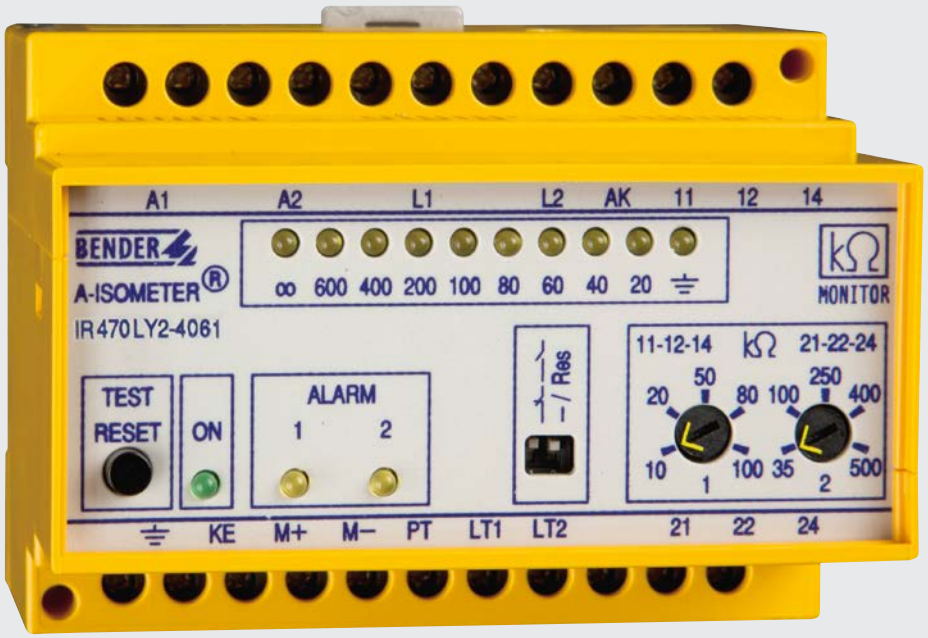
ISOMETER® IR470LY...

Insulation monitoring device for unearthed AC and 3(N)AC systems (IT systems)



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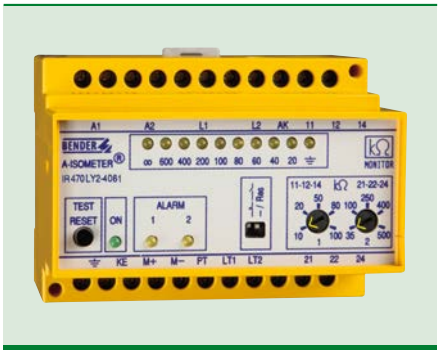


ISOMETER® IR470LY

Device features

- Insulation monitoring for AC, 3(N)AC systems 0…793 V (IT systems)
- Nominal voltage extendable via coupling device
- Response values, adjustable 1…200 kΩ
- Connection monitoring system/earth
- Power ON LED, Alarm LED for signalling AC, L+, L- insulation faults
- LED bar graph indicator for signalling AC, L+, L- insulation faults
- Connection for external kΩ indication
- Combined test and reset button
- Connection external test/reset button
- Alarm relay with two potential-free changeover contacts
- Selectable N/O or N/C operation
- Fault memory behaviour, selectable

Approvals

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. In combination with a coupling device, the devices can also be used for higher voltages. An external supply voltage allows de-energised systems to be monitored too.

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.

Function

When the insulation resistance between the system conductors and earth falls below the set response value, the alarm relay switches and the alarm LEDs light up. In case of interruption of the system and earth connection, the alarm LEDs flash. Different alarm LEDs AC, DC+, DC- allow to distinguish between insulation faults on the AC and the DC side. The measured value is indicated by 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 message 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

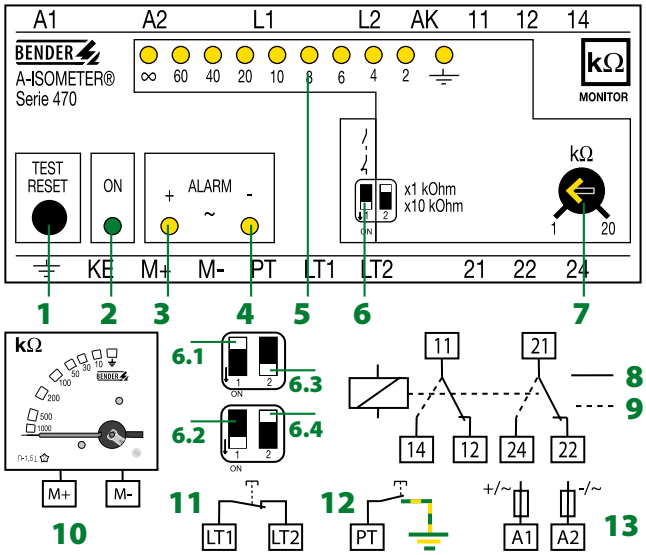
DC Superimposed DC voltage with inverter.

