GOSSEN METRAWATT

Measuring Instruments and Testers 2006

CERTIFICATE

DQS Deutsche Gesellschaft zur Zertifizierung von Managementsystemen mbH

hereby certifies that the company

Gossen-Metrawatt GMBH
Thomas-Mann-Strasse 16-20
D-90471 Nürnberg

GMC-Instruments Deutschland GmbH
Thomas-Mann-Strasse 16-20
D-90471 Nürnberg

for the scope

R & D, Manufacture, Sales and Service of Measuring, Test and Control Instruments as well as Energy Control Systems

has implemented and maintains a

Quality Management System.

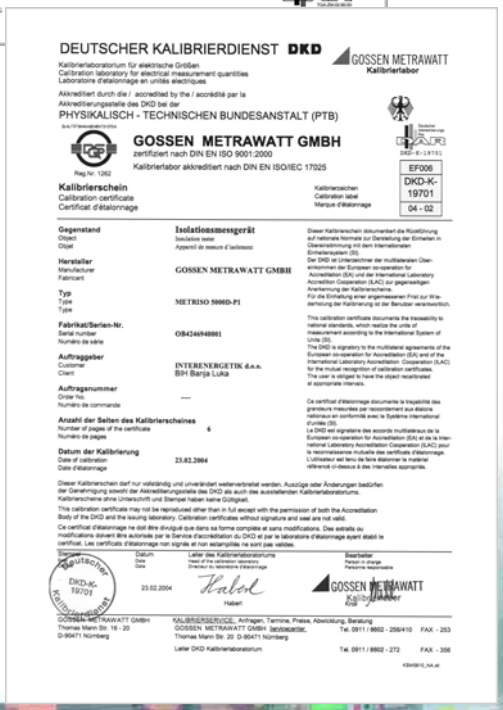
An audit, documented in a report, has verified that this quality management system fulfills the requirements of the following standard:

DIN EN ISO 9001 : 2000
December 2000 edition

This certificate is valid until 2005-04-22
Certificate Registration No.: 001262 QM
Frankfurt am Main, Berlin 2002-04-23

Dr.-Ing. K. Petrick — Dipl.-Ing. S. Heinloth
MANAGING DIRECTORS

Offices: D-60433 Frankfurt am Main, August-Schanz-Straße 21
D-10787 Berlin, Burggrafenstraße 6



DEUTSCHER KALIBRIERDIENST DKD

Kalibrierlaboratorium für elektrische Größen
Calibration laboratory for electrical measurement quantities
Laboratoire d'étalonnage en unités électriques

Akkreditiert durch die / accredited by the / accrédité par la Akkreditierungsstelle des DKD bei der
PHYSIKALISCH - TECHNISCHEN BUNDESANSTALT (PTB)

GOSSEN METRAWATT GMBH
zertifiziert nach DIN EN ISO 9001:2000
Kalibrierlabor akkreditiert nach DIN EN ISO/IEC 17025

EF006
DKD-K-19701
04 - 02

Kalibrierschein
Calibration certificate
Certificat d'étalonnage

Gegenstand / Objet: Isolationsmessgerät
Hersteller / Manufacturer / Fabricant: GOSSEN METRAWATT GMBH
Typ / Type: METRISO 5000D-PI
Fabrikat/Serien-Nr. / Serial number / Numéro de série: 08426940001
Auftraggeber / Customer / Client: INTERENERGETIK d.o.o. BiH Banja Luka
Auftragsnummer / Order No. / Numéro de commande: —
Anzahl der Seiten des Kalibrierscheines / Number of pages of the certificate / Numéro de pages: 6
Datum der Kalibrierung / Date of calibration / Date d'étalonnage: 23.02.2004

Dieser Kalibrierschein darf nur vollständig und unverändert weiterverbreitet werden. Auszüge oder Änderungen bedürfen der Genehmigung sowohl der Akkreditierungsstelle des DKD als auch des ausstellenden Kalibrierlaboratoriums. Kalibrierscheine ohne Unterschrift und Stempel haben keine Gültigkeit.

This calibration certificate may not be reproduced other than in full except with the permission of both the Accreditation Body of the DKD and the issuing laboratory. Calibration certificates without signature and seal are not valid.

Ce certificat d'étalonnage ne doit être divulgué que dans sa forme complète et sans modifications. Des extraits ou modifications doivent être autorisés par le Service d'accréditation du DKD et par le laboratoire d'étalonnage ayant établi le certificat. Les certificats d'étalonnage non signés et non estampillés ne sont pas valides.

Datum / Date / Date: 23.02.2004
Leiter des Kalibrierlaboratoriums / Head of the calibration laboratory / Directeur du laboratoire d'étalonnage: Habert
Bearbeiter / Person in charge / Personne responsable: Kraft

GOSSEN METRAWATT GMBH
Thomas Mann Str. 16 - 20
D-90471 Nürnberg

KALIBRIERSERVICE: Anfragen, Termine, Preise, Abwicklung, Beratung
GOSSEN METRAWATT GMBH Servicecenter
Thomas Mann Str. 20 D-90471 Nürnberg
Tel. 0911 / 8602 - 256/410 FAX - 253

Leiter DKD Kalibrierlaboratorium
Tel. 0911 / 8602 - 272 FAX - 356

Direct link
Measuring and Test Technology:
www.gossenmetrawatt.com

- Product descriptions for our instruments with illustrations including accessories and related software
- Comprehensive product data sheets in PDF format for printing or download
- Services including:
  Initial start-up and queries, updates, replacement parts, repairs and maintenance, used measuring instruments, bargain market, rental instruments and disposal of old instruments, calibrating and test services, tests per BGV A3 (VBG4)
- Training and seminars with practical experience
- Forum: applications reports and special features on subjects of interest
- Requests for information
- News and press reports
- Contact addresses inside and outside of Germany

Our DKD calibration laboratory is accredited in accordance with DIN ISO/IEC 17025 Calibration and recalibration of our own and other devices:

Made in Germany

Table of Contents

METRAHIT | BASE METRAHIT | PRO METRAHIT | X-TRA

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Our new 4½ place, STARLINE generation TRMS multimeters including the METRAHIT | BASE with 12, the | PRO with 16 and the | X-TRA with 23 multimeter functions are extremely rugged, reliable digital multimeters with housings made of impact-resistant plastic. The devices feature a new design and are equipped with state-of-the-art technology.

METRA | VIEW

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METRA | VIEW PC software is a multilingual, measurement data logging program for recording, visualizing, evaluating and documenting measured values from METRAHIT | X-TRA multimeters with reference to time. Communications between the PC and the measuring instrument(s) is established via the bidirectional USB | X-TRA interface adapter.

MINITEST | BASE MINITEST | PRO MINITEST Software

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These test instruments are intended for testing and measuring repaired or modified devices.
Testing electrical safety of electrical equipment per DIN VDE 0701-1: 2000 and 0702: 2004.
Indication of limit value violations by means of color LEDs.
With the MINITEST | PRO, all measured values are also clearly read out at a large, digital display, and a USB port allows for convenient, cost-effective measured value reports. Measured data are transmitted to the PC via a USB cable which is connected to the USB port. MINITEST software, supplied with the instrument on CD ROM, is used for remote control of the MINITEST | PRO, as well as for exporting measurement results to as word processing program.

PS | 3 Software

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Modular, universal software for test instrument, installation, equipment and service management, as well as hazard analysis and report generation. Automatic read-in and analysis of measured values from tests conducted on systems and equipment. Systems and equipment management with respective test results stored to a database. Automatic generation of test reports in accordance with recommendations issued by the trade associations.

METRISO 5024

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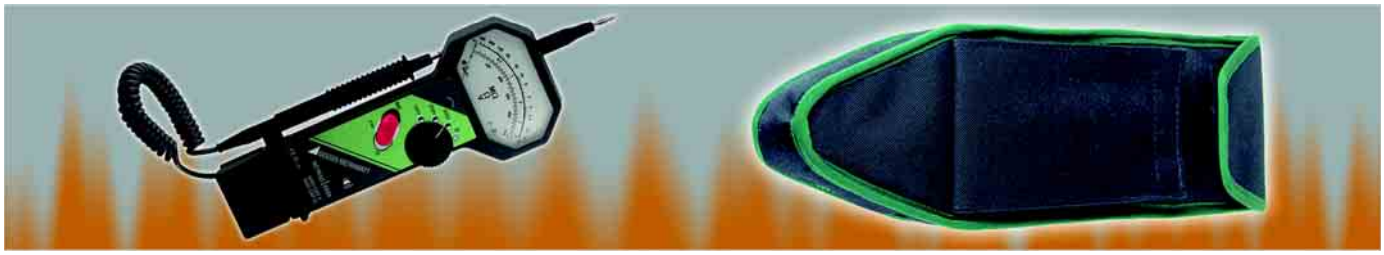
Analog insulation measuring instrument / low-resistance measuring instrument / voltmeter with buzzer – the analog insulation measuring instrument for fast two-hand operation per VDE 0413, part 1/2/4.



Recommended Workshop Equipment

Recommended Workshop Equipment According to Guidelines Issued by ZVEH and VDEW

Required Measuring and Test Devices	Per Standard	For First-Time Users	Standard	For Most Efficient Work
Test bay with permanently integrated measuring instruments	DIN VDE 0104	METRATESTER 5-3P 	SECUTEST 21F 	METRATESTER 5-3P + VL2 
Single-pole voltage tester	DIN VDE 0680, part 6	ProfiSafe 1	METRAVOLT 7A	METRAVOLT 12D
2-pole voltage tester	DIN VDE 0680, part 5			
Voltmeter to at least 600 V	DIN VDE 0410	METRA HIT ONE with WZ12A clip-on current transformer	METRA HIT 25S with WZ12C clip-on current transformer	METRA HIT 26S with Z3512 clip-on current transformer
Ammeter to at least 15 A	DIN VDE 0410			
Continuity tester	DIN VDE 0403			
Clip-on ammeter to at least 300 A		METRACLIP 60 	METRACLIP 70 	METRACLIP 81 
Insulation measuring instrument	DIN VDE 0413, part 1		METRISO C 	METRISO C 
Resistance measuring instrument	DIN VDE 0413, part 4	PROFiTEST ONE	PROFiTEST 0100S-II (also PGS ... test instrument set)	PROFiTEST 0100S-II (also PGS ... test instrument set)
Earth tester	DIN VDE 0413, part 6 or 7			
Loop resistance meas. instrument	DIN VDE 0413, part 3			
Test instrument for RCCBs	DIN VDE 0413, part 6			
Phase sequence indicator	DIN VDE 0413, part 9			
Measuring instruments for electrical devices	DIN VDE 0701/0702, part 1		METRATESTER 5 	SECUTEST SII with PSI Module 
Earth tester	DIN VDE 0413, part 5		GEOHM C 	GEOHM C 
Continuity tester	DIN VDE 0403		ProfiSafe 1 	ProfiSafe 1 
Illuminance meter	DIN VDE 5032		MAVOLUX 5032C ① 	MAVOLUX 5032B ① 
Cable detectors			CableCop 300 	CableCop 300 

① Sales outlet: GOSSEN Foto- und Lichtmesstechnik GmbH • Thomas-Mann-Str. 16-20 • 90471 Nürnberg, Germany • Phone: +49 (911) 8602 181 • Fax: +49 (911) 8602 142

SECUSTAR FM

Modular Test System for User-Controlled Execution of Legally Required or Company Specified Work Procedures and Directives.

SECUSTAR FM facility management solution

iF product design award 2005

The SECUSTAR FM has been developed for user-controlled execution of approvals, routine tests and periodic testing in accordance with legally specified directives (e.g. BGV A3, GUV2, MPG, BetrSichV, fire safety etc.).
Individual work steps can be combined by the user into complete work sequences to this end. Test sequences generated in this way can then be executed in a user-controlled fashion. Test sequences, including all required measurements in accordance with the following standards, have been predefined:

DIN VDE 0701-1, DIN VDE 0702 in preparation, DIN VDE 0751, NEN 3140, ÖVE 8701-1, ÖVE 8751-1, IEC E 62353

In addition to this, the modular test system allows for the integration of testing tasks through the connection of sensors, e.g. for the measurement of ambient temperature, relative humidity and light. In addition to test data archiving and management within the instrument, data exchange with visual FM or PS3 is also possible.
All of the values required for approval reports or device logbooks for electrical equipment (e.g. per ZVEH) can be measured with this test instrument.
Test data can be printed in standard or user created report forms by means of an interconnected printer.

