Monitoring module LTIC107E/D

Monitoring module with single fault tolerance for medical IT systems

LTIC107E – Typical example

Device features

- Complete solution for IT system monitoring
- Factory-made, tested module for time and cost-saving installation
- IT system monitoring (insulation, load, transformer temperature)
- Connection monitoring
- Internal functional testing
- Clear menu structure allows easy parameter setting
- Bus technology for easy installation and reduced fire load
- Power supply for MK2430/MK800
- Screwless-type connection technique
- Suitable for all common DIN rail systems

Product description

The factory-made modules of the LTIC107 series are designed for monitoring single-phase (LTIC107E) or three-phase (LTIC107D) IT systems in medical locations. Status indication and alarm texts on the alarm indicator and operator units takes place via bus technology. The module is suitable for mounting onto all common DIN rail systems (equipment racks have to be provided by the customer).

Functions in accordance with IEC 60364-7-710 / DIN VDE 0100-710

- Insulation monitoring IT system
- Load current monitoring IT system transformer
- Temperature monitoring IT system transformer
- Control circuit with single fault tolerance
- Cables laid to resist short-circuits and earth faults
- Functional test
- Monitoring of the system/PE connections of the insulation monitoring device

Further measures to increase the electrical safety

Monitoring of essential connecting leads, such as to

- Current transformers
- Temperature sensors

Indications/messages

- Plain text messages display for all essential operating, fault and alarm messages
- Information exchange between alarm indicator and operator units via BMS bus
- Common alarm contact with protective separation in accordance with EN 50178

Description of the IT system monitoring function

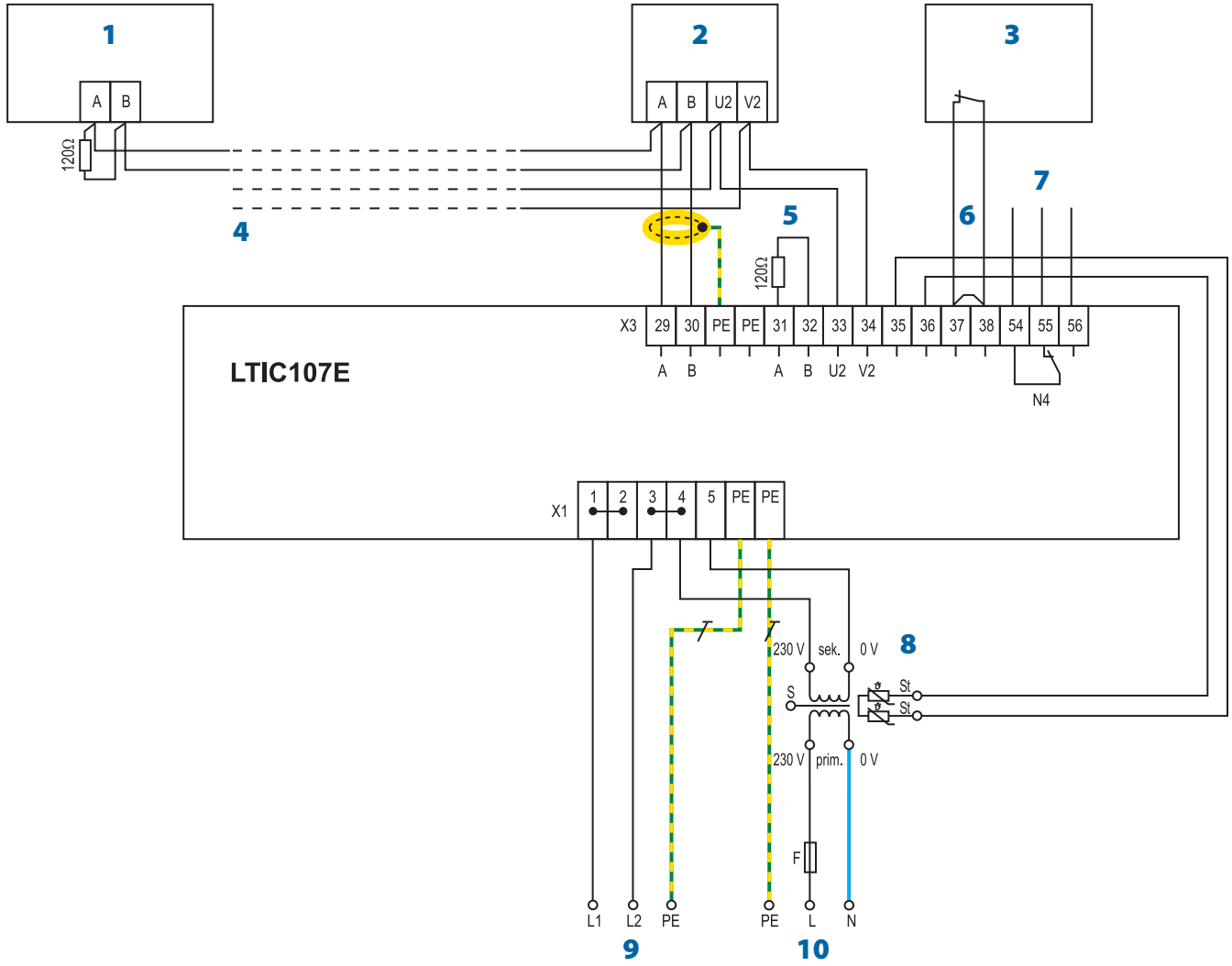
In group 2 medical locations safe and reliable operation must be guaranteed in case of an insulation fault or transient overload. Therefore, in this case, IT systems are used for the supply of electrical loads to monitor the insulation, load and temperature of isolating transformers.

