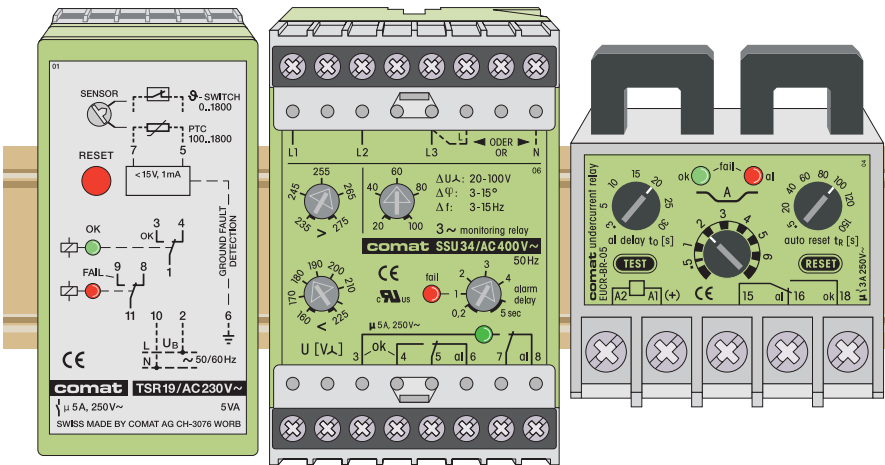


Monitoring Relays

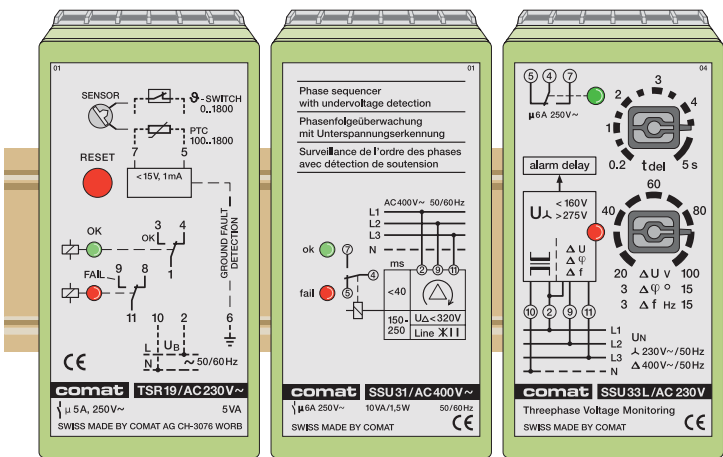


Notes

This image shows a full page of blank graph paper. The grid consists of thin, light gray horizontal and vertical lines that intersect to form small squares across the entire surface. There are no margins, text, or other markings on the paper.

3.1 Plug-in Monitoring Relays

Plug-in Monitoring Relays



Application	Types	Monitoring	Monitoring ratings	Output contacts	Design
3.1 Plug-in Monitoring Relays					
Thermo protection	TSR19		Th.sens. 0 ... 1800 Ω	2 CO	11 pin
Phase sequence monitoring	SSU31		Δ 208 V, 400 V	1 CO	11 pin
3 Phase monitoring	SSU33L		Δ 230 V, Δ 400 V	1 CO	11 pin

TSR 19

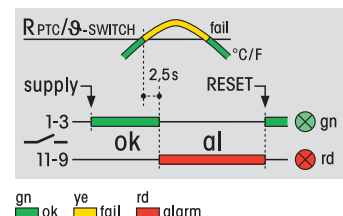
11 pin plug-in thermal motor protection relay according to IEC 67-I-18a



Type: TSR19/...V

Plug-in monitoring relay for temperature of coils of motors, transformers etc.
1 CO contact for OK state, 1 CO contact for alarm state.

Monitoring function



The TSR19 monitors the temperature of motor coils, generators and transformers. It detects the temperature of the windings by the change of the PTC thermistors resistances ① or by the state of the thermo switches ②. The circuit detects a sensor line interruption or a ground fault of the sensor lines. Reset after failure detection: Press reset button or interrupt the supply voltage for > 200 ms.

Measuring circuit data

Sensor resistance, OK range	100 ... 1800 Ω
Thermo switch, OK range	0 ... 1800 Ω
Fail ranges	≤ 50 Ω, ≥ 2250 Ω, ≤ 1 kΩ ground fault
Max. sensor conductor resistance	20 Ω
Sensor supply voltage, idle state	15 V @ $R_{Sens} = \infty$

Time data

Constant alarm delay time	2.5 s ± 20 %
Power failure security	100 ms

Contacts

Type / material	2 CO, micro disconnection / Ag Ni
Rated operational current	5 A
Inrush current (10 ms)	30 A
Max. switching voltage AC-1, DC-1	250 V
Max. AC load AC-1 (Fig 1.)	1250 VA
Max. DC load 30 V / 250 V (Fig 2.)	120 W / 50 W
Recommended min. contact load	10 mA / 12 V

Power supply

	UC 24 – 48 V	AC 230 V
Nominal voltage (UC = AC / DC)	UC 19 ... 60 V	AC 190 ... 250 V
Operating voltage range	1.5 W	1.5 W
Power consumption	50 / 60 Hz	50 / 60 Hz
Frequency range		

Insulation

Test voltage between contacts and other circuits	2 kV 1 minute
Test voltage between Power supply inputs and other circuits	2 kV 1 minute

General specifications

Ambient temperature storage / operation	-40 ... 85 °C / -10 ... 60 °C
Mechanical life of contacts	≥ 30 x 10 ⁶
Ingress protection degree	IP 40 when plugged in
Housing material	Lexan, alu front plate
Weight	210 g

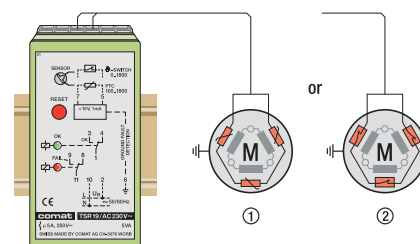
Standard types

AC 230 (50/60Hz)
UC 24-48

TSR19/AC230V
TSR19/UC24-48V

Accessories

Socket:	S-3B
Retention clip:	HF-24
Front panel mounting set:	FZ-23



Connection diagram

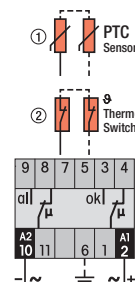


Fig.1 AC voltage endurance

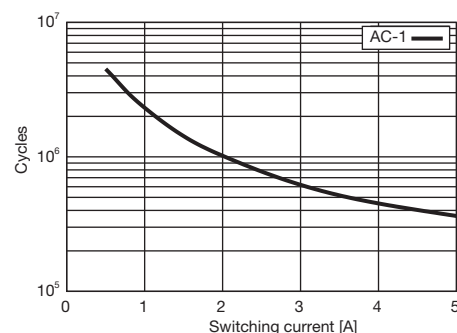
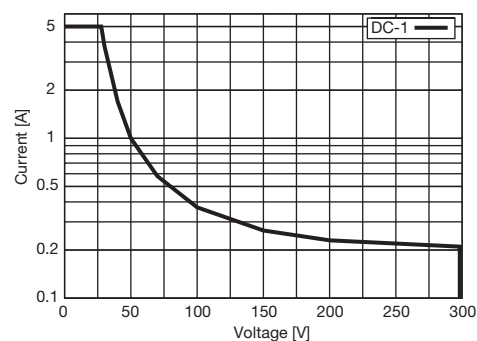
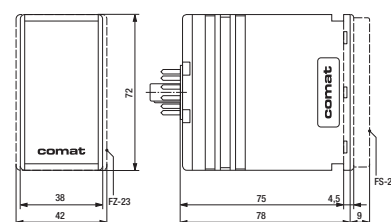


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

EN 61010; EN 60947



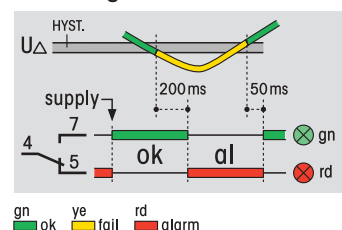
SSU31

11 pin plug-in phase sequence monitoring relay according to IEC 67-I-18a

Type: SSU31/... V

1 change over alarm contact 6 A 250V

Monitoring function



The SSU31 serves as a phase-sequence, three-phase undervoltage and phase failure monitor.

The monitoring function helps to ensure the correct rotation direction of pumps, motors and conveyors in mobile devices with connection to different power outlets.

The defined undervoltage and phase failure protects against malfunction and damage caused by overheating.

