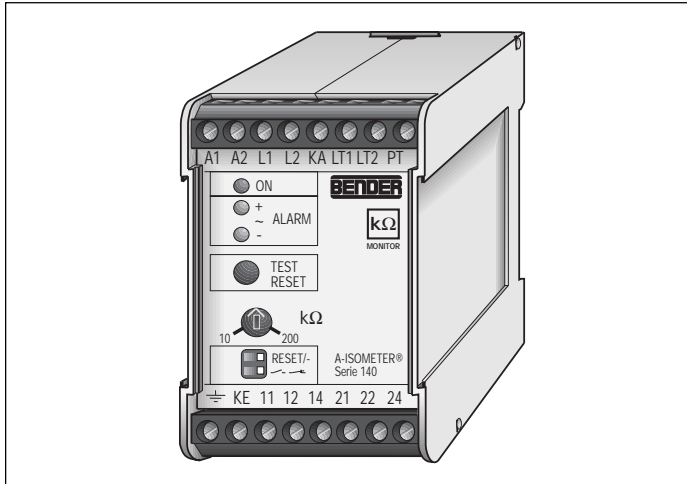
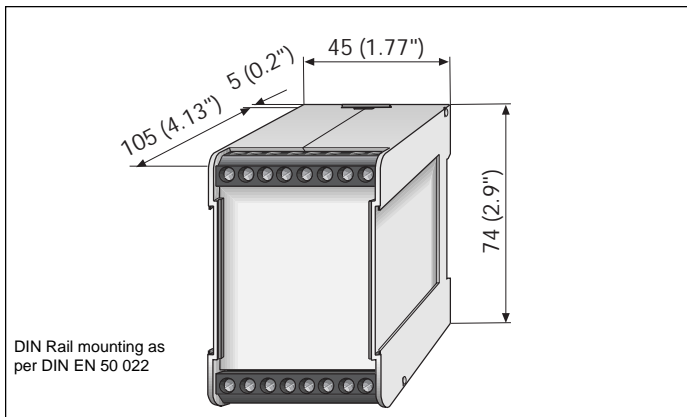




VDE IEC



### Dimension Diagram (mm/inch)



- For Ungrounded (floating) AC systems from AC 0 to 300 V
- Adjustable set-point ranges available from:
  - 1kΩ...20kΩ
  - 10kΩ...200kΩ
  - 0.5MΩ..5MΩ
- Operation and alarm LEDs
- Two voltage-free change-over contacts
- Connection monitoring
- Fault memory, selectable
- Test and reset button
- UL / CSA listed, Meets VDE/IEC standards, CE mark
- Meets IEC801-4, Class III EMC requirements

### Product Description

The BENDER A-ISOMETER IR140Y monitors the insulation resistance of ungrounded (floating) AC systems up to AC 300 V.

The response value is steplessly adjustable.

Versions IR140Y-40 and IR140Y-60 operate with a higher measuring voltage. Therefore, the increased response sensitivity to insulation faults behind directly connected rectifiers will be reduced in comparison to the sensitivity with lower measuring voltage (see characteristic curve).

The device is fitted into a standard plastic casing for quick assembly onto support rail according to DIN EN 50 022 or for screw mounting.

### Operational Information

Within the A-ISOMETER IR140Y, a DC measuring voltage is generated and the positive pole is connected to the system via the terminals L1/L2. The negative pole is connected to ground via an electronic circuitry and the terminals E ( $\frac{-}{\perp}$ )/KE. These connections are monitored continuously. If one of these connections is interrupted, the alarm LEDs flash and the alarm relay switches.

The measuring circuit is closed via ground faults between system and ground. When the insulation value of the system falls below the pre-set response value, the alarm LEDs "ALARM" illuminate and the alarm relay switches. The alarm LEDs indicate either "AC ground fault" or "DC ground fault".

