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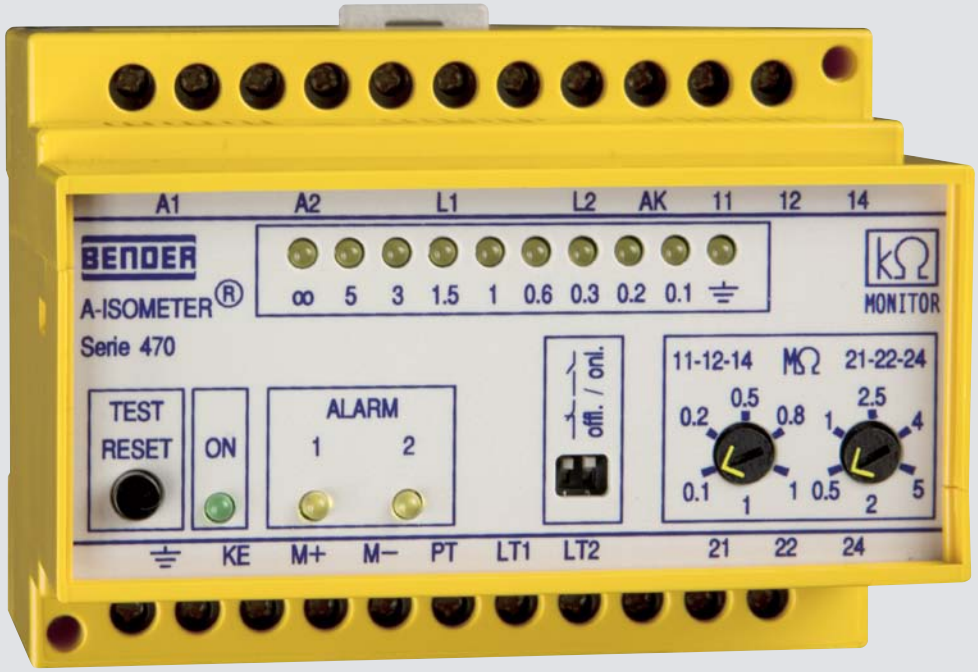
ISOMETER® IR470LY2-60

Insulation monitoring device for unearthed
AC and 3(N)AC systems (IT systems) and de-energised loads



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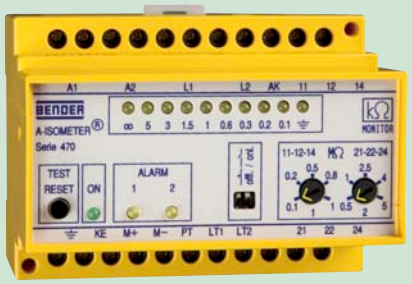


ISOMETER® IR470LY2-60

Device features

- Insulation monitoring for unearthed AC, 3(N)AC systems 0…793 V
- Off-line monitoring for TN, TT and IT systems 0…793 V
- Nominal voltage extendable via coupling device
- Operating mode selectable: Insulation monitoring/off-line monitoring
- Two separately adjustable response values 100 kΩ…1 MΩ/500 kΩ…5 MΩ
- Connection monitoring system/earth
- Power ON LED, Alarm LED for signalling AC, L+, L- insulation faults
- LED bar graph indicator for the indication of the insulation resistance
- Connection for external kΩ indication
- Combined test and reset button
- Two separate alarm relays with one potential-free changeover contact each
- N/O or N/C operation
- Fault memory behaviour, selectable

Approvals

GL · PCT AE25 · Lloyd's Register TYPE APPROVED

Product description

The ISOMETER®s of the IR470LY series monitor the insulation resistance of unearthed AC and three-phase systems (IT systems) AC/3(N)AC 0…793 V. The device series is particularly suitable for systems requiring a high insulation level. The device can also be used for monitoring de-energised loads. Two separately adjustable response values and alarm relays allow to distinguish between prewarning and alarm. In combination with a coupling device the device series can be used for higher voltages.

The systems to be monitored should not contain DC components. Due to the measuring method, insulation faults downstream of directly connected rectifiers are indicated with increased response sensitivity. The set response values apply to the pure AC system only.

