

CT monitoring module CT524, CT512, CT515, CT516

1 Characteristics

- Modular plug-in monitoring system
- Voltage monitoring up to 30 V DC
- Current monitoring up to 6 A DC
- 4 monitoring functions
- Alarm delay up to 2 s
- LED status display
- Railway versions available

2 Description

The modular COMATRELECO CT monitoring system consists of a plug-in monitoring module with front cover, an industrial relay with up to three changeover contacts and the socket with clip.

The advantage is that the monitoring module (CT) and the switching block (relay) are separated.

This allows the selection of the optimal equipment for the particular purpose. The subsequent exchange of the relay or monitoring module can be carried out at any time easily and without tools.

The CT system provides 4 selectable current or voltage monitoring functions. The thresholds can be adjusted with dials.

The function status is indicated by two LED.

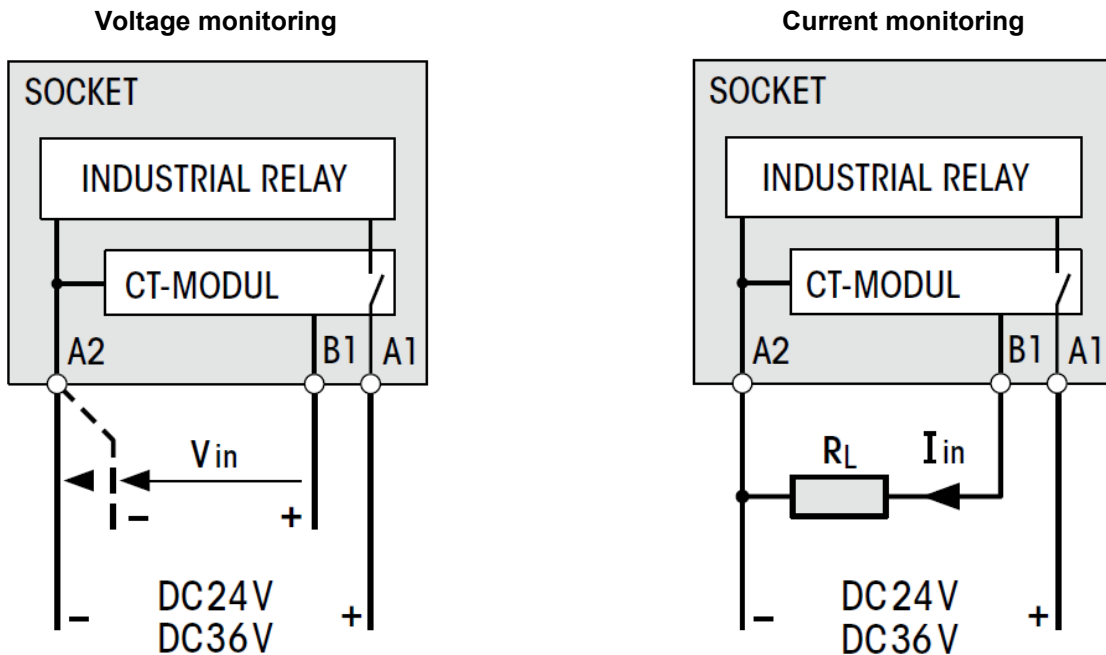
Subject to technical changes

3 Order code

CT voltage monitoring module	CT524/DC24V	(0 - 30 V DC)
	CT524R/DC24V	(0 - 30 V DC, Railway)
	CT524R/DC36V	(0 - 30 V DC, Railway)
CT current monitoring module	CT512/DC24V	(0 - 200 mA DC)
	CT512R/DC24V	(0 - 200 mA DC, Railway)
	CT512R/DC36V	(0 - 200 mA DC, Railway)
	CT515/DC24V	(0 - 2 A DC)
	CT515R/DC24V	(0 - 2 A DC, Railway)
	CT515R/DC36V	(0 - 2 A DC, Railway)
	CT516/DC24V	(0 - 6 A DC)
	CT516R/DC24V	(0 - 6 A DC, Railway)
	CT516R/DC36V	(0 - 6 A DC, Railway)
Relay	C3, C3x, C5	
Socket	C12B0	(for Relay C3, C3x)
	CS-155	(for Relay C5)
Front cover	FS-C	(for Relay C3x)
	FS-R	(for Relay C3)
	FS-C5	(for Relay C5)



4 Connection diagram and pin assignment



A freewheeling diode as surge suppressor is already integrated in the module. An additional, external coil suppression is not necessary.