- Testing for (electrical) safety of operating equipment executed by trained persons
- Predefined, standardized test steps and test sequences
- Can be easily supplemented with individual test steps and test sequences
- Operation via color touch-screen
- Sensors for temperature, atmospheric humidity, luminous intensity etc. can be connected via USB interface
- Mains-independent operation with rechargeable batteries
- Country-specific mains cable and test socket for electrical testing
- Internal data memory for more than 1000 objects, data exchange via compact flash, USB, LAN
- Data entry with soft-keys or USB input media (keyboard, barcode, transponder etc.)
- List generator for the evaluation of stored object data
- Data interfaces: – USB for connecting PC, printer or sensor
  – Ethernet, CF
- Dimensions (W x D x H): 325 x 250 x 90 mm, approximate weight: 2.4 kg with batteries
- Manufacturer's guarantee: 3 years material and workmanship, 1 year for calibration

● **Included with M7020-V001: Basic instrument with automated test sequence for DUTs with line frequencies of 50/60 Hz, USB and RS 232 interface, online instructions in German, English in preparation, earthing contact plug and outlet, special cable with test probe, plug-on alligator clip, 3 plug-on quick clips, test report, operating instructions in all available languages as PDF file on CD ROM**

● **For optional accessories refer to the table on page 7.**

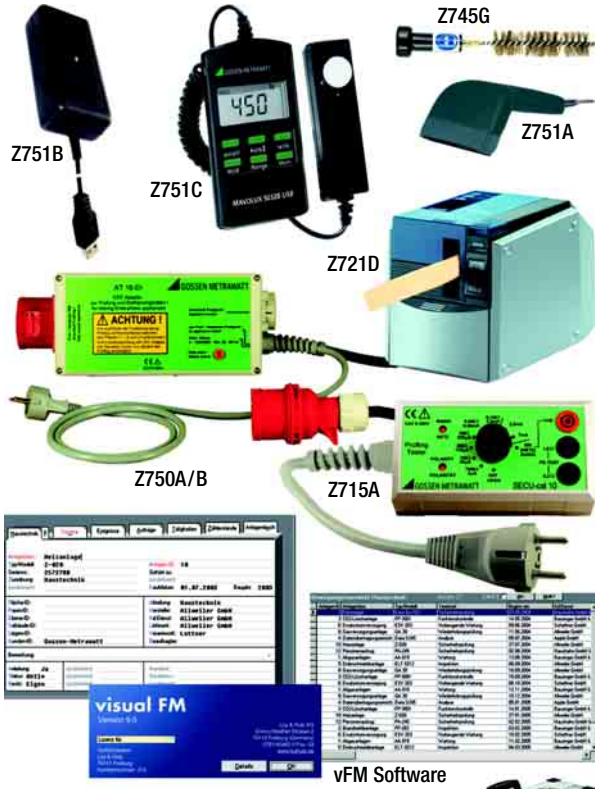
● **See visual FM analysis software on page 7, see PS3 AM analysis software and PS3 update on page 77.**

➲ **See page 91 for training seminar: GTT3010**

Type	Data Sheet No.	Article Number		
SECUSTAR FM	3-349-310-03	M7020-V001		
DKD calibration certificate	–	Z752A		
Maintenance contract	–	Z752B	–	

Accessories for Modular Test System

Accessories for SECUSTAR FM



Sensors, Plug Inserts and Adapters, Software, Carrying Cases, Hard Cases and Other Accessories

Z751B: temperature / humidity sensor for USB connection
For measuring temperature and relative humidity

Z751C: light sensor for USB connection, MAVOLUX 5032B USB
Digital luxmeter with large range of applications, classified per DIN 5032-7 and CIE no. 69 – for inspecting light sources, for example street lights.
For monitoring illumination at workstations, in buildings, and in sports and parking facilities.
For quality inspection of light sources during lamp and light bulb manufacturing.
For illumination designers and architects, as well as for agriculture and forestry applications.

Z750A: 3-phase 16 A differential current adapter, AT16-DI
Z750B: 3-phase 32 A differential current adapter, AT32-DI
For testing in accordance with DIN VDE 0701, 0702 and 0751 at 3-phase devices with 5-pole CEE connection, in particular for the measurement of loop current using the differential current method

Z715A: SECU-cal 10 calibration adapter for tests per DIN VDE 0701/0702 with test report

Z745G: brush probe
For measuring protective conductor resistance, e.g. at rotating devices under test

Z751A: barcode scanner for USB connection
For identifying devices and system components. Devices and system components can be logged by the test instrument, and acquired measured values can be allocated to them with the scanner.

Z721D: barcode and label printer including software for USB connection
Barcode and label printer for connection to a PC, for self-adhesive, smudge-proof barcode labels. For identifying devices and system components. Devices and system components can be logged by our test instruments, and acquired measured values can be allocated to them with the scanner.

F2010: SECUSTAR carrying pouch
Carrying pouch for mobile use, with retaining clips for sensors

K2010: carrying case for SECUSTAR FM and accessories
Aluminum case, approximate dimensions: 645 x 535 x 160 mm

F2000: universal carrying pouch
The universal carrying pouch is suitable for many different measuring and test instruments, as well as accessories. Dimension: 380 x 310 x 200 mm.

Z753A: package of 3 touch-screen wands (no photo)
For data entry via LCD touch-screen

Z753B: package of 2 retaining clips (no photo)
Sensor retaining clips (included with SECUSTAR carrying pouch)

visual FM
Facility management software for commercial, infrastructural and technical administration of all types of properties and objects, from property management right on up to administration of buildings, floor space, rooms, systems, medical technology, building services, vehicle pools, furnishings, cable networks, electrical circuits etc. Building structures, machines, equipment etc. can be precisely implemented and represented in the form of any desired objects in accordance with your special requirements.

Z722D: label set for Z721D barcode and label printer (no photo), self-adhesive, smudge-proof
Z722D: 3 x 24 mm, 1 x 18 mm, 1 x 9 mm wide, **Z722E:** 5 x 18 mm, 8 meters long.

	Type	Designation	Article Number		
Sensors, plug inserts and adapters	Z751B	Temperature / humidity sensor for USB connection	Z751B		
	MAVOLUX 5032B USB	Light sensor for USB connection	Z751C		
	AT16-DI	3-phase 16 A differential current adapter	Z750A		
	AT32-DI	3-phase 32 A differential current adapter	Z750B		
	SECU-cal 10	Calibration adapter for testing per DIN VDE 0701/0702 with test report	Z715A		
	Brush Probe	For measuring protective conductor resistance, e.g. at rotating devices under test	Z745G		
Accessories	Z751A	Barcode scanner for USB connection	Z751A		
	Z721D	Barcode and label printer including software for USB connection	Z721D		
	F2010	SECUSTAR carrying pouch	Z700E		
	K2010	Carrying case for SECUSTAR FM and accessories	Z504L		
	F2000	Universal carrying pouch	Z700D		
	Z753A	Package of 3 touch-screen wands	Z753A		
	Z753B	Package of 2 retaining clips	Z753B		
PC analysis software	visual FM	Facility management software for technical building management	Z7160	–	
Consumable materials	Z722D	Label set for Z721D barcode and label printer	Z722D		
	Z722E	Label set for Z721D barcode and label printer	Z722E		

METRA Hit Series Multimeter Overview

METRA HIT	BASE	PRO	X-TRA	ONE	22S/M	23S	24S
							
Catalog page	10	10	11	12	12	13	13
DC voltage measurement	10 µV...1000 V	10 µV...1000 V	10 µV...1000 V	10 mV...600 V	10 µV...1000 V	10 µV...600 V	10 µV...1000 V
Intrinsic error with V DC	±0.05% rdg.+3 d	±0.05% rdg.+3 d	±0.05% rdg.+3 d	±0.5% rdg.+3 d	±0.05% rdg.+3 d	±0.05% rdg.+3 d	±0.05% rdg.+3 d
AC voltage measurement	10 µV...1000 V	10 µV...1000 V	10 µV...1000 V	1 mV...600 V	10 µV...1000 V	10 mV...600 V	10 µV...1000 V
Intrinsic error with V AC	± 1% rdg.+3 d	±0.2% rdg.+30 d	±0.2% rdg.+30 d	± 1% rdg.+3 d	±0.2% rdg.+30 d	±0.2% rdg.+30 d	±0.2% rdg.+30 d
TRMS	AC, AC+DC	AC, AC+DC	AC, AC+DC	–	–	–	–
DC current measurement	With clip	100 µA...10 A	10 nA...10 A	0.1 A...10 A (16 A)	(with clip)	10 nA...10 A	10 nA...10 A
Intrinsic error, DC	–	±0.1% rdg.+5 d	± 0.05% rdg.+5 d	±1.0% rdg.+5 d	-	±0.1% rdg.+5 d	±0.1% rdg.+5 d
AC current measurement	With clip	10 nA ... 10 A	10 nA ... 10 A	1.0 A...10 A (16 A)	(with clip)	10 nA ... 10 A	10 nA ... 10 A
Intrinsic error, AC	–	±0.5% rdg.+30 d	±0.5% rdg.+30 d	±1,.% rdg.+2 d	–	±0.5% rdg.+30 d	±0.5% rdg.+30 d
TRMS	AC, AC+DC	AC, AC+DC	AC, AC+DC	–	–	–	–
Resistance measurement	0.01 Ω...30 MΩ	0.01 Ω...30 MΩ	0.01 Ω...30 MΩ	0.01 Ω...30 MΩ	0.01 Ω...30 MΩ	0.01 Ω...30 MΩ	0.01 Ω...30 MΩ
Intrinsic error, resistance	±0.2% rdg.+3 d	±0.2% rdg.+3 d	±0.2% rdg.+3 d	±0.7% rdg.+3 d	±0.1% rdg.+5 d	±0.1% rdg.+5 d	±0.1% rdg.+5 d
4-wire	–	–	–	–	–	–	–
Insulation resistance measurement	–	–	–	–	–	–	–
Capacitance Measurement	–	–		–	0.001 nF...30 mF	0.001 nF...30 mF	0.001 nF...30 mF
Intrinsic error, capacitance	–	–		–	±1.0% rdg.+6 d	±1.0% rdg.+6 d	±1.0% rdg.+6d
Temp. measurement, Pt100/1000	–	–	-200°...+850°	-200°...+850°	-200°...+850°	-200°...+850°	-200°...+850°
Type J and K thermocouples	-270°...+1372°	-270°...+1372°	-270°...+1372°	–	–	–	–
Continuity testing	✔	✔	✔	✔	✔	✔	✔
Diode test	5.1 V	5.1 V	5.1 V	2 V	3 V	3 V	3 V
Frequency measurement	0.01 Hz...100 kHz	0.01 Hz...100 kHz	0.001 Hz ...1 MHz	–	0.01 Hz...100 kHz	0.01 Hz...100 kHz	0.01 Hz...100 kHz
Level measurement	–	–	–	–	-48 dB...+63 dB	-48 dB...+63 dB	-48 dB...+63 dB
Power measurement	–	–	–	–	–	–	–
Events counter, event duration	–	–	–	–	✔	✔	✔
Frequency and pulse generator	–	–	–	–	✔	✔	✔
Stopwatch	–	–	–	–	✔	✔	✔
DATA / Min-Max storage	✔	✔	✔	✔	✔	✔	✔
Data storage (measured values)	–	–	500 kB (15400)	–	22 M: 128 kB (60000)	–	–
Analog display, 35/36 scale graduations	✔	✔	✔	✔	✔	✔	✔
Digital display (places/digits)	4½ = 12000 d	4½ = 12000 d	4½ = 12000 d	3¾ =3100 d	4¾ = 31000 d	4¾ = 31000 d	4¾ = 31000 d
Dual display / multiple display	–	–	–	–	–	–	–
Display illumination	✔	✔	✔	–	–	–	–
Measurements per second	40 analog / 10 digital	40 analog / 10 digital	40 analog / 10 digital	20 analog / 2 digital	20 analog / 2 digital	20 analog / 2 digital	20 analog / 2 digital
Bandwidth	1 kHz	10 kHz	20 kHz	1 kHz	1 kHz	1 kHz	1 kHz
IR Interface	–	–	✔	✔ (ONE plus)	✔	✔	✔
Automatic blocking sockets	✔	✔	✔	✔	✔	✔	✔
Measuring category	CAT III / 1000 V CAT IV / 600 V	CAT III / 1000 V CAT IV / 600 V	CAT III / 1000 V CAT IV / 600 V	CAT III / 600 V	CAT IV / 600 V	CAT II / 600 V	CAT III / 1000 V CAT IV / 600 V
Calibration certificate	DKD	DKD	DKD	–	DKD	DKD	DKD
Weight with batteries	395 gr.	395 gr.	395 gr.	350 gr.	350 gr.	350 gr.	350 gr.
Battery / service life	2 ea. 1.5 V / 200 hr.	2 ea. 1.5 V / 200 hr.	2 ea. 1.5 V / 200 hr.	9 V / to 750 hr.	2 ea. 1.5 V / 100 hr.	2 ea. 1.5 V / 100 hr.	2 ea. 1.5 V / 100 hr.
Dimensions in mm (W x H x D)	89 x 199 x 43	89 x 199 x 43	89 x 199 x 43	84 x 195 x 35	84 x 195 x 35	84 x 195 x 35	84 x 195 x 35
Manufacturer's Guarantee	3 years	3 years	3 years	3 years	3 years	3 years	3 years
Approvals and certificates	CE	CE	CE	CE, CSA	CE, CSA	CE, CSA	CE, CSA
Accessories / included	Cable sets, demo software	Cable sets, demo software	Cable sets, demo software	Cable sets	Cable sets	Cable sets	Cable sets
Software option			METRA VIEW	METRAwin 10	METRAwin 10	METRAwin 10	METRAwin 10

