

Insulation Testers

UNILAP ISO / ISO X

UNILAP ISO

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

UNILAP ISO X

- Insulation resistance 1 Ω ... 3 T Ω with measuring voltage 50 ... 1000 V DC with GUARD technology and auto-monitoring of prescribed limits
- Resistance 0.01 Ω ... 3 k Ω 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 M Ω 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

Technical Data

General:

Display: 4-digit (2999), 7-Segment-Liquid-Crystal-Display, 16 mm high, with fluorescent illumination, 56-division analog scale for voltage and resistance ranges

Working temperature range: $-10^{\circ}\text{C} \dots 50^{\circ}\text{C}$


Operating temp. range: $0^{\circ}\text{C} \dots 30^{\circ}\text{C}$

Storage temperature range: $-30^{\circ}\text{C} \dots 60^{\circ}\text{C}$

Operating error: referring 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 referring to DIN ISO 9001

Max. noise voltage: for $> 50\text{ V}$, 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 k Ω ... 30 G Ω	5 k Ω ... 200 G Ω	± 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 G Ω	70 Ω ... 30 G Ω
Display range	10 Ω ... 2.999 G Ω	10 Ω ... 29.99 G Ω
Operating error	$\pm (3\% \text{ of m.v.} + 2 \text{ digit})$	

Automatical discharging after an insulation measurement.

Pre-set limit value $< 500\text{ k}\Omega$

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: $\geq 1\text{ mA DC}$ at $U_N = 250 \dots 1000\text{ V}$
 $\geq 2.5\text{ mA DC}$ at $U_N = 50 \dots 250\text{ V}$

Short circuit current: $< 5\text{ mA DC}$

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 m Ω ...10 k Ω	100 m Ω ...100 k Ω	100 m Ω ...20 k Ω	± 1 Scalemarks

Digital display:

Range	Display range	Resolution	Operating error
0...30 k Ω	0.1...29.99 k Ω	0.1...10 Ω	$\pm (5\% \text{ of m.v.} + 3 \text{ digit})$

Pre-set limit value: $> 0.3\ \Omega$

Open circuit voltage: $< 20\text{ V DC}$

Short circuit current: $\leq 3\text{ mA DC}$

Max. overload: $U_{\text{rms}} = 600\text{ V}$

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	1 V	DC/45...65 Hz	$\pm(1\% \text{ of m.v.} + 1 \text{ digit})$

Impedance: approx. 600 k Ω

Max. overload: $U_{\text{eff}} = 600\text{ V}$

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 k Ω ...1 T Ω	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 G Ω	7 Ω ... 30 G Ω
Display range	1 Ω ... 2.999 G Ω	1 Ω ... 29.99 G Ω
Range with GUARD	7 Ω ... 300 G Ω	7 Ω ... 3 T Ω
Display range with GUARD	1 Ω ... 299.9 G Ω	1 Ω ... 2.999 T Ω
Operating error	$\pm (3\% \text{ of m.v.} + 2 \text{ digit})$	
with GUARD	depending on measuring voltage and measured value from $\pm(3\% \text{ of m.v.} + 20 \text{ digits})$ to $\pm(30\% \text{ of m.v.} + 20 \text{ digits})$	

Automatic discharging after an insulation measurement

Pre-set limit value $< 500\text{ k}\Omega$

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: $\geq 1\text{ mA DC}$ at $U_N = 250 \dots 1000\text{ V}$

$\geq 2.5\text{ mA DC}$ at $R_x U_N = 50 \dots 250\text{ V}$

Short circuit current: $< 5\text{ mA DC}$

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 m Ω ...10 k Ω	100 m Ω ...100 k Ω	100 m Ω ...20 k Ω	± 1 division

Digital display:

Range	Display range	Resolution	Operating error
0.12 Ω ...3 Ω	0.01...2999 Ω	0.01...1 Ω	$\pm(5\% \text{ of m.v.} + 4 \text{ digit})$