If the ground fault indication is to be stored, the terminals LT1/LT2 have to be bridged by an external reset button (NC contact) or by selecting "with fault memory" at the respective DIP switch on the front plate. The memory can be reset by pushing the <TEST/RESET> button located at the front plate or the external button for a short period provided that the insulation resistance exceeds the selected alarm response value by at least 25%.

By pushing the test button, the correct function of the measuring circuit, the alarm LEDs and the alarm relay can be checked.

Note: Insulation faults on directly connected DC circuits are indicated with an increased response sensitivity. The preset response values apply to the pure AC system only. In order to avoid complex system conditions, DC supplied components should be isolated galvanically from the system to be monitored or a BENDER A-ISOMETER IR140Y should be used.

### Standards

The A-ISOMETER corresponds to the standards of DIN 57 413 BI2/VDE 0413 T2/01.73, IEC 1557-8; 1995, prEN 50197-8: 1994, ASTM F1207-89, UL508.

## Technical Data IR140Y

### Insulation

Rated insulation voltage	AC 250 V
Rated impulse withstand voltage/ disturbance level	4 kV/3
Voltage test acc. to IEC 255	2 kV

### Monitored System

Rated mains voltage $U_N$	
- IR140Y-3	AC 40 ... 400 Hz, 0 ... 138 V
- IR140Y-4, IR140Y-40	AC 40 ... 400 Hz, 0 ... 300 V
- IR140Y-6, IR140Y-60	AC 40 ... 400 Hz, 0 ... 300 V

### Supply Voltage

Supply voltage $U_S$	See ordering details below
Operating range $U_S$	AC 0.8 ... 1.15 x $U_S$

### Alarm Relay

Switching components	2 voltage-free SPDT contacts
Rated contact voltage	AC 250 V/DC 300 V
Rated current	AC/DC 5 A
Limited breaking capacity	
- AC 230 V and p.f. = 0.4	AC 2 A
- DC 110 V and L/R = 0.04 s	DC 0.2 A
Operating principle, selectable	N.D. or N.E. mode
Pre-set by factory	N.E. (Normally De-energized) mode

### Testing Standards

Test of the Electromagnetic Compatibility (EMC):  
Immunity against electromagnetic Interferences acc. EN 50082-2:

ESD acc. to IEC 1000-4-2	severity degree 3
EM field acc. to IEC 1000-4-3	severity degree 3
Burst acc. to IEC 1000-4-4	severity degree 3
Surge acc. to draft of IEC 1000-4-5	severity degree 3
Impulse voltage and electrical disturbance test acc. to IEC 255:	
Impulse voltage test acc. to IEC 255-5	class III
Electrical disturbance test acc. to IEC 255-5	class III
Emissions acc. to EN 50081-2:	
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

Ambient temperature, during operation	-10°C ... +55°C
Storage temperature range	-40°C ... +70°C

### General Data

Operation class	continuous operation
Mounting	as desired
Type of connection	screw terminals
Wire cross section	
- solid	14 AWG
- stranded	16 AWG
Rapid mounting	DIN EN 50 022
Protection class acc. to EN 60529	
- Internal components	IP 30
- Terminals	IP 20
Type of casing	XM45
Flammability class	UL 94V-0
Weight approx.	1 lb

### Ordering Details

Model	Supply Voltage $U_S$	Article #
IR140Y-3	AC 230 V	910 15504
IR140Y-311	AC 24 V	910 15505
IR140Y-312	AC 42 V	910 15506
IR140Y-313	AC 90-132 V**	910 15509
IR140Y-321*	DC 10.5-80 V**	910 15508
IR140Y-4	AC 230 V	910 16505
IR140Y-411	AC 24 V	910 16525
IR140Y-412	AC 42 V	910 16526
IR140Y-413	AC 90-132 V**	910 16523
IR140Y-421*	DC 10.5-80 V**	910 16513
IR140Y-6	AC 230 V	910 16507
IR140Y-613	AC 90-132 V**	910 16519
IR140Y-621*	DC 10.5-80 V**	910 16515
IR140Y-40	AC 230 V	910 16506
IIR140Y-4013	AC 90-132 V**	910 16524
IR140Y-4021*	DC 10.5-80 V**	910 16514
IR140Y-60	AC 230 V	910 16508
IR140Y-6013	AC 90-132 V**	910 16521
IR140Y-6021*	DC 10.5-80 V**	910 16516