Standards

The ISOMETER® of the IR470LY series complies with the requirements of the device standards:

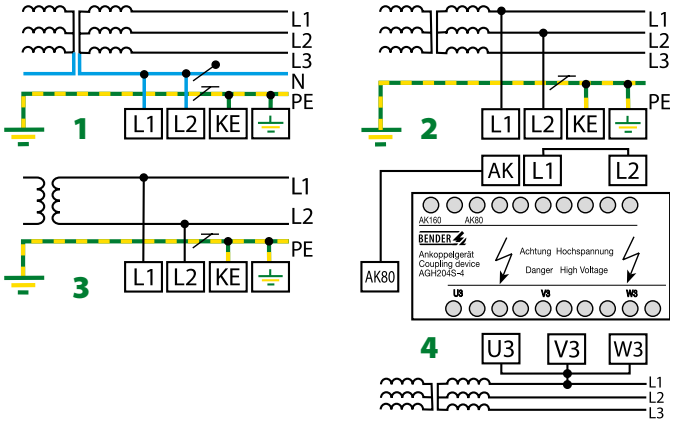
- EN 61557-1
- EN 61557-8

Wiring diagram – Front plate



1 - Combined test/reset button “TEST/RESET”; short-time pressing (< 1 s) = RESET, long-time pressing (> 1 s) = TEST
2 - LED Power “ON”
3, 4 - Alarm LEDs “+ ALARM -”, yellow, light when the value falls below the set response value and flash in case of interruption of the connecting leads E/KE or L1/L2
5 - LED bar graph indicator
6 - Operating principle of the alarm relays and setting range R_{ALARM}
6.1 - N/O operation
6.2 - N/C operation
6.3 - x 10 kΩ
6.4 - x 1 kΩ
Changing the setting range from x 1 kΩ to x 10 kΩ automatically changes the indication of the kΩ values on the LED bar graph indicator: Setting range x 1 kΩ: Meter scale point x 1 kΩ. Setting range: x 10 kΩ: Meter scale point has to be multiplied by 10 kΩ.
7 - Potentiometer to set the response value R_{ALARM}
8 - Alarm relay - N/O operation (basic setting)
9 - Alarm relay - N/C operation
10 - External kΩ indicating instrument
11 - External reset button “LT1, LT2” or bridge for fault memory
12 - External test button “PT”
13 - U_S see ordering information, 6 A fuse recommended

Wiring diagram – system connection



1 - U_n 3NAC system
2 - U_n 3AC system
3 - U_n AC system
4 - U_n with coupling devices: AGH204S-4 = 0…1300 V resp. 0…1650 V, AGH520S = 0…7200 V, here: coupling device AGH204S-4 connected to U_n 3AC system

Ordering information

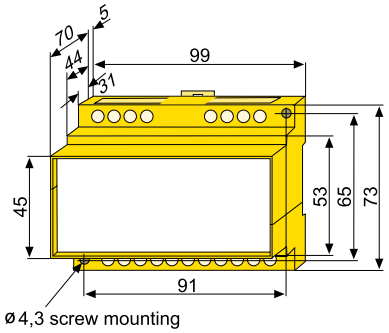
Supply voltage U_S		Type	Art. No.
AC	DC		
230 V	–	IR470LY-40	B91048007
24 V	–	IR470LY-4011	B91048012
42 V	–	IR470LY-4012	B91048002
90…132 V[1)]	–	IR470LY-4013	B91048011
400 V	–	IR470LY-4015	B91048008
500 V	–	IR470LY-4016	B91048018
690 V	–	IR470LY-4017	B91048017
440 V	–	IR470LY-4018	B91048024
–	9.6…84 V[1)]	IR470LY-4021	B91048006
–	77…286 V[1)]	IR470LY-4023	B91048026

Other supply voltages on request

[1)] Absolute values

Dimension diagram X470

Dimensions in mm



Suitable system components

Type designation	Nominal system voltage U_n	Type	Art. No.
	AC		
External kΩ measuring instruments	–	7204-1421	B986763
	–	9604-1421	B986764
Coupling devices	0…1650 V	AGH204S-4	B914013
	0…7200 V	AGH520S	B913033

Response delay

[1)] Response time t_{an} in the 10…200 kΩ range	[1)] Response time t_{an} in the 1…20 kΩ range	System leakage capacitance C_e max.	Type
≤ 1 s	≤ 3 s	≤ 20 µF	IR470LY-40…

[1)] Response times acc. to IEC 61557-8 at $R_F = 0.5 \times R_{an}$ and at 1 µF system leakage capacitance.

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)	1…200 kΩ
Response time t_{an} at R_F = 0.5 x R_{an} and C_e = 1 µF	
10…200 kΩ range	≤ 1 s
1…10 kΩ range	≤ 3 s

Measuring circuit

Measuring voltage U_m	≤ 40 V
Measuring current I_m (at R_F = 0 Ω)	≤ 200 µA
Internal DC resistance R_i	≥ 200 kΩ
Impedance Z_i at 50 Hz	≥ 180 kΩ
Permissible extraneous DC voltage U_{fg}	≤ 800 V
Permissible system leakage capacitance C_e	≤ 20 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

Switching elements	2 changeover contacts
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 (device in operation)	1 g/10…150 Hz
Vibration resistance IEC 60068-2-6 (transport)	2 g/10…150 Hz
Ambient temperature (during operation/during storage)	-10…+ 55 °C/-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
Documentation number	D00119
Weight	≤ 360 g

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