LINETRAXX® CMS460-D4

Load current monitor with three measuring channels for monitoring three-phase isolating transformers with currents up to 32/63 A

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Device features

- Three true r.m.s. measuring channels (true r.m.s.) for measuring the three load currents of three-phase isolating transformers
- Determination of the maximum load current of the three measured values
- Selectable measuring current transformer types: STW2/STW3/STW4
- Adjustable response value:
  STW2 , STW3: 1… 32 A
  STW4: 1…63 A
- Measuring range:
  STW2 , STW3: 1… 55 A
  STW4: 1…110 A
- Alarm on channel 4 when100 % of the response value is reached or exceeded on at least one of the channels 1…3
- Adjustable time delay t_{on}
- History memory with date and time stamp for 300 data records
- Data logger with 300 data records per channel
- Analysis of harmonics up to the order 40 (THF)
- Two alarm relays with changeover contact; N/O or N/C operation selectable.
- Connection possibility for external test and reset button.
- Backlit graphic display and alarm LEDs
- Data exchange via BMS bus
- Parameterisation with password protection
- RoHS-compliant

Certifications

Product description

Load current monitor with three measuring channels for monitoring three-phase isolating transformers with currents up to 32/63 A.

Typical applications

According to the standards set down for power supplies in medical locations (DIN VDE 0100-710 (VDE 0100-710), ÖVE/ÖNORM E 8007, IEC 60364-7-710), it overload protection of isolating transformers by disconnection is not allowed. Instead, monitoring of overload and high temperature is required for the medical IT transformer

In combination with the isoMED427P or the 107TD47, the CMS460-D4 has the task of monitoring the load current for three-phase transformers.

Description of function

The currents are detected and evaluated as true r.m.s. values in the frequency range of 42…2000 Hz. All channels are scanned simultaneously so that the maximum scanning time for the three channels is ≤ 180 ms if 1x the response value is exceeded, and ≤ 30 ms if 5x the response value is exceeded.

The CMS460-D4 determines the maximum current of the three measuring channels and outputs this as a load value, which is reprsented as a percentage based on the response value. The currents of the three measuring channels are shown in the display in bar graph format and are available via the BMS bus on the channels 1…3.
The latest maximum load value is available via the BMS bus on channel 4.

If the maximum response value of the load current is reached or exceeded the relays will be activated and an alarm is signalled via the BMS bus on channel 4 as soon as the response delay t_{on} has elapsed. Both alarm LEDs on the device light up.

CT connection faults are indicated via LED (Alarm 1) and can be queried via the BMS bus (channels 1…3).

History memory

The device utilises a history memory for fail-safe storing of up to 300 data records (date, time, channel, event code, measured value) so that all alarms can be traced back at any time (what happened when).

Analysis of harmonics

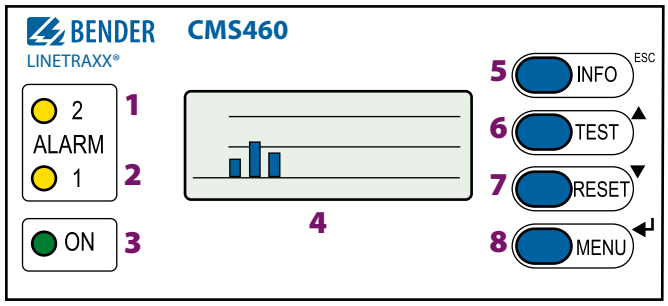
In addition to the load current measurement, the CMS460-D4 analyses the harmonics of the measuring channels 1…3 up to the order 40. The values are displayed as THF value (THF=Total Harmonic Factor).

Standards

The operating manuals for the individual system components provide you with information about the standards that apply to that particular device.

