Intelligent current limitation during start-up reduces the drive power by up to 65%. The integrated motor protection allows the adjustment of the nominal power and replaces an additional motor protection switch Thanks to an integrated bypass relay, there are no additional costs for external bridging. Comprehensive monitoring detects over- and undercurrent, incorrect phase sequences and wiring errors. CCL Softstarter is available in three versions with a nominal current of up to 35 A. Cage clamp terminals allow quick wiring.

Output	
Switching element	Thyristor
Numbers of phases	3
Bypass	integrated
Nominal voltage (U_{nom})	**400 VAC**
Output voltage range	230 – 400 Vrms
Reverse voltage	1200 Vrrm
Peak reverse voltage	1300 Vrsm
Min. load	10 A
Max. leakage current	5 mA
Max. inrush current (t=1 s)	150 A
Operation current AC-58 @ U_{nom}	**25 A**
Switching cycles / h	max. 12 cycles/h
Response/Release time	500 ms
Limit load	1800 A^2s

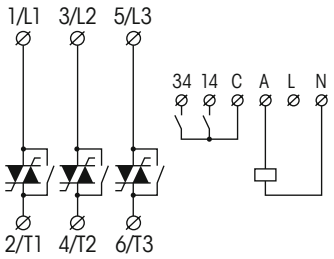
Input	
Voltage	230 VAC
Min. voltage	196 VAC
Max. voltage	264 VAC
Release voltage	110 VAC
Max. current	7 mA

Insulation	
Insulation voltage	4 kV
Dielectric strength	660 V

General Specifications	
Ambient temperature storage/operation	-20 – 80°C / -20 – 65°C
Connection terminals	Screw terminal 6 mm^2
Ingress protection degree	IP 20
Mounting	DIN rail TS35
Housing material	PPE Noryl SE1
Weight	470 g

Standard type	
Starting Torque Limiter	**CCL33H425US**

Connection diagram



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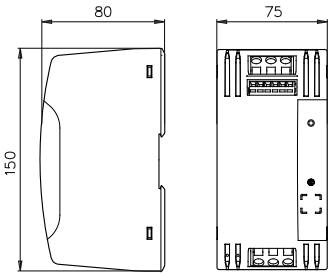


Technical approvals, conformities

Compressor Softstarter – CCL33H435US

Type: CCL33H435US

The CCL range has been developed for the operation of heat pumps and compressors. Intelligent current limitation during start-up reduces the drive power by up to 65%. The integrated motor protection allows the adjustment of the nominal power and replaces an additional motor protection switch Thanks to an integrated bypass relay, there are no additional costs for external bridging. Comprehensive monitoring detects over- and undercurrent, incorrect phase sequences and wiring errors. CCL Softstarter is available in three versions with a nominal current of up to 35 A. Cage clamp terminals allow quick wiring.

Output	
Switching element	Thyristor
Numbers of phases	3
Bypass	integrated
Nominal voltage (U_{nom})	**400 VAC**
Output voltage range	230 – 400 Vrms
Reverse voltage	1200 Vrrm
Peak reverse voltage	1300 Vrsm
Min. load	10 A
Max. leakage current	5 mA
Max. inrush current (t=1 s)	210 A
Operation current AC-58 @ U_{nom}	**35 A**
Switching cycles / h	max. 12 cycles / h
Response/Release time	500 ms
Limit load	1800 A^2s

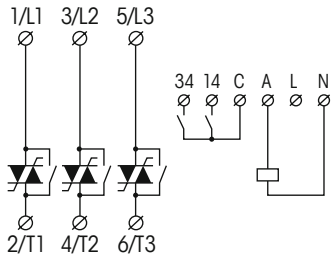
Input	
Voltage	230 VAC
Min. voltage	196 VAC
Max. voltage	264 VAC
Release voltage	110 VAC
Max. current	7 mA

Insulation	
Insulation voltage	4 kV
Dielectric strength	660 V

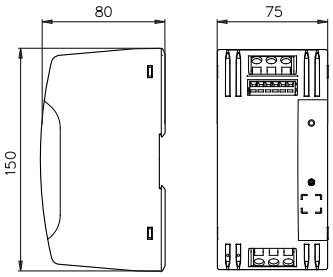
General Specifications	
Ambient temperature storage/operation	-20 – 80°C / -20 – 65°C
Connection terminals	Screw terminal 6 mm^2
Ingress protection degree	IP 20
Mounting	DIN rail TS35
Housing material	PPE Noryl SE1
Weight	470 g

Standard type	
Starting Torque Limiter	**CCL33H435US**

Connection diagram



Dimensions [mm]



Technical approvals, conformities

CE cULus LISTED

Softstarter 2 phases switched – CCM3H403USi

Type: CCM3H403USi

Softstarter CCM3 have two switched phases and are available with a nominal current of 3 to 50 A. The types CCM3...USi feature an integrated bypass. Separate potentiometers allow the adjustment of start-up and breaking times, as well as the kick-start function, and the start-up torque can be limited to 0 to 85 % of the nominal value.

