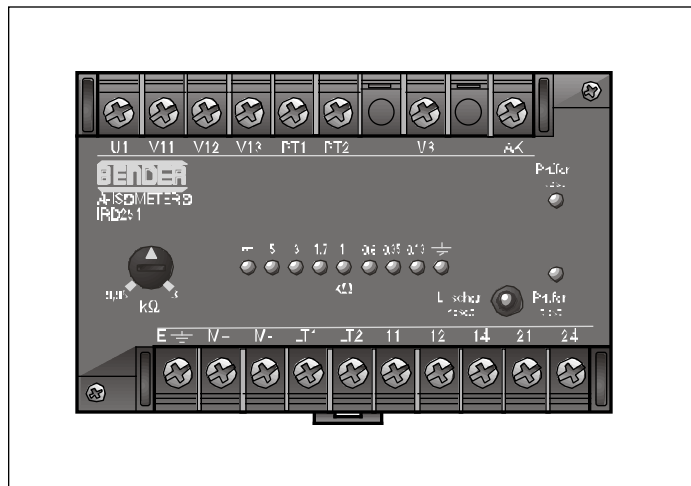
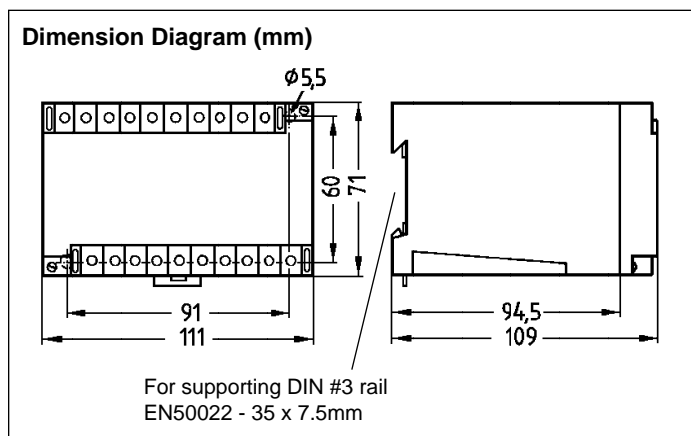


### INSULATION RESISTANCE MONITOR FOR 1Ø AND 3Ø AC SYSTEMS WITH OR WITHOUT DC COMPONENTS



#### Product Description

The IRD251..YX monitors the insulation resistance to ground in an ungrounded single or three-phase AC system. In addition to pure AC loads, it also operates with AC-supplied variable frequency and thyristor controlled DC drives. An active pulse-code measuring process enables fast and precise insulation resistance measurements to be obtained with system voltages from 0 to 220 V AC. High voltage couplers are required for higher voltages up to 2.5 kV. A supply voltage is necessary and may be taken from an independent power source or the system being monitored. The IRD251MYX has an integral analog ohmmeter. The IRD251LYX indicates the insulation resistance to ground on a LED chain display. The application possibilities include electrically operated furnaces, as e.g. melting furnaces, induction furnaces. These furnaces can also be operated by frequency converters.



#### Operational Information

The IRD251..YX is connected between the ungrounded single or three-phase AC system and the equipment ground. A pulse-code measuring voltage is superimposed on the complete system. An insulation fault between the system and ground completes the pulse-code measuring circuit. An electronic evaluation circuit calculates the insulation resistance to ground which is then displayed on the built-in ohmmeter. There is a slight time-delay which is dependent on the system capacitance. During short voltage variations, the measuring data is automatically suppressed and the last reading is stored until the next correct measurement can be made. If the reading is below the selected insulation resistance set-point, the output relay will change state. The output relay K1 will either deenergize in the fail-safe mode (NC operation) or energize in the standard mode (NO operation). A LED will indicate a ground fault.