METRA Hit Series Multimeter Overview

25S	26S/M	28S	29S	30M	16I; 16T; 16U	27M; 27I/AS	28C
 14	 14	 15	 15	 16	  16/ 17	  21	 25
10 µV...1000 V	10 µV...1000 V	1 µV...600 V	1 µV...600 V	0.1 µV...600 V	30 mV...600 V	3 V...600 V	300 mV...600 V
±0.05% rdg.+3d	±0.05% rdg.+3d	±0.02% rdg.+5d	±0.02% rdg.+5d	±0.003% rdg.+3d	±0.25% rdg.+1d	±0.1% rdg.+5d	±0.05% rdg.+15d
10 µV...1000 V	10 µV...1000 V	10 mV...600 V	10 mV...600 V	1 µV...600 V	3 V...600 V	3 V...600 V	300 mV...600 V
±0.2% rdg.+30d	±0.2% rdg.+30d	±0.2% rdg.+30d	±0.2% rdg.+30d	±0.08% rdg.+5d			
AC	AC, AC+DC	AC, AC+DC	AC, AC+DC	AC+DC	AC, AC+DC	–	AC
10 nA...10 A	10 nA...10 A	1 nA...10 A	1 nA...10 A	100 pA ... 120 mA	With clip	With clip	3 mA...300 mA
±0.1% rdg.+5 d	±0.1% rdg.+5 d	± 0.05% rdg.+5 d	±0.05% rdg.+5 d	±0.02% rdg.+5 d			
10 nA...10 A	10 nA...10 A	10 nA...10 A	10 nA...10 A	1 nA ... 120 mA			
±0.5% rdg.+30 d	±0.5% rdg.+30 d	±0.5% rdg.+30 d	±0.5% rdg.+30 d	±0.1% rdg.+5 d			
AC	AC+DC	AC+DC	AC+DC	AC+DC	–	–	–
0.01 Ω...30 MΩ	0.01 Ω...30 MΩ	0.01 Ω...30 MΩ	0.01 Ω...30 MΩ	0.1 mΩ...12 MΩ	30Ω ...30 MΩ	300Ω ...30 MΩ	300 Ω...30 MΩ
±0.1% rdg.+5d	±0.1% rdg.+5d	±0.05% rdg.+5d	±0.05% rdg.+5d	±0.005% rdg.+5d			
–	–	–	–	0.1 mΩ...30Ω		0.001 mΩ...30 Ω	3 mΩ...30 Ω
–	–	–	–	–	16I: 1 kΩ ... 3.1 GΩ at 500/1000 V 16T/16U: 1 kΩ ... 0.31 GΩ at 100 V	27I / AS: 10 kΩ ... 3 GΩ at 50/100/250/500 V	–
0.001 nF...30 mF	0.001 nF...30 mF	0.001 nF...30 mF	0.001 nF...30 mF	–	30 nF ... 3 µF / 16I/T: 30 µF	–	3 nF...30 F
±1.0% rdg.+6d	±1.0% rdg.+6d	±1.0% rdg.	±1.0% rdg.			–	
-200°...+850°	-200°...+850°	-200°...+850°	-200°...+850°	-200°...+850°	-200°...+800°	-200°...+600°	-200°...+850°
–	–	-270°...+1372°	-270°...+1372°	-270°...+1372°	–	–	-270°...+1820°
✔	✔	✔	✔	✔	✔	✔	✔
3 V	3 V	3 V	3 V	–	2 V	3 V	3 V
0.01 Hz...100 kHz	0.01 Hz...100 kHz	0.001 Hz...100 kHz	0.001 Hz...100 kHz	0.001mHz...100kHz	300 Hz...100 kHz	300 Hz...3 kHz	300 Hz...3 kHz
-48 dB...+63 dB	-48 dB...+63 dB	-48 dB...+63 dB	-48 dB...+63 dB	–	–	–	–
–	–	–	1 mW...10 kW	–	–	–	–
✔	✔	✔	✔	–	–	–	–
✔	✔	-	–	–	–	–	–
✔	✔	✔	✔	–	–	–	✔
✔	✔	✔	✔	✔ (MIN-MAX only)	✔	✔	✔
–	26M: 128 kB (60000)	–	✔	128 kB (30000)		32 kB (1000)	128 kB (3000)
✔	✔	–	–	–	✔	–	–
4¾ = 31000 d	4¾ = 31000 d	5¾ = 310000 d	5¾ = 310000 d	6½ = 1200000 d	3¾ =3100 d	4¾ = 31000 d	5¾ = 310000 d
–	–	✔	✔	–	–	–	–
–	–	–	–	–	– / 16U: ✔	✔	–
20 analog / 2 digital	20 analog / 2 digital	20 analog / 2 digital	20 analog / 2 digital	1 digital	–	–	–
1 kHz	20 kHz	100 kHz	100 kHz	100 kHz	1 kHz	1 kHz	1 kHz
✔	✔	✔	✔	✔	✔	✔	✔
✔	✔	✔	–	–	✔ / 16U: –		
CAT III / 1000 V CAT IV / 600 V	CAT III / 1000 V CAT IV / 600 V	CAT III / 600 V CAT IV / 300 V	CAT III / 600 V CAT IV / 300 V	CAT II / 600 V	CAT II / 600 V CAT III / 300 V	CAT II / 600 V	CAT II / 250 V
DKD	DKD	DKD	DKD	DKD	DKD	DKD	DKD
350 gr.	350 gr.	350 gr.	405 gr.	350 gr.	350 gr.	350 gr.	420 gr.
2 ea. 1.5 V / 100 hr.	2 ea. 1.5 V / 100 hr.	2 ea. 1.5 V / 100 hr.	2 ea. 1.5 V / 100 hr.	2 ea. 1.5 V / 100 hr.	9 V / to 750 / 16U: 500 hr.	3 ea. 1.5 V / to 20 hr.	3 ea. 1.5 V / to 70 hr.
84 x 195 x 35	84 x 195 x 35	84 x 195 x 35	84 x 195 x 35	84 x 195 x 35	84 x 195 x 35	84 x 195 x 35	84 x 195 x 35
3 years	3 years	3 years	3 years	3 years	3 years	3 years	3 years
CE, CSA	CE, CSA	CE, VDE-GS, CSA	CE	CE, CSA	CE, VDE-GS, CSA / 16U: CE	CE, CSA	CE
Cable sets	Cable sets	Cable sets	Cable sets	Cable sets	Cable sets, 16U: carrying pouch	Cable sets, pouch 27 AS : carrying case, METRAwin 10, Kelvin clip+probe set	Cable sets
METRAwin 10	METRAwin 10	METRAwin 10	METRAwin 10	METRAwin 10	16I / 16U: METRAwin 10	METRAwin 10, 90-2	METRAwin 10, 90-2

Our new STARLINE generation instruments, including METRAHIT | BASE, PRO and X-TRA, are highly rugged, reliable digital multimeters with housings made of impact-resistant plastic. The devices feature a new design and are equipped with state-of-the-art technology, for example:

- Resolution: ± 12,000 digits, 4½ places
- 3 connector jacks with patented automatic blocking sockets (ABS)
- Voltage measurement with a basic accuracy of ± 0.05% (V_{DC})
- Auto-ranging current measurement from 100 µA (resolution: 10 nA) to 10 A (16A) via a single connector jack and a single fuse
- Large, light-blue illuminated display with extra large characters (15 mm) and an analog bar graph for dynamic processes
- Separate battery and fuse compartments
- IP 52 protection against dust and water
- Measuring categories: 1000V CAT III and 600V CAT IV
- Made in Germany
- Furnished with DKD calibration certificate
- Min-Max measuring rate: 40 measurements per second

METRAHIT | BASE

TRMS Voltage Multimeter

4½ place TRMS digital multimeter – resolution: 12,000 digits – 12 multimeter functions

- $Voltage_{AC\ TRMS}$ – $voltage_{AC+DC\ TRMS}$ – $voltage_{DC}$
- Frequency (Hz) – resistance – continuity test – diode test
- $Current_{TRMS}$ via additional current sensors with voltage output
- Adjustable clip parameters
- Temperature with type K thermocouples
- Manufacturer's guarantee: 3 years material and workmanship, 1 to 3 years for calibration (depending upon application)

● **Included:** **Multimeter with KS17-2 measurement cable set, two 1.5 V mignon batteries (AA), condensed operating instructions, CD ROM with operating instructions (English/German), data sheet and METRA | View demo software, DKD calibration certificate**

● **For optional accessories refer to the table on page 28.**

➲ **See page 91 for training seminar: GTT1219B**

Type	Data Sheet No.	Article Number		
METRAHIT I BASE	3-349-350-03	M241A		

METRAHIT | PRO

TRMS Professional Multimeter

4½ place TRMS digital multimeter for professional use – resolution: 12,000 digits – 16 multimeter functions

- $Voltage_{AC\ TRMS}$ – $voltage_{AC+DC\ TRMS}$ – $voltage_{DC}$
- Frequency (Hz) – resistance – continuity test – diode test
- $Current_{AC\ TRMS}$ – $current_{AC+DC\ TRMS}$
- Temperature with type K thermocouples
- Additional filter function and voltage measurement with reduced input impedance for limiting interference, for example when performing measurements at frequency converters
- Manufacturer's guarantee: 3 years material and workmanship, 1 to 3 years for calibration (depending upon application)

● **Included:** **Multimeter with KS17-2 measurement cable set, two 1.5 V mignon batteries (AA), condensed operating instructions, CD ROM with operating instructions (English/German), data sheet and METRA | View demo software, DKD calibration certificate**

● **For optional accessories refer to the table on page 28.**

➲ **See page 91 for training seminar: GTT1219B**

Type	Data Sheet No.	Article Number		
METRAHIT I PRO	3-349-350-03	M242A		

METRAHIT | X-TRA

TRMS System Multimeter

4½ place high-end TRMS digital multimeter, system compatible with data memory and IR interface – resolution: 12,000 digits – 23 multimeter functions

- $Voltage_{AC\ TRMS}$ – $voltage_{AC+DC\ TRMS}$ – $voltage_{DC}$
- Frequency (Hz, MHz) – keying ratio – resistance – continuity test – diode test – capacitance
- $Current_{AC\ TRMS}$ – $current_{AC+DC\ TRMS}$
- Temperature with Pt 100/1000 sensors and type K thermocouples
- Additional filter function and voltage measurement with reduced input impedance for limiting interference, e.g. when performing measurements at frequency converters
- 500 KB data memory as data logger for long-term measurements
- Power pack connector socket for operation without batteries
- Infrared interface for communication with the PC
- Protective rubber cover safeguards against shocks and impacts
- Manufacturer's guarantee: 3 years material and workmanship, 1 to 3 years for calibration (depending upon application)

● **Included:** **Multimeter with KS17-2 measurement cable set, two 1.5 V mignon batteries (AA), condensed operating instructions, CD ROM with operating instructions (English/German), data sheet and METRA | View demo software, DKD calibration certificate**

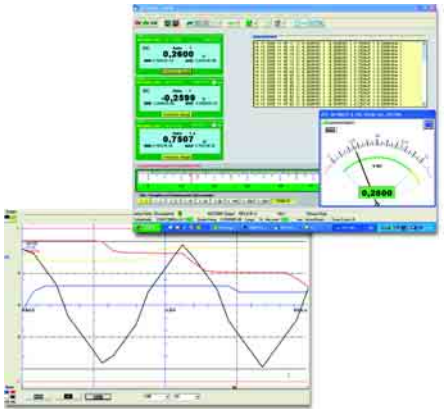
● **For optional accessories refer to the table on page 28.**

➲ **See page 91 for training seminar: GTT1219B**

Type	Data Sheet No.	Article Number		
METRAHIT | X-TRA	3-349-350-03	M240A		

METRA | VIEW

PC Software



METRA | VIEW PC software is a multilingual, measurement data logging program for recording, visualizing, evaluating and documenting measured values from METRAHIT | X-TRA multimeters with reference to time.

Communications between the PC and the measuring instrument(s) is established via the bidirectional IR-USB interface adapter.
Depending upon device type, one or several of the following operating modes are possible:

- Measuring instrument parameters configuring – online recording of measurement data – read-out stored data
- Measured value display – graphic representation (can be saved as a BMP file or read out to a printer)

Demo software with limited functions is included with the instrument, or can be downloaded via the Internet.

Type	Data Sheet No.	Article Number		
METRA | VIEW	3-349-350-03	Z211G		**89,–**

Accessories

Accessories for METRAHIT | Multimeters

GH X-TRA:
Protective rubber cover and carrying strap for METRAHIT BASE/PRO/X-TRA

NA X-TRA (no photo):
Power pack: AC 90 ... 250 V / DC 5 V / CAT IV 600 V

USB X-TRA:
Bidirectional IR-USB interface adapter for METRAHIT X-TRA

FF (UR)10A/1kV AC-DC (no photo):
Fuses (pack of 10) for METRAHIT X-TRA, PRO, 28S, 29S

Type	Data Sheet No.	Article Number		
GH X-TRA	–	Z104C		
NA X-TRA	–	Z218G		
USB X-TRA	–	Z216C		
FF (UR)10A/1kV AC-DC	–	Z109L		

METRA HIT ONE

3¾ Place Digital Multimeter with Analog Bar Graph and Temperature Measuring Instrument

Universal auto-ranging multimeter for use in all areas of electrical engineering. The MetraHit ONE provides users with all the measuring functions of a highly diverse multimeter: convincing technology with all voltage, resistance, current and temperature measuring ranges, and additional measuring functions and automatic functions.

- Resolution: +/- 3100 digits plus analog bar graph
- Patented automatic blocking sockets (ABS)
- Voltage: 30 mV to 600 V_{DC} and 3 to 600 V_{AC}
- Current: 300 µA to 10 A_{DC} (16 A 30 sec.) and 3 mA to 10 A_{AC} (16 A 30 sec.)
- Resistance: 30 Ω to 30 MΩ
- Temperature: -200.0° C to +850.0° C, Pt100-Pt1000
- Continuity and diode testing
- Min-Max measured value storage and DATA hold
- IR interface (METRA HIT ONE plus)
- 600 V CAT III per IEC 61010-1
- CSA certificate
- Manufacturer's guarantee: 3 years material and workmanship, 1 to 3 years for calibration (depending upon application)

● **Included:** **M204B: Digital multimeter with battery, measurement cable set and condensed operating instructions**
M204C: Same as M204B plus protective rubber cover
M204D: Same as M204B plus IR interface and protective rubber cover

● **For optional accessories refer to the table on page 28.**

➲ **See page 91 for training seminar: GTT1219B**

Type	Data Sheet No.	Article Number		
METRA HIT ONE	3-349-237-03	M204B		
METRA HIT ONE with protective rubber cover	3-349-237-03	M204C		
METRA HIT ONE plus	3-349-237-03	M204D		

METRA HIT 22S 12

4¾ Place Precision Multimeter and Temperature Measuring Instrument, METRA HIT 22M same as 22S plus Data Logger

Universal, basic multimeter for professional training, as well as electrical and energy applications, no direct current measurement, no fuses: very cost effective with low maintenance costs

- Display range: +/- 30,000 digits and analog bar graph
- Intrinsic error: 0.05% of the measured value + 3 digits
- Measuring functions: 300 mV to 1000 V, 300 Ω to 30 MΩ, 3 nF to 30 mF, dBV, Hz, °C and °F
- Stopwatch from 10 ms to 100 minutes
- A_{AC} with additional type WZ12C current sensor with mV output
- Min-Max measured value storage, DATA hold
- Continuity and diode testing
- Frequency and pulse generator: 1 Hz to 1 kHz
- Automatic range selection and battery cutoff
- **METRA HIT 22M** with integrated 128 kB measurement data memory, 1 ms to 10 minute sampling interval, versatile trigger functions
- Patented automatic blocking sockets (ABS)
- IR data interface
- Integrated quartz movement
- Protective rubber cover
- Optional METRAwin 10 software
- CSA certificate
- DKD calibration certificate as standard feature
- CAT IV at 600 V or CAT III at 1000 V per IEC 61010-1
- Manufacturer's guarantee: 3 years material and workmanship, 1 to 3 years for calibration (depending upon application)