Output

Switching element	Thyristor
Numbers of phases	2
Bypass	integrated
Nominal voltage (U_{nom})	**400 VAC**
Output voltage range	400 – 480 VAC
Reverse voltage	1200 Vrrm
Peak reverse voltage	1300 Vrsm
Min. load	3 A
Max. leakage current	5 mA
Max. inrush current	12 A
Operation current AC-53B @ U_{nom}	**3 A**
Switching cycles / h	32 cycles / h
Startup time	0,5 – 10 s
Deceleration time	0,5 – 10 s
Limit load	72 A^2s

Input

Voltage	24 – 230 VAC
Min. voltage	20,4 VAC
Max. voltage	253 VAC
Release voltage	5 VAC
Max. current	15 mA

Insulation

Insulation voltage	4 kV
Dielectric strength	660 V

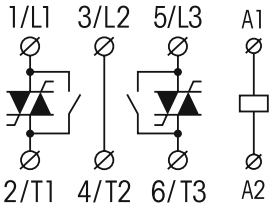
General Specifications

Ambient temperature storage/operation	-20 – 80°C / -5 – 40°C
Connection terminals	Screw terminal 6 mm^2
Ingress protection degree	IP 20
Mounting	DIN rail TS35
Housing material	PPE Noryl SE1 / Aluminium
Weight	270 g

Standard type

Starting Torque Limiter	**CCM3H403USi**

Connection diagram



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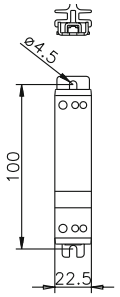
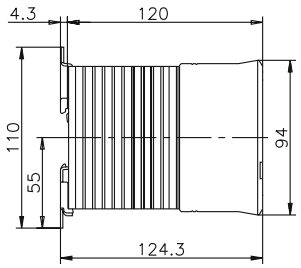




Technical approvals, conformities

CE cULus LISTED

Softstarter 2 phases switched – CCM3H415

Type: CCM3H415

Softstarter CCM3 have two switched phases and are available with a nominal current of 3 to 50 A. The types CCM3...USi feature an integrated bypass. Separate potentiometers allow the adjustment of start-up and breaking times, as well as the kick-start function, and the start-up torque can be limited to 0 to 85 % of the nominal value.

Output	
Switching element	Thyristor
Numbers of phases	2
Bypass	—
Nominal voltage (U_{nom})	**400 VAC**
Output voltage range	400 – 480 VAC
Reverse voltage	1200 Vrrm
Peak reverse voltage	1300 Vrsm
Min. load	3 A
Max. leakage current	5 mA
Max. inrush current	75 A
Operation current AC-53B @ U_{nom}	**15 A**
Switching cycles / h	120 cycles / h
Startup time	0,5 – 10 s
Deceleration time	0,5 – 10 s
Limit load	1800 A^2s

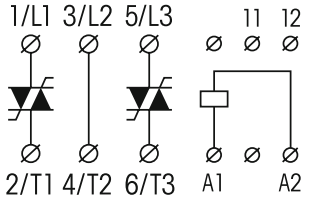
Input	
Voltage	24 – 230 VAC
Min. voltage	20,4 VAC
Max. voltage	253 VAC
Release voltage	5 VAC
Max. current	15 mA

Insulation	
Insulation voltage	4 kV
Dielectric strength	660 V

General Specifications	
Ambient temperature storage/operation	-20 – 80°C / -5 – 40°C
Connection terminals	Screw terminal 6 mm^2
Ingress protection degree	IP 20
Mounting	DIN rail TS35
Housing material	PPE Noryl SE1 / Aluminium
Weight	650 g