Other supply voltages on request

\* EMC not tested

\*\*Absolute value of the voltage range

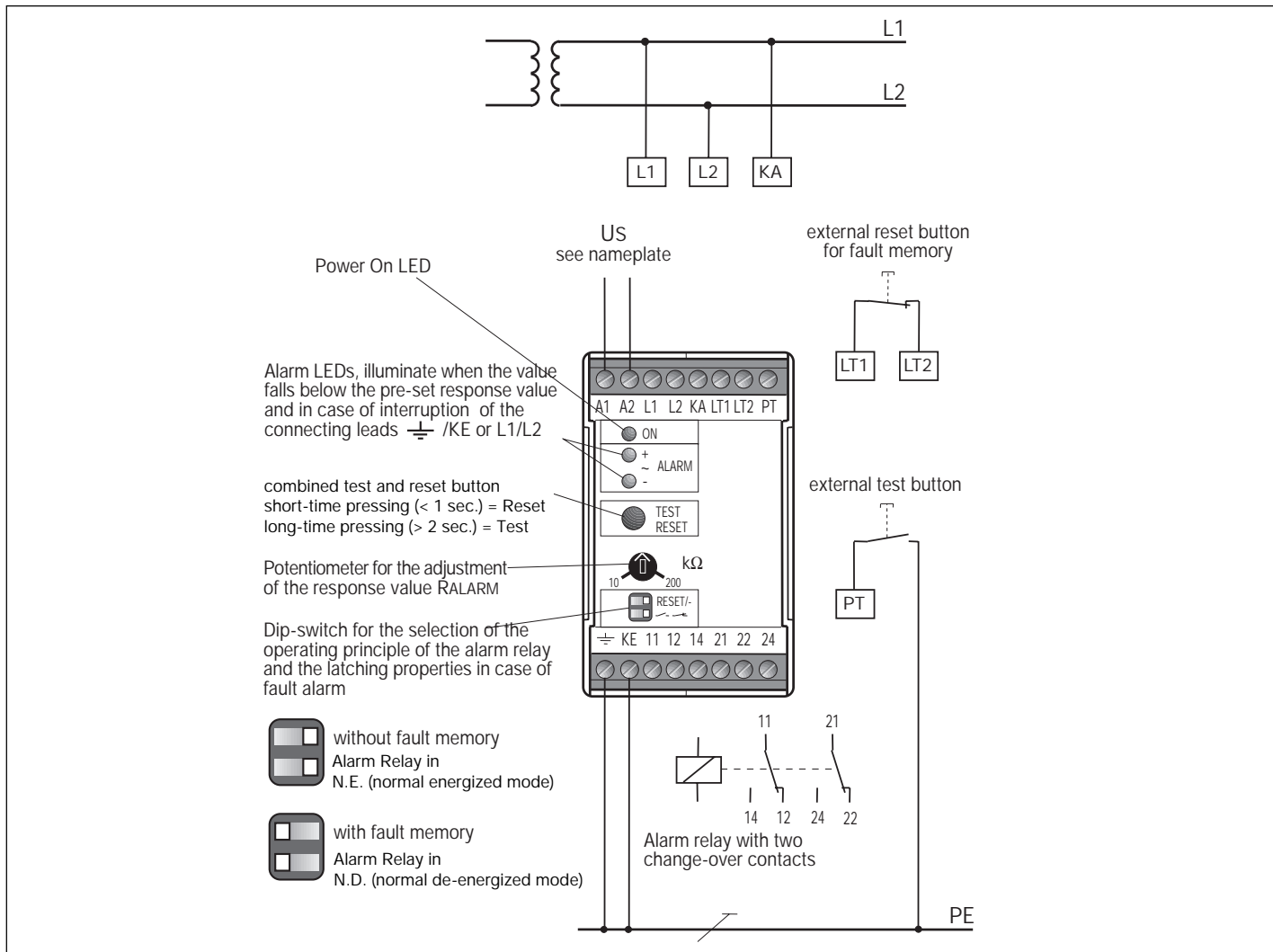
### Response Values

Model	Response value $R_{ALARM}$	Hysteresis	Response time ( $R_E=0k\Omega, C_E=1\mu F$ )	Response time ( $R_E=0.5xR_{ALARM}, C_E=1\mu F$ )	Response time ( $R_E=R_{ALARM}$ )	System leakage capacitance $C_E$ , max.
IR140Y-3	1 ... 20 k $\Omega$	25% for $R_{ALARM}$	0.5 s	0.8 s	0.9 s	20 $\mu F$
IR140Y-4	10 ... 200 k $\Omega$	25% for $R_{ALARM}$	0.5 s	0.8 s	0.9 s	20 $\mu F$
IR140Y-40	10 ... 200 k $\Omega$	25% for $R_{ALARM}$	0.5 s	0.8 s	0.9 s	20 $\mu F$
IR140Y-6	0.5 ... 5 M $\Omega$	25% for $R_{ALARM}$	1 s	2 s	5 s	10 $\mu F$
IR140Y-60	0.5 ... 5 M $\Omega$	25% for $R_{ALARM}$	1 s	2 s	5 s	10 $\mu F$

### Measuring Circuit

Model	Measuring voltage $U_M$	Measuring current $I_M$	Internal DC resistance/impedance acc. to DIN VDE 0413	Max. admissible stray DC voltage
IR140Y-3	20 V	0.72 mA	28 k $\Omega$ / 24 k $\Omega$	138 V
IR140Y-4	20 V	0.17 mA	120 k $\Omega$ / 98 k $\Omega$	290 V
IR140Y-40	40 V	0.34 mA	120 k $\Omega$ / 110 k $\Omega$	290 V
IR140Y-6	20 V	17 $\mu A$	1.2 M $\Omega$ / 0.98 M $\Omega$	290 V
IR140Y-60	40 V	34 $\mu A$	1.2 M $\Omega$ / 1.1 M $\Omega$	290 V

## Wiring diagram



### Important Instructions

Only one insulation monitoring device may be used in each interconnected system. Please check for correct system and supply voltage.

The terminal KA must be connected by a separate wire to one phase conductor (L1 or L2) of the system to be monitored. This KA connection monitors the connections between the system being monitored and the Ground Fault Monitoring Device. There must be a connection between L1/L2/KA for connection monitoring (e.g. via the winding of the isolation transformer). This function is disabled if L1/L2 or KE/  $\frac{\perp}{\text{KE}}$  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 starting the operation.