- **DIN VDE 0100-710 (VDE 0100-710)**
  Errichten von Niederspannungsanlagen - Teil 7-710: Anforderungen für Betriebsstätten, Räume und Anlagen besonderer Art - Medizinisch genutzte Bereiche
- **DIN VDE 0100-718 (VDE 0100-718)**
  Errichten von Niederspannungsanlagen - Anforderungen für Betriebsstätten, Räume und Anlagen besonderer Art; Teil 718: Bauliche Anlagen für Menschenansammlungen (Low voltage electrical installations - Part 7-718: Requirements for special installations or locations - Communal facilities and workplaces)
- **ÖVE/ÖNORM E 8007**
  Starkstromanlagen in Krankenhäusern und medizinisch genutzten Räumen außerhalb von Krankenhäusern (Electrical installations in hospitals and locations for medical use outside hospitals)
- **IEC 60364-7-710**
  Electrical installations of buildings – Part 7-710: Requirements for special installations or locations – Medical locations

Operator control and display elements CMS460-D



1 - **ALARM 2** LED lights up when the measured value exceeds or falls below the response value "Alarm".

2 - **ALARM 1** LED lights up when the measured value exceeds or falls below the response value "Prewarning". In the event of a device error, the LED lights up.

3 - **ON** LED lights up when the device is switched on and flashes during power on until the device is ready for operation.

4 - Backlit graphics LC display

5 - **INFO** to query standard information

ESC to exit the menu function without changing parameters

6 - **TEST** to call up automatic self test

▲ to change parameters, scroll

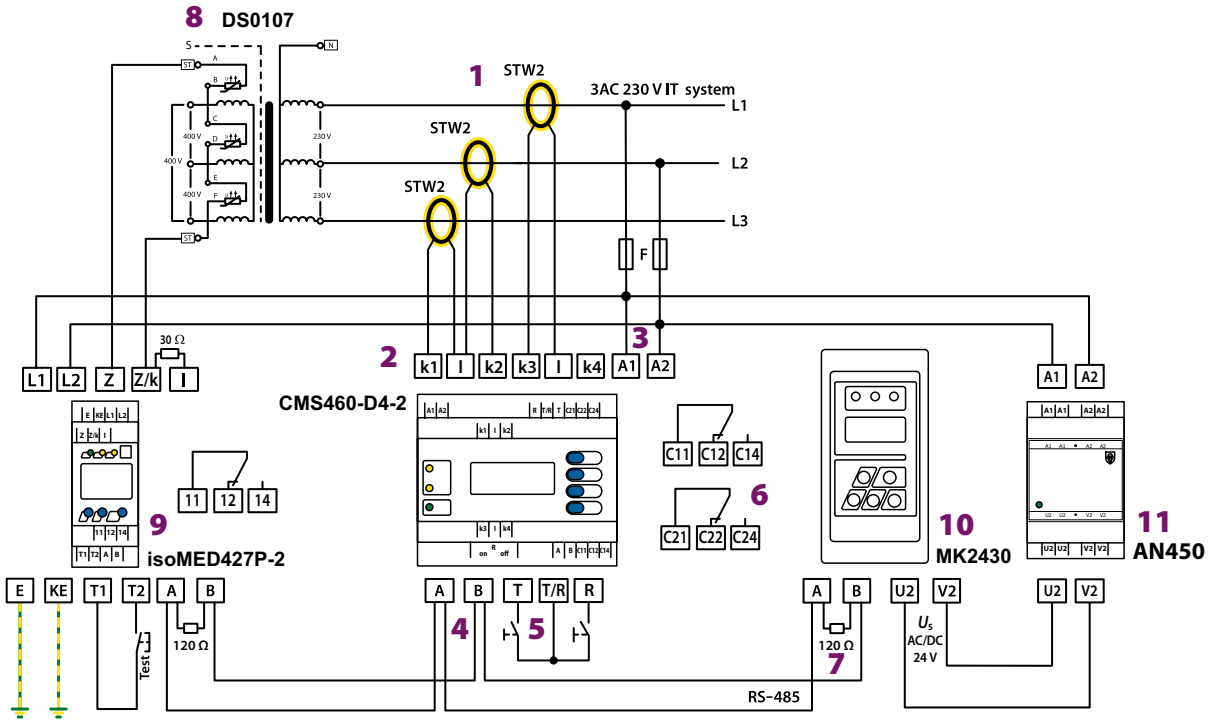
7 - **RESET** to delete alarm and fault messages

▼ to change parameters, scroll

8 - **MENU** to toggle between the standard display, menu and alarm display

↵ to confirm parameter changes

Wiring diagram



1 - **STW** Standard measuring current transformers (use the same transformer type for each of the three phases).

