

CME420 Series

Digital Current Relay

AC Systems





CME420

Device features

- Undercurrent and/or overcurrent monitoring in AC systems
- Directly connects to systems 0.1 A...16 A
- Utilizing x/5 type current transformer extends monitoring range to 999 A
- Start-up delay, response delay, delay on release
- Adjustable switching hysteresis
- RMS value measurement (AC)
- Digital LCD display with real-time readings and onboard menu
- LEDs: Power On, Alarm 1, Alarm 2
- Memory stores last alarm value
- Non-volatile memory for settings
- Continuous self monitoring
- Internal test/reset button
- Two separate SPDT alarm relays (gold-plated relay contacts)
- Normally energized or normally de-energized operation
- Latching or non-latching operation
- Password protection for device setting
- Sealable transparent cover
- Two-module enclosure (36 mm)
- RoHS compliant

Approvals



Product description

The CME420 series monitors for overcurrent and/or undercurrent in AC systems. Current is measured as an RMS value. Each alarm may be individually activated or deactivated based on the system requirements. Three separate time delays (startup delay, alarm response delay, and delay on release) allow the CME420 to be tailored to specific applications. Two SPDT alarm contacts may be separately assigned individual alarms.

The CME420 may directly connect to and monitor systems up to 16 A. Utilizing an X/5 type current transformer will extend the monitoring range up to 999 A. The current transformer's ratio may be entered into the device's onboard menu. Doing so displays real values on the device as if it were directly connected - no mental calculations required.

The digital LCD display shows the currently read value in real-time. When an alarm is activated, the value is stored in the device's history. The CME420 utilizes an external supply voltage for power.

Typical applications

- Current consumption of motors, such as pumps, elevators, cranes
- Monitoring of lighting circuits, heating circuits, charging stations
- Monitoring of emergency lighting
- Monitoring of screw conveyors, e.g. in sewage plants
- Dust removal in wood working

Function

Once the supply voltage is applied, the startup delay "t" is activated. Measured current that may cause an alarm will not activate until after the startup delay is complete.

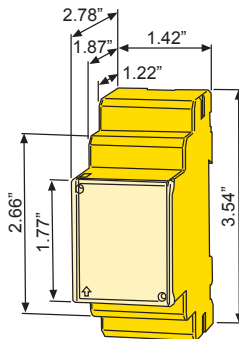
Each type of alarm may be assigned an individual value. Two separate alarm states ("R1" and "R2") may then be assigned any combination of these alarms to trip their respective contacts. When any alarm has been activated, the response delay "t_{on1/2}" will activate. Once the response delay has elapsed, if the alarm is still active, the appropriate contact will trip and the alarm LEDs light. Once the alarm has cleared, the delay on release "t_{off}" begins. Once this delay has elapsed and the alarm is still cleared, the appropriate contact will switch back.

If the device is set to operate in latching mode ("fault memory"), the device must be manually reset if it goes into alarm. If it is set to non-latching mode, the alarm will automatically clear itself. Regardless of this setting, the last alarm value will be stored in the device's onboard history. Device settings are stored in non-volatile memory and will remain set even with a loss of supply voltage.

Dimensions

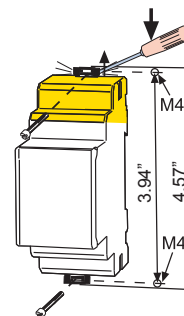
Dimensions in mm

Open the front plate cover in direction of arrow.



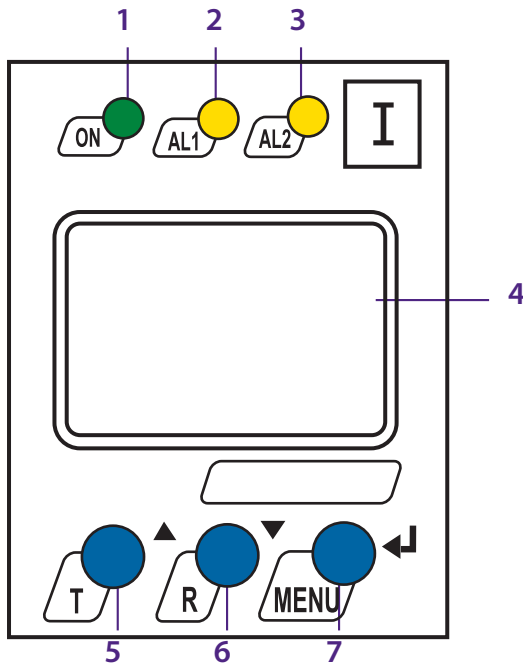
Screw fixing

Note: Additional clip required for screw mounting (See ordering information).