- Early warning detection of developing ground faults
- For ungrounded (floating) 1Ø and 3Ø AC systems
- Steplessly adjustable alarm set-point from 50 ...3000
- Built-in analog or LED chain meter
- Built-in ground fault indication LED
- Built-in test / reset toggle switch
- Two voltage-free change-over contacts
- System capacitance adjustment
- Connection for high-voltage coupler
- Alarm relay, normally energized / de-energized mode
- Fault memory, selectable
- External 400µA ohmmeter connection
- Two-year warranty

Insulation monitors display the combined value of all insulation faults and paths to ground in parallel. In a disconnected circuit the conductors L1, L2 and L3 must be coupled via a low impedance (e.g. via an isolating transformer), to ensure correct k readings. Any connected DC circuits are monitored only when a current (> 1mA) flows through the rectifying diodes, thyristors or transistors. The test/reset toggle switch allows the unit to be tested. By switching to the test position, the yellow test LED will activate to indicate that a test cycle is being initiated. The ohmmeter should deflect to 0 and the ground fault LED will activate. The ground fault LED should deactivate and the meter should return to its normal position after the cycle is completed.

When the unit responds to a ground fault and the relay changes state, the unit cannot be reset until the ground fault has dropped below 25% of the alarm set-point value.

## Technical Data IRD251.YX

Nominal insulation voltage	AC 250 V
Isolation class according to	ASTM 1207-89
Test voltage	2000 V
Operation class	continuous operation
Rated system voltage $U_N$ with AGH251	AC 50 ... 400 Hz 0 ... 230 V AC 50 ... 10000 Hz 0 ... 1000 V
with AGH507S	AC 50 ... 1000 Hz 0 ... 2500 V
Operating range of $U_N$	0 ... 1.1 $U_N$
Max DC voltage allowed (between system and ground)	DC 55 V
Supply voltage $U_S$	U1-V11 U1-V12 U1-V13
AC 50 ... 60 Hz	42 V 110 V 230 V
or	230 V 380 V 500 V
or	380 V 500 V 660 V
Operating range of $U_S$	0.8 ... 1.15 $U_S$
Max. self-consumption	4 VA
Measuring voltage $U_M$	unsymm. 15 Vss
Measuring current max. $I_M$	8.3 mA
Internal resistance $R_I$	1.2 k
Impedance at 50 Hz $Z_I$	> 40 k
with AGH251 at 50 Hz	> 50 k
with AGH507S at 50 Hz	> 120 k
Response value $R_{AN}$ (adjustable)	50 ... 3000
Test cycle time = response retardation $t_{AN}$	> 5 sec
Max. mains leakage capacitance $C_E$	1 ... 10 $\mu$ F
Meter output	0 ... 400 $\mu$ A
Load	12.5 k
Switch components	1 SPDT / 1 SPST contacts
Switching capacity max.	1200 VA
Rated contact voltage	AC 230 V
Continuous current	5 A
Break capacity	
at AC 220 V and p.f. = 0.4	2 A
at DC 110 V and L/R = 0	0.5 A
Operating principle	Normally energized (NC)
Admissible ambient temperature	
when operating	- 5°C ... + 50°C
when stored	- 20°C ... + 70°C
Mounting	
IRD251M	according to meter
IRD251, IRD251L	indifferent
AGH251, AGH507S	indifferent
Type of connection	Terminal screws with self-lifting clamp-washers
Wire size	
solid	14AWG
stranded with end sleeve	16AWG
Protection class according to UL 508	type 2
Weight approx.	
IRD251.	1.55 lb
AGH251	2.87 lb
AGH507S	8.82 lb

## Please Note

Please check the label for correct supply voltage.

Only one insulation monitor may be connected per isolated system.

Before starting the operation, it is recommended to carry out a functional test by applying a ground fault via a suitable resistance.

Electrical equipment shall only be installed by qualified personnel and in compliance with current safety regulations.