● **Included:** **M222A: Digital multimeter with batteries, measurement cable set, operating instructions, DKD calibration certificate**
M222F: Same as M222A plus GH18 protective rubber cover
M222B: Same as M222F plus 128 kB measured value memory

● **For optional accessories refer to the table on page 28.**

➲ **See page 91 for training seminar: GTT1219B**

Type	Data Sheet No.	Article Number		
METRA HIT 22S	3-349-026-03	M222A		
METRA HIT 22S with protective rubber cover	3-349-026-03	M222F		
METRA HIT 22M	3-349-026-03	M222B		

METRA HIT 23S

4¾ Place Special Multimeter and Temperature Measuring Instrument for Energy Technology

Special multimeter for energy technology (power plants, utility companies):
no fuse in 16 A measuring circuit and thus suitable for 0 to 5 A current transformer circuits

- Display range: +/- 30,000 digits
- Intrinsic error: 0.05% of the measured value + 3 digits
- Measuring functions: 300 mV to 1000 V, 300 µA to 16 A, 300 Ω to 30 MΩ, 3 nF to 30 mF, dBV, Hz, °C and °F
- Stopwatch from 10 ms to 100 minutes
- Min-Max measured value storage, DATA hold
- Continuity and diode testing
- Frequency and pulse generator, 1 Hz to 1 kHz
- Automatic range selection and battery cutoff
- Heavy-duty mA fuse with 1000 V nominal voltage
- Patented automatic blocking sockets (ABS)
- IR data interface
- Integrated quartz movement
- Protective rubber cover
- Optional METRAwin 10 software
- Extended A_{AC} by means of additional current transformer with mA output
- CSA certificate
- DKD calibration certificate as standard feature
- CAT II at 600 V per IEC 61010-1
- Manufacturer's guarantee: 3 years material and workmanship, 1 to 3 years for calibration (depending upon application)

● **Included:** **M223A: Digital multimeter with GH18 protective rubber cover, batteries, measurement cable set, operating instructions, DKD calibration certificate**

● **For optional accessories refer to the table on page 28.**

➲ **See page 91 for training seminar: GTT1219B**

Type	Data Sheet No.	Article Number		
METRA HIT 23S	3-349-026-03	M223A		

METRA HIT 24S

4¾ Place Precision Multimeter and Temperature Measuring Instrument for Universal Use

Low-cost universal instrument for electricians, process engineers, schools etc.

- Display range: +/- 30,000 digits
- Intrinsic error: 0.05% of the measured value + 3 digits
- Measuring functions: 300 mV to 1000 V, 300 µA to 10 A, 300 Ω to 30 MΩ, 3 nF to 30 mF, dBV, Hz, °C and °F
- Stopwatch from 10 ms to 100 minutes
- Min-Max measured value storage, DATA hold
- Continuity and diode testing
- Automatic range selection and battery cutoff
- Heavy-duty mA fuse with 1000 V nominal voltage
- Patented automatic blocking sockets (ABS)
- IR data interface
- Integrated quartz movement
- Protective rubber cover
- Optional METRAwin 10 software
- Extended A_{AC} by means of additional current transformer with mA output
- CSA certificate
- DKD calibration certificate as standard feature
- CAT IV at 600 V or CAT III at 1000 V per IEC 61010-1
- Manufacturer's guarantee: 3 years material and workmanship, 1 to 3 years for calibration (depending upon application)

● **Included:** **M224A: Digital multimeter with GH18 protective rubber cover, batteries, measurement cable set, operating instructions, DKD calibration certificate**

● **For optional accessories refer to the table on page 28.**

➲ **See page 91 for training seminar: GTT1219B**

Type	Data Sheet No.	Article Number		
METRA HIT 24S	3-349-026-03	M224A		

METRA HIT 25S

4¾ Place TRMS Multimeter and Temperature Measuring Instrument for Universal Use

Cost-effective $TRMS_{AC}$ digital multimeter for universal use in electrical and electronics applications with distorted AC signals

- Display range: +/- 30,000 digits
- Intrinsic error: 0.05% of the measured value + 3 digits
- Measuring functions: 300 mV to 1000 V $_{AC}$ (TRMS), bandwidth from 20 Hz to 1k Hz, 300 µA to 10 A, 300 Ω to 30 MΩ, 3 nF to 30 mF, dBV, Hz, °C and °F
- Stopwatch from 10 ms to 100 minutes
- Min-Max measured value storage, DATA hold
- Continuity and diode testing
- Automatic range selection and battery cutoff
- Heavy current fuses with 1000 V nominal voltage
- Patented automatic blocking sockets (ABS)
- IR data interface
- Integrated quartz movement
- Protective rubber cover
- Optional METRAwin 10 software
- Extended A_{AC} by means of additional current transformer
- CSA certificate
- DKD calibration certificate as standard feature
- CAT IV at 600 V or CAT III at 1000 V per IEC 61010-1
- Manufacturer's guarantee: 3 years material and workmanship, 1 to 3 years for calibration (depending upon application)

● **Included:** **M225A: Digital multimeter with GH18 protective rubber cover, batteries, measurement cable set, operating instructions, DKD calibration certificate**

● **For optional accessories refer to the table on page 28.**

➲ **See page 91 for training seminar: GTT1219B**

Type	Data Sheet No.	Article Number		
METRA HIT 25S	3-349-026-03	M225A		

METRA HIT 26S/26M

4¾ Place Precision TRMS Multimeter and Temperature Measuring Instrument for Demanding Universal Use, 26M with Data Logger

Digital multimeter for demanding universal applications, TRMS measurement for $_{AC\ and\ AC+DC}$, with broad-band (20 kHz), high-speed TRMS value converter

- Display range: +/- 30,000 digits
- Intrinsic error: 0.05% of the measured value + 3 digits
- Measuring functions: 300 mV to 1000 V, $TRMS_{AC+DC}$ and $TRMS_{AC}$, bandwidth from 16 Hz to 20 kHz, 300 µA to 10 A, 300 Ω to 30 MΩ, 3 nF to 30 mF, dBV, Hz, °C and °F
- Stopwatch from 10 ms to 100 minutes
- Min-Max measured value storage, DATA hold
- Continuity and diode testing
- Frequency and pulse generator, 1 Hz to 1 kHz
- Automatic range selection and battery cutoff
- Heavy current fuses with 1000 V nominal voltage
- **METRA HIT 26M** with integrated 128 kB measurement data memory, 1 ms to 10 minute sampling interval, versatile trigger functions
- Patented automatic blocking sockets (ABS)
- IR data interface
- Integrated quartz movement
- Protective rubber cover
- Optional METRAwin 10 software
- Extended A_{AC} by means of additional current transformer with mA output
- CSA certificate
- DKD calibration certificate as standard feature
- CAT IV at 600 V or CAT III at 1000 V per IEC 61010-1
- Manufacturer's guarantee: 3 years material and workmanship, 1 to 3 years for calibration (depending upon application)

● **Included:** **M226A: Digital multimeter with GH18 protective rubber cover, batteries, measurement cable set, operating instructions, DKD calibration certificate**
M226B: Same as M226A plus 128 kB measured value memory

● **For optional accessories refer to the table on page 28.**

➲ **See page 91 for training seminar: GTT1219B**

Type	Data Sheet No.	Article Number		
METRA HIT 26S	3-349-026-03	M226A		
METRA HIT 26M	3-349-026-03	M226B		

METRA HIT 28S

5¾ Place, Multifunctional, Precision TRMS Multimeter, System Compatible

Precision multimeter for universal use in the field of energy electronics, and for high bandwidth electronics from 16 Hz to 100 kHz and $TRMS_{AC}$ / $TRMS_{AC+DC}$

- Triple display: ± 310,000 digits
- Minimal intrinsic error: ± (0.02% + 10 digits for V DC)
- Measuring functions: 300 mV to 1000 V, 300 µA to 100 A, 300 Ω to 30 MΩ, 3 nF to 30 mF, dBV, Hz, °C and °F (Pt100/Pt1000, type K and J thermocouples with reference junction)
- Patented automatic blocking sockets (ABS)
- IR Interface
- Continuity and diode testing
- Min-Max measured value storage, DATA hold
- With cable set, protective rubber cover and DKD calibration certificate
- Optional METRAwin 10 software
- CSA certificate
- DKD calibration certificate as standard feature
- CAT IV at 300 V or CAT III at 600 V per IEC 61010-1
- Manufacturer's guarantee: 3 years material and workmanship, 1 to 3 years for calibration (depending upon application)

● **Included:** **M228A: Digital multimeter with GH18 protective rubber cover, batteries, measurement cable set, operating instructions, DKD calibration certificate**

● **For optional accessories refer to the table on page 28.**

➲ **See page 91 for training seminar: GTT1219B**

Type	Data Sheet No.	Article Number		
METRA HIT 28S	3-348-866-03	M228A		

METRA HIT 29S

5¾ Place Precision TRMS Multimeter, Power Meter and Power Disturbance Measuring Instrument with Data Logger

Precision multimeter, power multimeter and power disturbance measuring instrument with integrated memory for universal use in the field of energy electronics, and for high bandwidth electronics from 16 Hz to 100 kHz and $TRMS_{AC}$/$TRMS_{AC+DC}$

- Triple display: ± 310,000 digits
- Minimal intrinsic error: ± (0.02% + 10 digits for V_{DC})
- Measuring functions: 300 mV to 1000 V, 300 uA to 100 A, 300 Ohm to 30 MOhm, 3 nF to 30 mF, dBV, Hz, °C and °F (Pt100/Pt1000, type K and J thermocouples with reference junction)
- W, VA, VAr, Wh, VAh, peak load profile, power disturbance measurement, power disturbance recording
- Patented automatic blocking sockets (ABS)
- IR Interface
- Continuity and diode testing
- Integrated 128 kB measured value memory, 0.5 s to 10 minute sampling interval
- Versatile trigger functions
- Min-Max measured value storage, DATA hold
- With cable set, protective rubber cover and DKD calibration certificate
- Optional METRAwin 10 software
- CSA certificate
- DKD calibration certificate as standard feature
- CAT IV at 300 V or CAT III at 600 V per IEC 61010-1
- Manufacturer's guarantee: 3 years material and workmanship, 1 to 3 years for calibration (depending upon application)

● **Included:** **M229A: Digital multimeter with batteries, measurement cable set, operating instructions, DKD calibration certificate**
M229E: Same as M229A in HC30 carrying case with WZ12D current sensor, TF220 temperature sensor and BD-Pack1 (BD232 interface adapter, cable, METRAwin 10 software)

● **For optional accessories refer to the table on page 28.**

➲ **See page 91 for training seminar: GTT1219B**

Type	Data Sheet No.	Article Number		
METRA HIT 29S	3-348-866-03	M229A		
METRA HIT 29S Set 1	–	M229E		
KS29 safety cable set	–	Z229A		

METRA HIT 30M

6½ Place, Precision TRMS Multimeter, Temperature Measuring Instrument and Data Logger

Precision multimeter, temperature measuring instrument and data logger for demanding universal use in the laboratory and for service applications

- Display range:+/- 1,200,000 digits
- Intrinsic error: +/- (35 ppm of the measured value + 70 ppm)
- Measuring functions: 120 mV to 600 V_{DC} and $TRMS_{AC+DC}$ (bandwidth from 16 Hz to 100 kHz), 120 µA to 120 mA, 120 Ω to 12 MΩ, 1 Hz to 100 kHz, °C and °F (Pt100, Pt1000, J, K)
- Resistance and temperature measurement with Kelvin terminal
- Min-Max measured value storage
- Automatic range selection and battery cutoff
- PTC fuse, max. 250 V
- Integrated 128 kB measurement data memory, 0.1 s - 10 min. sampling interval
- IR data interface
- Protective rubber cover
- DKD calibration certificate as standard feature
- Power pack (optional)
- CAT III at 300 V or CAT II at 600 V per IEC 61010-1
- Manufacturer's guarantee: 3 years material and workmanship, 1 to 3 years for calibration (depending upon application)

● **Included:** **M230B: Digital multimeter with GH18 protective rubber cover, batteries, measurement cable set, operating instructions, DKD calibration certificate**

● **For optional accessories refer to the table on page 28.**

➲ **See page 91 for training seminar: GTT1219B**

Type	Data Sheet No.	Article Number		
METRA HIT 30M	3-348-979-03	M230B		

METRA HIT 16I

Digital-Analog TRMS Multimeter with Insulation Measurement for Service Technicians

This inexpensive universal multimeter is designed for use by electrical service technicians. In addition to a multimeter, it includes a 500 V / 1000 V insulation tester in accordance with VDE 0413, and a precision temperature indicator. The optional WZ12B clip-on meter allows for easy, safe measurements of up to 30 A / 100 A.