Measuring circuit data

Nominal delta connection mains voltage	208 V	400 V
Under voltage threshold	$\leq 166 \text{ V} \pm 5 \%$	$\leq 320 \text{ V} \pm 5 \%$
Hysteresis	5 V	10 V
Phase sequence	L1-L2-L3	L1-L2-L3
Phase loss	One or several	One or several

Time data

Alarm delay for phase sequence	30 ms / +0 % ... -25 %
Alarm delay for phase loss	150 - 250 ms
Alarm delay for under voltage	150 - 250 ms
Reset time	50 ms

Contacts

Type / Material	1 CO, micro disconnection / AgNi
Rated operational current	6 A
Max. inrush current (10 ms)	30 A
Max. switching voltage	250 V
Max. AC load AC-1 (Fig.1)	1500 VA
Max. DC load DC-1, 30 V / 250 V (Fig.2)	180 W / 75 W
Recommended min. contact load	10 mA / 12 V

Power supply data

Nominal delta connection mains voltage	208 V	400 V
Operating voltage range	176 ... 235 V	340 ... 460 V
Power consumption	1.5 W	1.5 W
Input current	$\leq 25 \text{ mA}$	$\leq 25 \text{ mA}$
Frequency range	45 ... 65 Hz	45 ... 65 Hz

Insulation

Test voltage between contacts and supply	2 kVrms, 1 minute (basic insulation)
--	--------------------------------------

General specifications

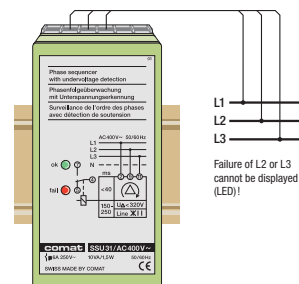
Ambient temperature storage /operation	-40 ... +85 °C / -25 ... +60 °C
Mechanical life of contacts	30 x 10 ⁶ operations
Ingress protection degree	IP 40 when plugged in
Weight	300 g

Standard types

AC 208 50 / 60Hz	SSU31/AC208V
AC 400 50 / 60Hz	SSU31/AC400V

Accessories

Socket:	S-3B
Retention clip:	HF-24
Front panel mounting set:	FZ-23



Connection diagram

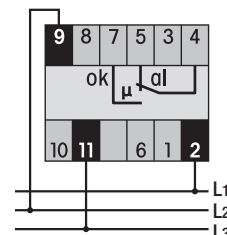


Fig.1 AC voltage endurance

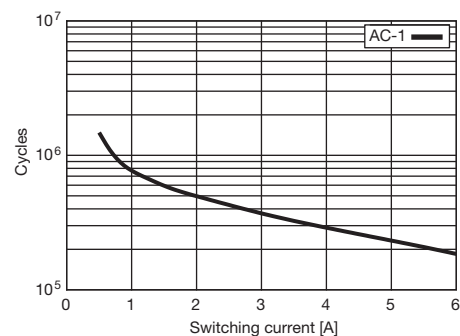
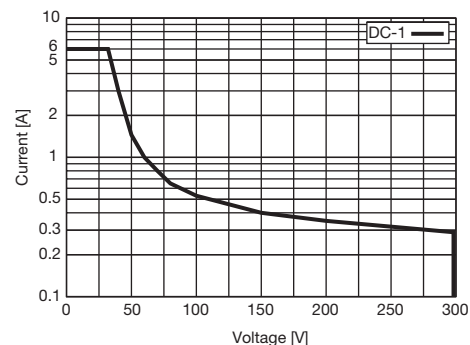
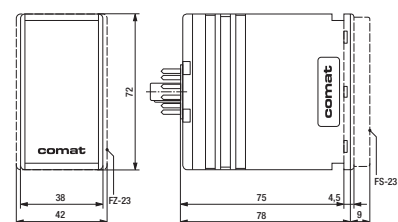


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

EN 60947



SSU33L

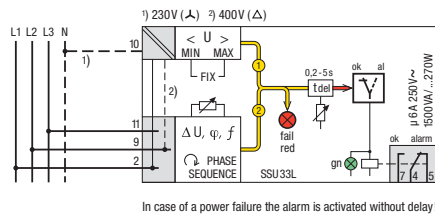
11 pin plug-in 3 phase monitoring relay according to IEC 67-I-18a



Type: SSU33L/... V

1 change over alarm contact 6 A 250 V

Monitoring function



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 (ΔU , $\Delta \varphi$):

Exceeding or dropping below the fixed voltage values U_{min}/U_{max} for L1-N or L1-L2 (no differential voltage, phase position or frequency fault).

Error signal ② U, $\Delta \varphi$, Δf :

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

Nominal mains voltage
Constant under voltage threshold $\pm 5\%$
Constant over voltage threshold $\pm 5\%$
Difference voltage adjustment range ¹⁾
 φ adjustment range ¹⁾
 f adjustment range ¹⁾
¹⁾ adjustment with the same rotary knob

Type star with N

230 V
L1 – N ≤ 160 V
L1 – N ≥ 275 V
20 ... 100 V
3 ... 15 °
3 ... 15 Hz

Type delta

400 V
L1-L2 ≤ 280 V
L1-L2 ≥ 480 V
20 ... 100 V to N
3 ... 15 °
3 ... 15 Hz

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

Nominal mains voltage 230 V
Operating voltage range 160 ... 275 V
Power consumption 1.5 W
Input current 1.5 mA
Frequency 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 10⁶ operations
Ingress protection degree IP 40 when plugged in
Housing material Lexan, alu front plate
Weight 300 g

Standard types

AC 230 50 Hz

AC 400 50 Hz

SSU33L/AC230V (Star connection)

SSU33L/AC400V (delta connection)

Accessories: Socket:

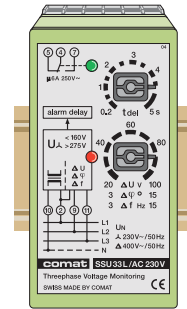
Retention clip:

Front panel mounting set:

S-3B

HF-24

FZ-23



Connection diagram

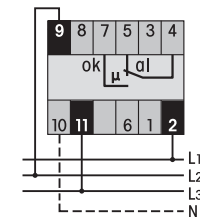


Fig.1 AC voltage endurance

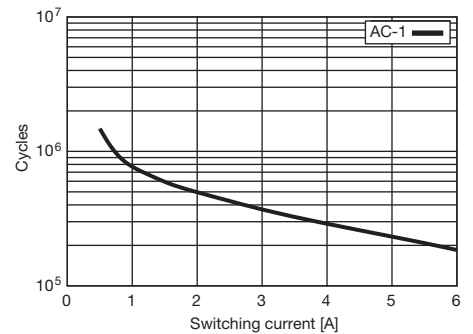
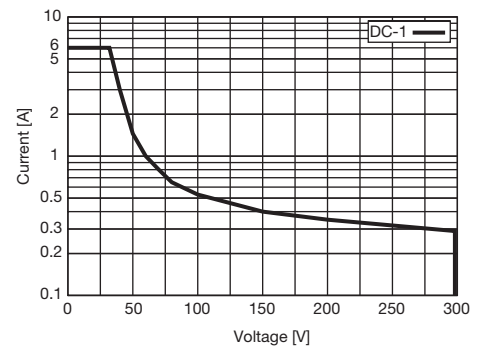
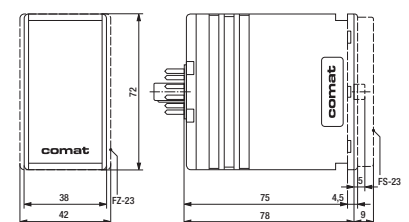


Fig. 2 DC load limit curve



Dimensions [mm]



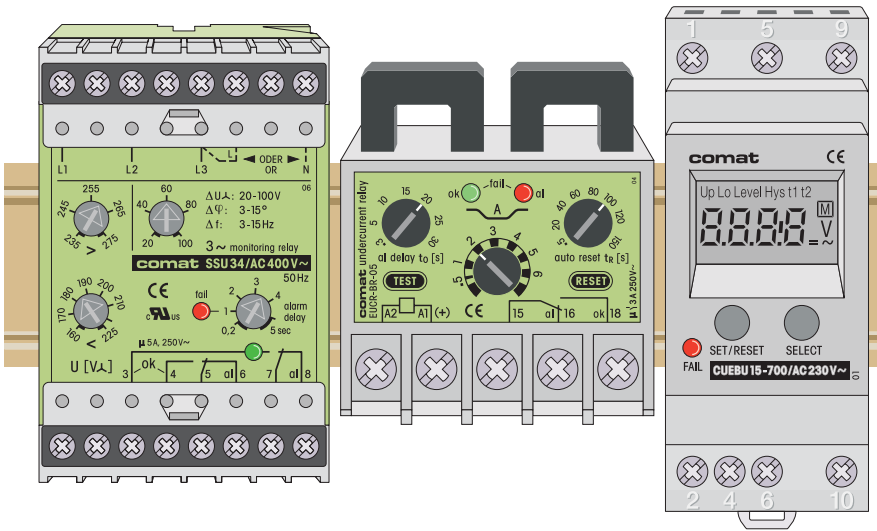
Technical approvals, conformities

EN 60947



3.2 DIN Monitoring Relays

DIN Monitoring Relays



Application	Types	Monitoring	Monitoring ratings	Output contacts	Design
3.2 DIN Monitoring Relays					
Voltage monitoring, AC 50 / 60 Hz	MV53		AC 115 V, 230 V	1 CO	22.5 mm
Voltage monitoring, AC 50 / 60 Hz / DC	CUEBU		15 ... AC 480 V / DC 700 V	1 CO	35 mm
Current monitoring, AC 50 / 60 Hz / DC	CUEBI		0.1 ... 10 A	1 CO	35 mm
Over- or under current Monitoring	ExCR		6 A, 30 A, 60 A	1 CO	54 mm
Over- and under current Monitoring	ECR-3D		6 A, 60 A	1 CO	70 mm
50 Hz, 3 Phase monitoring, differential voltage, phase position, frequency	SSU34		100 V, 400 V, 500 V	2 CO	50 mm
60 Hz, 3 Phase monitoring, differential voltage, phase position, frequency	SSU36		208 V, 460 V, 480 V	2 CO	50 mm
Isolation	ESU		1 ... 50 k Ω	1 CO / 1 CO+NO	50 mm

Type: MV53 / ... V

Voltage monitoring relay with over- and under voltage thresholds.