Standard type	
Starting Torque Limiter	**CCM3H415**

Connection diagram



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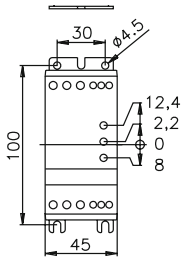
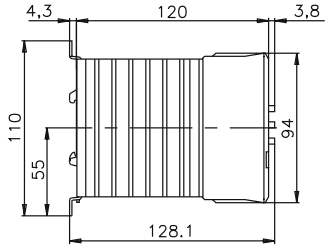




Technical approvals, conformities

CE cULus LISTED

Softstarter 2 phases switched– CCM3H425

Type: CCM3H425

Softstarter CCM3 have two switched phases and are available with a nominal current of 3 to 50 A. The types CCM3...USi feature an integrated bypass. Separate potentiometers allow the adjustment of start-up and breaking times, as well as the kick-start function, and the start-up torque can be limited to 0 to 85 % of the nominal value.

Output	
Switching element	Thyristor
Numbers of phases	2
Bypass	—
Nominal voltage (U_{nom})	**400 VAC**
Output voltage range	400 – 480 VAC
Reverse voltage	1200 Vrrm
Peak reverse voltage	1300 Vrsm
Min. load	3 A
Max. leakage current	5 mA
Max. inrush current	125 A
Operation current AC-53B @ U_{nom}	**25 A**
Switching cycles / h	120 cycles / h
Startup time	0,5 – 20 s
Deceleration time	0,5 – 20 s
Limit load	6300 A^2s

Input	
Voltage	24 – 230 VAC
Min. voltage	20,4 VAC
Max. voltage	253 VAC
Release voltage	5 VAC
Max. current	15 mA

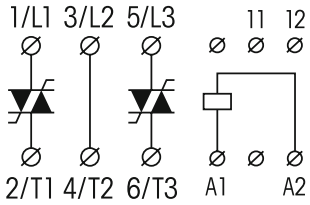
Insulation	
Insulation voltage	4 kV
Dielectric strength	660 V

General Specifications	
Ambient temperature storage/operation	-20 – 80°C / -5 – 40°C
Connection terminals	Screw terminal 10 mm^2
Ingress protection degree	IP 20
Mounting	DIN rail TS35
Housing material	PPE Noryl SE1 / Aluminium
Weight	1050 g

Standard type

Starting Torque Limiter	**CCM3H425**

Connection diagram



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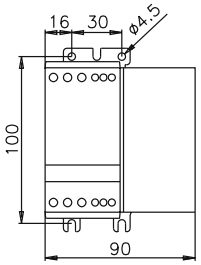
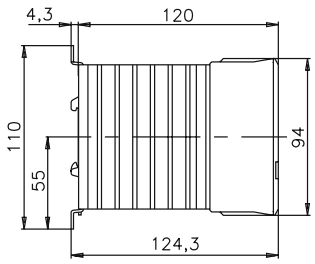




Technical approvals, conformities

Softstarter 2 phases switched– CCM3H415DS

Type: CCM3H415DS

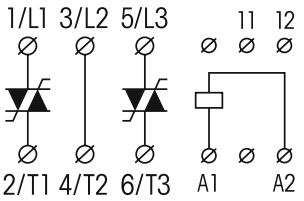
The motor contactor CCM3H415DS have two switched phases and a nominal current of 15 A.

Output	
Switching element	Thyristor
Numbers of phases	2
Bypass	—
Nominal voltage (U_{nom})	**400 VAC**
Output voltage range	400 – 480 VAC
Reverse voltage	1200 Vrrm
Peak reverse voltage	1300 Vrsm
Min. load	3 A
Max. leakage current	5 mA
Max. inrush current	90 A
Operation current AC-53B @ U_{nom}	**15 A**
Switching cycles / h	120 cycles/h
Startup time	1 period
Deceleration time	1 period
Limit load	1800 A^2s
Input	
Voltage	24 – 60 VDC / 24 – 480 VAC
Min. voltage	20,4 VAC
Max. voltage	253 VAC
Release voltage	5 VAC
Max. current	15 mA
Insulation	
Insulation voltage	4 kV
Dielectric strength	660 V
General Specifications	
Ambient temperature storage/operation	-20 – 80°C / -5 – 40°C
Connection terminals	Screw terminal 6 mm^2
Ingress protection degree	IP 20
Mounting	DIN rail TS35
Housing material	PPE Noryl SE1 / Aluminium
Weight	650 g