Pre-set limit value $> 0.3\ \Omega$

Open circuit voltage: Battery voltage 6-9 V DC

Short circuit current: $\geq 200\text{ mA DC}$

Max. ext. voltage: for $U > 3\text{ V}$ the measurement is locked

Max. overload: $U_{\text{eff}} = 600\text{ V}$

Equivalent leakage current (VDE 0701/part 1)

Range	Display range	Resolution	Operating error
0.12...30 mA	0.01...29.99 mA	10 μA	$\pm (5\% \text{ of m.v.} + 3 \text{ digit})$

Pre-set limit value: $> 7\text{ mA}$

Open circuit voltage: approx. 40 V AC, sinusoidal

Measuring frequency: 50 Hz

Max. overload: $U_{\text{eff}} = 600\text{ V}$

Compensation of test lead resistance up to 10 Ω .

Standing surface insulation resistance

Analog display:

Range	Display range	Resolution	Operating error
30k Ω ...100 M Ω	10...100 M Ω	10 k Ω	± 1 division

Digital display:

Range	Display range	Resolution	Operating error
0.11 k Ω ...3 M Ω	10 Ω ...2999 k Ω	10 Ω ...1 k Ω	$\pm 3\% \text{ of m.v.} + 3 \text{ digit}$
with GUARD	10 Ω ...29.99 M Ω	10 k Ω	to $\pm 15\% \text{ of m.v.}$

Pre-set limit value $< 50\text{ k}\Omega$

Open circuit voltage: approx. 40 V AC, sinusoidal

Measuring frequency: 50 Hz

Max. overload: $U_{\text{eff}} = 600\text{ V}$

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	$\pm(1\% \text{ of m.v.} + 1 \text{ digit})$

Impedance: approx. 600 k Ω

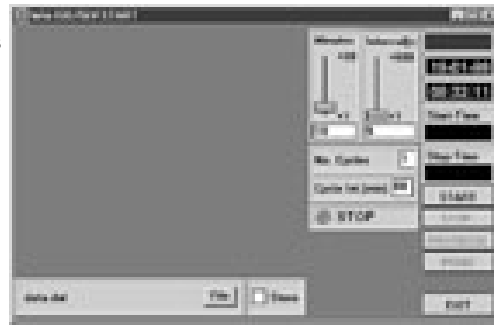
Max. overload: $U_{\text{eff}} = 600\text{ V}$

UNILAP ISO X + WIN ISO

Professional data acquisition system for insulation measurements

Raum für Firmen- Logo - Schriftkopf - Adresse

Prüfprotokoll über Isolationsprüfung		Protokoll-Nr.: 2001.99	Zeit: 11.34
Prüfer & Type:		Seriennummer	
Prüfung:			
Type:	Hersteller:		
Ser. Nr.:	Einjeder:	Nennspannung:	Leistung:
Name des Kunden:			
Anschluß:			
Kundenangaben:			
Durchgeführte Arbeiten:			
Leistungsdaten, Rechnung:			
Arbeitszeit:	3 min		
Ergebnis:			
sonstige Angaben:			
Rechnungslegung (- % MWSt = enthalten)			
Enderkprüfung:			
Prüfung: Fluo 1000V		Datum: 20.01.99	Zeit: 11:00:30
Parameter	Messwert	Zulimert	In Ordnung ja/nein
Fluo 1000V	+0.47070k		
Uiso[V]	1023		
Absorption	1.54		
Hinweis: Prüfung ist fertig			
Unterschrift des Prüfers:		Unterschrift des Kunden:	



Calib. Date	Insulation Test	Insulation	1885 VS.02 IP V1.01
Calib.	Insulation Date	Insulation (kV)	Ser. No.
000	20-01-99	0	
*** REFERENCE ***		*** LIMITS ***	
Fluo var. = 50V	Fluo = 500kOhm	INSULATION Tester	
Type = 51V	Fluo > 0.300k	*** SETTINGS ***	
Fluo Limit = 5000kOhm	Fluo > 7.00k	Fluo 500V = 08	
Analog Meter On = 0k	Fluo < 10.00k	Fluo 250V = 08	
Fluo Meter = 08		Fluo 500V = 08	
		Fluo 500V = 08	

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