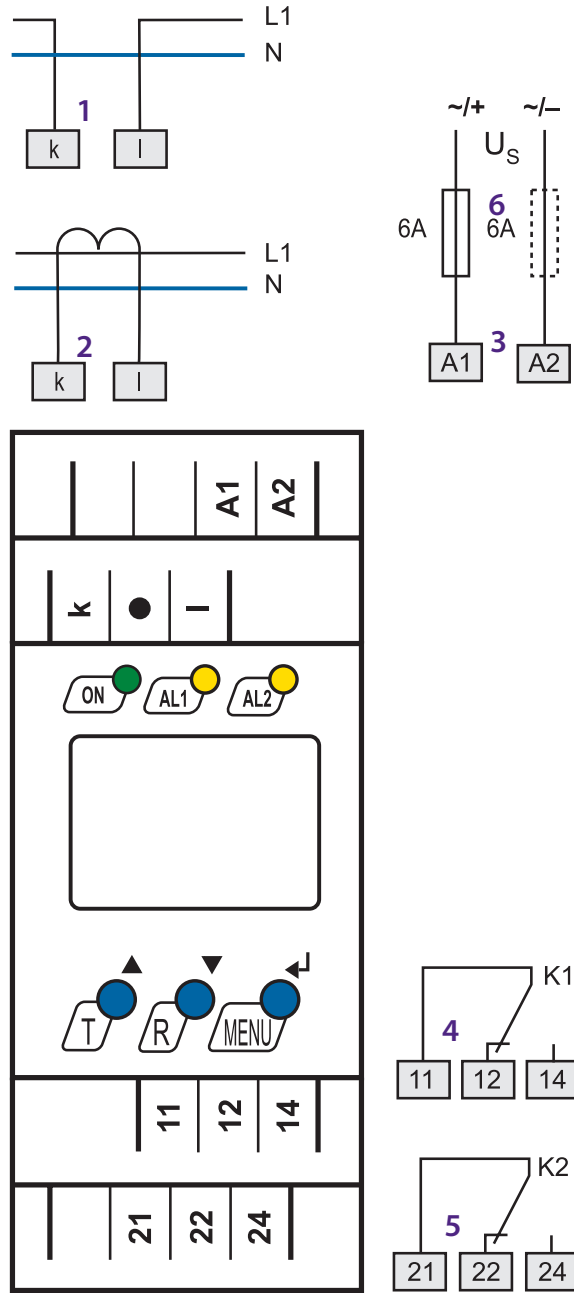


Front display



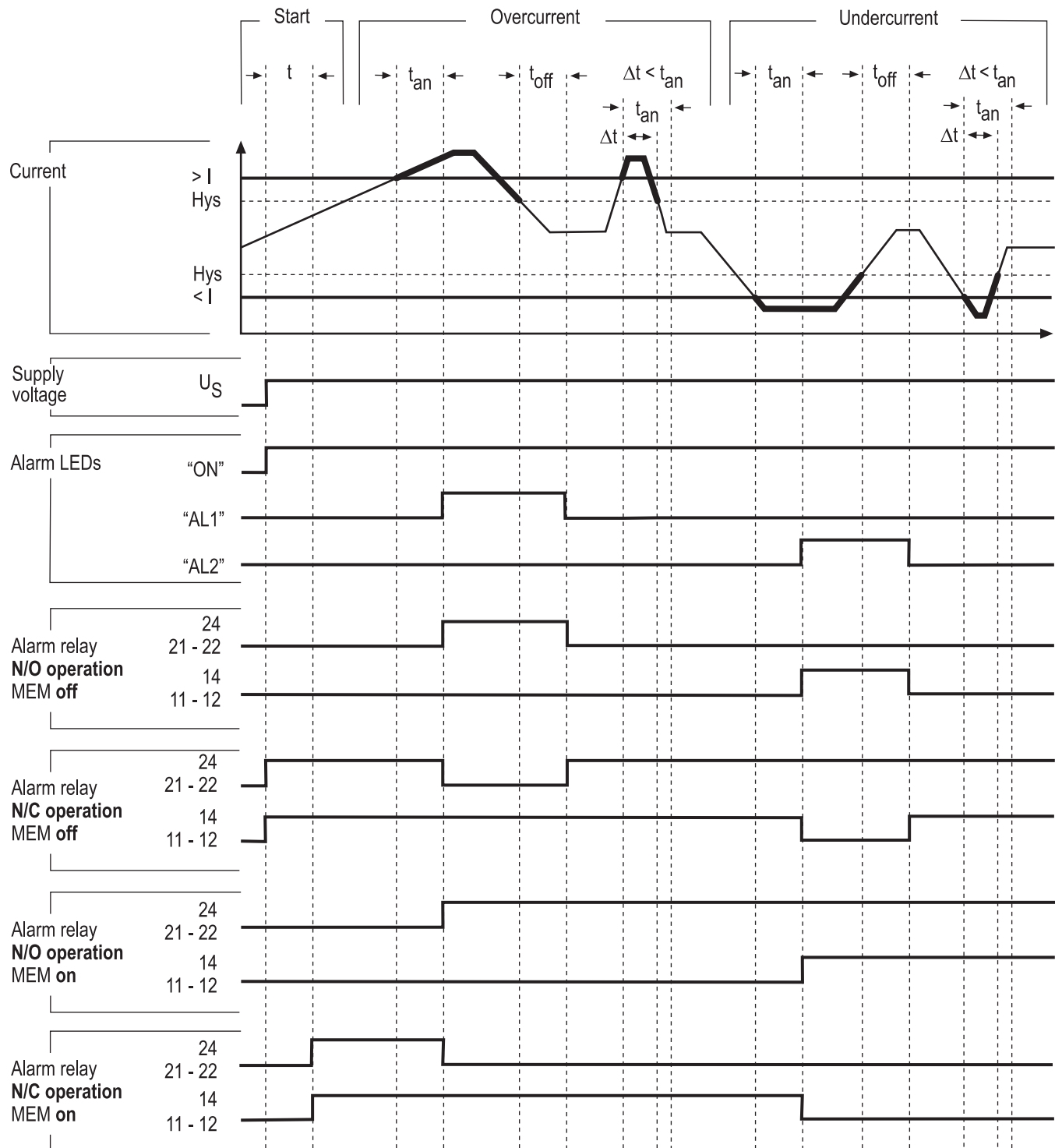
- 1 - Power On LED "ON" (green), lights when supply voltage is applied and flashes in the event of system fault alarm.
- 2 - Alarm LED "AL1" (yellow): lights when the set response value is exceeded and flashes in the event of system fault alarm.
- 3 - Alarm LED "AL2" (yellow): lights when the value falls below the set response value and flashes in the event of system fault alarm.
- 4 - Multi-functional LCD display
- 5 - Test button "T": UP key: Change displayed value, move downwards in the menu or change parameters. Holding for > 1.5 s initiates a self-test.
- 6 - Reset "R" button: DOWN key: Change displayed value, move downwards in the menu or change parameters. Holding for > 1.5s resets the device.
- 7 - MENU key: Enter key: Confirms / changes parameters. When on the main screen, holding for > 1.5 s enters the main menu. When in the menu, holding for > 1.5 s cancels an action or moves back a step in the menu structure.

Wiring diagram



- 1 - Direct connection to system being monitored
- 2 - Connection to system being monitored via current transformer
- 3 - Supply voltage U_s (see ordering information)
- 4 - Alarm relay K1: Configurable for all available alarms
- 5 - Alarm relay K2: Configurable for all available alarms
- 6 - Recommended fuse for line protection

Sample timing diagram



- t - Start-up delay
- t_{an} - Response time
Operating time (t_{ae}) + Response delay ($t_{an\ 1/2}$)
- t_{off} - Delay on release

Technical data
Insulation coordination acc. to IEC 60664-1 / IEC 60664-3

Rated insulation voltage	250 V
Rated impulse voltage/pollution degree	2.5 kV / III
Protective separation (reinforced insulation) between (A1, A2) - (k, l) - (11, 12, 14) - (21, 22, 24)	

Maximum rated voltage of the system being monitored (conductor to be monitored directly connected)	
With protective separation	AC 230 V
Without protective separation	AC 400 V
Voltage test according to IEC 61010-1	2.21 kV

