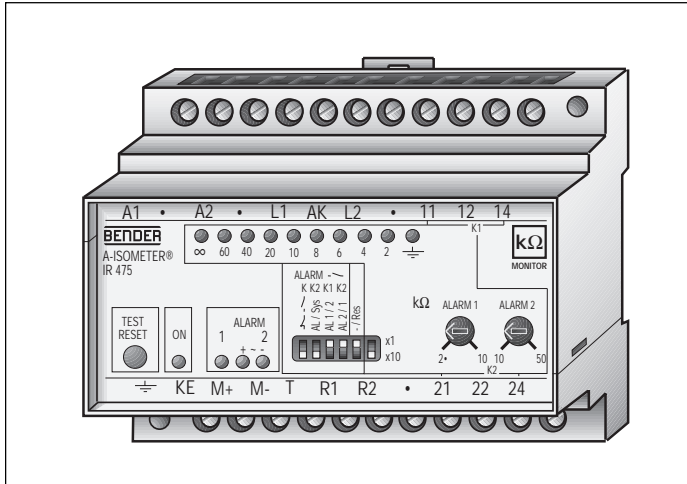
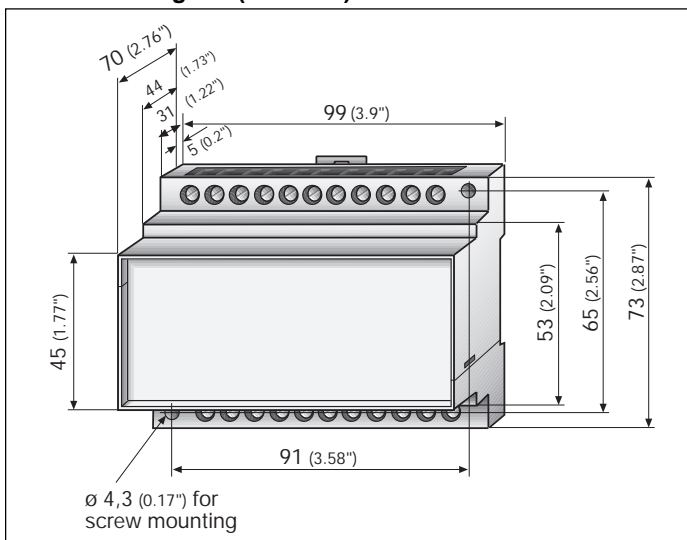




VDE IEC



### Dimension Diagram (mm/inch)



- For Ungrounded AC-, 3AC- and DC systems (isolated power) from AC 0 to 690 V/ DC 0 to 400 V
- Nominal voltage range can be extended by coupling units to 6000V
- Automatic adaption to the system leakage capacitance
- BENDER AMP-measuring method
- Two steplessly adjustable alarm set-points:  
Pre-alarm: 20..500kΩ, Main-alarm: 2...50kΩ
- Power ON LED, alarm LEDs, LED kΩ-bar graph
- Two alarm relays with SPDT contacts
- Relay normally energized or de-energized, selectable
- Fault memory, selectable

### Product Description

The Insulation Resistance Monitor IR475LY-4.. monitors the insulation resistance of ungrounded systems (isolated power) up to AC 690 V or DC 400 V. The device can be used universally in AC, DC and AC/DC systems.

The IR475LY-4.. is particularly suited for DC systems and AC systems with variable frequency drives and DC loads. The monitor will automatically adjust to the system leakage capacitance to 20 μF.

The AMP measuring method guarantees reliable insulation monitoring of AC/DC systems as well as pure AC or DC systems.

### Operational Information

Within the IR475LY-4.. a pulsating AC measuring voltage is generated. The positive pole is connected to the system to be monitored via the terminals L1/L2. The negative pole is connected to ground via an electronic circuitry and the terminals  $\perp$  / KE. The connections are monitored continuously. If one of these connections is interrupted, the alarm LEDs flash and the alarm relays switch.

The measuring pulse consists of positive and negative pulses of the same amplitude. The pulse duration depends on the respective leakage capacitances and insulation resistance of the system to be monitored.

