A-ISOMETER® for AC systems > 230 V

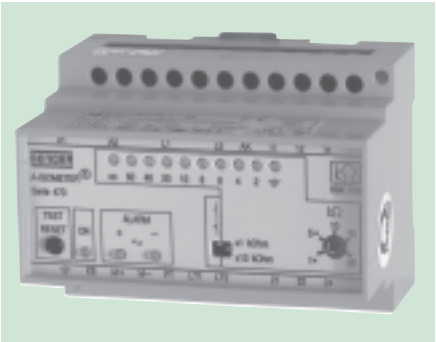
Chapter 1.4

A-ISOMETER® for AC systems > 230 V

e. g. main circuits with motors, pumps, fans and similar devices

A-ISOMETER® IR470LY...

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



IR470LY

Device characteristics

- Insulation monitoring for IT AC / 3(N) AC systems 0…793 V
- Nominal voltage extendable via coupling device
- Adjustable response values 1…200 kΩ
- Connection monitoring system / earth
- Power On and alarm LEDs indicating insulation faults AC, L+, L-
- LED bar graph indicator for the insulation resistance value
- Connection for external kΩ indication
- Combined TEST and RESET button
- Connection for external TEST and RESET button
- Alarm relay with 2 voltage-free changeover contacts
- N/O / N/C operation, selectable
- Fault memory, selectable

Product description

The A-ISOMETERs® 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 A-ISOMETERs® can also be used for higher voltages. Due to a separate supply voltage source it is possible to monitor de-energized systems.

The systems to be monitored should not include DC components. Due to the measuring principle, insulation faults behind directly connected rectifiers are indicated with increased response sensitivity. The preset response values apply to the pure AC system.

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 installation etc.

Function

If 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. The measured value is indicated on the LED bar graph indicator or an external measuring instrument. Different alarm LEDs AC, DC+ and DC- allow to distinguish between insulation faults on the AC and the DC side. In this way changes such as the connection of branch circuits can easily be detected. The fault message can be stored. The fault memory can be reset by pressing the RESET button. By pressing the TEST button, the function of the device can be tested.

Measuring principle

DC

Superimposed DC voltage with reversing stage (see chapter annex – measurement technology).

Standards

The IR470LY series complies with the standards: DIN EN 61557-8 (VDE 0413 part 8): 1998-05; EN 61557-8: 1997-03, IEC 61557-8: 1997-02, ASTM F 1669M-96.

Certifications

c UL us LISTED

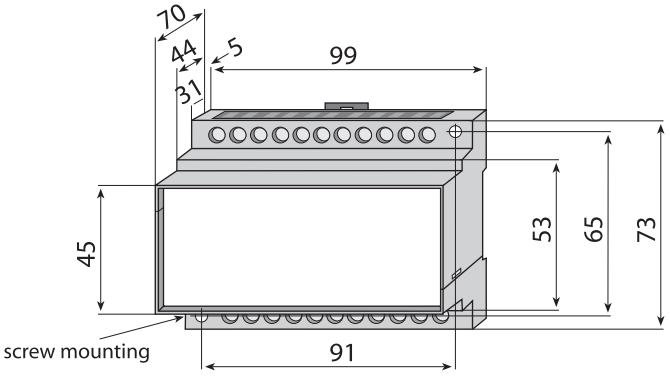
GL

Response delay

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

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

Dimension diagram, enclosure X470 Dimensions in mm



Ordering details

Type	Supply voltage U_S	Art. No.	Type	Supply voltage U_S	Art. No.
IR470LY-40	AC 230 V	B 9104 8007	IR470LY-4016	AC 500 V	B 9104 8018
IR470LY-4011	AC 24 V	B 9104 8012	IR470LY-4017	AC 690 V	B 9104 8017
IR470LY-4012	AC 42 V	B 9104 8002	IR470LY-4018	AC 440 V	B 9104 8024
IR470LY-4013	AC 90…132 V*	B 9104 8011	IR470LY-4021	DC 9.6…84 V*	B 9104 8006
IR470LY-4015	AC 400 V	B 9104 8008	IR470LY-4023	DC 77…286 V*	B 9104 8026