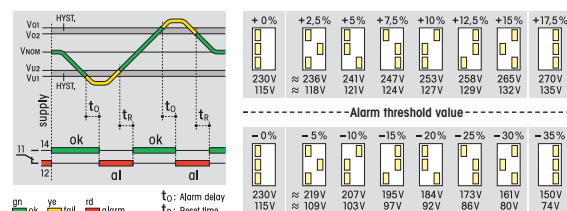
Adjustable alarm delay. Alarm LED. Threshold setting by DIP switch.

1 change over alarm contact 6 A 250 V. Very suitable for protecting of contactor coils against under voltage (under voltage → low Z of coil → over current → defective).

Monitoring function

Threshold settings in % of nominal voltage.

Do not set 0 % for both thresholds.

**Measuring circuit data**

Nominal voltage V_{nom} , type	AC 115 V / AC 230 V
Over voltage setting range (2.5 % steps)	0 ... 17.5 % from V_{nom}
Under voltage setting range (5 % steps)	0 ... - 35 % from V_{nom}
Frequency range	45 ... 65 Hz
Accuracy	± 3 %

Time data

Fault detection time	100 ms
Alarm delay adjustment range	25 ms ... 2.5 s
Power failure security	≥ 10 ms

Contacts

Type / Material	1 CO, micro disconnection / AgNi
Rated operational current	6 A
Max. inrush current (10 ms)	15 A
Max. switching voltage	250 V
Max. AC load AC-1 (Fig.1)	1500 VA
Max. DC load DC-1, 24 V / 220 V (Fig.2)	120 W / 65 W
Recommended min. contact load	100 mA / 5 V

Power supply

	AC 115 V	AC 230 V
Nominal voltage	65 ... 135 V	130 ... 270 V
Operating voltage range	2.2 W	2.2 W
Power consumption	45 ... 65 Hz	45 ... 65 Hz
Frequency range	2 kV	2 kV
Surge immunity EN 6100-4-5		

Insulation

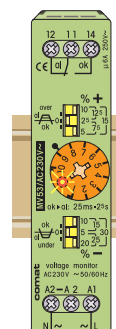
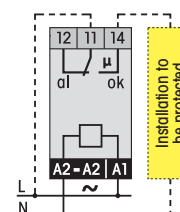
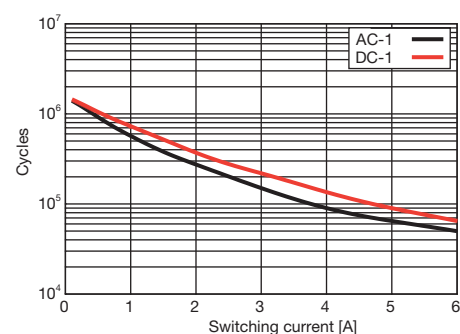
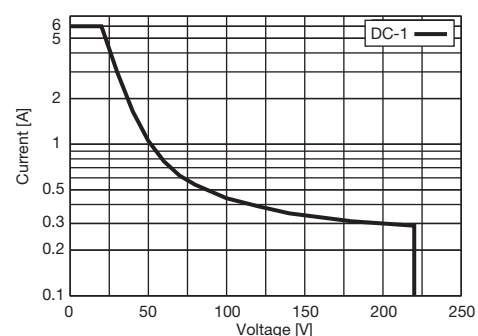
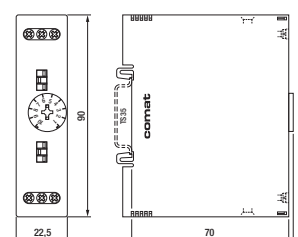
Test voltage open contact	1 kVrms 1 minute
Test voltage between contact and power supply	2 kVrms 1 minute

General specifications

Ambient temperature storage /operation	-40 ... +85 °C / -25 ... +60 °C
Mechanical life of contacts	20 x 10 ⁶ operations
Conductor cross section	Stranded wire 2.5 mm ² , 2 x 1.5 mm ²
Ingress protection degree	Housing: IP 40, terminals: IP 20
Max. Screw torque	0.4 Nm
Housing material	Lexan
Weight	80 g

Standard types

AC 115 50 / 60 Hz	MV53/AC115V
AC 230 50 / 60 Hz	MV53/AC230V

**Connection diagram****Fig.1 Contact endurance****Fig. 2 DC load limit curve****Dimensions [mm]****Technical approvals, conformities**

CUEBU15-700

Voltage monitoring relay AC/DC

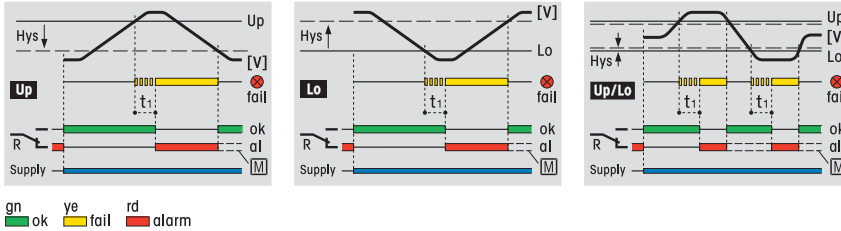
DIN Rail mounting according to DIN 43 880



Type: CUEBU15-700/AC230V

Voltage monitoring relay with over- and under voltage thresholds, up to 700 V.
Alarm delay setting. Alarm LED. Display for voltmeter function, alarm signal and interactive parameter setting. Selectable memory function.
1 change over alarm contact 8 A 250 V. Uncomplicated parameter setting.

Monitoring function



Measuring circuit data

Over-under voltage setting ranges AC / DC	15 ... 480 V / 15 ... 700 V
Frequency	50 / 60 Hz
Resolution	1 V
Accuracy	2 % + ± 1 digit
Input resistance	1 M Ω

Time data

Alarm delay time setting range	0.1-12 s
Reset time	0.2 s
Power failure security	≥ 200 ms

Contacts

Type / Material	1 CO, micro disconnection / AgSnO ₂
Rated operational current	8 A
Max. inrush current (10 ms)	15 A
Max. switching voltage	250 V
Max. AC load AC-1 (Fig.1)	2000 VA
Max. DC load DC-1, 24 V / 220 V (Fig.2)	190 W / 35 W
Recommended min. contact load	5 mA / 5 V

Power supply

Nominal voltage	AC 230 V
AC operation voltage range	180 ... 260 V
Frequency	50 / 60 Hz
Power consumption	1.5 W

Insulation

Test voltage open contact	1 kVrms 1 minute
Test voltage between contacts and power supply	3 kVrms 1 minute
Test voltage between measuring inp. and other circuits	3 kVrms 1 minute

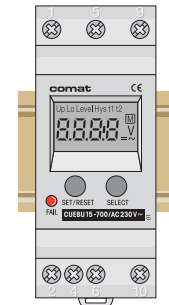
General specifications

Ambient temperature storage /operation	-40 ... +70 °C / -20 ... +55 °C
Mechanical life of contacts	10 x 10 ⁶ operations
Conductor cross section	Stranded wire 2.5 mm ² , 2 x 1.5 mm ²
Ingress protection degree	Housing: IP 40, terminals: IP 20
Max. Screw torque	0.5 Nm
Weight	172 g

Standard types

AC 230, 50/60Hz

CUEBU15-700/AC230V



Connection diagram

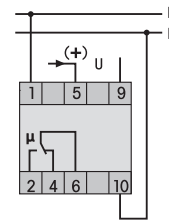


Fig.1 AC voltage endurance

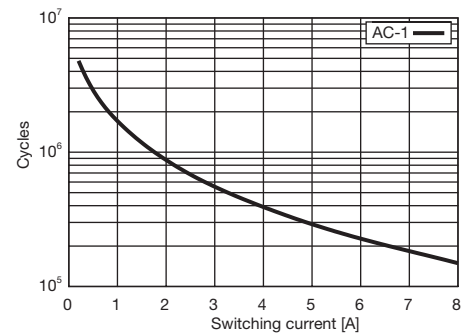
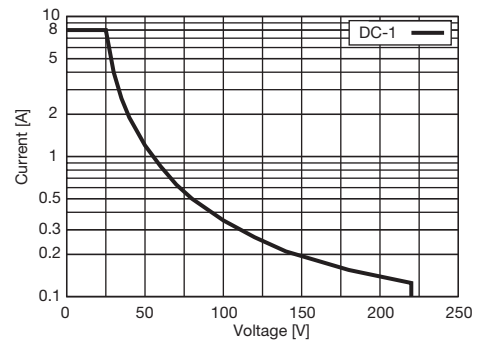
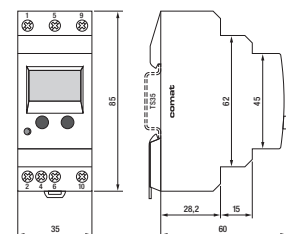


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities



EOCR, EUCR

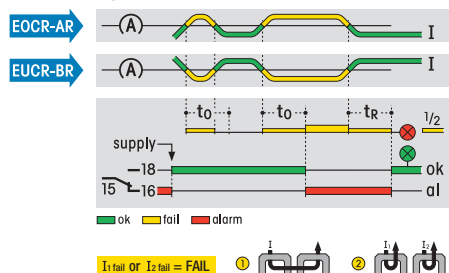
Current monitoring relay with 2 current inputs DIN Rail mounting according to DIN 43 880



Type: EOCR-AR-... / ... V (Over current), EUCR-BR-... / ... V (Under current)

AC current monitoring relay for 1 or 3 phase lines, 1 change over alarm contact 3 A / 250 V
Integrated current transformer coupling system, 6 A, 30 A, 60 A types

Monitoring function



The EOCR-AR and the EUCR-BR monitor overcurrent and undercurrent on AC power circuits.