The measuring circuit is closed via ohmic insulation faults. When the insulation value falls below the pre-set response value, the alarm LEDs "ALARM" illuminate and the alarm relays switch. The alarm LEDs "ALARM 2" indicate either "AC ground fault" or "DC ground fault".

Insulation faults in DC circuits which are directly connected to the AC system are only monitored when the rectifiers carry a load of at least 5 mA.

If the fault indication is to be stored, the terminals R1/R2 have to be bridged by an external reset button (NC contact) or the DIP switch has to be set to <Res>. The fault memory can be reset by pressing the front-mounted <TEST/RESET> button for a short time or by using an external reset button, provided that the insulation resistance is at least 25% above the pre-set response value.

The correct function of the measuring circuit, the alarm LEDs and the alarm relays can be checked by using the test button.

The alarm relay 21-22-24 can optionally be used for fault alarm or system fault alarm (interruption of the connecting leads L1/L2 resp.  $\perp$  / KE, failure of the electronic measuring circuit). Both alarm relays can indicate both Alarm 1 as well as Alarm 2.

The response range can be selected by using the DIP switch x1 (2...10 kΩ, 10...50 kΩ) or x10 (20...100 kΩ, 100...500 kΩ). Scaling of the LED bar graph kΩ indicator is also related to the pre-set multiplier, e.g. x1 (4 = 4 kΩ), x10 (4 = 40 kΩ).

## Technical Data, IR475LY-4..

### Insulation

Rated insulation voltage	AC 630 V
Rated impulse voltage / disturbance grade	6 kV / 3
Voltage test acc. to IEC 255	3.75kV

### System being Monitored

System nominal voltage $U_{N(AC)}$	3AC 0...690 V
Operating range	0...1.2 $U_N$
Frequency (for f<50Hz see manual)	50...400 Hz
System nominal voltage $U_{N(DC)}$	DC 0...400 V
Operating range	0...1.2 $U_N$

### Supply Voltage

Supply voltage $U_S$	See Ordering Guide for complete list
Operating range $U_S$	0.8...1.15 $U_S$
Maximum self-consumption	3.5 VA

### Alarm Response Values

	<b>x1 / x10</b>
Response value ALARM1	2...10 / 20...100k $\Omega$
Response value ALARM2	10...50 / 100.500k $\Omega$
Hysteresis	approx. 25%
Measuring time ( $R_E=0,5 \times R_{ALARM}$ , $C_E=1\mu F$ )	
Range 6...500k $\Omega$	< 8...12 sec
Range 2...6k $\Omega$	< 8...35 sec
System leakage capacitance	max. 20 $\mu F$

### Measuring Circuit

Measuring voltage $U_M$ (PEAK VALUE)	20 V
Measuring current $I_M$	max. 100 $\mu A$
Internal DC resistance $R_I$	200k $\Omega$
Impedance (60Hz)	180k $\Omega$
Maximum admissible stray DC voltage	DC 800V

### Outputs

Measuring instrument SKMP	120 k $\Omega$
Current output (max. load)	0..400 $\mu A$ (25 k $\Omega$ )
Terminal [AK] for high-voltage coupling device	Yes

### Contact Configuration

Type	2 voltage-free SPDT contacts
Rated contact voltage	AC 250 V / DC 300 V
Rated current	UC 5 A
Break capacity AC 230 V, p.f. = 0.4	AC 2 A
DC 220 V, L/R = 0.04s	DC 0.2 A
Operating mode	N/E or N/D mode
Factory setting	Normally De-energized (N/D) mode

### Testing

Test of the Electromagnetic Compatibility (EMV):	
Immunity against electromagnetic interferences acc. EN 50082-2	
Emissions acc. to EN 50081:	
Emissions acc. to EN 55011/CISPR11	class B
Mechanical tests:	
Shock resistance acc. to IEC 68-2-27	15 g/11 ms
Bumping acc. to IEC 68-2-29	40 g/6 ms
Vibration strength acc. to IEC 68-2-6 10 ... 150 Hz/0,15 mm - 2 g	