- Rugged digital multimeter, ±3100 digits,
- With analog display
- Patented automatic blocking sockets (ABS)
- IR Interface
- V_{DC}, V_{AC-DC}, V_{AC}, Ω, °C (Pt100/Pt1000)
- Continuity and diode testing
- Min-Max measured value storage, DATA hold
- Minimal intrinsic error: ± (0.25% + 1 digit for V_{DC})
- With cable set and protective rubber cover
- CSA certificate
- DKD calibration certificate as standard feature
- Manufacturer's guarantee: 3 years material and workmanship, 1 to 3 years for calibration (depending upon application)

● **Included:** **M216B: Digital multimeter with GH18 protective rubber cover, battery, KS17 cable set, operating instructions, DKD calibration certificate**
M216E: Same as M216B in HC20 measuring case with GH18 protective rubber cover and TF220 temperature sensor
M216F: Same as M216B in HC20 measuring case with GH18 protective rubber cover, WZ12B clip-on current sensor and TF220 temperature sensor

● **For optional accessories refer to the table on page 28:**

➲ **See page 91 for training seminar: GTT1219B**

Type	Data Sheet No.	Article Number		
METRA HIT 16I	3-348-972-03	M216B		
METRA HIT 16I Set 1	3-348-972-03	M216E		
METRA HIT 16I Set 2	3-348-972-03	M216F		

METRA HIT 16T

Digital-Analog TRMS Multimeter with Insulation Measurement for Telecommunications Service

METRA HIT 16T, same as 16I but optimized with 100 V insulation measurement for telecommunications service

- Rugged digital multimeter, ±3100 digits, with analog display
- Patented automatic blocking sockets (ABS)
- IR Interface
- V_{DC}, V_{AC-DC}, V_{AC}, Ω, °C (Pt100/Pt1000)
- Continuity and diode testing
- Min-Max measured value storage, DATA hold
- Minimal intrinsic error: ± (0.25% + 1 digit for V DC)
- With cable set and protective rubber cover
- CSA certificate
- DKD calibration certificate as standard feature
- Manufacturer's guarantee: 3 years material and workmanship, 1 to 3 years for calibration (depending upon application)

● **Included:** **M216A: Digital multimeter with GH18 protective rubber cover, battery, KS17 cable set, operating instructions, DKD calibration certificate**

● **For optional accessories refer to the table on page 28.**

➲ **See page 91 for training seminar: GTT1219B**

Type	Data Sheet No.	Article Number		
METRA HIT 16T	3-348-972-03	M216A		

METRA HIT 16U

Cable Multimeters for Measurements in Symmetrical Copper Cable Networks

The METRA HIT 16U cable multimeter is a rugged portable measuring instrument for use in the field. It is used to perform measurements for pinpointing errors in copper cable networks. Interruption of a single core or contact with an open-circuit core (capacitive asymmetry) can be recognized at the high speed logarithmic bar graph display by switching polarity.

- Insulation resistance measurement (100 V test voltage) with simultaneous recognition of interference voltage and polarity reversal for diode testing
- Cable symmetry testing by means of rapid changeover switching
- Multifunctional multimeter (V, Ω, F, Hz)
- AC and AC+DC TRMS measurement
- Scaled current measurement from 10 mA to 100 A with accessory clip-on current sensor
- Precision temperature indication in °C and °F for Pt100/Pt1000 sensors
- Display illumination can be activated, analog display: linear or logarithmic for insulation measurement
- Acoustic signal for continuity testing, dangerous contact voltages, exceeded overload limits
- Min-Max value storage
- IP 54 housing, protective rubber cover as standard feature
- Windows software available as accessory for processing and graphic display of measured values via RS 232 interface
- DKD calibration certificate as standard feature
- Manufacturer's guarantee: 3 years material and workmanship, 1 to 3 years for calibration (depending upon application)

● **Included:** **M216U: Digital multimeter with F836 carrying pouch, GH18 protective rubber cover, battery, KS21T special cable set, operating instructions and DKD calibration certificate**

● **For optional accessories refer to the table on page 28.**

➲ **See page 91 for training seminar: GTT1219B**

Type	Data Sheet No.	Article Number		
METRA HIT 16U	3-349-227-03	M216U		

METRAmax® 12

Digital-Analog Multimeter for Electrical Applications

Favorably priced hand-held multimeters for professional results.
Suitable for use in the fields of general electronics and electrical engineering.

- ± 4000 digits with bar graph
- Voltage measurement from 400 mV to 600 V $_{AC/DC/AC}$
- Switchable input resistance: 10 MΩ / 400 kΩ
- Intrinsic error, $V_{AC/DC}$: ± 0.5% of measured value +2 digits,
- V_{AC}: ±1% of measured value +5 digits
- Current measurement: 40, 400 mA $_{AC/DC/DC}$, 10 A =/~ (12 A max. 5 min.)
- Intrinsic error, $A_{AC/DC}$: ± 0.8% of measured value +2 digits
- A_{AC}: ± 1% of measured value + 5 digits
- Resistance measurement: 400 Ω to 40 MΩ
- Frequency measurement: 10 Hz to 400 kHz
- Capacitance measurement: 4 nF to 40 uF
- Continuity and diode testing, Min, Max and HOLD memory
- Case with tilt stand and take-up reel
- Dimensions (W x H x D): 92 x 154 x 25 mm
- Weight: approx. 0.2 kg with batteries
- Batteries: 2 ea. 1.5 V IEC LR 6 (AA mignon)
- CSA certificate
- Manufacturers guarantee: 1 year material and workmanship

● **Included:** **M212A: Digital multimeter with battery, cable set and operating instructions**
M212D: METRAmax 12 Set 1 measuring case, same as M212A in HC20 carrying case with WZ12A clip-on ammeter

● **For optional accessories refer to the table on page 28.**

Type	Data Sheet No.	Article Number		
METRAmax 12	3-348-831-03	M212A		
METRAmax 12 Set 1	3-348-831-03	M212D		
F823 ever-ready case	–	GTY3172097P01		
F829 carrying pouch	–	GTZ3301000R0003		

METRA HIT 1A, 2A

METRA HIT 1A: Analog Multimeter, Basic Model for Hobby and Work
METRA HIT 2A: Analog Multimeter for Electrical Applications, Class 2.5

METRA HIT 1A: basic analog multimeter for training and hobby applications, compact time-tested design

- Voltage measurement: 0...0.15/0...0.5 V=, 0...1.5/5/15/50/150/500 V=/~
- Input resistance: 20 kΩ/V=, 4 kΩ/V~
- Current measurement: 0...50 µA=, 0...0.5/5/50/500 mA/5 A=/~
- Resistance measurement: 1 Ω ... 1 MΩ (4 ranges)
- Level: -15 ...+56 dB (6 ranges)
- Dimensions (W x H x D): 92 x 126 x 45 mm
- Weight: approx. 0.25 kg without battery
- Battery: 11.5 V, IEC LR 6 (AA mignon)
- Manufacturers guarantee: 1 year material and workmanship

METRA HIT 2A: basic analog multimeter for electrical applications, class 2.5, compact time-tested design

- Voltage measurement: 0...0.15/0...0.5 V=, 0...1.5/5/15/50/150/500 V=/~
- Input resistance: 20 kΩ/V=, 4 kΩ/V~
- Current measurement: 0...50 µA=, 0...1.5/15/150 mA/1.5/15 A=/~
- Resistance measurement: 1 Ω...1 MΩ (4 ranges)
- Level: -15...+56 dB (6 ranges)
- Accuracy: class 2.5
- Dimensions (W x H x D): 92 x 126 x 45 mm
- Weight: approx. 0.25 kg without battery
- Battery: 11.5 V, IEC LR 6 (AA mignon)
- Manufacturers guarantee: 1 year material and workmanship

● **Included:** **M100A: Analog multimeter with operating instructions (without battery and cable set)**
M101A: Analog multimeter with operating instructions (without battery and cable set)

● **For optional accessories refer to the table on page 28.**

Type	Data Sheet No.	Article Number		
METRA HIT 1A	–	M100A		
METRA HIT 2A	–	M101A		
F809 ever-ready case	–	GTY3172083P01		
GH185 protective rubber cover	–	GTY3171185P01		

METRAmax 2

Analog Multimeter for Training Applications

The METRAmax 2 hand-held multimeter was developed in cooperation with a renowned German supplier of training systems and fulfills all of the demands placed upon contemporary vocational training.
Thanks to exceptional overload capacity, a selectable scale zero point at left or center and automatic battery cutoff, this instrument is not only well suited for training, but rather for balancing and service work as well.

- Voltage measurement: 0...100/300 mV/1 V=, 0...3/10/30/100/300 V=/~
- Current measurement: 0...100 µA/1/10/100 mA/1/3 A =/~
- Zero point: left / center
- Accuracy: class 2 =/3 ~
- Dimensions (W x H x D): 100 x 140 x 35 mm
- Weight: approx. 0.3 kg with battery
- Battery: 9 V flat cell battery, IEC 6 LR 61 (6 F 22)
- Manufacturers guarantee: 1 year material and workmanship

● **Included:** **M102A: Analog multimeter with battery and operating instructions (no cable set)**

● **For optional accessories refer to the table on page 28.**

Type	Data Sheet No.	Article Number		
METRAmax 2	3-348-792-01	M102A		
Cable set for METRAmax KS14	–	Z110A		
F841 carrying pouch	–	Z104A		
GH19 protective rubber cover	–	Z104B		
NW10A shunt resistor	–	GTZ0156000R0001		

CE

METRAmax 3

Analog Multimeter for Training Applications, and for Use in the Electrical Trades

The METRAmax 3 analog multimeter is an inexpensive, handy multimeter without amplifier stage with an integrated circuit breaker for current measuring circuits. Good overload protection is provided in the voltage ranges as well by means of generous dimensioning and high performance PTC thermistors.

- Voltage measurement: 30/300/600 V=/~
- Current measurement: 0.3/3/15 A=/~
- Resistance measurement: 1 Ω ... 500 kΩ
- Protective Conductor
- Accuracy: class 2.5
- Dimensions: 100 x 140 x 35 mm, weight: approx. 0.3 kg with battery
- Battery: 11.5 V, IEC LR 6 (AA mignon)
- Manufacturers guarantee: 1 year material and workmanship

● **Included:** **M103A: Analog multimeter with battery and operating instructions (no cable set)**

● **For optional accessories refer to the table on page 28.**

Type	Data Sheet No.	Article Number		
METRAmax 3	3-349-117-03	M103A		
Cable set for METRAmax KS14	–	Z110A		
F841 carrying pouch	–	Z104A		
GH19 protective rubber cover	–	Z104B		
NW10A shunt resistor	–	GTZ0156000R0001		

CE

METRAport®32XS, 32S

3¾ place (32XS) or 4¾ place (32S) Folding, Universal TRMS Multimeter with "Auto-Fuse"

Folding digital multimeter for universal use in general electrical and electronics applications, as well as for automotive service. Ideal reading angle adjustment thanks to tilt stand. When suspended from the neck strap, both hands are free for performing measurements. The instrument is switched off automatically when folded closed, and the display and the control panel are protected against damage. Automatic shutdown in the event of overcurrent minimizes maintenance costs and reduces downtime.

- Precision multimeter
- Resolution, **METRAport 32XS**: 100 µV, 100 nA, 100 mΩ, **METRAport 32S**: 10 µV, 10 nA, 10 mΩ
- TRMS measurement for V_{AC} and I_{AC} to 1 kHz
- Voltage measurement: 300 mV/3/30/300/600 V ⎓/~
- Direct current measurement via transformer or current sensor with voltage output: 300 µA/3/30/300 mA/15 A ⎓/~
- Resistance measurement: 300 Ω/3/30/300 kΩ/3/30 MΩ
- Frequency measurement: 300 Hz/3/100 kHz
- Capacitance measurement: 30/300 nF/3/30/300/3000/30000 µF
- Measured value storage and Min-Max recording, indication for overload and blown fuse
- Temperature measurement with automatic Pt sensor recognition: Pt100 or Pt1000
- Automatic and manual measuring range selection
- 20 mm digital display with additional analog scale
- Dimensions (W x H x D): 146 x 118 x 44 mm, approximate weight: 450 gr. including batteries
- Battery: 2 ea. 1.5V IECLR 6 (AA mignon)
- DKD certificate
- Manufacturer's guarantee: 3 years material and workmanship, 1 to 3 years for calibration (depending upon application)

● **Included:** **M234C: Digital multimeter with carrying strap, batteries, KS17 cable set, operating instructions, DKD calibration certificate**
M234A: Digital multimeter with carrying strap, batteries, KS17 cable set, operating instructions, DKD calibration certificate

● **For optional accessories refer to the table on page 28.**

Type	Data Sheet No.	Article Number		
METRAport 32XS	3-349-105-03	M234C		
METRAport 32S	3-349-105-03	M234A		
F822 carrying pouch	–	GTY3172095P01		

METRAport®3A

Folding Analog Multimeter for Demanding Applications

Folding multimeter with analog display and 46 measuring ranges for universal use in process engineering, electronics and electrical applications, testing, R&D, service and training in accordance with EN 61010-1/DIN VDE 0411 part 1 1

- For measurement of voltage, current, resistance and level
- With reflective scale, accuracy class: 1.5 =
- High 10 MΩ input resistance for load-free voltage measurement
- Automatic battery cutoff when instrument is folded closed
- Scale can be tilted with folding lid which also provides protection during transport
- Overload protection in all ranges: 250 V~ (except for 10 A range)
- Voltage measurement:
  9 measuring ranges each for direct and alternating voltage, 100 mV / 300 mV / 1 V / 300 V / 1000 V
- Power supply: commercially available 9 V battery, service life: 500 hours
- 10 measuring ranges each for AC and DC, 10µA / 100 µA / 1 A / 10 A
- Resistance simulation, 5 measuring ranges: 1 Ω ... 20 MΩ / 1Ω ... 2 kΩ / Ω x 1 / Ω x 10 / Ω x 10k
- Power supply: 9 V battery per IEC6F22 (commercially available), service life: 500 hr.
- Recommended accessories: NA2-9/20 mains power pack (highly isolated)
- G fuse element (FF1.6 / 250G)
- Manufacturers guarantee: 1 year material and workmanship

● **Included:** **M113A: Analog multimeter with carrying strap, battery, KS17 cable set, operating Instructions**

● **For optional accessories refer to the table on page 28.**

Type	Data Sheet No.	Article Number		
METRAport 3A	–	M113A		
F822 carrying pouch	–	GTY3172095P01		

METRA HIT 27M / 27EX

Precision Milliohmmeter and 4¾ Place Multimeter (27M) or Milliohmmeter for Use in Potentially Explosive Atmospheres (27EX)

