Insulation Testers

UNILAP ISO / ISO X

UNILAP ISO

- Insulation resistance 10 Ω … 30 GΩ with measuring voltages 50 … 1000 V DC and auto-monitoring of prescribed limits
- Resistance 0.1 Ω … 30 kΩ
- DC or AC voltage up to 600 V

UNILAP ISO X

- Insulation resistance 1 Ω … 3 TΩ with measuring voltage 50 … 1000 V DC with GUARD technology and auto-monitoring of prescribed limits
- Resistance 0.01 Ω … 3 kΩ with automatic pole-changing and high short-circuit current as per DIN VDE 0413/4 (>200 mA)
- Equivalent leakage current as per DIN VDE 0701/1 at extra-low voltage, with automatic recomputation for mains-voltage level
- Standing surface insulation resistance 10 Ω … 30 MΩ at extra-low voltage sinusoidal 50 Hz
- DC or AC voltage up to 600 V

Description

For the protection of humans, certain safety precautions must be complied with when erecting and operating electrical devices and installations. These precautions have been laid down in national and international regulations and must be checked at regular intervals. All of them are ultimately based on measurements of insulation resistance. In practice, however, requirements differ widely; thus diverse measuring voltages and, irrespective of these, the largest possible ranges. In addition, a modern meter is expected to offer useful additional measuring functions, such as a device check after repairs and reassembly as per VDE 0701, ÖVE HG 701 and other standards. All these requirements must, however, not interfere with simplicity of operation or with the overload capacity of the instrument.

The meters **UNILAP ISO** and **UNILAP ISO X** are the perfect solution. Both instruments meet the most stringent technical requirements within an area of application of maximum breadth and comply with all pertinent regulations. Their freely selectable test voltage and outstanding high ranges, together with full autoranging and GUARD technology, are eminently suitable for even the toughest measuring problems, e.g. for measuring highly insulating materials.

All measuring functions are fully automated under microprocessor control and indicated unequivocally and for any length of time on a large display optimized for clarity.

In practice this means:

- Select function

- Press START key

- Read measured value

But UNILAP ISO and UNILAP ISO X also offer extra features:

- fully automated prompting for protection against misconnection and damage due to misoperation
- automatic display of mains voltage before and after measurement, and of the discharge process after measurement
- unlimited display of the results of all measurements
- simultaneous display of actual measuring voltage and insulation resistance
- freely programmable LIMITs with optical and acoustical reporting on high and low infringement (standard values are stored!)
- locking of an undesirably high insulation voltage by a personal user code
- battery-saving automatic switchoff
- condensed user instructions in user's view
- splashproof case (IP 56)
- use of rechargeable batteries possible
- interface as option
- extensive accessories including carrying case included as supplied
- developed, designed and manufactured according to DIN ISO 9001

ELMES • HEME • NORMA

Technical Data

General:

Display: 4-digit (2999), 7-Segment-Liquid-Cristal -Display, 16 mm high, with fluorescent illumination, 56-division analog scale for voltage and resistance ranges
Working temperature range: –10° C ... 50° C
Operating temp. range: 0° C ... 30° C
Storage temperature range: –30° C ... 60° C
Operating error: refering to the nominal temperature range
Climate class: JWG as per DIN 40040 (3/73)
Protection: IP 56 as per DIN 40050 (7/80)
Safety class: complies with II (⧈) as per DIN VDE 0411 part 1 / IEC 61010
Quality Standards: developed, designed and manufactured refering to DIN ISO 9001
Max. noise voltage: for > 50 V, measurements are locked
Power supply: 6 Alkaline batteries 1.5 V(LR6) or Zink-Carbon batteries 1.5 V (IEC R6) or 1.2 V accus
Dimensions: 240 x 220 x 90 mm (L x W x H)
Weight: approx. 1.8 kg with batteries
approx. 4.0 kg with accessories in carrying case

UNILAP ISO

Insulation Resistance (VDE 0413/part 1)
Analog display:
Display switchable to the actual measuring voltage at the test object

Range	Resolution	Operating error*)
10 kΩ ... 30 GΩ	5 kΩ ... 200 GΩ	± 1 Scalemarks

*) Measuring voltage = 1000 V
Measuring rate: approx. 5/s

Digital display:

Nominal voltage	50 V ... 490 V	500 V ... 1000 V
Range	70 Ω ... 3 GΩ	70 Ω ... 30 GΩ
Display range	10 Ω ... 2.999 GΩ	10 Ω ... 29.99 GΩ
Operating error	± (3 % of m.v. + 2 digit)	

Automatical discharging after an insulation measurement.
Pre-set limit value: < 500 kΩ
Nominal voltage: 50…1000 V DC variable and 100/250/500/1000 V DC in fixed positions
Open circuit voltage: max. 1.05 x nominal voltage
Measuring current: ≥ 1 mA DC at U_N = 250 ... 1000 V
≥ 2.5 mA DC at U_N = 50 ... 250 V
Short circuit current: < 5 mA DC
Measuring rate: approx. 3/s
Max. overload: 1.2 x nominal voltage (measurement will not be started)

Resistance
Analog display:

Range	Display range	Resolution	Operating error
100 mΩ...10 kΩ	100 mΩ...100 kΩ	100 mΩ...20 kΩ	± 1 Scalemarks

Digital display:

Range	Display range	Resolution	Operating error
0…30 kΩ	0.1…29.99 kΩ	0.1…10 Ω	± (5% of m.v.+3 digit)

Pre-set limit value: > 0.3 Ω
Open circuit voltage: < 20 V DC
Short circuit current: ≤ 3 mA DC
Max. overload: U_{rms} = 600 V
Compensation of test lead resistance up to 10 Ω.

Voltage Measurement with automatic AC/DC detection
Analog display:

Range	Display range	Resolution	Frequency range	Operating error
20…600V	0…1000 V	20 V	DC/45…65 Hz	± 1 division

Digital display:

Range	Display range	Resolution	Frequency range	Limits of error
1…600V	0…1000 V	1V	DC/45…65 Hz	±(1% of m.v.+1 digit)

Impedance: approx. 600 kΩ
Max. overload: U_{eff} = 600 V

UNILAP ISO X

Insulation resistance (VDE 0413/part 1)
Analog display:
Display switchable to the real measuring voltage at the test object

Range	Resolution	Limits of error
10 kΩ ...1 TΩ	56 dots in part linear divided	±1 division

*) Measuring voltages = 1000 V
Measuring rate: approx. 5/s

Digital display:

Nominal voltage	100 V ... 250 V	500 V ... 1000 V
Range	7 Ω ... 3 GΩ	7 Ω ... 30 GΩ
Display range	1 Ω ... 2.999 GΩ	1 Ω ... 29.99 GΩ
Range with GUARD	7 Ω ... 300 GΩ	7 Ω ... 3 TΩ
Display range with GUARD	1 Ω ... 299.9 GΩ	1 Ω ... 2.999 TΩ
Operating error	± (3 % of m.v. + 2 digit)	
with GUARD	depending on measuring voltage and measured value from ±(3 % of m.v.+ 20 digits) to ±(30 % of m.v. +20 digits)	

Automatic discharging after an insulation measurement
Pre-set limit value: < 500 kΩ
Nominal voltage: 50…1000 V DC variable and 100/250/500/1000 V DC in fixed positions
Open circuit voltage: max. 1.05 x nominal voltage
Measuring current: ≥ 1 mA DC at U_N = 250 ... 1000 V
≥ 2.5 mA DC at Rx U_N = 50 ... 250 V
Short circuit current: < 5 mA DC
Measuring rate: approx. 3/s
Max. overload 1.2 x nominal voltage (measurement will not be started

Resistance (VDE 0413/Part 4)
Analog display:

Range	Display range	Resolution	Operating error
100 mΩ ...10 kΩ	100 mΩ...100 kΩ	100 mΩ...20 kΩ	± 1 division

Digital display:

Range	Display range	Resolution	Operating error
0.12 Ω...3 Ω	0.01…2999 Ω	0.01…1 Ω	±(5% of m.v. +4 digit)

Pre-set limit value > 0.3 Ω
Open circuit voltage: Battery voltage 6–9 V DC
Short circuit current: ≥ 200 mA DC
Max. ext. voltage: for U > 3 V the measurement is locked
Max. overload: U_{eff} = 600 V

Equivalent leakage current (VDE 0701/part 1)

Range	Display range	Resolution	Operating error
0.12...30 mA	0.01...29.99 mA	10 µA	± (5% of m.v.+ 3 digit)

Pre-set limit value: > 7 mA
Open circuit voltage: approx. 40 V AC, sinusoidal
Measuring frequency: 50 Hz
Max. overload: U_{eff} = 600 V
Compensation of test lead resistance up to 10 Ω.