To avoid incorrect measurements, it is recommended to connect the operating voltage and measuring ground with separate wires on terminal 10 (A2).

5 Functionality

All four monitoring functions +, -, ●, ○, are independently monitoring the two thresholds set through potentiometer W1 and W2.

Basically, W1 sets the lower threshold and W2 the upper one. A reversed assignment leads to a different monitoring behavior, please note Section.

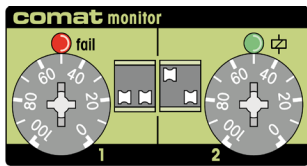
In the event of an alarm, the relay drops off delayed by t . At return from the alarm state, the relay picks up delayed by t_R .

On functions +, -, the hystereses are defined by the difference in value W1-W2.

On functions ●, ○, the hystereses are at a fixed value of about 5% of W1 or W2.

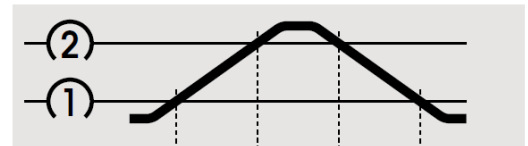
The functions +, -, ●, ○, are set with the dip switches S1 and S2.

t	selected delay time
t_{Amin}	minimum alarm time (shortest time the relay is inactive)
t_R	alarm reset time
W1	threshold 1
W2	threshold 2
W	measurement value
Rel	relay
Alarm	relay inactive



Setting with dials

W1: lower threshold
W2: upper threshold

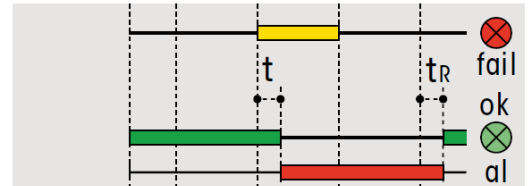


5.1 Overvoltage, overcurrent monitoring (+)



The alarm is triggered when the threshold W2 is exceeded.

The alarm is reset when the value falls below threshold W1.

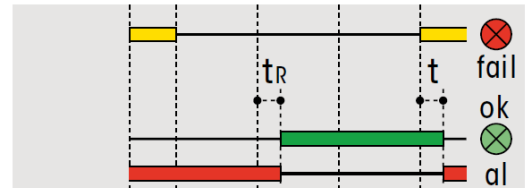


5.2 Undervoltage, undercurrent monitoring (-)



The alarm is triggered when the value falls below threshold W1.

The alarm is reset when the threshold W2 is exceeded.

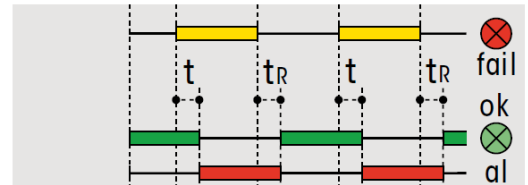


5.3 Inside monitoring (•)

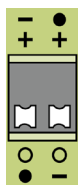


The alarm is triggered when the value is between the thresholds.

The hysteresis is 5% of the set value.

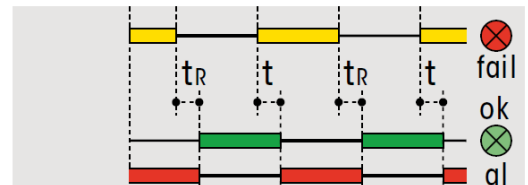


5.4 Outside monitoring (◦)



The alarm is triggered when the value is outside the thresholds.