METRAHit 27M: compact milliohmmeter plus multimeter and thermometer. Very well suited for on-site service, as well as for a wide variety of laboratory tasks.
In addition to general low-resistance measurements, applications include: measurement of low-value contact resistance at welded and riveted connections, as well as on aircraft outer skins (lightning protection and wick test)

- 3.000 mOhm to 300.00 mOhm with 1 A measuring current and 30.00 mOhm to 30.00 Ohm with 200 mA measuring current
- Kelvin connection (4-wire measurement) – resistance measurement from 300 Ohm to 30 MOhm
- Voltage measurement from 3 to 600 V DC and 3 to 600 V AC – with ±30,000 digits
- Frequency measurement from 300 Hz to 3 kHz
- DATA hold memory for up to 1200 measured values – continuity and diode testing – overload protection
- CSA certificate – DKD calibration certificate as standard feature
- Manufacturer's guarantee: 3 years material and workmanship, 1 to 3 years for calibration (depending upon application)

METRA HIT 27EX: compact milliohmmeter for measuring low-value contact resistance on aircraft outer skins (lightning protection, wick test), as well as for general low value resistance measurements inside and outside of potentially explosive atmospheres

- Measuring ranges: 30 mΩ, 300 mΩ, 3 Ω, 30 Ω – resolution: 10 µΩ
- Measuring method: Kelvin connection (4-wire measurement)
- DATA hold memory: 1200 measured values
- EX designation: Ex II 2 G EEx ia IIA T4 – prototype test certificate: INERIS 05ATEX0040
- Manufacturer's guarantee: 3 years material and workmanship, 1 to 3 years for calibration (depending upon application)

● **Included:** **M227A: Digital multimeter with GH18 protective rubber cover, KS17S cable set, operating instructions, DKD calibration certificate**
M227D: Milliohmmeter with KC27 Kelvin probe, KC4 Kelvin clip, 8 type Z206E rechargeable NiMH batteries, protective rubber cover, HC30 hard case, operating instructions, DKD calibration certificate

● **For optional accessories refer to the table on page 28.**
Z206D: NiMH quick charger without batteries for type Z206E EX approved rechargeable batteries

➲ **See page 91 for training seminar: GTT1219B**

Type	Data Sheet No.	Article Number		
METRA HIT 27M	3-349-206-03	M227A		
METRA HIT 27EX	3-349-335-03	M227D		
NiMH quick charger, EX	3-349-335-03	Z206D		
4 rechargeable NiMH batteries, EX approved	3-349-335-03	Z206E		

METRA HIT 27I/27AS

Precision Milliohmmeter, Insulation Tester and 4¾ Place Multimeter

In addition to a milliohmmeter and a multimeter, an insulation tester has been integrated into the METRAHit 27I for measurements up through the giga-ohm range. Especially where service and repairs in the field of aviation technology are involved, the instrument can be used in a broad range of applications.

- Insulation resistance measurement: 30 MOhm to 3 GOhm
- With selectable test voltages: 50V, 100V, 250V, 500V

Milliohmmeter:

- 3.000 mOhm to 300.00 mOhm with 1 A measuring current and 30.00 mOhm to 30.00 Ohm with 200 mA measuring current
- Kelvin Connection (4-wire measurement)
- Resistance measurement from 300 Ohm to 30 MOhm
- Voltage measurement from 3 to 600 V DC and 3 to 600 V AC with ± 30,000 digits – frequency meas. from 300 Hz to 3 kHz
- DATA hold memory for up to 1200 measured values – continuity and diode testing
- Overload protection – CSA certificate – DKD calibration certificate as standard feature
- LCD panel with background illumination – furnished with 3 rechargeable NiMH batteries and charger as standard equipment
- Manufacturer's guarantee: 3 years material and workmanship, 1 to 3 years for calibration (depending upon application)
- METRAHit 27AS: avionics set with extensive accessories and software in carrying case

● **Included:** **M227B: Digital multimeter with GH18 protective rubber cover, rechargeable NiMH batteries, NA4/500 charger, KS17S cable set, operating instructions, DKD calibration certificate**
M227C: Same as M227B in HC30 measuring case with KC 4 Kelvin clip set (2 pieces), KC27 Kelvin probes (2 pieces) and BD pack including adapter, cable and METRAwin10 software

● **For optional accessories refer to the table on page 28.**

➲ **See page 91 for training seminar: GTT1219B**

Type	Data Sheet No.	Article Number		
METRA HIT 27I	3-349-206-03	M227B		
METRA HIT 27AS	3-349-206-03	M227C		
VL15 extension cable, 15 m	–	Z110I		

METRAmax 6

Analog Resistance Measuring Instrument with Rough Capacitance Measurement

Resistance measuring instrument with analog display for use in the plant, on service calls and for installation work

- Measuring method: current measurement
- Large variety of measuring ranges from 0.05 Ω to 1 MΩ (5 ranges)
- Ranges for rough capacitance measurement from 0 to 30000 µF
- Integrated buzzer for continuity testing
- Rugged moving-coil mechanism with spring loaded bearing jewels allows for use under adverse operating conditions
- Dimensions (W x H x D): 100 x 140 x 35 mm
- Weight: approx. 0.3 kg without battery
- Battery: 11.5 V, IEC LR 6 (AA mignon)
- Manufacturers guarantee: 1 year material and workmanship

● **Included:** **Resistance measuring instrument with operating instructions**

● **For optional accessories refer to the table on page 28.**

Type	Data Sheet No.	Article Number		
METRAmax 6	–	GTM3060000R0001		
F825 ever-ready case	–	GTY3172100P01		

METRA HIT 1 ASi

ASi Bus Tester – Diagnosis and Addressing Tool

The handy, rugged addressing and diagnosis tool for initial start-up, maintenance and service of ASi systems offers the following functions:

- Read-out of slave addresses 0 through 31, A and B, without scrolling including clear-cut, full LCD
- Read-out of slave IO and ID codes (including extended ID codes 1 and 2)
- Standard addressing mode and extended addressing mode per AS-i version 2.1
- Programmable ID code 1
- Function test for slaves, including analog slaves with profile 7.2 (7.3 in preparation)
- Recognition of complete arrays of system components
- Storage, diagnosis and PC gateway functions
- Data transmission and management, as well as documentation of system parameters with optional software
- Connection with jack plugs

Included:

- **METRA HIT 1ASi**: AS-i addressing device and tester with GH18, batteries and KS31A
- Set 1ASi: AS-i addressing device and tester with batteries, GH18, KS31C, BD232 and ASi-doc documentation software in HC30 hard case

● **Included:** **M235A: AS-i addressing device and tester with protective rubber cover, batteries and addressing cable with jack plug**
M235C: AS-i addressing device and tester with protective rubber cover, batteries, KS31C connector cable set (M12 female to M12 male), BD232 interface adapter and ASi.doc-win documentation software in HC30 case

● **For optional accessories refer to the table on pages 22 and 23.**

Type	Data Sheet No.	Article Number		
METRA HIT 1ASi	3-349-108-03	M235A		
Set 1ASi	3-349-108-03	M235C		

Bus Tester Accessories

Accessories for METRA HIT® 1 ASI

Type	Designation	Article Number		
1ASi battery set	Battery set (4 ea. rechargeable NiMH batteries, 1600 mAh) and charger	Z206B		
KS31A	Connector cable set (banana plug to jack plug)	Z231A		
KS31B	Connector cable set (banana plug to M12)	Z231B		
KS31C	Connector cable set (banana plug to jack plug) and module base with addressing socket	Z231C		
KS36E	1 ea. AS-i ribbon cable pick-off with M12	Z236E		
ASi-Pack 1	Documentation and management set for ASi bus including ASi-Access, BD232, RS 232 cable	Z231D		
HC20	Hard case for METRAHit 1ASi	Z113A		

METRAtest 36 ASi

AS-i Bus Testers

Measuring, test, monitor and addressing device for ASi bus and ASi slaves for initial start-up and troubleshooting

- Simple menu-driven operation with function keys and matrix display
- Measurement of bus characteristics (voltage, current consumption)
- Recognition of data protocol errors (e.g. duplicate addresses)
- Master mode operation for ASi bus
- Programming and parameters configuration for ASi slaves
- PC gateway function
- Monitoring function with address trigger for indication of error frequency
- Tool kit and extensive accessories included
- Complete display of all parameters and addresses
- Compatible with existing installations and latest ASi standard 2.11
- Integrated 128 kB memory for saving entire systems, also allows for copying functions
- Firmware can be downloaded from a PC via IrDA interface: simplifies later upgrades.
- Inexpensive documentation and management software (ASi-doc or ASi-access, optional) streamlines documentation, planning and start-up

● **Included:** **M236A: AS-i addressing device and tester with neck strap, measurement cable, KS36A connector cable set, ground cable, NA 0100S charger, and HC30 case**
M236B: Same as M236A but with additional, extensive connector accessories (module base with addressing socket, KS36A, B, C, D, E connector cable sets), IrDA 0100S interface adapter and ASi-access software

● **For optional accessories refer to the table on page 23.**

CE

Type	Data Sheet No.	Article Number		
METRAtest 36ASi	3-349-106-03	M236A		
Set 36 ASi	3-349-106-03	M236B		

Bus Tester Accessories

Accessories for METRAtest 36 ASi

Type	Designation	Article Number		
NA 0100S	Charger for 36A rechargeable battery pack	Z501D		
KS36A	Connector cable set (M12 to jack plug)	Z236A		
KS36B	Connector cable set (M12 female to M12 male)	Z236B		
KS36C	Connector cable set (M12 male to M12 male)	Z236C		
KS36E	1 ea. AS-i ribbon cable pick-off with M12	Z236E		
IrDa 0100S	Interface adapter to RS 232 for METRAtest 36A	Z501C		
ASi-Pack 1	Documentation set for AS-i bus with BD232, RS 232 cable and ASi-doc (for METRA HIT 1 ASi)	Z231D		

Bus Tester Software

Software for METRA HIT® 1 ASI and METRAtest 36 ASi

Type	Designation	Article Number		
ASi.doc-win	Documentation software for AS-i bus	Z710Q		
ASi-access	Documentation and management software for AS-i bus	Z710J		

METRA HIT 28c *light*

Handheld Calibrator with Current Measuring Instrument for Process Engineering

The METRA HIT 28c light calibrator functions as a precision calibrator and simulation device for electrical and physical quantities. As a handheld instrument, it is suitable for precise, on-site calibration and inspection tasks, as well as for test department and laboratory work.
Thanks to its diverse functions, the highly flexible instrument can be used in process engineering, control room and equipment fabrication, general measuring technology and many other applications.
As a system component it can be used in calibration systems for calibrating measuring transducers, buffer amplifiers, transmitters, temperature measuring instruments and recording instruments, controllers, signaling devices and indicators.
With plugged on BD232 or USB-HIT interface adapter, complete calibration procedures and measuring point oriented calibration cycles can be transferred from a PC, and stored and accessed by simply pressing a key.
The calibrator setup procedure can thus be significantly shortened, and erroneous settings can be avoided.
METRAwin 90-2 software simplifies programming, controls data transfer to the calibrator, receives measurement data of any interconnected multimeter from the output of a transducer and executes a comparison of the targeted and the actual situation. Acquired values can be printed out as a calibration report by the PC.

- Universal calibrator, simulator with easy operation
- Measuring functions: mA / mV ... V / °C (Pt100/1000, Ni100/1000, thermocouples J, L, T, U, K, E, S, R, B and N) / 5 ... 2000 Ω
- Frequency and pulse run generator: 1 Hz ... 1000 Hz
- Absolute and percentage (scaled) read-out
- Ramp and staircase functions
- Procedures memory
- Interface and METRAwin 90-2 calibration software
- Transmitter simulator (sink: 0 ... 24 mA)
- DKD calibration certificate included
- Rugged, EMC compliant design
- Dimensions: 84 x 185 x 35 mm, weight: 0.4 kg with batteries
- Batteries: 3 ea. 1.5 V IEC LR 6 (AA mignon)
- Manufacturer's guarantee: 3 years material and workmanship, 1 year for calibration

● **Included:** **M231A: Calibrator with batteries, KS17 cable set (yellow/black), GH18 protective rubber cover, operating instructions, DKD calibration certificate**

● **For optional accessories refer to the table on page 28.**

DKD CE

Type	Data Sheet No.	Article Number		
METRA HIT 28c *light*	3-349-316-03	M232A		

METRA HIT 28C

Calibrator, Multimeter and Milliohmmeter for Process Engineering

Process engineers can use the METRAHit 28C as a calibrator and a multimeter simultaneously, e.g. in order to simulate sensor conditions at the input of a transmitter while measuring and saving the output signal. If the METRAHit BD232 plug-in infrared interface adapter is attached to the instrument, measurement and calibration results can be uploaded to a PC, where they can be recorded and printed out as a calibration report.
The multimeter can also be used as a data logger.
Software allows for convenient analysis and display of measurement data, and can be used to create, upload and download calibration procedures, as well as for the generation of calibration certificates.