Application

- AC, 3(N)AC main circuits (without directly connected rectifiers), such as motors, pumps, rolling mills without variable-speed drives, air cooling and air conditioning systems, lighting systems, heating systems, mobile generators, building services, domestic electrical installation practice, etc.
- De-energised loads, such as fire extinguisher pumps, slide-valve drives (gas, water, oil etc.), flue gas valves, cranes

Function

When the insulation resistance between the system conductors and earth falls below the set response value, the alarm relays switch and the alarm LEDs light up. In case of interruption of the system or earth connection, the alarm LEDs flash. The measured value is indicated on the LED bar graph indicator or a measuring instrument that can be connected externally. In this way any changes, for example when circuits are connected to the system, can be recognised easily. The fault messages can be stored. The fault memory can be reset by pressing the reset button. The device function can be tested using the test button.

Measurement method

DC — Superimposed DC voltage with inverter.

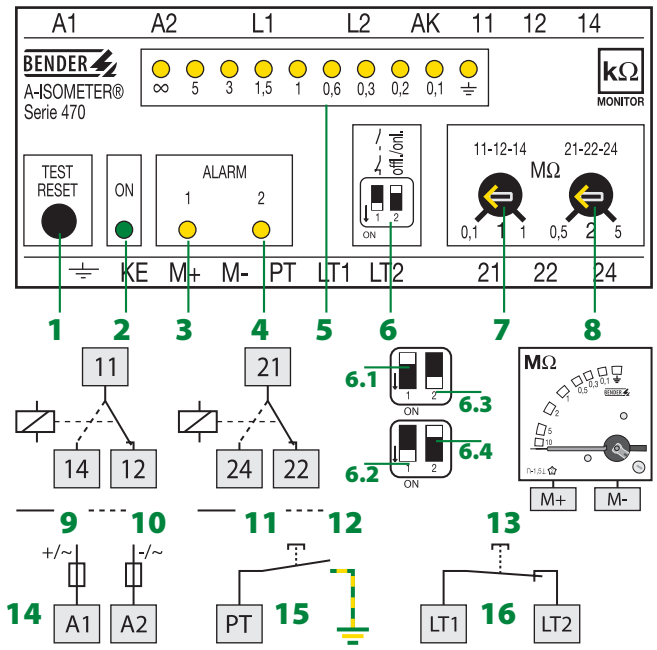
Off-line mode

In this mode, the insulation monitoring process is automatically activated when the system voltage between the terminals L1 and L2 falls below 80 V. Only if the system voltage has fallen below this value, the device assumes that the load is de-energised. If the voltage between the terminals L1 and L2 exceeds 80 V, insulation monitoring will be automatically deactivated. This is signalled by a flashing LED ∞ of the LED line.

Standards

The ISOMETER® of the IR470LY2-60 series complies with the requirements of the device standards: DIN EN 61557-8 (VDE 0413-8), IEC 61557-8, ASTM F 1669M-96 (2007), ASTM F1134-94.

Wiring diagram – Operating elements



1 - Combined test and reset button “TEST RESET”,
short-time pressing (< 1 s) = RESET,
long-time pressing (> 2 s) = TEST

2 - Power On LED “ON”

3 - Alarm LEDs “1 ALARM 2”, yellow, light when the value falls below the set response value and flash

4 - In case of interruption of the connecting leads ⏚/KE or L1/L2

5 - LED bar graph indicator

6 - Operating principle of the alarm relays on-line/off-line
6.1 - N/O operation 6.2 - N/C operation
6.3 - OFF-Line 6.4 - ON-Line

7 - Potentiometer to set the response value R_{an1} (Alarm 1)

8 - Potentiometer to set the response value R_{an2} (Alarm 2)

9 - Alarm relay 1: N/O operation (basic setting)

10 - Alarm relay 1: N/C operation

11 - Alarm relay 2: N/O operation (basic setting)

12 - Alarm relay 2: N/C operation

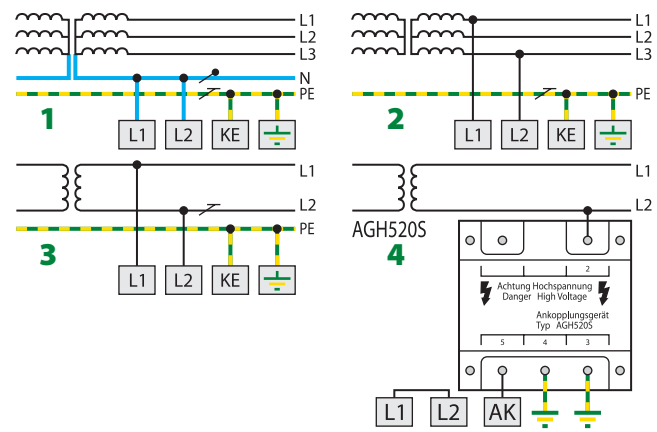
13 - External MΩ indicating instrument

14 - U_S see ordering information, 6 A fuse recommended

15 - External test button “PT”