Standing surface insulation resistance
Analog display:

Range	Display range	Resolution	Operating error
30kΩ...100 MΩ	10...100 MΩ	10 kΩ	± 1 division

Digital display:

Range	Display range	Resolution	Operating error
0.11 kΩ...3 MΩ	10 Ω...2999 kΩ	10 Ω...1 kΩ	± 3% of m.v. +3 digit)
with GUARD 0.11 kΩ...30 MΩ	10 Ω...29.99 MΩ	10 kΩ	to ± 15 % of m.v.

Pre-set limit value < 50 kΩ
Open circuit voltage: approx. 40 V AC, sinusoidal
Measuring frequency: 50 Hz
Max. overload: U_{eff} = 600 V

Voltage Measurement with automatic AC/DC detection
Analog display:

Range	Display range	Resolution	Frequency range	Operating error
20…600 V	0…1000 V	20 V	DC/45…65 Hz	± 1 division

Digital display:

Range	Display range	Resolution	Frequency range	Operating error
1…600 V	0…1000 V	1 V	DC/45 ... 65 Hz	±(1% of m.v.+1 digit)

Impedance: approx. 600 kΩ
Max. overload: U_{eff} = 600 V

UNILAP ISO X + WIN ISO

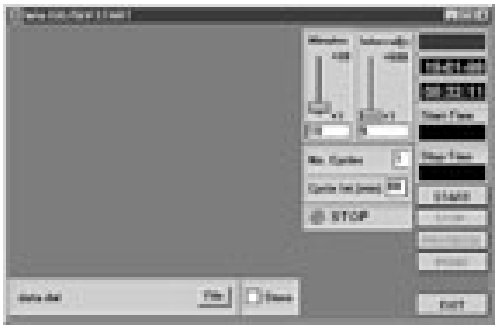
Professional data acquisition system for instulation measurements

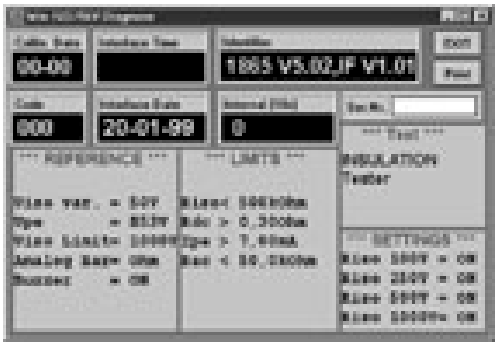

Raum für Firmen - Logo - Schriftkopf - Adresse

Prüfprotokoll über Isolationsprüfung

Prüfung: Riso 1000V Datum: 20.01.99 Zeit: 11:08:39

Parameter	Messwert	Sollwert	In Ordnung ja/nein	Bemerkungen
Riso 1000V	+0.470TOhm			
Uiso [V]	1023			
Absorption	1.94			





PC-Software WIN ISO

- Operative for **UNILAP ISO X** with RS232-interface or DOCU-PACK
- Acquisition of measuring values from **UNILAP ISO X** or DOCU-PACK
- Data export (ASCII) to other Windows® applications
- Measuring protocols - automatic data transfer into predefined forms (Windows®-Word)
- Graphical presentation of measuring values - curves, scaled diagrams
- Calculation of Polarisation Index IP
- Remote control of **UNILAP ISO X** - industrial test field, quality assurance, research, development, education...
- **BARCODE**-reader is supported
- **SETUP** - setting of date, time, user-definable text
- **DIAGNOSE** - display of instrument settings

Optimum benefit is achieved with **WIN ISO and UNILAP ISO X** with

Option DOCU-PACK

Suitable for UNILAP ISO X and UNILAP ISO 5kV with RS232-Interface consists of:

Serial interface:

Transmission:	19200 Baud, 8 data bits, no parity, 1 stop bit
Wires:	RXD, TXD, DSR, DTR, CTS, RTS
Data memory:	57kB (more than 100 data records) Date, time with buffer battery
Thermo printer:	24 characters/line, for protocol printing on site, interval printing

Option RS 232-Interface

Suitable for **UNILAP ISO X**, recommended: WIN ISO for comfortable data acquisition.