2 - **k1, I**
k2, I
k3, I Connection STW measuring current transformer
For the measuring channels k1…3. only one type of measuring current transformer from the STW 2…4 series can be selected.

3 - **A1, A2** Connection of supply voltage U_s (see ordering information), 6 A fuse recommended

4 - **A, B** BMS bus (RS-485 interface with BMS protocol)

5 - **R, T/R** External reset button (N/O contact). The external reset buttons of several devices must not be connected to each other.

T, T/R External test button (N/O contact). The external test buttons of several devices must not be connected to each other.

6 - **C11, C12, C14** Common alarm relay K1: ALARM 1, common alarm for alarm, device error

C21, C22, C24 Common alarm relay K2: ALARM 2, common alarm for alarm, device error

7 - **120 Ω** (slide switch on the underside of the device) Activate or deactivate the terminating resistor of the BMS bus (120 Ω).

8 - **DS0107** Three-phase isolating transformer

9 - **isoMED427P-2** ISOMETER® for medical locations

10 - **MK2430** Remote alarm indicator and test combination for Bender monitoring systems with BMS

11 - **AN450** Power supply unit for MK2430

Technical data

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

Supply voltage U_S	AC/DC 100…240 V (-20…+15 %)
Supply voltage frequency	DC, 50/60 Hz
Rated insulation voltage	**250 V**
Overvoltage category/pollution degree	III/3
Rated impulse voltage	**6 kV**
Protective separation (reinforced insulation) between	(A1, A2) - (k1, l…k4, R, T/R, T, A, B), (C11, C12, C14), (C21, C22, C24)
Protective separation (reinforced insulation) between	(C11, C12, C14) - (C21, C22, C24)
Voltage test acc. to IEC 61010-1	3.536 kV
Rated insulation voltage	**250 V**
Overvoltage category/pollution degree	III/3
Rated impulse voltage	**4 kV**
Basic insulation between:	k1, l…k4, R, T/R, T, A, B) - (C11, C12, C14), (C21, C22, C24)
Voltage test acc. to IEC 61010-1	2.21 kV

Measuring circuit

Number of measuring channels	3
External measuring current transformer	STW2…4
Load	68 Ω
Rated insulation voltage (measuring current transformer)	800 V
Rated frequency	42…2,000 Hz
Measuring range	1 A…110 A
Crest factor	
up to 10 A	4
up to 110 A	2
Rated operating current I_{n2} (alarm)	1…60 A (1 A overload)*
Preset for alarm	100 %*
Relative uncertainty	+10…-20 %
Hysteresis	2…40 % (5 %)*

Time response

Start-up delay t (start-up) per device	0…99 s (3 s)*
Response delay t_{on} per channel	0…10 s (1 s)*
Operating time t_{ae} at $I_n = 1 \times I_{n1/2}$	≤ 180 ms
Operating time t_{ae} at $I_n = 5 \times I_{n1/2}$	≤ 30 ms
Response time t_{an} for current measurement	$t_{an} = t_{ae} + t_{on1/2}$
Scanning time for all measuring channels (current measurement)	≤ 180 ms
Recovery time t_b	500…600 ms

Displays, memory

Display range, measuring value	< 10 mA…110 A
Operating uncertainty	± 10 %
LEDs	ON/ALARM
LC display	backlit graphical display
History memory	300 data records
Data logger	300 data records per measuring channel
Password	off/0…999 (off)*
Language	D, GB, F (GB)*

Inputs/outputs

Test/reset button	internal/external
Cable length for external test/reset button	0…10 m