Supply voltage

Supply voltage U_S	see ordering information
Power consumption	≤ 3 VA

Measuring circuit

Rated frequency	42...460 Hz
Measuring range	AC 0.05...16 A
Overload capability, continuous	17.6 A
Overload capability < 1 s	40 A
Frequency display range	10...2000 Hz

Response values	
Undercurrent (alarm 2)	direct connection: AC 0.1...16 A (1 A)*
Overcurrent (alarm 1)	direct connection: AC 0.1...16 A (10 A)* current transformer x/5 A: 0.1 x n...999 A (10 A)*
Transformation ratio n	1...2000 (1)*
Relative percentage error in the range of 50/60 Hz	$\pm 3\% \pm 2$ digit
Relative percentage error in the range 40...460 Hz	$\pm 5\% \pm 2$ digit
Hysteresis	1...40% (15%)*

Specified time

Start-up delay t	0...99 s (0.5 s)*
Response delay t_{on1}	0...99 s (1 s)*
Response delay t_{on2}	0...99 s (0 s)*
Delay on release t_{off}	0...99 s (0.1 s)*
Operating time t_{ae}	≤ 70 ms
Response time t_{an}	$t_{an} = t_{ae} + t_{on1}/2$
Recovery time t_b	≤ 300 ms

Displays, memory

Display range measured value	AC 0.01...16 A x n
Operating error in the range of 50/60 Hz	$\pm 3\% \pm 2$ digit
Operating error in the range of 40...460 Hz	$\pm 5\% \pm 2$ digit
Measured-value memory for alarm value	data record measured values
Password	off / 0...999 (off)*
Fault memory alarm relay	on / off (on)*

Switching elements

Number of changeover contacts	2 SPDT relays				
Operating principle	Normally energized or normally de-energized				
Electrical service life	10.000 switching operations				
Contact data acc. to IEC 60947-5-1					
Utilization category	AC-13	AC-14	DC-12	DC-12	DC-12
Rated operational voltage	230 V	230 V	24 V	110 V	220 V
Rated operational current	5 A	3 A	1 A	0.2 A	0.1 A
Minimum contact load / gold-plated relay contacts	1 mA at AC/DC ≥ 10 V				

Environment / EMC

EMC	IEC 61326-1
Operating temperature	-13 °F...+131 °F (-25 °C...+55 °C)
Climatic class acc. to IEC 60721	
Stationary use (IEC 60721-3-3)	3K5 (except condensation and formation of ice)
Transport (IEC 60721-3-2)	2K3 (except condensation and formation of ice)
Long-time storage (IEC 60721-3-1)	1K4 (except condensation and formation of ice)
Classification of mechanical conditions IEC 60721	
Stationary use (IEC 60721-3-3)	3M4
Transport (IEC 60721-3-2)	2M2
Long-time storage (IEC 60721-3-1)	1M3

Connection

Connection	push-wire terminals
Connection properties:	
rigid	0.2...2.5 mm ² (AWG 24...14)
Flexible without ferrules	0.2...2.5 mm ² (AWG 24...14)
Flexible with ferrules	0.2...1.5 mm ² (AWG 24...16)
Stripping length	10 mm
Opening force	50 N
Test opening, diameter	2.1 mm

Other

Operating mode	continuous operation
Position of normal use	any
Degree of protection, internal components (IEC 60529)	IP30 (NEMA 1)
Degree of protection, terminals (IEC 60529)	IP20 (NEMA 1)
Enclosure material	polycarbonate
Flammability class	UL94V-0
DIN rail mounting acc. to	IEC 60715
Screw mounting	2 x M4 with mounting clip
Product standard	IEC 61010-1 and according to IEC 60255-6
Operating manual	TGH1400
Weight	≤ 160 g

() * factory setting

Ordering information

Type	Supply voltage U_S *	Measurement	Display range	Response value	Art. No.
CME420-D-1	DC 9.6...94 V / AC 42...460 Hz 16...72 V	directly/via current transformer x/5A	0.1...16 A / 5...999 A	0.1...16 A x n	B 9306 0001
CME420-D-2	DC 70...300 V / AC 42...460 Hz 70...300 V	directly/via current transformer x/5A	0.1...16 A / 5...999 A	0.1...16 A x n	B 9306 0002

* absolute values

Accessories

Type	Art. No.
Mounting clip for screw fixing (1 piece per device)	B 9806 0008



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