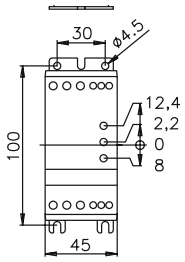
Standard type

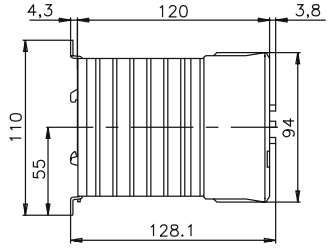
Starting Torque Limiter	**CCM3H415DS**

Connection diagram



Dimensions [mm]





Technical approvals, conformities

CE cULus LISTED

Softstarter 3 phases switched – CCM33H425US

Type: CCM33H425US

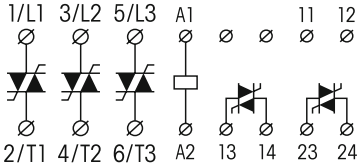
Softstarter CCM33 have three switched phases and are available with a nominal current of up to 85 A. The types CCM33...USi feature an integrated bypass. Separate potentiometers allow the adjustment of start-up and breaking times, as well as the kick-start function, and the start-up torque can be limited to 0 to 85 % of the nominal value.

Output	
Switching element	Thyristor
Numbers of phases	3
Bypass	externally
Nominal voltage (U_{nom})	**400 VAC**
Output voltage range	400 – 480 VAC
Reverse voltage	1200 Vrrm
Peak reverse voltage	1300 Vrsm
Min. load	3 A
Max. leakage current	5 mA
Max. inrush current	150 A
Operation current AC-53B @ U_{nom}	**25 A**
Switching cycles / h	120 cycles / h
Startup time	0,5 – 30 s
Deceleration time	0,5 – 60 s
Limit load	6300 A^2s
Input	
Voltage	24 – 230 VAC
Min. voltage	20,4 VAC
Max. voltage	253 VAC
Release voltage	5 VAC
Max. current	15 mA
Insulation	
Insulation voltage	4 kV
Dielectric strength	660 V
General Specifications	
Ambient temperature storage/operation	-20 – 80°C / -5 – 40°C
Connection terminals	Screw terminal 10 mm^2
Ingress protection degree	IP 20
Mounting	DIN rail TS35
Housing material	PPE Noryl SE1 / Aluminium
Weight	1050 g

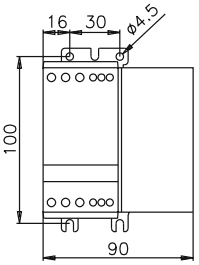
Standard type

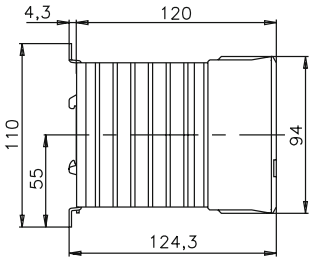
Starting Torque Limiter	**CCM33H425US**

Connection diagram



Dimensions [mm]





Technical approvals, conformities

Softstarter 3 phases switched – CCM33H450US

Type: CCM33H450US

Softstarter CCM33 have three switched phases and are available with a nominal current of up to 85 A. The types CCM33...USi feature an integrated bypass. Separate potentiometers allow the adjustment of start-up and breaking times, as well as the kick-start function, and the start-up torque can be limited to 0 to 85 % of the nominal value.

Output	
Switching element	Thyristor
Numbers of phases	3
Bypass	externally
Nominal voltage (U_{nom})	**400 VAC**
Output voltage range	400 – 480 VAC
Reverse voltage	1200 Vrrm
Peak reverse voltage	1300 Vrsm
Min. load	3 A
Max. leakage current	5 mA
Max. inrush current	300 A
Operation current AC-53B @ U_{nom}	**50 A**
Switching cycles / h	120 cycles / h
Startup time	0,5 – 30 s
Deceleration time	0,5 – 60 s
Limit load	25300 A^2s

Input	
Voltage	24 – 230 VAC
Min. voltage	20,4 VAC
Max. voltage	253 VAC
Release voltage	5 VAC
Max. current	15 mA

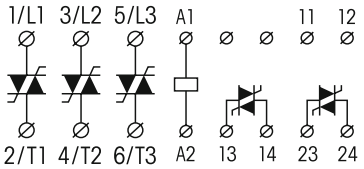
Insulation	
Insulation voltage	4 kV
Dielectric strength	660 V