### Environmental conditions

Operating temperature	-10°C ... +55°C
Storage temperature	-40°C ... +70°C
Climatic class acc. to IEC 721	3K5, except condensation and formation of ice

### General Data

Type of connection	screw terminals
Wire size, solid	14 AWG
Wire size, stranded with end sleeve	16 AWG
Mounting	DIN rail or screw (#990 056)
Weight	2 lbs

## Important Information:

The IR475LY-... is suited for both single- and three-phase AC as well as DC systems. As indicated in the wiring diagram, there are several ways of connection. From the metrological point of view, it is irrelevant whether the connections L1 and L2 are connected to one or two different system conductors or to the N-conductor. L1 and L2 have to be connected separately. Consider the maximum rated voltage when connecting the device. The terminals KE and  $\frac{1}{2}$  have also to be connected separately. A response error of max. +/- 1 k $\Omega$  is possible within the setting range 2 ... 6 k $\Omega$ .

### Operation in combination with coupling devices:

The IR475LY-4.. can be used in combination with the coupling devices AGH204S (up to AC 1.5 kV) and AGH520S (up to AC 6 kV) only within the range of 20 ... 500 k $\Omega$ . For this purpose, the range selector has to be set to x10. Connection monitoring is not possible when using the device with coupling devices. Therefore the connections L1 and L2 have to be bridged.

## Ordering Guide

Model	Supply voltage $U_S$	Article #
IR475LY-411	AC 24 V	91068 039
IR475LY-412	AC 42 V	91068 040
IR475LY-413	AC 120 V	91068 041
IR475LY-414	AC 230 V	91068 038
IR475LY-415	AC 400 V	91068 042
IR475LY-416	AC 500 V	91068 047
IR475LY-417	AC 690 V	91068 043
IR475LY-421	DC 9.6 ... 84 V*	91068 037
IR475LY-423	DC 77 ... 286 V*	91068 044

## High-voltage Coupling Devices

Model	System voltage	Article #
AGH204S	AC 0...1500V	914013
AGH520S	AC 0...6000V	913033
AGH150W	DC 0 ... 1000V	915576