Consists of

Accumulator set:	600mAh, with charging and mains adapter
Transmission:	2400 baud, 8 data bits, no parity, 1 stop bit
Wires:	RXD, TXD, RTS, half duplex

Date, time, memory for 48 characters of customer text
SETUP- DIAGNOSE-software (3½ inch disk)
Remote control, data transfer by RS232-commands
Long-term evaluations, automatic test equipment

Description	Order-No.
Unilap ISO incl. 2 safety measuring leads with test picks,1 alligator clip, 6 batteries, carrying belt, operating instructions, in small case	A 1865 06111
UNILAP ISO X incl. 3 safety measuring leads with test picks, 2 alligator clips, 6 batteries, carrying belt, operating instructions,in small case	A 1865 06211
UNILAP ISO X with RS 232 interface and accuset 600 mAh incl. 3 safety measuring leads with test picks, 2 alligator clips, interface, set up software, RS 232 cable, Accu set, 600 mAh, 6 batteries, carrying belt, operating instructions, in small case	A 1865 06212
UNILAP ISO X with DOCU-PACK incl. 3 safety measuring leads with test picks, 2 alligator clips, DOCU-PACK, set-up software, RS 232 cable, 2 rolls thermopaper, 6 batteries, carrying belt, operating instructions, in large case	A 1865 06215
Interface RS 232 for UNILAP ISO X for data transfer to printer or PC incl. accumulator set (600 mAh), mains adapter, printer cable, PC-adapter, set up software (3 ½ inch disk)	A 6412 10211AT
Thermo printer RS 232 DPU 201	A 6413 06111
Interface-cable for RS 232	A 6045 00406
Printer-cable for DPU 201	A 6045 00405
Adapter RS 232-Centronics	A 6045 00610
Barcode Handscanner for reading in barcodes	A 6914 40300
DOCU-PACK for UNILAP ISO X with RS 232 interface Interface, data memory, printer 2 rolls thermopaper, 1 PC-cable (9-pole / 9-pole), 3 ½ inch disk, set up software 3 mounting rails, battery lid, Operating instructions	A 6412 06111
Thermopaper for DOCU-PACK/DPU 201 Paper roll for thermo-printer and DOCU-PACK	A 6202 46111
Transportcase for UNILAP with DOCU-PACK Case large for UNILAP-series with DOCU-PACK	A 6030 10300
Transportcase for UNILAP without DOCU-PACK Case small for UNILAP-series without DOCU-PACK	A 6030 10101
Carrying bag	A 6030 03300
Test probe for UNILAP ISO / ISO X with light and START-button	A 6914 40210
Accuset 1500 mAh (only possible when no RS 232 interface is built-in) 1,5 Ah with charging and mains adapter 230 V	A 6403 04111
Accuset 600 mAh 0.6 Ah with charging and mains adapter 230 V	A 6403 06211
PC Software for UNILAP ISO X Windowssoftware for SETUP, DIAGNOSE, data acquisition, protocol generation	A 6899 00171
Probe for standing surface insulation resistance	A 6045 07000
GUARD measuring lead set, 10 m	A 6045 10400
GUARD measuring lead set, 2,5 m	A 6045 10401
Safety measuring leads 1 pair red/black (silicon), 1.5 m long with test tips	A 6003 14205
Safety measuring leads with test picks, 2.5 m, 2 pcs. 1 pair redd/black, 2.5 m long with test picks	A 6003 14207
Test picks (3 pcs.) 3 pcs. per Set	A 6009 54300
Pair of measuring leads 1.5 m with 2 insulated alligator clips	A 6045 10211
Insulated alligator clips (3 pcs.) 3 pcs. per Set	A 6009 17103

Distributor

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LEM NORMA GmbH
Palmersstraße 2
A-2351 Wiener Neudorf
PHONE: +43(0)2236 691-0
FAX: +43(0)2236 63 080
E-mail: lno@lem.com

LEM UK LTD
Geneva Court, 1 Penketh Place, West Pimbo
Skelmersdale, Lancashire WN8 9QX
PHONE: 01695 - 720 777
FAX: 01695 - 507 04
E-mail: luk@lem.com

LEM Instruments Inc.
23822 Hawthorne Boulevard #100
Torrance, CA 90505
PHONE: 1-310-373-0966
FAX: 1-310-373-9056
E-mail: liu@lem.com