Other supply voltages on request. * absolute values

Accessories

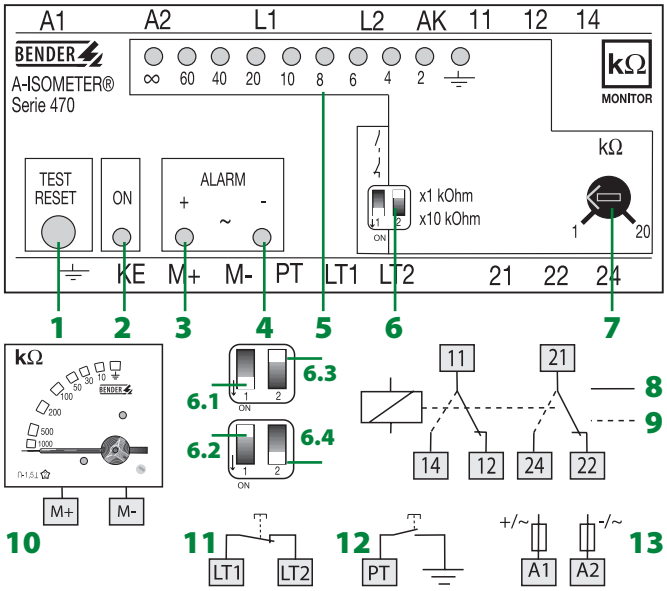
External kΩ measuring instruments

Type	Art. No.
7204-1421	B 986 763
9604-1421	B 986 764

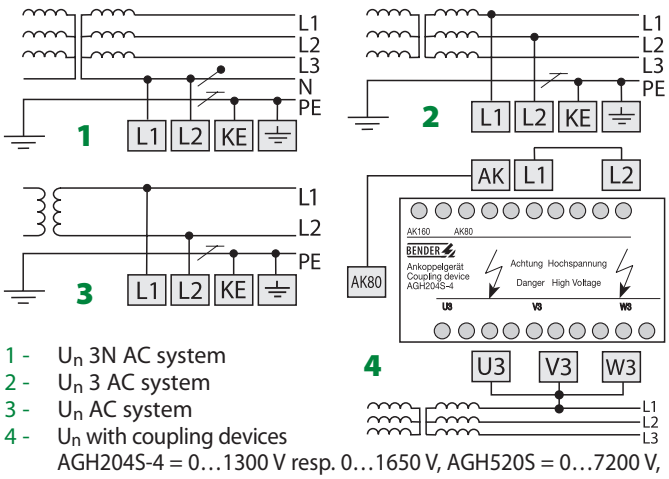
Coupling devices

Type	Nominal system voltage U_n	Art. No.
AGH204S-4	AC 0…1650 V	B 914 013
AGH520S	AC 0…7200 V	B 913 033

Wiring diagram – operating elements



1 - Combined TEST and RESET button; short-time pressing (< 1 s) = RESET; long-time pressing (> 2 s) = TEST
2 - Power On LED
3, 4 - Alarm LEDs yellow, light up when the insulation value falls below the preset value and flash in case of interruption of the connecting leads earth / KE or L1 / L2
5 - kΩ LED line
6 - Operating principle of the alarm relay and setting range R_{ALARM}
6.1 - N / O operation 6.3 - x 10 kΩ
6.2 - N / C operation 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: the meter scale point has to be multiplied by 10 kΩ.
7 - Potentiometer for the adjustment of the response value (R_{ALARM})
8 - Alarm relay – N / O operation (basic setting)
9 - Alarm relay – N / C operation
10 - External kΩ meter
11 - External RESET button or contact bridge for fault memory
12 - External TEST button
13 - U_S see ordering details, 6 A fuse (recommended)



1 - U_n 3N AC system
2 - U_n 3 AC 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 3 AC system

Technical data A-ISOMETER® IR470LY…

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 details
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} (ALARM1)	1 kΩ…200 kΩ
Response time t_{an} at R_F = 0.5 x R_{an} and C_e = 1 µF	
Range 10…200 kΩ	≤ 1 s
Range 1…10 kΩ	≤ 3 s

Measuring circuit

Measuring voltage U_m	≤ 40 V
Measuring current I_m max. (at R_F = 0 Ω)	≤ 200 µA
Internal d.c. resistance R_i	≥ 200 kΩ
Internal impedance Z_i at 50 Hz	≥ 180 kΩ
Max. admissible extraneous DC voltage U_{fg}	≤ 800 V
System leakage capacitance C_e	≤ 20 µF

Outputs

TEST / RESET button	internal / external
Current output at measuring instrument (scale centre point = 120 kΩ)	0…400 µA
Max. load	25 kΩ

Switching elements

Switching elements	2 changeover contacts
Operating principle	N/O / N/C operation
Factory setting	N/O operation
Electrical endurance	12000 cycles
Contact class	IIB acc. to DIN IEC 60255 part 0-20
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
Minimum contact current at DC 24 V	2 mA (50 mW)

General data

Shock resistance acc. to IEC 60068-2-27 (device in operation)	15 g / 11 ms
Bumping acc. to IEC 60068-2-29 (during transport)	40 g / 6 ms
Vibration resistance acc. to IEC 60068-2-6 (device in operation)	1 g / 10…150 Hz
Vibration resistance acc. to IEC 60068-2-6 (during transport)	2 g / 10…150 Hz
Ambient temperature, during operation	-10 °C…+55 °C
Storage temperature range	-40 °C…+70 °C
Climatic class according to IEC 60721-3-3	3K5
Operating mode	continuous operation
Mounting	any position
Connection	screw terminals
Wire cross section, rigid, flexible	0.2…4 mm² / 0.2…2.5 mm²
Degree of protection, int. components (DIN EN 60529)	IP30
Degree of protection, terminals (DIN EN 60529)	IP20
Screw fixing	2 x M4
DIN rail mounting according to	DIN EN 60715 / IEC 60715
Flammability class	UL94V-0
Instruction leaflet	104001
Weight approx.	360 g

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