One or two current paths can be monitored directly up to 60 (75) A, by means of the integrated current loop transformers. The adjustable alarm delay (t0) and the automatic alarm resetting (tR) permit universal usage in motor and transformer protection systems, monitoring of electrical heating elements and in the control of pumps, ventilation systems, suction and feed devices.

Measuring circuit data

Setting ranges	0.5 ... 6 A / 3 ... 30 A / 5 ... 60 A
Frequency range	48 ... 62 Hz
Accuracy	2.5 %
Hysteresis	3 % from set value
Max. continuous current 6 / 30 / 60 A type	60 A / 90 A / 120 A
Peak current (1 sec) 6 / 30 / 60 A type	3 kA / 5 kA / 5 kA

1) Expansion of the current ranges:
Lower currents (see table at right):
Higher currents:

Two or more loops through the current transformer.
External current transformer. See accessories.

Time data

Alarm delay time adjustment range	0.3 ... 30 s
Reset time adjustment range	0.5 ... 150 s
Response time, power on, on A1	80 ... 150 ms

Contacts

Type / Material	1 CO, micro disconnection / AgNi
Rated operational current	3 A
Max. switching voltage, AC-1	250 V
Max. AC load	750 VA
Max. DC load	90 W

Power supply

Nominal voltage (UC = AC/DC)	UC 24 V	AC 115 V	AC 230 V
Operation voltage range [V]	19 ... 30	88 ... 130	184 ... 264
Power consumption [W]	1.5	1.5	1.5
Frequency [Hz]	50 / 60	50 / 60	50 / 60

Insulation

Test voltage between contacts and supply inp.	2 kVrms 1 minute
Test voltage between curr. transf. and other circuits	4 kVrms 1 minute

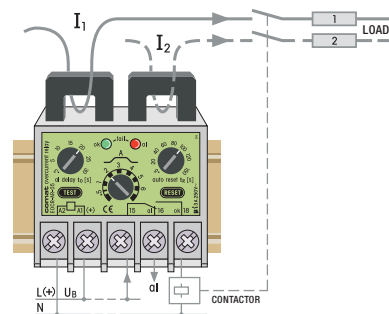
General specifications

Ambient temperature storage /operation	-25 ... 85 °C / -20 ... 60 °C
Ingress protection degree	Housing: IP 40, terminals: IP 20
Max. screw torque	0.8 Nm
Weight	120 g

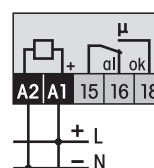
Standard types

Current [x] 05/30/60

Over current	Under current
EOCR-AR- x /UC24V	EUCR-BR-x /UC24V
EOCR-AR- x /AC115V	EUCR-BR-x /AC115V
EOCR-AR- x /AC230V	EUCR-BR-x /AC230V



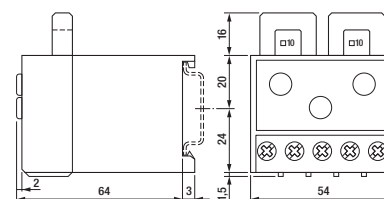
Connection diagram



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]



Accessories

Current transformer for expanded current values, 50, 100, 250, 500 A **SRCT-35-.../5A**

Technical approvals, conformities



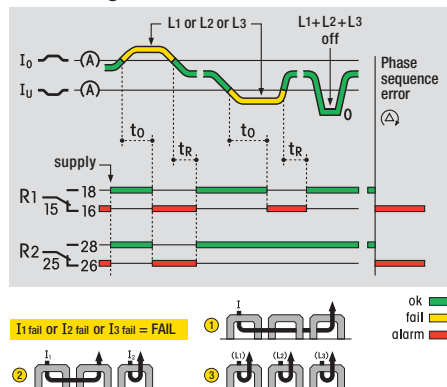
ECR-3D

Current monitoring relay with 3 phase current inputs, interactive display for settings and amperemeter, DIN Rail mounting according to DIN 43 880

Type: ECR-3D-... / ... V

AC current monitoring relay for 3 phase lines, 2 change over alarm contacts 3 A / 250 V
Integrated current transformer coupling system, 5 A, 60 A types

Monitoring function



The ECR-3D monitors overcurrent (IO) and undercurrent (IU) on AC power circuits. Three current paths of up to 60 (75) A can be monitored directly by means of the integrated current loop transformers. The integrated phase sequence monitoring, which can be switched off is extending applications in 3 phases mains. A failure or switch off of all 3 phases will be recognized as an intended switch off and does not trigger an alarm. The adjustable alarm delay (t_0) and the automatic alarm resetting (t_R) permit universal usage in automation and protection techniques. The set values are displayed automatically by setting the respective parameters. The output relay function can be inverted with the DIP switch «R».

Measuring circuit data

Setting ranges	0.5 ... 6.5 A / 5 ... 75 A
Frequency range	50 / 60 Hz
Accuracy @ 50 Hz	3 % + 2 digits
Hysteresis	2 % from set value
Max. continuous current 5 / 60 A type	60 A / 120 A
Peak current (1 sec) 5 / 60 A type	3 kA / 5 kA

Time data

Alarm delay time adjustment range	0.3 ... 30 s
Auto Reset time adjustment range	1 ... 120 s or ∞ (manual reset)
Response time, power on, on A1	≤ 200 ms

Contacts

Type / Material	1 CO, micro disconnection / AgNi
Rated operational current	3 A
Max. switching voltage, AC-1	250 V
Max. AC load AC-1	750 VA
Max. DC load DC-1	125 V 0.2 A

Power supply

Nominal voltage (UC = AC/DC)	UC 24 V	UC 110 ... 240 V
Operation voltage range [V]	19 ... 30	85 ... 264
Power consumption [W]	1.5	1.5
Frequency [Hz]	50 / 60	50 / 60

Insulation

Test voltage between contacts and supply inp.	2 kVrms 1 minute
Test voltage between curr. transf. and other circuits	4 kVrms 1 minute

General specifications

Ambient temperature storage /operation	-40 ... 85 °C / -20 ... 60 °C
Ingress protection degree	Housing: IP 40, terminals: IP 20
Max. screw torque	0.8 Nm
Weight	165 g

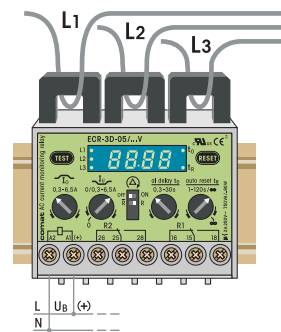
Standard types

Current [x] 05/60

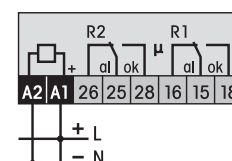
ECR-3D- x /UC24V
ECR-3D- x /UC110-240V

Accessories

Current transformer for expanded current values, 50, 100, 250, 500 A **SRCT-35-.../5A**



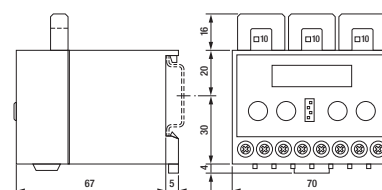
Connection diagram



Expansion of current ranges

[A]	1x	2x	3x	4x	5x
-05	0,5-6,5	0,25-3,2	0,17-2,1	0,13-1,63	0,1-1,3
-60	5-75	2,5-38	1,7-25	1,25-18,8	1-15

Dimensions [mm]



Technical approvals, conformities



CUEBI01-10

Current monitoring relay AC/DC

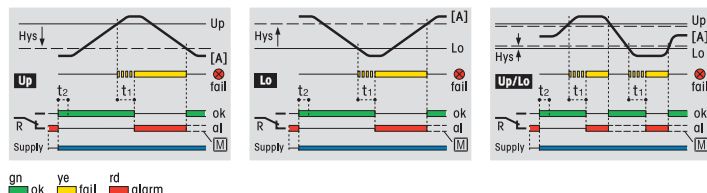
DIN Rail mounting according to DIN 43 880



Type: CUEBI01-10/AC230V

Current monitoring relay with over- and under current thresholds 0.1 ... 10 A.
Alarm delay setting. Alarm LED. Display for ampere meter function, alarm signal
and interactive parameter setting. Selectable memory function.
1 change over alarm contact 8 A 250 V. Uncomplicated parameter setting.