16 - External reset button “LT1, LT2” or bridge for fault memory

Wiring diagram – system connection



1 - 3NAC system

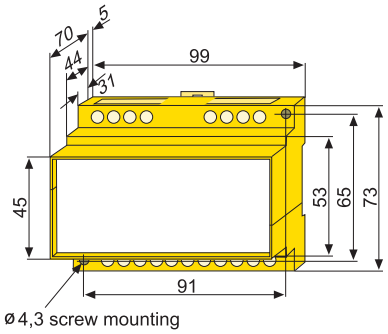
2 - 3AC system

3 - AC system

4 - AC > 690 V with coupling device

Dimension diagram X470

Dimensions in mm



Technical data

Insulation coordination acc. to IEC 60664-1

Rated insulation voltage	AC 630 V
Rated impulse voltage/pollution degree	6 kV/3

Voltage ranges

Nominal system voltage U_n	AC, 3(N)AC 0…793 V
Nominal frequency f_n	40…460 Hz
Supply voltage U_S	see ordering information
Operating range of U_S	0.8…1.15 x U_S
Frequency range U_S	50…460 Hz
Power consumption	≤ 3 VA

Response values

Response value R_{an1} (Alarm 1)	100 kΩ…1 MΩ
Response value R_{an2} (Alarm 2)	500 kΩ…5 MΩ
Response time t_{an} at R_F = 0.5 x R_{an} and C_e = 1 µF	≤ 4 s

Measuring circuit

Measuring voltage U_m	≤ 40 V
Measuring current I_m (at R_F = 0 Ω)	≤ 33 µA
Internal DC resistance R_i	≥ 1.2 MΩ
Impedance Z_i at 50 Hz	≥ 1 MΩ
Permissible extraneous DC voltage U_{fg}	≤ 800 V
Permissible system leakage capacitance C_e	≤ 10 µF

Outputs

Test/reset button	internal/external
Current output for measuring instrument (scale centre point = 120 kΩ)	0…400 µA
Load	≤ 25 kΩ

Switching elements

Number of switching elements	2 x 1 changeover contact
Operating principle	N/O operation/N/C operation
Factory setting	N/O operation
Electrical endurance, number of cycles	12000
Contact class	IIB in accordance with DIN IEC 602550-20
Rated contact voltage	AC 250 V/DC 300 V
Making capacity	AC/DC 5 A
Breaking capacity	2 A, AC 230 V, cos phi = 0.4 0.2 A, DC 220 V, L/R = 0.04 s
Contact rating at DC 24 V	≥ 2 mA (50 mW)

Environment

Shock resistance IEC 60068-2-27 (device in operation)	15 g/11 ms
Bumping IEC 60068-2-29 (transport)	40 g/6 ms
Vibration resistance IEC 60068-2-6 (during operation)	1 g 10…150 Hz
Vibration resistance IEC 60068-2-6 (during transport)	2 g/10…150 Hz
Ambient temperature (during operation)	-10…+55 °C
Ambient temperature (during storage)	-40…+70 °C
Climatic class acc. to DIN IEC 60721-3-3	3K5

Connection

Connection type	modular terminals
Connection properties rigid/flexible	0.2…4 mm²/0.2…2.5 mm²

Other

Operating mode	continuous operation
Mounting	any position
Degree of protection, internal components (DIN EN 60529)	IP30
Degree of protection, terminals (DIN EN 60529)	IP20
Screw mounting	2 x M4
DIN rail mounting acc. to	IEC 60715
Flammability class	UL94 V-0
Operating manual	TBP104002
Weight	≤ 360 g

Ordering information

Supply voltage U_S		Type	Art. No.
DC	AC		
–	AC 230 V	IR470LY2-60	B 9104 8010
–	AC 90…132 V[1)]	IR470LY2-6013	B 9104 8013
–	AC 400 V	IR470LY2-6015	B 9104 8009
9.6…84 V[1)]	–	IR470LY2-6021	B 9104 8014

Other supply voltages on request

[1)] Absolute values

Suitable system components

Type designation	Type	Art. No.
External kΩ measuring instruments	7204-1421	B 986 763
	9604-1421	B 986 764
Coupling devices	AGH520S	B 913 033

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