The hysteresis is 5% of the set value.



5.5 Behavior on reversed threshold assignment



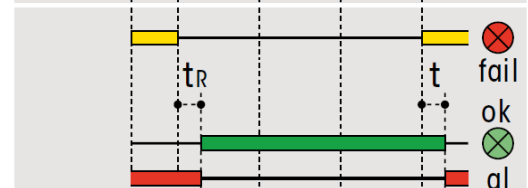
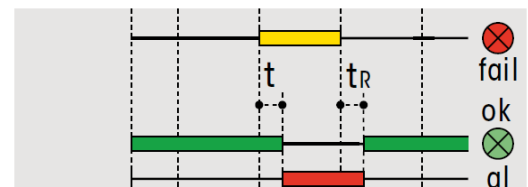
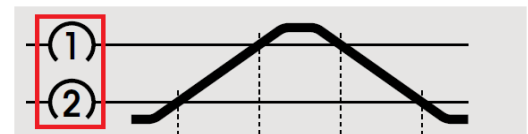
The alarm is triggered when threshold W1 is exceeded. When the value falls below W1, the alarm is reset.

W2 is ignored.

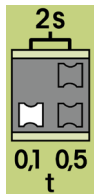


The alarm is triggered when the value falls below threshold W2. The alarm is reset when W2 is exceeded.

W1 is ignored.



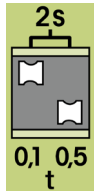
5.6 Setting the time delay



Alarm delay t: **100 ms**

Alarm reset time t_R : 100 ms fixed

(the position of the second Switch is irrelevant)



Alarm delay t: **500 ms**

Alarm reset time t_R : 100 ms fixed



Alarm delay t: **2.0 s**

Alarm reset time t_R : 100 ms fixed

6 Technical information

6.1 General

6.1.1 Mechanical data

Housing	Module housing, compatible to sockets C12B0, CS-155
Connection	via the socket
Protection	IP20
Housing material	Lexane EXL9330
Weight	25 g
Fastening	Detent in the socket Cover latching the relay

6.1.2 Environmental conditions

Storage temperature	-40 °C ... +85 °C
Operating temperature	-25 °C ... +60 °C -40 °C ... +70 °C (Railway)
Relative humidity	10 % ... 95 % (non-condensing)

6.1.3 Lifetime

Life expectancy	> 100'000 h (at 25°C)
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6.2 Time behavior

Alarm delay t	100 ms, 500 ms, 2 s (+25%, -10%)
Minimum alarm time t_{Amin}	100 ms \pm 25 ms
Alarm reset time t_R	100 ms \pm 25 ms
Aberration on interference according to	\leq 10%

6.3 Electrical data

Type	CT51x	CT51xR (Railway)	CT524
Nominal operating voltage DC	24 V	36 V	24 V
Operating voltage range	18 ... 30 V	18 ... 45 V	18 ... 30 V
Power	≤ 0.5 W	≤ 0.5 W	≤ 0.5 W
Ripple	< 15 %	< 5 %	-
Polarity reversal protection	- 30 V	-50 V	-
Consumption at rated voltage			
"OK", Output active (green LED)	5 ... 7 mA	5 mA	11... 13 mA
Fail signal (red LED)	3 ... 5 mA	4.5 mA	8 ... 10 mA

6.3.1 Relay control

Type	CT51x	CT51xR (Railway)	CT524
Load current	≤ 200 mA	≤ 65 mA	≤ 200 mA
Voltage drop	≤ 1,5V	≤ 0.5 V	≤ 1,5V
Residual current	-	≤ 150 µA	-

6.3.2 Measuring input current monitoring

Type	CT512	CT515	CT516
Continuous current	200 mA	2 A	6 A
Maximum current I_{max} 10ms	2 A	10 A	20 A
Maximum current I_{max} 100%ED	300 mA	3 A	7 A
Voltage drop at I_{max}	300 mV	200 mV	100 mV
Measuring / Setting range	0 ... 200 mA	0 ... 2 A	0 ... 6 A
Temperature dependence (-25°C...+60°C)	≤ 5%	≤ 5%	≤ 5%
Aberration on interference according to	≤ 5%	≤ 5%	≤ 5%