Monitoring function



Measuring circuit data

Over-under current setting ranges AC / DC	0.1 ... 10 A
Frequency	50 / 60 Hz
Resolution	0.1 A
Accuracy	2 % + ± 1 digit
Internal resistance	5 mΩ

Time data

Alarm delay time setting range	0.1-12 s
Reset time	0.2 s
Power failure security	≥ 200 ms

Contacts

Type / Material	1 CO, micro disconnection / AgSnO2
Rated operational current	8 A
Max. inrush current (10 ms)	15 A
Max. switching voltage	250 V
Max. AC load AC-1 (Fig.1)	2000 VA
Max. DC load DC-1, 24 V / 220 V (Fig.2)	190 W / 35 W
Recommended min. contact load	5 mA / 5 V

Power supply

Nominal voltage	AC 230 V
AC operation voltage range	180 ... 260 V
Frequency	50 / 60 Hz
Power consumption	1.5 W

Insulation

Test voltage open contact	1 kVrms 1 minute
Test voltage between contacts and power supply	3 kVrms 1 minute
Test voltage between measuring inp. and other circuits	3 kVrms 1 minute

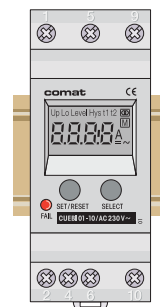
General specifications

Ambient temperature storage /operation	-40 ... +70 °C / -20 ... +55 °C
Mechanical life of contacts	10 x 10 ⁶ operations
Conductor cross section	Stranded wire 2.5 mm ² , 2 x 1.5 mm ²
Ingress protection degree	Housing: IP 40, terminals: IP 20
Max. Screw torque	0.5 Nm
Weight	172 g

Standard types

AC 230, 50/60Hz

CUEBI01-10/AC230V



Connection diagram

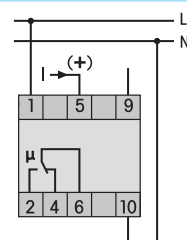


Fig.1 AC voltage endurance

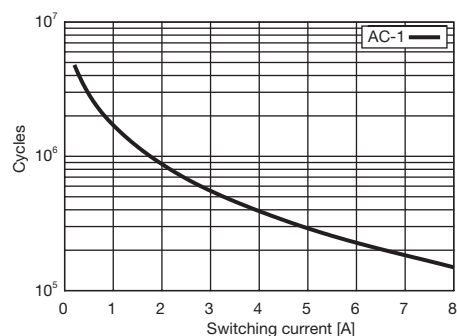
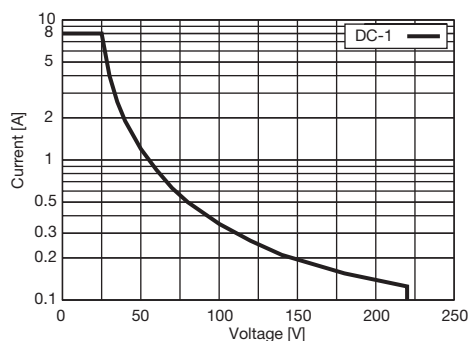
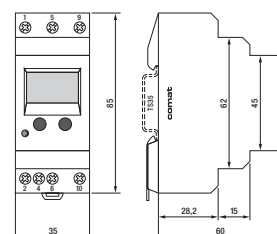


Fig. 2 DC load limit curve



Dimensions [mm]



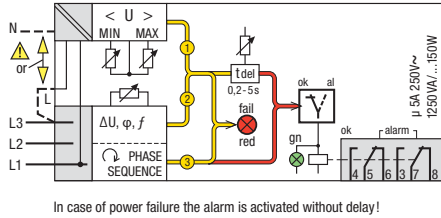
Technical approvals, conformities



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



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_{Δ} , V_{λ}):

Exceeding or dropping below the set voltage values U_{min}/U_{max} for L1-N or L1-L3,L (no differential voltage, phase position or frequency fault).

Error signal ② ΔU , $\Delta \phi$, 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
$\Delta \phi$ 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

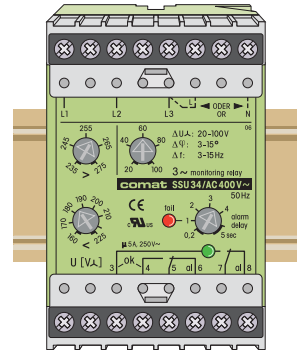
Ambient temperature storage /operation	-40 ... +85 °C/-10 ...+60 °C
Mechanical life of contacts	30 x 10 ⁶ operations
Ingress protection degree	Housing: IP 40, terminals: IP 20
Max. screw torque	0.5 Nm
Housing material / Weight	Lexan / 350 g

Standard types

50 Hz, AC 100, 400, 500

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

SSU34/AC...V



Connection diagram

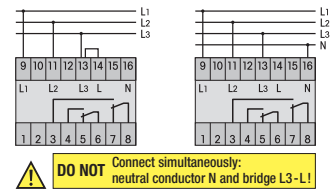


Fig. 1 AC electrical endurance

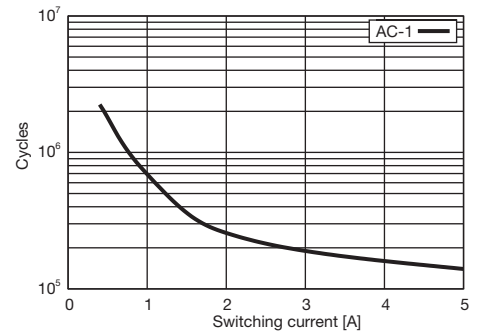
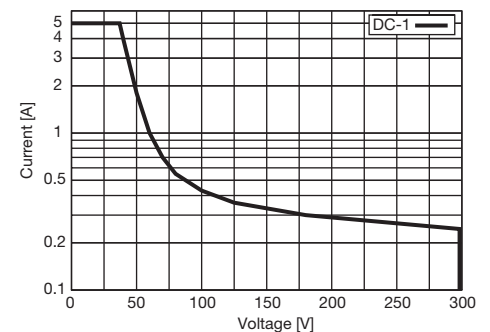
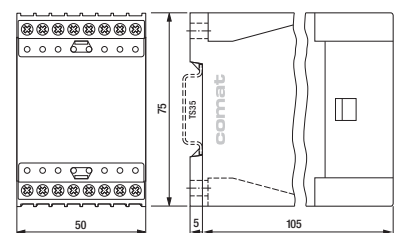


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

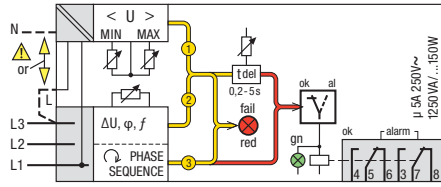
EN 60947



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_{Δ} , V_{Λ}):

Exceeding or dropping below the set voltage values U_{min}/U_{max} for L1-N or L1-L3,L (no differential voltage, phase position or frequency fault).

Error signal ② ΔU , $\Delta \phi$, 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
$\Delta \phi$ 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)
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General specifications

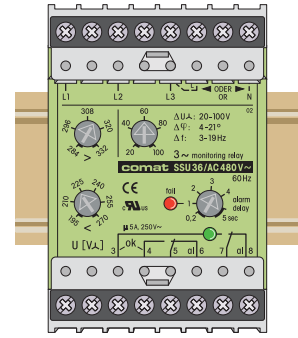
Ambient temperature storage /operation	-40 ... +85 °C / -10 ... +60 °C
Mechanical life of contacts	30 x 10 ⁶ operations
Ingress protection degree	Housing: IP 40, terminals: IP 20
Max. screw torque	0.5 Nm
Housing material / Weight	Lexan / 350 g

Standard types

60 Hz , AC 208, 460, 480

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

SSU36/AC...V



Connection diagram

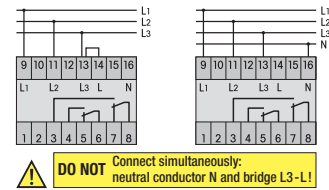


Fig. 1 AC electrical endurance

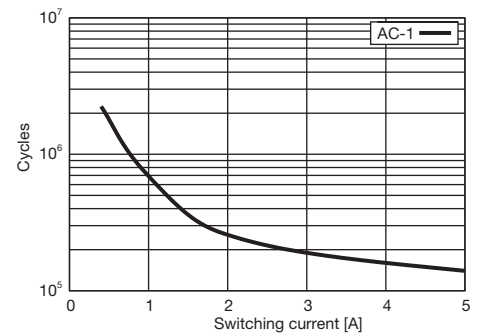
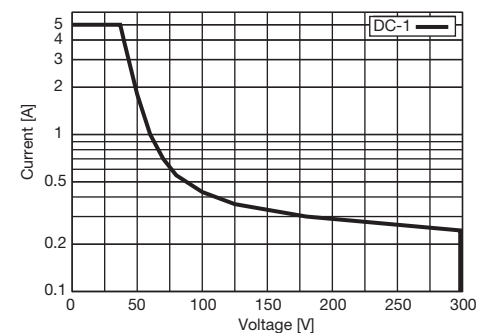
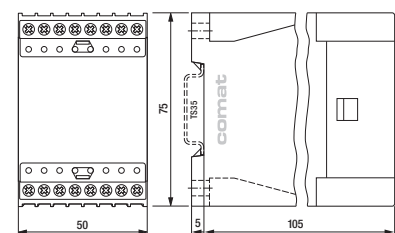


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

EN 60947



ESU-D2

Insulation monitoring relay for unearthed DC-networks DIN Rail mounting according to DIN 43 880



comat
RELECO
by comat

Type: ESU-D2/... V

Earth insulation resistance monitoring relay

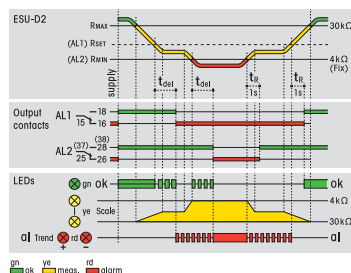
Pre alarm 1 CO and main alarm 1 NO + 1 CO contact outputs 5 A / 250 V

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, over-voltage, 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	18 ... 60 V	88 ... 265 V
Operation voltage range	18 ... 60 V	88 ... 265 V
Power consumption	2 W	2 W
Power failure security	≥ 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