- Measuring functions: mA, mV.. V, 30 ... 2000 Ω, °C, Pt100/1000, Ni100/1000, thermocouples (J,L,T,U,K,E,S,R,B,N)
- Dual mode – simultaneous encoding and measuring (U/I)
- Measuring and encoding in absolute terms and as percentage (scaled)
- Memory for calibration procedures and results
- Frequency and pulse run generator
- Ramp and staircase functions
- Interface and METRAwin 90-2 calibration software
- Transmitter simulator (sink 0 ... 24 mA)
- Rugged, EMC compliant design
- Infrared interface
- Precision multimeter (V, A, Ω, F, Hz, °C/°F) 300,000 digits and triple display, CAT II at 600 V
- Milliohmmeter, 4-wire connection with 0.01 mΩ resolution
- DKD calibration certificate as standard feature
- Manufacturer's guarantee: 3 years material and workmanship, 1 to 3 years for calibration (depending upon application)

● **Included:** **M231A: Calibrator with batteries, KS17 cable set (yellow/black), KS17 cable set (red/black), GH18 protective rubber cover, operating instructions, DKD calibration certificate**

● **For optional accessories refer to the table on page 28.**

DKD CE IEC 61010-1

Type	Data Sheet No.	Article Number		
METRA HIT 28C	3-349-098-03	M231A		

CP28 Calibrator Pack

Mobile Calibration System

Fully automated calibration of measuring transducers, transmitters, buffer amplifiers and measuring modules is possible in just a matter of seconds – including certificate generation – with the CP28 calibrator pack.
The CP2 calibrator pack includes everything required for an automated calibration system:

- METRAHit 28C calibrator
- BD232 interface adapter
- RS 232 interface cable
- KC2 Kelvin clip
- 1ASi battery set
- KY95-1 alligator clips
- METRAwin 90-2 for automatic read-out of calibration values
- METRAwin10/METRAHit for precision measurement of values read out from the object to be calibrated
- DKD calibration certificate as standard feature
- Manufacturer's guarantee: 3 years material and workmanship, 1 year for calibration

● **Included:** **M231C: METRA HIT 28C with batteries, KS17 cable set (yellow/black), KS17 cable set (red/black), GH18 protective rubber cover, operating instructions, DKD calibration certificate plus METRAwin10 and METRAwin 90-2 software, RS 232 interface cable, BD232 interface adapter, KC4 Kelvin clips, HC30 case and 1ASi battery set**

● **For optional accessories refer to the table on page 28.**

Type	Data Sheet No.	Article Number		
CP28 calibrator pack	3-349-098-03	M231B		

Technical Data – METRA HIT 28C light and METRA HIT 28C Calibrators

Function ▼	Instrument ➤	METRA HIT 28c *light*			METRA HIT 28C		
		Range	Resolution	Intrinsic Error	Range	Resolution	Intrinsic Error
Calibration:	Voltage =	0...300 mV/3/10/15 V	0.01...1 mV	± 0.05%+ 2 mV	0...300 mV/3/10/15 V	0.01...1 mV	± 0.05% + 2 mV
	Current =	0...24 mA	1 µA	± 0.05%+ 2 µA	0...24 mA	1 µA	± 0.05% + 2 µA
	Resistance, 2-wire	5...2000 Ω	0.1 Ω	± 0.05%+ 0.2 Ω	5...2000 Ω	0.1 Ω	± 0.05% + 0.2 Ω
	Resistance, 4-wire	0...2000 Ω	0.1 Ω	± 0.05%+ 0.2 Ω	0...2000 Ω	0.1 Ω	± 0.05% + 0.2 Ω
	Thermocouples	– 200...1800° C	0.1 K	± (0.1% input + 0.5 K)	– 200...1800° C	0.1 K	± (0.1% input + 0.5 K)
	Resistance thermometers	– 180...850° C	0.1 K	± (0.1% input + 0.4/0.5 K)	– 180...850° C	0.1 K	± (0.1% input + 0.4/0.5 K)
	Frequency	1 kHz	0.1...8 Hz	± 0.05%+ 3 digits	1 kHz	0.1...8 Hz	± 0.05% + 3 digits
Measuring:	Voltage ≃	–	–	–	0...300 mV/600 V	1 µV (10 µV)	± 0.05% + 15 digits
	Current =	–	–	–	0...3/30/300 mA	10 nA...1 µA	± 0.05% + 15 digits
	Current ~	–	–	–	0...3/30/300 mA	10 nA...1 µA	± 0.05% + 5 digits
	Resistance, 2-wire	–	–	–	0...300 Ω/30 MΩ	1 mΩ/0.1 kΩ	± 0.07% + 15 digits
	Resistance, 4-wire	–	–	–	0...30 mΩ/30 Ω	10 µΩ/1 mΩ	± 0.5% + 5 digits
	Thermocouples	–	–	–	-200 ... 1800ξ C	0.1 K	± 0.2...0.8%+ 3 digits
	Resistance thermometers	–	–	–	–200 ... 850ξ C	0.1 K	± 0.25 K/0.5% + 3 digits
	Capacitance	–	–	–	0...3 nF/30 µF	1 pF/10 nF	± 1% + 5 digits
	Frequency	–	–	–	0...300 Hz/30 kHz	0.01...10 Hz	± 0.05% + 5 digits
	Diode test at 1 mA	–	–	–	0...3 V/15 V	0.1 mV	± 0.5% + 5 digits

MAVOWATT 4

Multiple Power Meter

The multiple power meter allows for direct measurement of DC power as well as RMS power measurements for single-phase alternating current and balanced load three-wire, three-phase current.

- Determination of reactive power
- Measurement of phase-to-phase voltage(s)
- Ideal instrument for manufacturing, service and installation
- Phase sequence indicator
- cos φ measurement

Technical Data:

Direct current	12.5 kW
Single-phase alternating current	12.5 kW (active power)
3-wire, 3-phase, balanced load	25 kW (active power) / 25 kVar x $\sqrt{3}$ (reactive power)
Nominal current	0.25 A / 0.01 A / 5 A / 1 A
Nominal voltage	50 / 100 / 250 / 500 V
Frequency Range	10 Hz ... 400 Hz
AC-DC voltage measurement	50 / 100 / 250 / 500 V
AC-DC current measurement	0.25 A / 0.01 A / 5 A / 1 A
Accuracy class	1.5 (2.5 P–, U, I)
Power Supply	2 ea. 9 V flat cell, IEC 6 F 22, 6LF22 or 6LR61
Dimensions (W x H x D)	110 x 181 x 62 mm
Weight	0.8 kg

● **Included:** **GTM3033000R0001: Multiple power meter with batteries and operating instructions**

Type	Data Sheet No.	Article Number		
MAVOWATT 4	3-348-801-03	GTM3033000R0001		
KS28 cable set	–	GTY3620065P0001		

METRA HIT 29S

5¾ Place Precision TRMS Multimeter, Power Meter and Power Disturbance Measuring Instrument with Data Logger

Precision multimeter, power multimeter and power disturbance measuring instrument with integrated memory for universal use in the field of energy electronics, and for high bandwidth electronics from 16 Hz to 100 kHz and $TRMS_{AC}$/$TRMS_{AC+DC}$

- Triple display: ± 310,000 digits
- Minimal intrinsic error: ± (0.02% + 10 digits for V_{DC})
- Measuring functions: 300 mV to 1000 V, 300 uA to 100 A, 300 Ohm to 30 MOhm, 3 nF to 30 mF, dBV, Hz, °C and °F (Pt100/Pt1000, type K and J thermocouples with reference junction)
- W, VA, VAr, Wh, VAh, peak load profile, power disturbance measurement, power disturbance recording
- Patented automatic blocking sockets (ABS)
- IR Interface
- Continuity and diode testing
- Integrated 128 kB measured value memory, 0.5 s to 10 minute sampling interval
- Versatile trigger functions
- Min-Max measured value storage, DATA hold
- With cable set, protective rubber cover and DKD calibration certificate
- Optional METRAwin 10 software
- CSA certificate
- DKD calibration certificate as standard feature
- CAT IV at 300 V or CAT III at 600 V per IEC 61010-1
- Manufacturer's guarantee: 3 years material and workmanship, 1 to 3 years for calibration (depending upon application)

● **Included:** **M229A: Digital multimeter with GH18 protective rubber cover, batteries, measurement cable set, operating instructions, DKD calibration certificate**
M229E: Same as M229A in HC30 carrying case with WZ12D current sensor, TF220 temperature sensor and BD-Pack1 (BD232 interface adapter, cable, METRAwin 10 software)

● **For optional accessories refer to the table on page 28.**

➲ **See page 91 for training seminar: GTT1219B**

Type	Data Sheet No.	Article Number		
METRA HIT 29S	3-348-866-03	M229A		
METRA HIT 29S Set 1	–	M229E		
KS29 safety cable set	–	Z229A		

Fuses – Consumable Materials for Multimeters

Type	Designation	For Following Devices:	Shipped in	Article Number		
FF(UR)16A/1kVAC-DC	Fuse link	METRAHIT 24S ... 26S	Package of 10	Z109B		
FF (UR)10A/1kV AC-DC	Fuse link	METRAHIT X-TRA, PRO, 28S, 29S	Package of 10	Z109L		
FF(UR)1.6A/1kVAC-DC	Fuse link	METRAHIT 23S ... 26S, 27M/I, 28S, 29S	Package of 10	Z109C		
FF 1.6 A/700 VAC	Fuse link	METRAHIT ONE/2A, METRAmax 12, METRAport 3A	Package of 10	Z109E		
FF 16 A/600 VAC	Fuse link	METRAmax 14, METRAport 3A, METRAHIT 2A	Package of 10	Z109A		
FF(UR)16 A/600 VAC	Fuse link	METRAHIT ONE	Package of 10	Z109D		
FF 630 mA / 700 V	Fuse link	METRAHIT 1A	Package of 10	Z109J		
FF 6.3 A / 500 V	Fuse link	METRAHIT 1A	Package of 10	Z109K		
FF1.6 A/700 VAC	Fuse link	METRAHIT ONE/2A, METRAmax 12, METRAport 3A	Package of 10	Z109E		
FF16 A/600 VAC	Fuse link	METRAmax 14, METRAport 3A, METRAHIT 2A	Package of 10	Z109A		
FF 1A/380V (5 x 20)	Fuse link	METRAport 32S/32 XS	Package of 10	Z109H		
T 16A/500V (6.3 x 32)	Fuse link	METRAport 32S/32 XS	Package of 10	Z109I		
FF 1.6 A/700 VAC	Fuse link	METRAHIT ONE/2A, METRAmax 12, METRAport 3A	Package of 10	Z109E		
FF 16 A/600 VAC	Fuse link	METRAmax 14, METRAport 3A, METRAHIT 2A	Package of 10	Z109A		
F500mA/250V	Fuses, F1/F2 multimeter	METRAHIT 28C	Package of 10	Z109F		
M125mA/250V	Fuse, F3 calibrator	METRAHIT 28C and 28c light	Package of 10	Z109G		

Overview of Pouches, Cases and Protective Rubber Covers for Multimeters

Type	Designation	Suitable for Device Type:										
			METRA HIT						METRAmax			METRAport
		BASE/PRO/X-TRA	ONE	22S ... 30M	16I/16T/16U	27M/27I	28C/28C light	1A/2A	2/3	6	12	32S, XS/3A
HitBag	Cordura belt pouch	✔	✔	✔	✔	✔	✔	–	–	–	–	✔
F809	Ever-ready case with cable compartment	–	–	–	–	–	–	✔	–	–	–	–
F822	Ever-ready case with cable compartment	–	–	–	–	–	–	–	–	–	–	✔
F823	Ever-ready case with cable compartment	–	–	–	–	–	–	–	–	–	✔	–
F825	Ever-ready case	–	–	–	–	–	–	–	✔	✔	–	–
F829	Carrying pouch for METRAHIT and METRAmax	✔	✔	✔	✔	✔	✔	–	–	–	✔	–
F836	Ever-ready case with cable compartment	✔	✔	✔	✔	✔	✔	–	–	–	–	–
F840	Ever-ready case for 2 devices, 2 adapters, accessories	✔	✔	✔	✔	✔	✔	–	–	–	–	–
F841	Carrying pouch	–	–	–	–	–	–	–	✔	✔	–	–
GH18	Protective rubber cover and carrying strap (green)	–	–	✔	✔	✔	✔	–	–	–	–	–
GH185	Protective rubber cover	–	–	–	–	–	–	✔	–		–	–
GH19	Protective rubber cover	–	–	–	–	–	–	–	✔	✔	–	–
HC20	Hard case for 1 device, accessories	✔	✔	✔	✔	✔	✔	–	–	–	–	–
HC30	Hard case for 2 devices, accessories	✔	✔	✔	✔	✔	✔	–	–	–	–	–


HitBag


F829


F836


F809


F840


GH18


GH185


GH19


HC20

HC30

Designation	Type	Article Number		
Cordura belt pouch	HitBag	Z115A		
Ever-ready case with cable compartment	F809	GTY3172083P01		
Ever-ready case with cable compartment	F822	GTY3172095P01		
Ever-ready case with cable compartment	F823	GTY3172097P01		
Ever-ready case	F825	GTY3172100P01		
Carrying pouch for 1 device with GH18, sensor	F829	GTZ3301000R0003		
Ever-ready case with cable compartment	F836	GTZ3302000R0001		
Ever-ready case for 2 devices, 2 adapters, accessories	F840	GTZ3302001R0001		
Carrying pouch	F841	Z104A		
Protective rubber cover and carrying strap (green)	GH18	GTZ3212000R0001		
Protective rubber cover	GH185	GTY3171185P01		
Protective rubber cover	GH19	Z104B		
Hard case for 1 device, accessories	HC20	Z113A		
Hard case for 2 devices, accessories	HC30	Z113A		