6.3.3 Measuring input voltage monitoring

Type	CT524
Measuring / Setting range	0 ... 30 V
Input voltage U_{max} 10ms	± 150 V
Input resistance	106 kΩ
Temperature dependence	≤ 5% von -25°C ... +60°C
Aberration on interference according to	≤ 5%

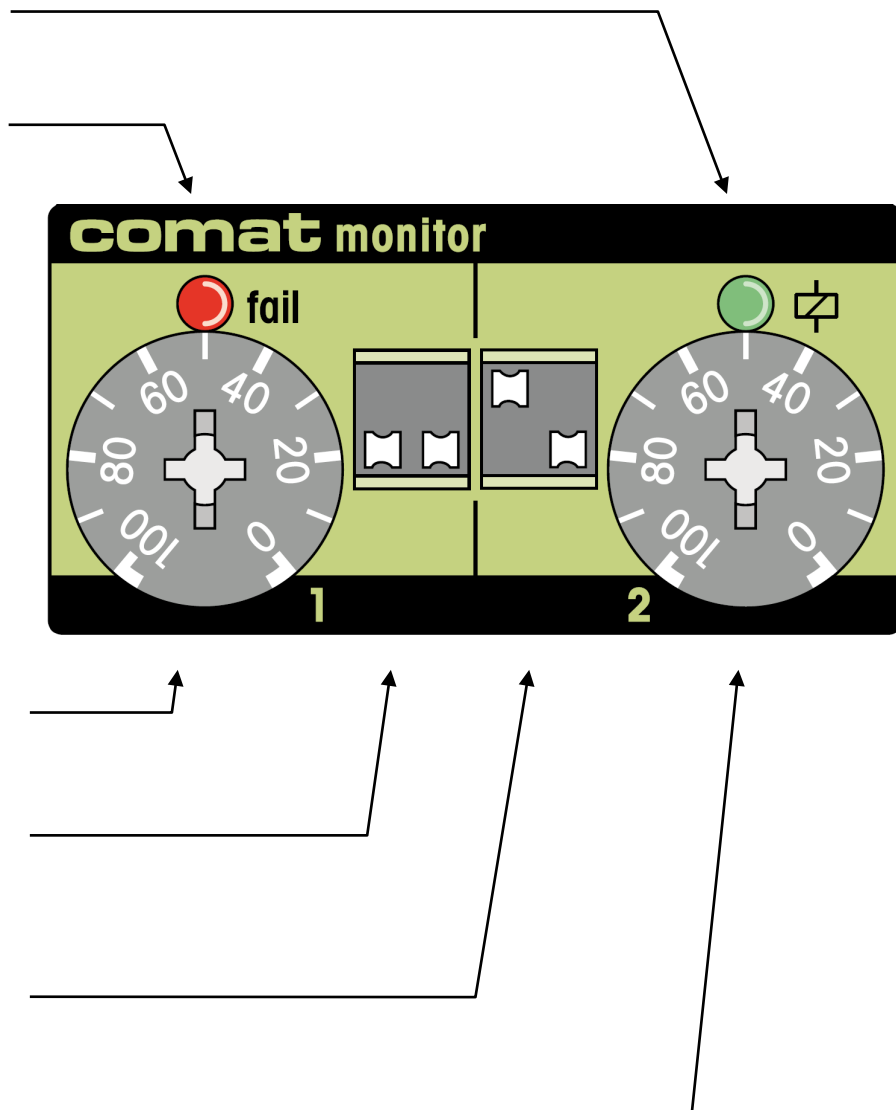
7 Operation

Green LED

OK, Output active

Red LED

Fail signal



Dial 1

lower threshold

Function selector switch

Selection of monitoring function

Alarm delay selector switch

Setting the alarm delay time t

Dial 2

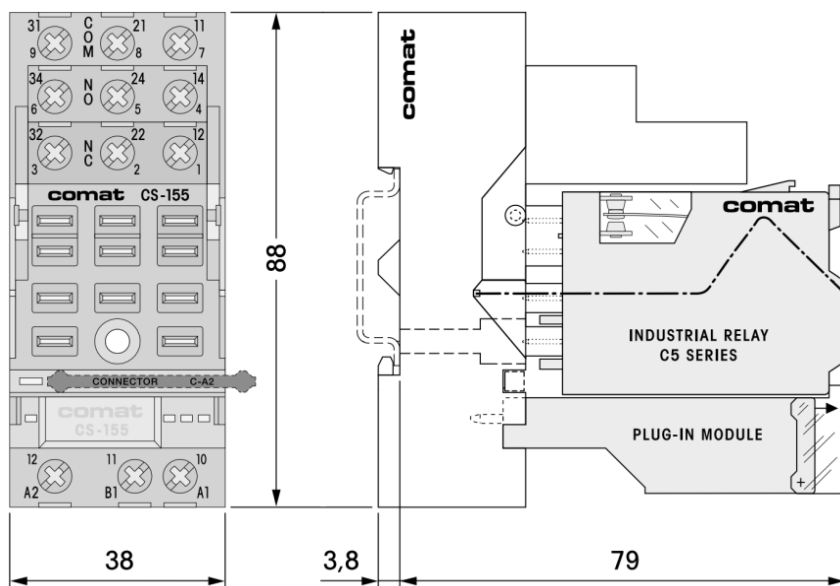
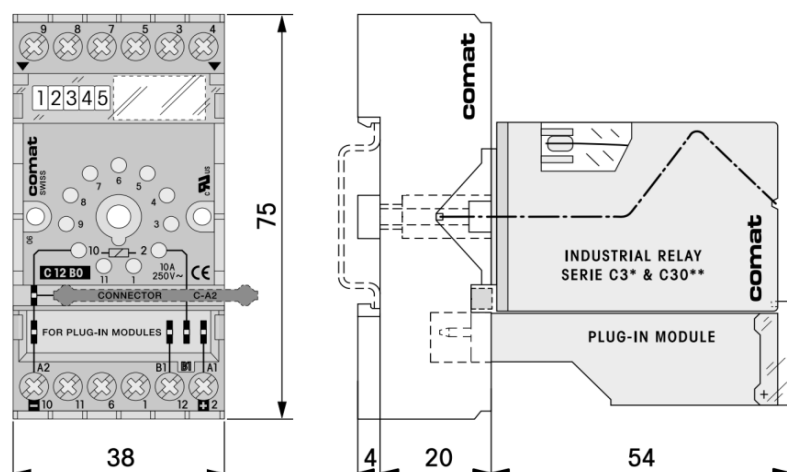
upper threshold

7.1 Status display

The status is indicated with 2 LED.

Green	Red	Relay	Status
X		Active	OK
X	X	Active	Alarm delay t active
	X	Inactive	Alarm triggered
		Inactive	Alarm not yet reset (hysteresis)

8 Dimensions



9 Standards

Security

EN 61812-1:1996+A11:1999
EN 50155:2007

Interference immunity

EN 61000-6-2:2005
EN 61000-4-2:2009 Level 3 (Air: 8 kV)
EN 61000-4-4:2004 Level 3 (2 kV)
EN 61000-4-5:2006 Level 3 (2 kV)

Interference emission

EN 61000-6-3:2007
EN 55022:2006 Class B

Vibration immunity

EN 61373:1999 Category 1, Class B

Conformity

CE

10 Revisions

Version	Date	Responsible	Changes
15517-77-57-401	26.01.1995	Pd	Version 1
15517-77-57-402	20.11.2003	Hp	
15517-77-57-403	15.09.2008	An	
15517-77-57-004	31.01.2014	Vs	Revision