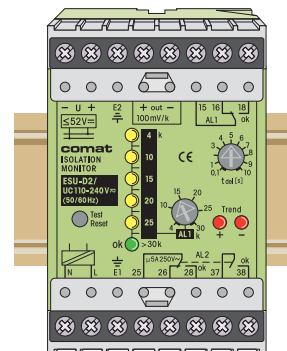
Standard types

UC 110-240

UC24-48

ESU-D2/UC110-240V

ESU-D2/UC24-48V



Connection diagram

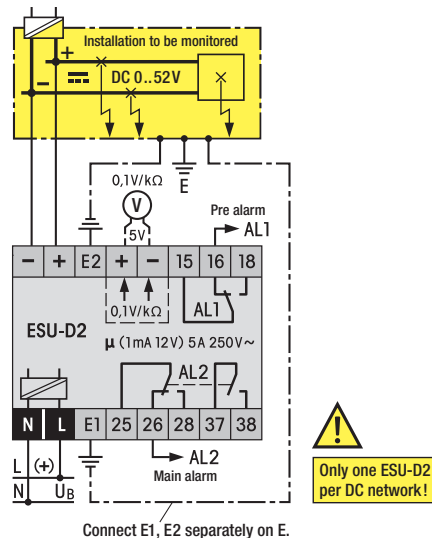
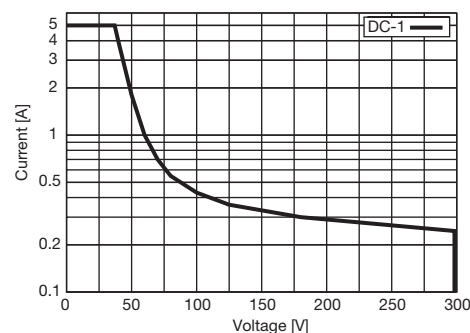
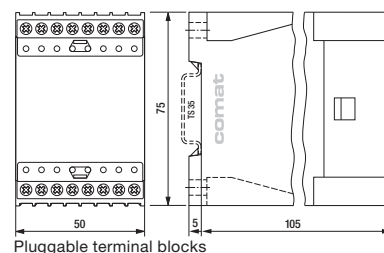


Fig. 1 DC load limit curve



Dimensions [mm]



Technical approvals, conformities

EN 60947

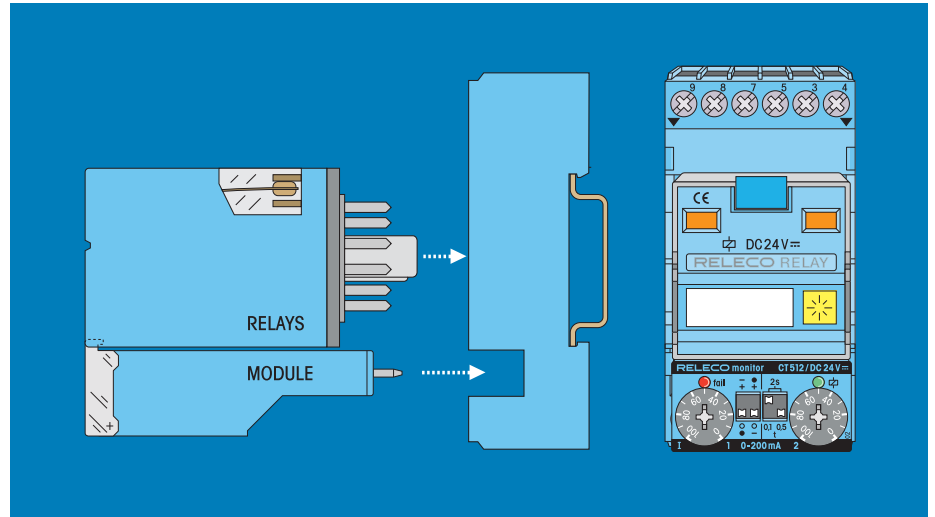


Notes

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3.3 Monitoring Modules

Modular plug-in Monitoring Relays



The modular monitoring system consists of individual plug-in monitoring modules with front cover, an 11-pole plug-in relay and a system socket with retaining spring.

The individual combination allows an optimal device selection for the foreseen application.

Later modifications as for example an exchange of relay from mechanical contacts to a relay with solid-state outputs are possible at any time.

The user profits of a universal system of worldwide unique flexibility.

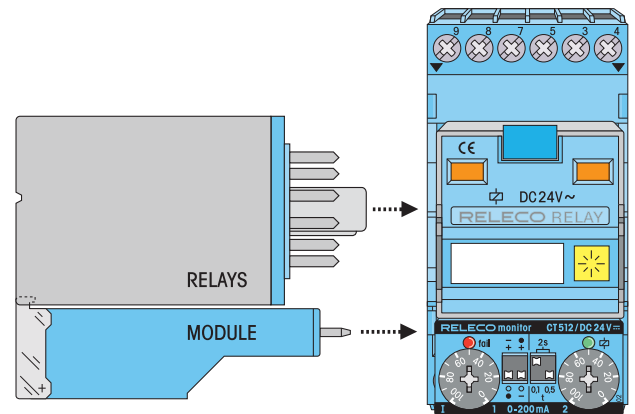
Notes

This image shows a full page of blank graph paper. The grid consists of thin, light gray horizontal and vertical lines that intersect to form small squares across the entire surface. There are no margins, text, or other markings on the paper.

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 4mm² 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 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.

CT512, CT515, CT516

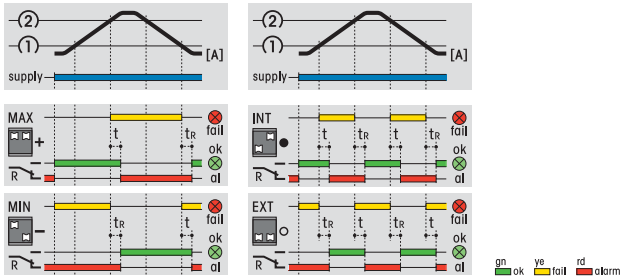
Plug-in current monitoring modules (combined with industrial relays)
0.2 A, 2 A, 6 A. DC 24 V operation



Type Blue: CT512, CT515, CT516, /24V R
 Green: CT512, CT515, CT516, /24V

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

Monitoring functions



Over / under voltage internal / external range

Measuring circuit data

Type	CT512	CT515	CT516
Measuring and setting ranges (rotary knobs)	0 ... 200 mA	0 ... 2 A	0 ... 6 A
Max. current 100% duty cycle	300 mA	3 A	7 A
Voltage drop on internal shunt res. @ I _{max}	300 mV	200 mV	100 mV
Temperature drift -25 ... 60 °C	≤ 3 %	≤ 3 %	≤ 3 %

Time data

Alarm delay time settings	100 ms, 500 ms, 2 s
Reset time	100 ms

Power supply

Nominal voltage	DC 24 V
Operation voltage range	18 ... 30
Supply current	3 ... 7 mA
Polarity reversal protection	- 30 V

General specifications

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

Standard types

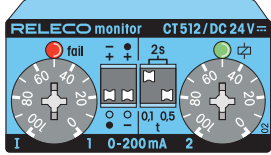
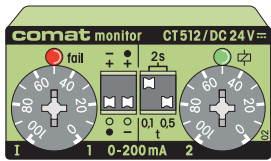
CT512, CT515, CT516, DC24

Blue	Green
CT51x/DC24V R	CT51x/DC24V
CT51x/DC36V R	CT51x/DC36V

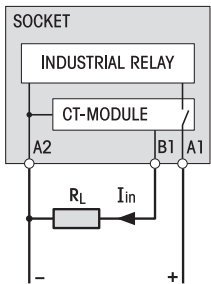
Available

CT512, CT515, CT516, DC36V

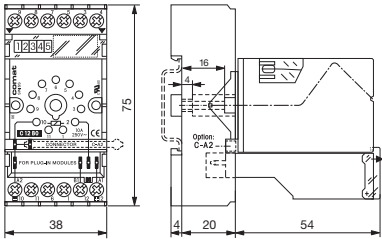
Remark: This module is part of several ready for connection units consisting of socket, relay and module.
A wide range of suitable relays are available.



Connection diagram



Dimensions [mm]



Technical approvals, conformities

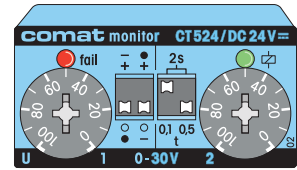


CT524

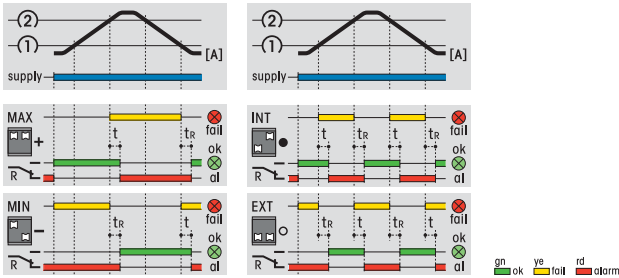
Plug-in DC voltage monitoring module. DC 24 V operation.
(combined with industrial relays)

Type **Blue:** **CT524/24V R**
 Green: **CT524/24V**

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



Monitoring functions



Over / under voltage internal / external range

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

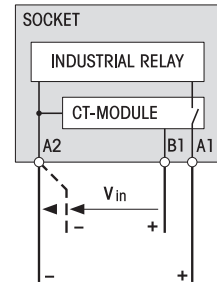
Ambient temperature storage/operation	-40 ... 85 °C / -25 ... 60 °C
Ingress Protection degree	IP 40 when plugged in
Housing material	Lexan
Weight	25 g

Standard types

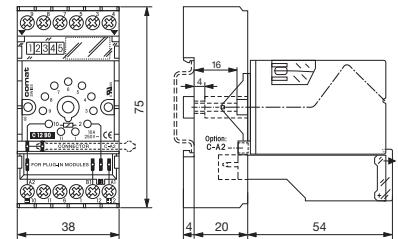
	Blue	Green
DC 24	CT524/DC24V R	CT524/DC24V

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

Connection diagram



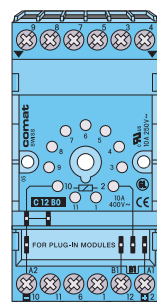
Dimensions [mm]



Technical approvals, conformities



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.