Interface

Interface/protocol	RS-485/BMS
Baud rate	9.6 kbit/s
Cable length	0…1200 m
Cable: twisted pair, one end of shield connected to PE	J-Y(St)Y min. 2x0.8
For UL applications: Copper lines	at least 60/70 °C
Terminating resistor	120 Ω (0.25 W) connectable via DIP switch
Device address, BMS bus	1…90 (2)*

Cable lengths for measuring current transformers STW

Single wire ≥ 0.75 mm²	0…1 m
Single wire, twisted ≥ 0.75 mm²	0…10 m
Shielded cable ≥ 0.5 mm²	0…40 m
Recommended cable (shielded, shield connected to terminal l at one end, must not be earthed)	J-Y(St)Y min. 2x0.8

Switching elements

Number of changeover contacts	2 x 1 changeover contacts
Operating principle	N/C or N/O operation (N/O operation)*
Electrical endurance, number of cycles	10,000

Contact data acc. to IEC 60947-5-1

Utilisation 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 (common alarm relay)	5 A	3 A	1 A	0.2 A	0.1 A
Rated operational current (alarm relay)	2 A	0.5 A	5 A	0.2 A	0.1 A
Minimum contact rating	1 mA at AC/DC ≥ 10 V				

Environment/EMC

EMC	IEC 61326-1
Operating temperature	-25…+55 °C

Climatic class acc. to IEC 60721 (except condensation and formation of ice)

Stationary use (IEC 60721-3-3)	3K23
Transport (IEC 60721-3-2)	2K11
Long-term storage (IEC 60721-3-1)	1K22

Classification of mechanical conditions acc. to IEC 60721

Stationary use (IEC 60721-3-3)	3M11
Transport (IEC 60721-3-2)	2M4
Long-term storage (IEC 60721-3-1)	1M12

Connection

Connection	screw-type terminals
Connection properties:	
Rigid/flexible/conductor sizes	0.2…4/0.2…2.5 mm²/AWG 24…12
Multi-conductor connection (2 conductors with the same cross section):	
Rigid/flexible	0.2…1.5/0.2…1.5 mm²
Stripping length	8…9 mm
Tightening torque	0.5…0.6 Nm

Other

Operating mode	continuous operation
Mounting	display-oriented
Degree of protection, internal components (IEC 60529)	IP30
Degree of protection, terminals (IEC 60529)	IP20
Enclosure material	polycarbonate
Flammability class	UL94V-0
Screw fixing	2 x M4
DIN rail mounting acc. to	IEC 60715
Software version measurement technique	D0452 V1.2
Software version display	D256 V2.29
Power consumption	≤ 10 VA
	< 5 W
Documentation number	D00166
Weight	≤ 300 g

( )* Factory setting

Ordering information

Supply voltage[1] U_s		Type	Art. No.
AC	DC		
100…240 V, 50/60 Hz	100…240 V	CMS460-D4-2	B94053030

Accessories

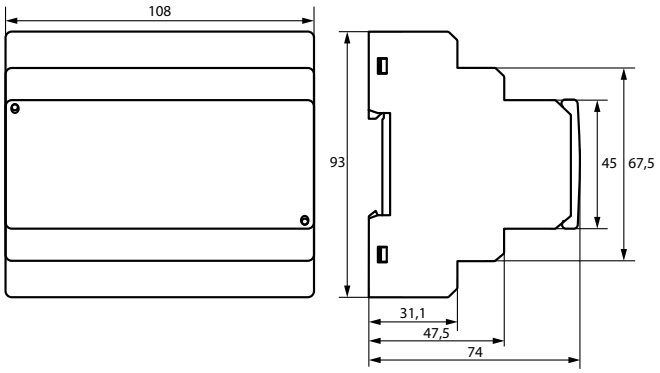
Type	Art. No.
XM460 Mounting frame, 144 x 82 mm	B990995

Suitable system components

Type	Measuring range	Type	Art. No.
	AC		
Measuring current transformers	0…50 A	STW2	B942709
	0…100 A	STW3	B98021000
	0…200 A	STW4	B98021001

Dimension diagram

Dimensions in mm



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