Insulation monitoring with the AMP measuring principle avoids that DC components which can be caused by electronic devices influence the measurement. If the insulation resistance falls below the set response value or if the load current or the transformer temperature exceed the threshold value, an alarm message is indicated and the common alarm contact switches.

Continuous self monitoring of the monitoring module, the measuring leads for insulation, load and temperature monitoring, provides high availability of the system. Interactive device monitoring via the bus informs about device failure.

The test button can be used to simulate faults and in this way check the function of the monitoring module.

Wiring diagram



1 - Other devices connected to the BMS bus
2 - Remote alarm indicator and test combination MK…
3 - Insulation monitoring main OP light
4 - Other MK…
5 - Remove the terminating resistor, if additional bus devices are connected here.
6 - Before connecting an insulation monitoring device for main OP lights, remove the bridge.
7 - Common alarm insulation monitoring device 107TD47
8 - Isolating transformer for IT system
9 - IT system AC 230 V 50 Hz
10 - AC 230 V 50 Hz

Technical data monitoring module LTIC107E/D

Insulation coordination acc. to IEC 60664-1

Rated insulation voltage	AC 250 V
Rated impulse voltage/pollution degree	4 kV/3

Supply voltage devices

Supply voltage devices U_S	AC 230 V
Operating range of U_S	0.8…1.15 x U_e
Frequency range of U_S	50…60 Hz
Power consumption	LTIC107E ≤ 10 W
	LTIC107D ≤ 14 W

A-ISOMETER® 107TD47

Display, characters	LCD, illuminated, 2 x 16 characters
Test button	internal/ external

Insulation monitoring 107TD47

Response value R_{an} adjustable	50…500 kΩ
Relative percentage error	0…+ 10 %
Hysteresis	≤ 25 %
Response time t_{an} at R_F = 0.5 x R_{an} and C_e = 1µF	≤ 3 s
Measuring voltage U_m	≤ 12 V
Measuring current Im (at R_F = 0 Ω)	≤ 50 µA
Internal DC resistance R_i	≥ 240 kΩ
Impedance Z_i at 50 Hz	≥ 200 kΩ
Permissible extraneous DC voltage U_{fg}	≤ DC 375 V
Permissible system leakage capacitance C_e	≤ 5 µF

Load monitoring 107TD47

Response value, adjustable	5…50 A
Hysteresis	≤ 4 %
Temperature influence	≤ 0.15 % / °C

Temperature monitoring 107TD47

Response value	4 kΩ
Release value	1.6 kΩ
PTC resistors acc. to DIN 44081	max. 6 in series

Interface

Interface/protocol	RS-485/BMS
Baud rate	9.6 kbit / s
Cable length	≤ 1200 m
Recommended cable (shielded, shield connected to PE on one side)	min. J-Y(St)Y 2 x 0.6
Terminating resistor	120 Ω (0.25 W)
Device address, BMS bus	107TD47: 2…30
Factory-set device address	107TD47: 3

Switching elements (alarm contacts 107TD47)

Number of changeover contacts	1 changeover contact
Operating principle, adjustable	N/C or N/O operation

Contact data acc. to IEC 60947-5-1

Rated operational voltage U_e	AC 230 V / DC 220 V
Rated operational current I_e	AC 5 A / DC 0.2 A
Utilization category	AC 14/DC 12
Electrical service life, number of cycles	10.000
Minimum contact load	1 mA at AC / DC > 10 V

Terminals

Control unit

Connection	cage clamp spring terminal
Connection properties rigid/flexible/conductor sizes	0.08…2.5 mm²/AWG 28-12
Stripping length	8…9 mm

Power supply unit

Connection	cage clamp spring terminal
Connection properties rigid/flexible/conductor sizes	6…16 mm²/AWG 24-6
Stripping length	16…17 mm

General data

EMC immunity	acc. to EN 61000-6-2
EMC emission	acc. to EN 61000-6-4
Classification of climatic conditions acc. to IEC 60721	
Stationary use	3K5
Transport	2K3
Long-time storage	1K4
Operating temperature	-10 °C…+55 °C
Classification of mechanical conditions acc. to IEC 60721	
Stationary use	3M4
Transport	2M1
Long-time storage	1M3
Operating mode	continuous operation
Mounting position	vertical
Degree of protection, internal components (IEC 60529)	IP30
Degree of protection, terminals (IEC 60529)	IP20
Mounting into standard distribution cabinets	see ordering information/dimensions and weights
Flammability class	UL94V-0
Product standards	IEC 60364-7-710 / DIN VDE 0100-710 (VDE 0100-710)
Operating manual	TGH1343
Weight	see ordering information/dimensions and weights

Ordering information/dimensions and weights

Type	Dimensions fields/rows (W/H/D mm)	Recommended cabinet depth	Weight approx.	Art. No.
LTIC107E	1/2 (250/300/130)	300 mm	3 kg	B 9205 6004
LTIC107D	1/4 (250/600/130)	300 mm	3.4 kg	B 9205 7007