General Specifications	
Ambient temperature storage/operation	-20 – 80°C / -5 – 40°C
Connection terminals	Screw terminal 35 mm^2
Ingress protection degree	IP 20
Mounting	DIN rail TS35
Housing material	PPE Noryl SE1 / Aluminium
Weight	2600 g

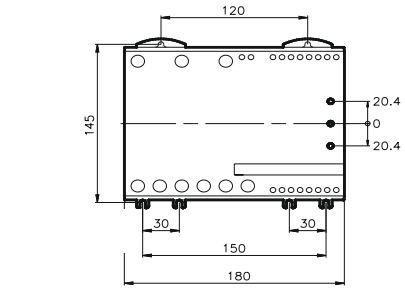
Standard type

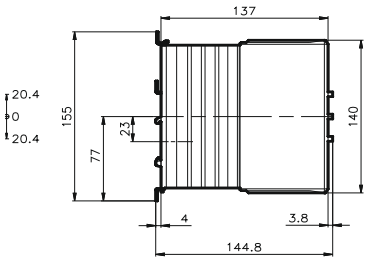
Starting Torque Limiter	**CCM33H450US**

Connection diagram



Dimensions [mm]





Technical approvals, conformities

CE cULus LISTED

Softstarter 3 phases switched – CCM33H530USi

Type: CCM33H530USi

Softstarter CCM33 have three switched phases and are available with a nominal current of up to 85 A. The types CCM33...USi feature an integrated bypass. Separate potentiometers allow the adjustment of start-up and breaking times, as well as the kick-start function, and the start-up torque can be limited to 0 to 85 % of the nominal value.

Output	
Switching element	Thyristor
Numbers of phases	3
Bypass	externally
Nominal voltage (U_{nom})	**480 VAC**
Output voltage range	200 – 480 VAC
Reverse voltage	1200 Vrrm
Peak reverse voltage	1300 Vrsm
Min. load	3 A
Max. leakage current	5 mA
Max. inrush current	150 A
Operation current AC-53B @ U_{nom}	**30 A**
Switching cycles / h	120 cycles / h
Startup time	0,5 – 30 s
Deceleration time	0,5 – 60 s
Limit load	6300 A^2s

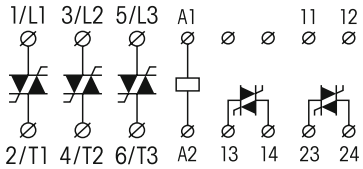
Input	
Voltage	24 – 230 VAC
Min. voltage	20,4 VAC
Max. voltage	253 VAC
Release voltage	5 VAC
Max. current	15 mA

Insulation	
Insulation voltage	4 kV
Dielectric strength	660 V

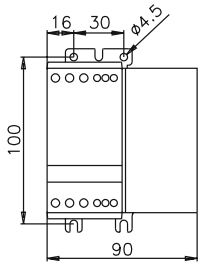
General Specifications	
Ambient temperature storage/operation	-20 – 80°C / -5 – 40°C
Connection terminals	Screw terminal 10 mm^2
Ingress protection degree	IP 20
Mounting	DIN rail TS35
Housing material	PPE Noryl SE1 / Aluminium
Weight	1050 g

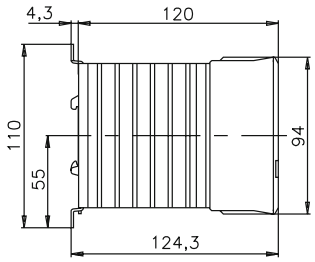
Standard type	
Starting Torque Limiter	**CCM33H530USi**

Connection diagram



Dimensions [mm]





Technical approvals, conformities

CE cULus LISTED

Softstarter 3 phases switched – CCM33H550USi

Type: CCM33H550USi

Softstarter CCM33 have three switched phases and are available with a nominal current of up to 85 A. The types CCM33...USi feature an integrated bypass. Separate potentiometers allow the adjustment of start-up and breaking times, as well as the kick-start function, and the start-up torque can be limited to 0 to 85 % of the nominal value.