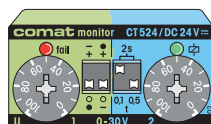
Relay data's see:
Section Industrial Relays



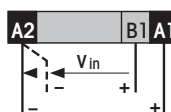
Alarm delay t	0,1/0,5/2s
Reset time t_R	100ms
Voltage tolerance	0,8-1,2Un
Power consumption	$\leq 0,5W$
Ambient temperature	-25...+60°C

CT524 DC Voltage Monitoring

Range: 0-30V
U_{max}: 40V



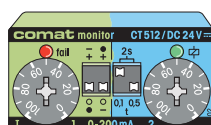
Triggering



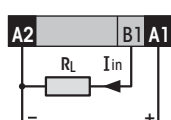
Input resistance
B1 → A2: 100kΩ

CT512 DC Current Monitoring

Range: 0-200mA
I_{max}: 300mA



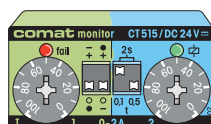
Triggering



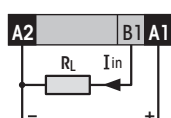
Voltage drop
A1 → B1 ≤ 300mV

CT515 DC Current Monitoring

Range: 0-2A
I_{max}: 3A



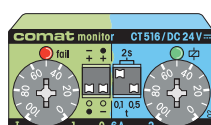
Triggering



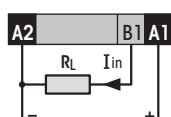
Voltage drop
A1 → B1 ≤ 200mV

CT516 DC Current Monitoring

Range: 0-6A
I_{max}: 7A

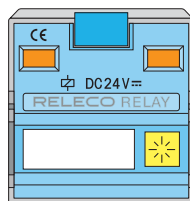
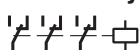


Triggering



Voltage drop
A1 → B1 ≤ 100mV

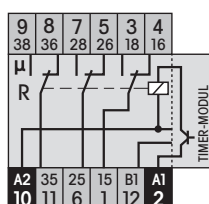
Power Relay



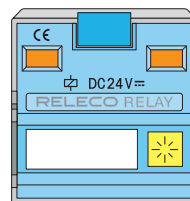
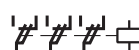
C3-A30X

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



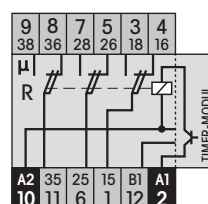
Control Relay



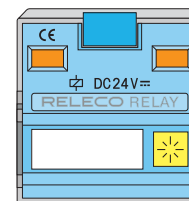
C3-T31X

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

6A 250V~
5mA 5V



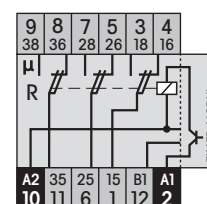
Signal Relay



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-A30/DC24V R

Delivery includes:

- Relay C3-A30X/DC24V
- Module CT524/DC24V R
- Front cover FS-R
- Socket C12B0 R
- Retaining clip S3-C

Set Order-Nr.:

CT524.3-T31/DC24V R

Delivery includes:

- Relay C3-T31X/DC24V
- Module CT524/DC24V R
- Front cover FS-R
- Socket C12B0 R
- Retaining clip S3-C

Set Order-Nr.:

CT524.3-T32/DC24V R

Delivery includes:

- Relay C3-T32X/DC24V
- Module CT524/DC24V R
- Front cover FS-R
- Socket C12B0 R
- Retaining clip S3-C

Set Order-Nr.:

CT512.3-A30/DC24V R

Delivery includes:

- Relay C3-A30X/DC24V
- Module CT512/DC24V R
- Front cover FS-R
- Socket C12B0 R
- Retaining clip S3-C

Set Order-Nr.:

CT512.3-T31/DC24V R

Delivery includes:

- Relay C3-T31X/DC24V
- Module CT512/DC24V R
- Front cover FS-R
- Socket C12B0 R
- Retaining clip S3-C

Set Order-Nr.:

CT512.3-T32/DC24V R

Delivery includes:

- Relay C3-T32X/DC24V
- Module CT512/DC24V R
- Front cover FS-R
- Socket C12B0 R
- Retaining clip S3-C

Set Order-Nr.:

CT515.3-A30/DC24V R

Delivery includes:

- Relay C3-A30X/DC24V
- Module CT515/DC24V R
- Front cover FS-R
- Socket C12B0 R
- Retaining clip S3-C

Set Order-Nr.:

CT515.3-T31/DC24V R

Delivery includes:

- Relay C3-T31X/DC24V
- Module CT515/DC24V R
- Front cover FS-R
- Socket C12B0 R
- Retaining clip S3-C

Set Order-Nr.:

CT515.3-T32/DC24V R

Delivery includes:

- Relay C3-T32X/DC24V
- Module CT515/DC24V R
- Front cover FS-R
- Socket C12B0 R
- Retaining clip S3-C

Set Order-Nr.:

CT516.3-A30/DC24V R

Delivery includes:

- Relay C3-A30X/DC24V
- Module CT516/DC24V R
- Front cover FS-R
- Socket C12B0 R
- Retaining clip S3-C

Set Order-Nr.:

CT516.3-T31/DC24V R

Delivery includes:

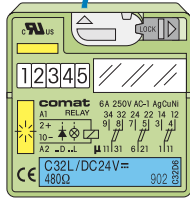
- Relay C3-T31X/DC24V
- Module CT516/DC24V R
- Front cover FS-R
- Socket C12B0 R
- Retaining clip S3-C

Set Order-Nr.:

CT516.3-T32/DC24V R

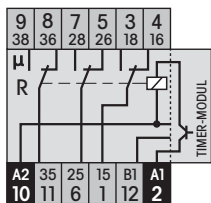
Delivery includes:

- Relay C3-T32X/DC24V
- Module CT516/DC24V R
- Front cover FS-R
- Socket C12B0 R
- Retaining clip S3-C

Power Relay**C31L**

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

10 A 250V~
50mA 10V

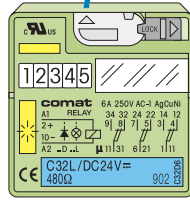


Set Order-Nr.:

CT524.31/DC24V

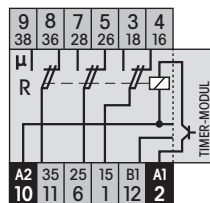
Delivery includes:

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

Control Relay**C32L**

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

6 A 250V~
10mA 5V

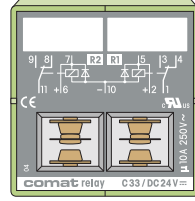


Set Order-Nr.:

CT524.32/DC24V

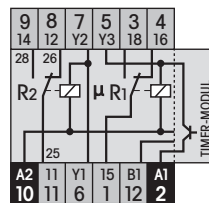
Delivery includes:

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

Power Relay**C33**

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

10 A 250V~
10mA 12V

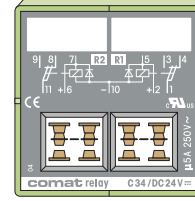
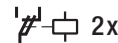


Set Order-Nr.:

CT524.33/DC24V

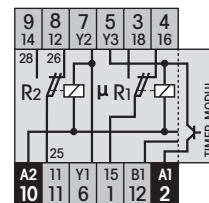
Delivery includes:

- Relay C33/DC24V
- Module CT524/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

Control Relay**C34**

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

5 A 250V~
1mA 6V

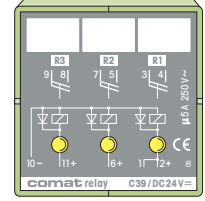


Set Order-Nr.:

CT524.34/DC24V

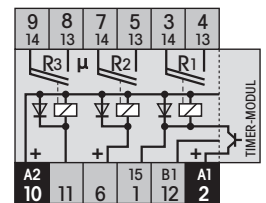
Delivery includes:

- Relay C34/DC24V
- Module CT524/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

Power- and Signal Relay**C39**

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

5 A 250V~
1mA 100mV



Set Order-Nr.:

CT524.39/DC24V

Delivery includes:

- Relay C39/DC24V
- Module CT524/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

Set Order-Nr.:

CT512.31/DC24V

Delivery includes:

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

Set Order-Nr.:

CT512.32/DC24V

Delivery includes:

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

Set Order-Nr.:

CT512.33/DC24V

Delivery includes:

- Relay C33/DC24V
- Module CT512/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

Set Order-Nr.:

CT512.34/DC24V

Delivery includes:

- Relay C34/DC24V
- Module CT512/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

Set Order-Nr.:

CT512.39/DC24V

Delivery includes:

- Relay C39/DC24V
- Module CT512/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

Set Order-Nr.:

CT515.31/DC24V

Delivery includes:

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

Set Order-Nr.:

CT515.32/DC24V

Delivery includes:

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

Set Order-Nr.:

CT515.33/DC24V

Delivery includes:

- Relay C33/DC24V
- Module CT515/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