## External Panel-mount Meters

Model	Dimensions	Article #
7204S-1421	72x72mm	986804
9604S-1421	96x96mm	986774

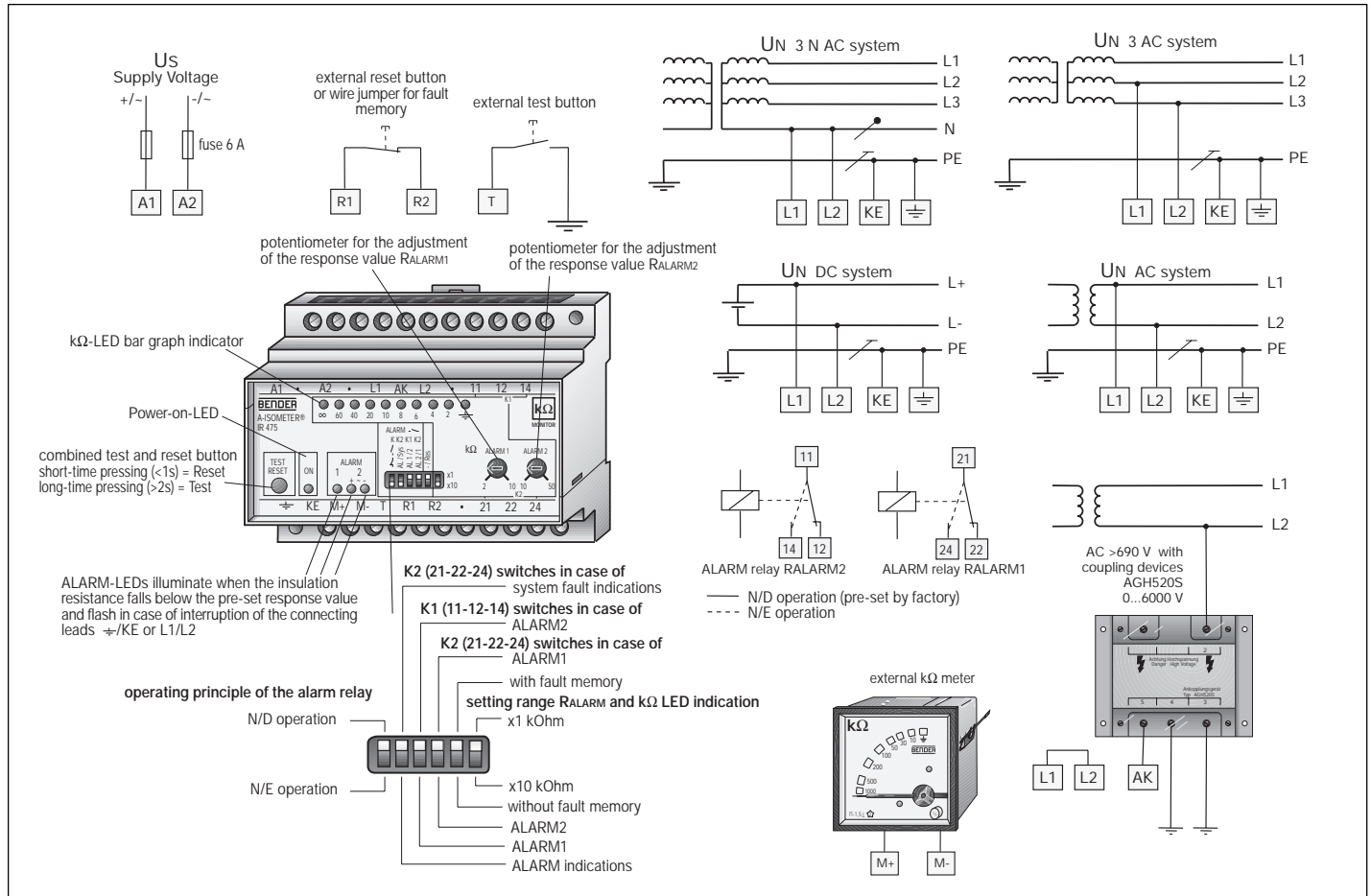
\* Explanation:

$R_E$  = insulation resistance between system and ground (total resistance)

$C_E$  = leakage capacitance between system and ground (total leakage capacitance)

SKMP = meter scale center point

## Wiring Diagram



## Safety Instructions

Only one insulation monitoring device may be used in each interconnected system.

There must be a connection between L1/L2 for connection monitoring (e.g. via the winding of the isolating transformer). Connection monitoring is essential to guarantee the safety measure. This function remains deactivated when L1/L2 or KE/PE are bridged.

In order to check the proper connection of the device, it is recommended to carry out a functional test using a genuine ground fault, e.g. via a suitable resistance, before using the Insulation Resistance Monitor.

When insulation or voltage tests are to be carried out, the device must be isolated from the system for the test period.

Please check for correct system & supply voltage !

Electrical equipment shall only be installed by a skilled person in consideration of current local and national safety regulations.

For short-circuit protection, the connection to the supply voltage has to be equipped with a protective device according to IEC 364-4-473 (a fuse of 6A is recommended).

Short-circuit protection for system coupling and connection monitoring according to IEC 364-4-473 is not necessary when the wiring has been installed short-circuit and ground-fault proof; i.e. that the risk of a short-circuit is reduced to the absolute minimum.

For checking the connection of the IR475LY-4.. measuring circuit to the system being monitored, the IR475LY-4.. is equipped with connection monitoring. The following fault indications are possible:

Fault Indications	Alarm-LEDs		Alarm Relays	
	1	2	11-12-14	21-22-24
Alarm2 AC faults	x	x		x
Alarm2 DC faults L+	x			x
Alarm2 DC faults L-		x		x
Alarm1 AC faults	x	x	x	x
Alarm1 DC faults L+	x	x	x	x
Alarm1 DC faults L-	x		x	x
Interruption PE/E or L1/L2	0	0	x	x
Systemfault (DIP2 to Sys)				x

o = flashing

x = continuous indication



If one of these indications occurs, the connections have to be checked by a skilled person immediately.