Output	
Switching element	Thyristor
Numbers of phases	3
Bypass	externally
Nominal voltage (U_{nom})	**480 VAC**
Output voltage range	200 – 480 VAC
Reverse voltage	1200 Vrrm
Peak reverse voltage	1300 Vrsm
Min. load	3 A
Max. leakage current	5 mA
Max. inrush current	300 A
Operation current AC-53B @ U_{nom}	**50 A**
Switching cycles / h	120 cycles/h
Startup time	0,5 – 30 s
Deceleration time	0,5 – 60 s
Limit load	25300 A^2s

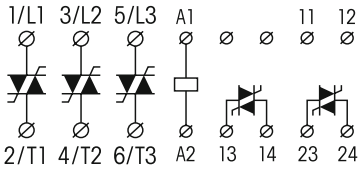
Input	
Voltage	24 – 230 VAC
Min. voltage	20,4 VAC
Max. voltage	253 VAC
Release voltage	5 VAC
Max. current	15 mA

Insulation	
Insulation voltage	4 kV
Dielectric strength	660 V

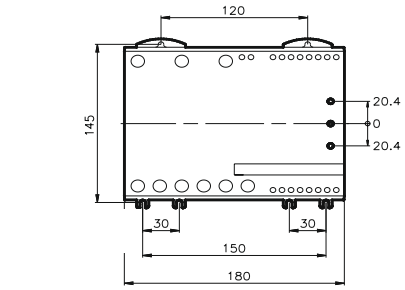
General Specifications	
Ambient temperature storage/operation	-20 – 80°C / -5 – 40°C
Connection terminals	Screw terminal 35 mm^2
Ingress protection degree	IP 20
Mounting	DIN rail TS35
Housing material	PPE Noryl SE1 / Aluminium
Weight	2600 g

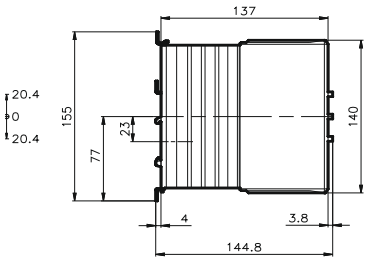
Standard type	
Starting Torque Limiter	**CCM33H550USi**

Connection diagram



Dimensions [mm]





Technical approvals, conformities

CE cULus LISTED

Softstarter with dynamic breaking – CCMB3H425 (2 phases switched)

Type: CCMB3H425

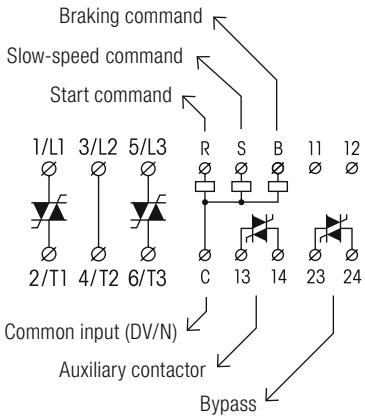
Softstarter CCMB also offers a dynamic break function with automatic stand-still detection in addition to the functions of the CCM3 range. They provide an output for an external bypass and have a nominal current of 25A.

Output	
Switching element	Thyristor
Numbers of phases	2
Bypass	externaly
Nominal voltage (U_{nom})	**400 VAC**
Output voltage range	400 – 480 VAC
Reverse voltage	1600 Vrrm
Peak reverse voltage	1650 Vrsm
Min. load	1 A
Max. leakage current	5 mA
Max. inrush current	200 A
Operation current AC-58 @ U_{nom}	**25 A**
Response/Release time	100 ms
Limit load	6300 A^2s
Input	
Voltage	24 – 230 VAC
Min. voltage	20,4 VAC
Max. voltage	253 VAC
Release voltage	5 VAC
Max. current	15 mA
Insulation	
Insulation voltage	4 kV
Dielectric strength	660 V
General Specifications	
Ambient temperature storage/operation	-20 – 80°C / -5 – 65°C
Connection terminals	Screw terminal 6 mm^2
Ingress protection degree	IP 20
Mounting	DIN rail TS35
Housing material	PPE Noryl SE1 / Aluminium
Weight	1050 g

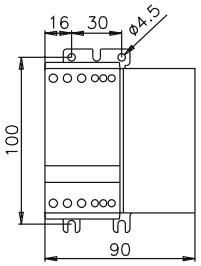
Standard type

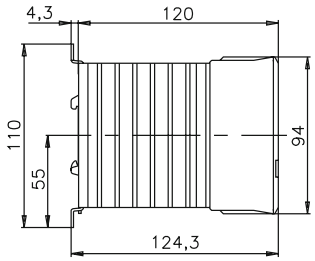
Starting Torque Limiter	**CCMB3H425**

Connection diagram



Dimensions [mm]





Technical approvals, conformities