Set Order-Nr.:

CT515.34/DC24V

Delivery includes:

- Relay C34/DC24V
- Module CT515/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

Set Order-Nr.:

CT515.39/DC24V

Delivery includes:

- Relay C39/DC24V
- Module CT515/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

Set Order-Nr.:

CT516.31/DC24V

Delivery includes:

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

Set Order-Nr.:

CT516.32/DC24V

Delivery includes:

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

Set Order-Nr.:

CT516.33/DC24V

Delivery includes:

- Relay C33/DC24V
- Module CT516/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

Set Order-Nr.:

CT516.34/DC24V

Delivery includes:

- Relay C34/DC24V
- Module CT516/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

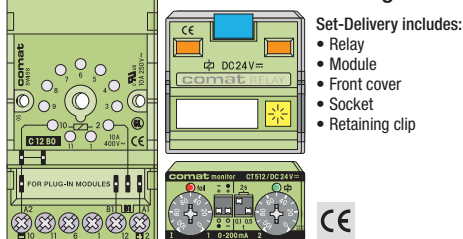
Set Order-Nr.:

CT516.39/DC24V

Delivery includes:

- Relay C39/DC24V
- Module CT516/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

DC Voltage Monitoring-Set DC Current Monitoring-Set



Set-Delivery includes:

- Relay
- Module
- Front cover
- Socket
- Retaining clip

Monitoring Module

4 functions can be selected:
Overvoltage/undervoltage monitoring with adjustable hysteresis or 2 range monitors (INT or EXT). Adjustable alarm delay.
LED display for errors and ok. Contact inspection window at the top. Manual safety operation.

Relay data's see:
Section Industrial Relays

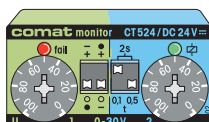


Data at Tamb. = 20°C

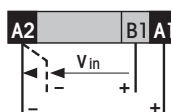
Alarm delay t	0,1/0,5/2s
Reset time tR	100ms
Voltage tolerance	0,8-1,2Un
Power consumption	≤0,5W
Ambient temperature	-25...+60°C

CT524 DC Voltage Monitoring

Range: 0-30V
Umax: 40V



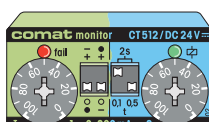
Triggering



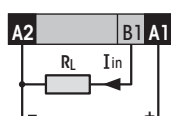
Input resistance
B1 → A2: 100kΩ

CT512 DC Current Monitoring

Range: 0-200mA
Imax: 300mA



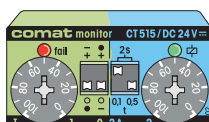
Triggering



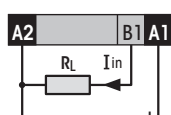
Voltage drop
A1 → B1 ≤ 300mV

CT515 DC Current Monitoring

Range: 0-2A
Imax: 3A



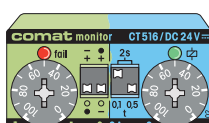
Triggering



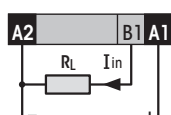
Voltage drop
A1 → B1 ≤ 200mV

CT516 DC Current Monitoring

Range: 0-6A
Imax: 7A



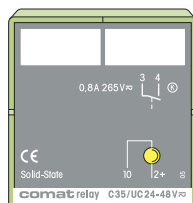
Triggering



Voltage drop
A1 → B1 ≤ 100mV

UC Solid-State Relay

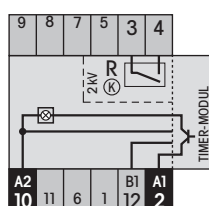
1x



C35

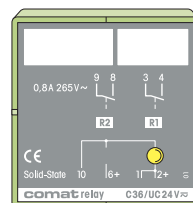
Universal Solid-State Relay for AC or DC load
Highest switching frequency for virtually limitless life cycle due to solid-state operation. No external protective wiring required.

0,8A 10...265V~
1mA 10V



AC Solid-State Relay

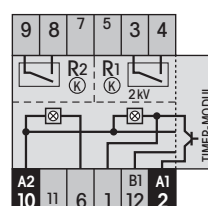
2x



C36

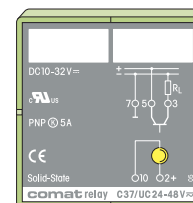
AC SS double-channel
Triac output, crossover switch. Built-in RC wiring protection. Specially designed for frequent switching cycles and inductive loads. Minimum load: 30mA

0,8A 20...265V~
30mA 20V



DC Solid-State Relay

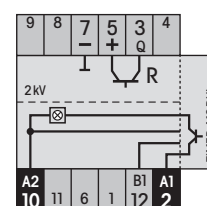
1x



C37

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

5A 10...32V~
1mA 10V



Set Order-Nr.:

CT524.35/DC24V

Delivery includes:

- Relay C35/DC24V
- Module CT524/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

Set Order-Nr.:

CT524.36/DC24V

Delivery includes:

- Relay C36/DC24V
- Module CT524/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

Set Order-Nr.:

CT524.37/DC24V

Delivery includes:

- Relay C37/DC24V
- Module CT524/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

Set Order-Nr.:

CT512.35/DC24V

Delivery includes:

- Relay C35/DC24V
- Module CT512/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

Set Order-Nr.:

CT512.36/DC24V

Delivery includes:

- Relay C36/DC24V
- Module CT512/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

Set Order-Nr.:

CT512.37/DC24V

Delivery includes:

- Relay C37/DC24V
- Module CT512/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

Set Order-Nr.:

CT515.35/DC24V

Delivery includes:

- Relay C35/DC24V
- Module CT515/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

Set Order-Nr.:

CT515.36/DC24V

Delivery includes:

- Relay C36/DC24V
- Module CT515/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

Set Order-Nr.:

CT515.37/DC24V

Delivery includes:

- Relay C37/DC24V
- Module CT515/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

Set Order-Nr.:

CT516.35/DC24V

Delivery includes:

- Relay C35/DC24V
- Module CT516/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

Set Order-Nr.:

CT516.36/DC24V

Delivery includes:

- Relay C36/DC24V
- Module CT516/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

Set Order-Nr.:

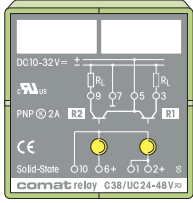
CT516.37/DC24V

Delivery includes:

- Relay C37/DC24V
- Module CT516/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

DC Solid-State Relay

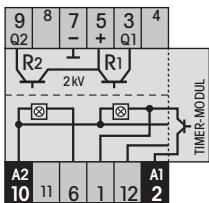
2x



C38

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

2A 10...32V~
1mA 10V



Set Order-Nr.:

CT524.38/DC24V

Delivery includes:

- Relay C38/DC24V
- Module CT524/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

Set Order-Nr.:

CT512. 38/DC24V

Delivery includes:

- Relay C38/DC24V
- Module CT512/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

Set Order-Nr.:

CT515.38/DC24V

Delivery includes:

- Relay C38/DC24V
- Module CT515/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32

Set Order-Nr.:

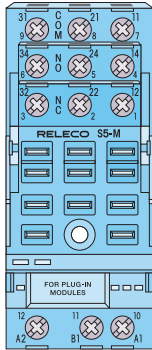
CT516.38/DC24V

Delivery includes:

- Relay C38/DC24V
- Module CT516/DC24V
- Front cover FS-C
- Socket C12B0
- Retaining clip HF-32



DC Voltage Monitoring-Set DC Current Monitoring-Set



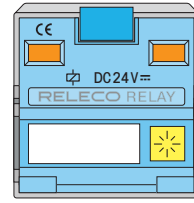
Set-Delivery includes:

- Relay
- Module
- Front cover
- Socket
- Retaining clip



High Power Relay DC

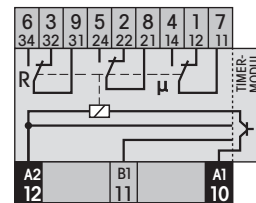
16A 400V~



C5-A30X

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

16A 400V~
10mA 10V



Set Order-Nr.:

CT524.5-A30/DC24V R

Delivery includes:

- Relay C5-A30/DC24V
- Module CT524/DC24V R
- Front cover FS-C5
- Socket S-5M
- Retaining clip S3-C

Set Order-Nr.:

CT512.5-A30/DC24V R

Delivery includes:

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

Set Order-Nr.:

CT515.5-A30/DC24V R

Delivery includes:

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

Set Order-Nr.:

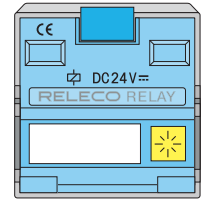
CT516.5-A30/DC24V R

Delivery includes:

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

High Power Relay DC

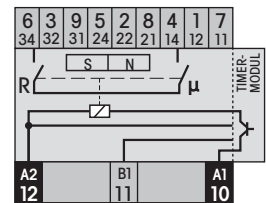
10A @ 220V~



C5-M10X

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

16A 400V~
10mA 10V



Set Order-Nr.:

CT524.5-M10/DC24V R

Delivery includes:

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

Set Order-Nr.:

CT512.5-M10/DC24V R

Delivery includes:

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

Set Order-Nr.:

CT515.5-M10/DC24V R

Delivery includes:

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

Set Order-Nr.:

CT516.5-M10/DC24V R

Delivery includes:

- Relay C5-M10/DC24V
- Module CT516/DC24V R
- Front cover FS-C5
- Socket S-5M
- Retaining clip S3-C