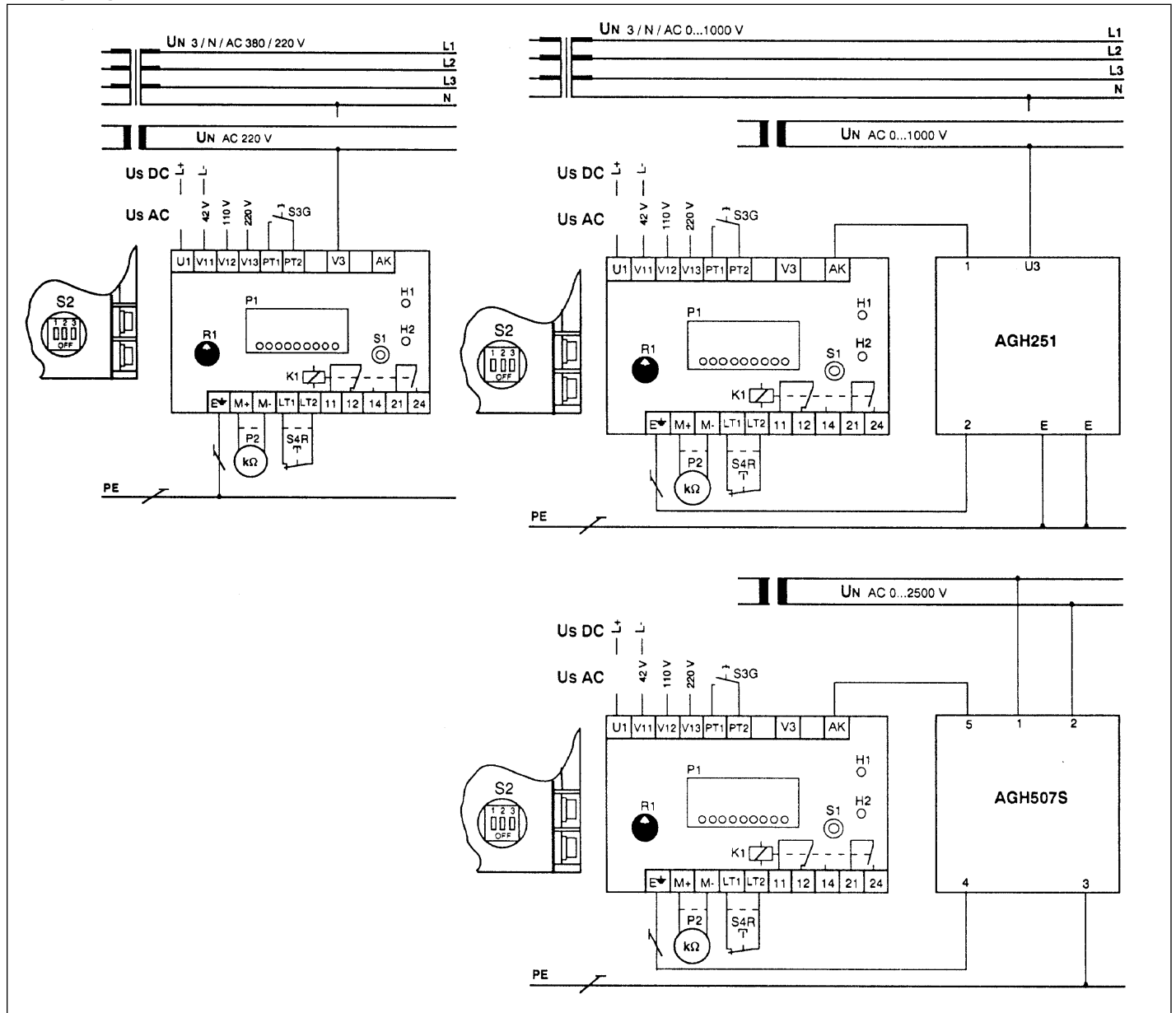
## Ordering Guide

Model	Supply voltage $U_S$	Article Number
IRD251LYX	AC 42/110/230V	914584
IRD251MYX	AC 42/110/230V	914585
IRD251MYX	DC 10.5...80V	914350

## High Voltage Couplers

Model	System voltage $U_N$	Article Number
AGH251S	AC 0...1kV	915578
AGH507S	AC 0...2.5kV	915570

## Wiring Diagram



### Legend to Wiring Diagram

- H1 LED, red, indicates "Ground Fault"
- H2 LED, yellow, indicates "Test Mode"
- S1 Combined test / reset toggle switch
- S2 DIP switch setting for system capacitance

$\mu\text{F}$	1	2	3
1	on	off	off
2	off	on	off
3	on	on	off
5	off	off	on
6	on	off	on
8	off	on	on
10	on	on	on

- S3G External test button
- S4G External reset button. When insulation faults are to be stored, the terminals LT1-LT2 have to be connected by either a bridge or a reset button.
- R1 Adjustable set-point value from 50 ...3000 .
- P1 Built-in k display. IRD251MYX analog meter.  
IRD251LYX LED chain display.
- P2 External k meter (0...400 $\mu\text{F}$  / 1.2k center-of-meter)
- K1 Alarm output relay (1 SPDT / 1 SPST contacts)