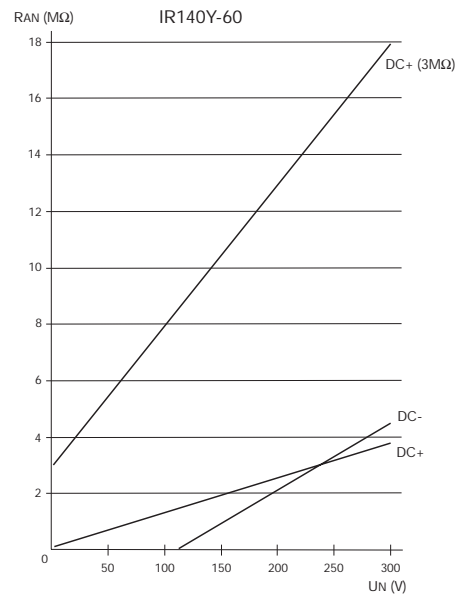
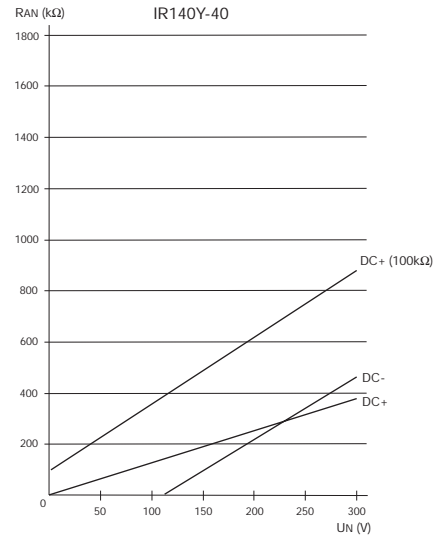
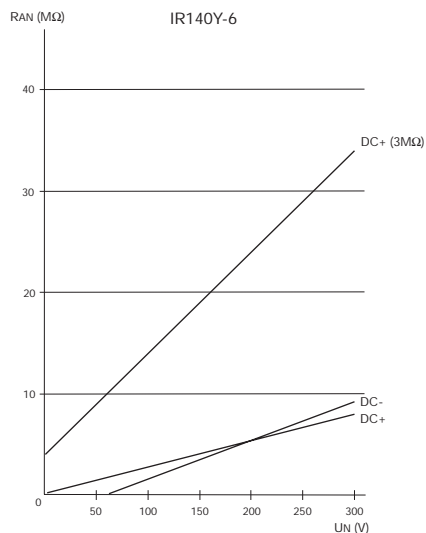
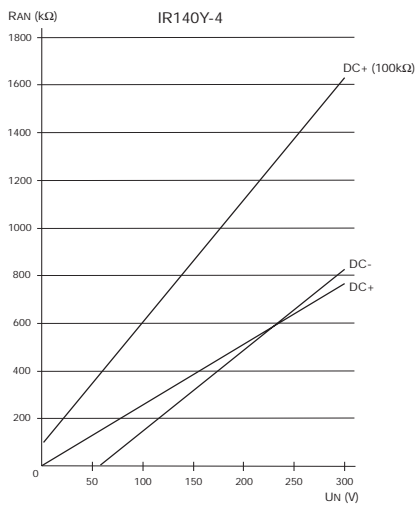
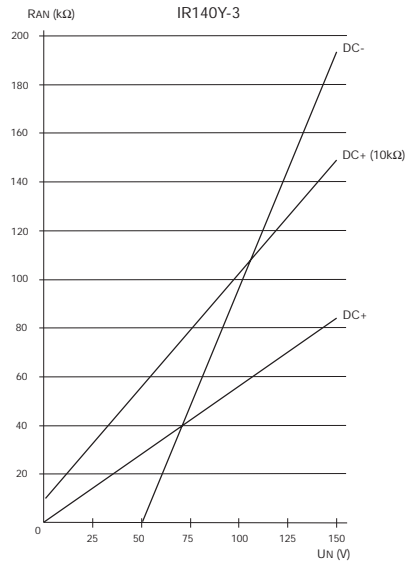
When insulation and voltage tests are to be carried out, the device must be isolated from the system for the test period. Electrical equipment shall only be installed by qualified personnel in consideration of the current national and local safety regulations.

For checking the measuring circuit, the BENDER A-ISOMETERS are equipped with connection monitoring. The following fault indications are possible:

Fault Indication	Alarm LED		Alarm relay
	+	-	
AC faults	x	x	x
DC faults L+	x		x
DC faults L-		x	x
Interruption $\frac{\perp}{\text{KE}}$ or L1/L2	o	o	x
o = flashing x = continuous indication			

If one of these fault indications occurs, the connections have to be checked as soon as possible.

## Characteristic Curve IR140Y/IR140Y-.0



### Response Sensitivity for DC ground faults

- DC+ Y version, response value in center position (midscale) (only relay)
- DC+ (1 MΩ) the middle DIP switch for the response value is activated
- DC+ alarm LED + and relay
- DC- alarm LED - and relay