Multimeter Accessories – Overview

Type	Designation	Suitable for Device Type: METRA HIT									
		BASE	PRO	X-TRA	ONE	22S	22M	23S	24S	25S	26S	26M
	Current Transformers											
NW3A	Shunt resistor, 3 A, 10 Ω, class 0.5, 100 mV/A, 600 V CAT IV	✔				✔						
NW300mA	Shunt resistor, 300 mA, 1Ω, class 0.5, 1 mV/mA	✔				✔						
WZ11A	AC clip-on current transformer, 1 ... 200 A~, 1mA/A		✔	✔				✔	✔	✔	✔	✔
WZ11B	AC clip-on current transformer, 0.5 ... 20/200 A~, switchable, 100/10 mV/A	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
WZ12A	AC clip-on current transformer, 15 ... 180 A~, 1 mA/A		✔	✔				✔	✔	✔	✔	✔
WZ12B	AC clip-on current sensor, 10 mA ... 100 A~, 1 mV/10 mA	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
WZ12C	AC clip-on current sensor, 1 mA ... 10 A/120 A~, switchable, 1 mV/mA1 / 1 mV/A	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
WZ12D	Clip-on current transformer, 30 mA ... 150 A~, 1 mA/A		✔	✔	✔			✔	✔	✔	✔	✔
Z3511	AC clip-on current transformer, 4 ... 500 A~, 1 mA/A		✔	✔	❸			✔	✔	✔	✔	✔
Z3512	AC clip-on current transformer, 0.5 ... 1000 A~, 1 mA/A		✔	✔	✔			■	■	■	✔	✔
Z3512A	AC clip-on current sensor, 1 mA ... 1/10/100/1000 A~, switchable, 1000/100/10/1 mV/A	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
Z3514	AC clip-on current transformer, 1 ... 2000 A~, 1 mA/A		✔	✔				■	■	■	✔	✔
Z201A	DC-AC clip-on current sensor, 0.01 ... 30 A⎓/... 20 A~, 100 mV/A, with battery	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
Z202A	DC-AC clip-on current sensor, 0.1...30/300 A⎓/...20/200 A~, switchable, 10/1 mV/A, battery	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
Z13B	DC-AC clip-on current sensor, 0.4...60/600 A⎓/...40/400 A~, switchable, 10/1 mV/A, battery	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
Z203A	DC-AC clip-on current sensor, 1...300/1000 A⎓/...200/1000 A~, switchable, 1 mV/A, battery	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
AF033A	Ampflex AC current sensor, 5 ... 30/300 A~, switchable, 100/10 mV/A, with battery	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
AF11A	Ampflex AC current sensor, 5 ... 1000~, 1 mV/A, with battery	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
AF33A	Ampflex AC current sensor, 5 ... 300/3000 A~, switchable, 10 mV/1 mV/A, with battery	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
AF101A	Ampflex AC current sensor, 5 ... 1000/10000A~, switchable, 1 mV/0,1 mV/A, with battery	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
	Voltage Probes											
KS30	Probe for voltage measurement in power installations with up to 1000 V~	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
HV3	High-voltage probe, 3 kV/3 V≃	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
HV30	High-voltage probe, 30 kV/30 V⎓ (for direct voltage only)	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
	High Frequency Probe											
Z3431-2	High frequency probe, 100 kHz ... 750 MHz, 0.25 ... 50 V~	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
	Temperature Sensors and Probes											
TF400CAR	Dip-stick oil temperature sensor, Pt1000 class B, -50...+500° C, sensor: 3 mm dia. x 180 mm long			✔	✔	✔	✔	✔	✔	✔	✔	✔
TF220	Pt1000 temperature sensor, class B, for measurement in gases and liquids, -50 ... +220° C			✔	✔	✔	✔	✔	✔	✔	✔	✔
Z3409	Standard Pt100 sensor, class A, for surface and immersion measurements, -40 ... +600ξ C			✔	✔	✔	✔	✔	✔	✔	✔	✔
TF550	Pt100 oven sensor, class B, for measurements in ovens, refrigerators etc., -50 ... +550ξ C			✔	✔	✔	✔	✔	✔	✔	✔	✔
TS Chipset	10 miniature Pt100 sensors, class B (2 x 2.3 mm), adhesive, -50 ... +550° C			✔	✔	✔	✔	✔	✔	✔	✔	✔
Z3431-3	Temperature probe with standard immersion sensor, type K thermocouple (NiCr-Ni), -20 ... +350° C	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
Z3431-9	Temperature probe without plug-in sensor, for type K thermocouple (NiCr-Ni), -20 ... +350° C	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
Z3431-4	Temperature probe without plug-in sensor, for type K thermocouple (NiCr-Ni), -25 ... +1150° C	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
Z3431-5	Standard plug-in immersion sensor, type K thermocouple, to +1100° C	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
Z3431-6	Plug-in surface sensor, type K thermocouple, to +850° C	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
Z3431-7	High temperature plug-in sensor tape, type K thermocouple, to +450° C	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
Z3431-8	Flexible, insulated plug-in sensor, type K thermocouple, to +250° C	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
	Measuring Adapters											
Z3450	Leakage current measuring adapter, DIN VDE 0107/DIN VDE 0750										✔	✔
SM16	Current measuring adapter, 16 A/230 V, for earth contact plugs		✔	✔	✔			✔	✔	✔	✔	✔
PMA16	Power measuring adapter (single-phase) 16 A/230 V, for earth contact plugs		❍	❍	❍			❍	❍	❍	❍	❍
EMA1	Energy measuring adapter for (3-phase) Ferraris meters											
	EMC Measuring Adapter											
FMA1	METRA HIT field measuring adapter for electrical and magnetic fields	❍	✔	✔							✔	✔
	Measuring Accessories											
KS17-ONE	Cable set for multimeter, 600 V CAT III 16 A				✔	✔	✔	✔	✔	✔	✔	✔
KS17-2	Cable set consisting of 1 pair of measurement cables, 1.5 m, 1000 V/CAT III, 600 V/CAT IV	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
KS17S	Cable set with 2 mm diameter steel tips and 120 cm cable, 1000 V / CAT III	✔	✔	✔		✔	✔	✔	✔	✔	✔	✔
KY94	Hook clips (1 pair) for KS17-2	❍	❍	❍	✔	✔	✔	✔	✔	✔	✔	✔
KY95-1	Alligator clips (1 pair) for KS17-2, 300 V/CAT III	❍	❍	❍	✔	✔	✔	✔	✔	✔	✔	✔
KY95-2	Alligator clips (1 pair) for KS17-2, 1000 V CAT III 19 A	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
KY96	Push-on lugs (1 pair) for KS17-2	❍	❍	❍	✔	✔	✔	✔	✔	✔	✔	✔
Z3241	RS 232 interface cable, 2 m, (included with 1-Ch. Pack, 4-Ch. Pack and Z3231)				✔	✔	✔	✔	✔	✔	✔	✔
	Kelvin Clips											
KC4	Kelvin clips (1 pair) with normal terminals											
KC27	Kelvin probes (1 pair) with stainless steel tips											
	Power Packs											
NA4/500	Power pack, 230 V / 4.5 V, for METRA HITs manufactured through 2003						✔				✔	✔
NA5/600	Power pack, 230 V / 5 V, for METRA HITs manufactured as of 2004											
	PC Interface											
BD232	IR – RS 232 bidirectional interface adapter					✔	✔	✔	✔	✔	✔	✔
BD-Pack 1	Single channel pack with BD232 adapter, RS 232 cable, METRAwin 10 and installation instructions					✔	✔	✔	✔	✔	✔	✔
SI232 II	IR – RS 232 bidirectional memory adapter				●	✔	✔	✔	✔	✔	✔	✔
1-Ch. Pack II	Single channel pack with SI232 II adapter, RS 232 cable, METRAwin 10 and installation instructions				●	✔		✔	✔	✔	✔	✔
4-Ch. Pack II	4 channel pack with four SI232 II adapters, RS 232 cable, METRAwin 10 and installation instructions				●	✔	✔	✔	✔	✔	✔	✔
USB-Hit	Bidirectional interface adapter, IR-USB					✔	✔	✔	✔	✔	✔	✔
USB-Pack	Set consisting of USB-HIT interface adapter, USB cable and METRAwin 10 software					✔	✔	✔	✔	✔	✔	✔
	Software											
METRAwin10	METRAwin 10/METRAHit – system software for METRAHIT multimeters				✔	✔	✔	✔	✔	✔	✔	✔
METRAwin90-2	Calibration software for controlling the METRAHIT 28C and for analysis of calibration results											
METRA VIEW	PC software			✔								

Multimeter Accessories – Overview

Suitable for Device Type:																			Type
METRA HIT												METRAmax				METRAport			
28S	29S	30M	16I	16T	16U	27M	27I	28C	28C light	1A	2A	2	3	6	12	32S	32XS	3A	
			✔	✔	✔														NW3A
			✔	✔	✔														NW300mA
✔	✔							✔		✔	✔	✔			❼	✔	✔	✔	WZ11A
✔	❑	✔	✔	✔	✔					✔	✔	❍			✔	✔	✔	✔	WZ11B
✔	✔							✔		✔	✔	✔	✔		✔	✔	✔	✔	WZ12A
✔	❑	✔						✔				❹			✔	✔	✔	✔	WZ12B
✔	❑	✔						✔				✔			✔	✔	✔	✔	WZ12C
✔	✔	❷						✔		❹	❹	✔	❾		❼	✔	✔	✔	WZ12D
✔	✔							❸		❺	❺	✔	❾		✔	✔	✔	✔	Z3511
✔	✔							❸		❺	❺	✔	❾		❼	✔	✔	❺	Z3512
✔	❑	✔	✔	✔	✔							✔			✔	✔	✔	✔	Z3512A
✔	✔							❸		❻	❻	✔	❻		❼	✔	✔	❺	Z3514
✔	❑	✔	✔	✔	✔							✔			❽	✔	✔	✔	Z201A
✔	❑	✔	✔	✔	✔							✔			❼	✔	✔	✔	Z202A
✔	❑	✔	✔	✔	✔	✔	✔					✔			❼	✔	✔	✔	Z13B
✔	❑	✔	✔	✔	✔										❾	✔	✔	✔	Z203A
✔	❑	✔	✔	✔	✔										❽	✔	✔	✔	AF033A
✔	❑	✔	✔	✔	✔										❾	✔	✔	✔	AF11A
✔	❑	✔	✔	✔	✔							❾			❼	✔	✔	✔	AF33A
✔	❑	✔	✔	✔	✔										❾	✔	✔	✔	AF101A
✔	✔	✔	✔	✔	✔			✔				✔			✔	✔	✔	✔	KS30
✔	✔	✔	✔	✔	✔							✔DC			✔	✔	✔	✔	HV3
✔	✔	✔	✔	✔	✔							✔			✔	✔	✔	✔	HV30
✔	✔	✔	✔	✔	✔							✔			✔	✔	✔	✔	Z3431-2
✔	✔	✔	✔	✔	✔			✔								✔	✔		TF400CAR
✔	✔	✔	✔	✔	✔	✔	✔	✔								✔	✔		TF220
✔	✔	✔	✔	✔	✔			✔								✔	✔		Z3409
✔	✔	✔	✔	✔	✔	✔	✔	✔								✔	✔		TF550
✔	✔	✔	✔	✔	✔											✔	✔		TS Chipset
✔	✔	✔	✔	✔	✔							✔			✔	✔	✔		Z3431-3
✔	✔	✔	✔	✔	✔							✔			✔	✔	✔		Z3431-9
✔	✔	✔	✔	✔	✔							✔			✔	✔	✔		Z3431-4
✔	✔	✔	✔	✔	✔							✔			✔	✔	✔		Z3431-5
✔	✔	✔	✔	✔	✔							✔			✔	✔	✔		Z3431-6
✔	✔	✔	✔	✔	✔							✔			✔	✔	✔		Z3431-7
✔	✔	✔	✔	✔	✔							✔			✔	✔	✔		Z3431-8
✔	✔	✔	✔	✔	✔														Z3450
✔	✔									✔	✔	✔	✔		✔	✔	✔	✔	SM16
❍	✔												❍		❍	❍	❍		PMA16
	✔																		EMA1
✔	✔							❶											FMA1
✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	KS17-ONE
✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	KS17-2
✔	✔		✔	✔	✔	✔	✔	✔	✔										KS17S
✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	KY94
✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	KY95-1
✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	KY95-2
✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	KY96
✔	✔	✔	✔	✔	✔	✔	✔												Z3241
		✔				✔	✔	✔											KC4
		✔				✔	✔	✔											KC27
✔	✔	✔				✔	✔	✔											NA4/500
✔	✔	✔				✔	✔	✔	✔										NA5/600
✔	✔	✔	❍	❍	❍	✔	✔	✔	✔										BD232
✔	✔	✔	❍	❍	❍	✔	✔	✔											BD-Pack 1
✔	✔		✔	✔	✔														SI232 II
✔	✔		✔	✔	✔														1-Ch. Pack II
✔	✔		✔	✔	✔														4-Ch. Pack II
✔	✔	✔				✔	✔	✔	✔										USB-Hit
✔	✔	✔				✔	✔	✔											USB-Pack
✔	✔	✔	✔	✔	✔	✔	✔	✔											METRAwin10
								✔	✔										METRAwin90-2
						✔	✔	✔											METRA VIEW

Explanation of Symbols:

✔ = suitable for this device

❍ = suitable for this device under certain circumstances

☆ = suitable for METRA HIT ONE plus

■ = suitable for higher current measuring ranges

❑ = not for power measurement

❶ = to 1 kHz

❷ = to 120 A

❸ = to 300 A

❹ = as of 5 A

❺ = as of 50 A

❻ = as of 500 A

❼ = as of 2 A

❽ = as of 0.2 A

❾ = as of 20 A

NW3A / NW300mA

Shunt Resistors for Multimeters Without Current Measuring Function

The shunt resistors function as adapters for multimeters without their own current measuring function (e.g. METRA HIT 22S, 16I, 16T, 16U).

● **Usable with instruments specified in the overview on page 28**

Type	Data Sheet No.	Article Number		
NW3A	–	Z205B		
NW300mA	–	Z205C		

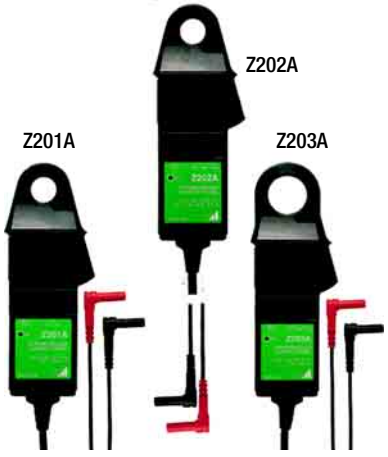
Clip-on Current Transformers Clip-On Current Sensors

Current within conductors can be conveniently and safely measured with clip-on current transformers and clip-on current sensors.

The following advantages result:

- The electrical circuit need not be interrupted – no electrical connection to the conductor.
- Measurement of current up to 2000 A – no multimeter overloading as a result of current surges.

● **Usable with instruments specified in the overview on page 28**



Type	Measuring Range	CAT at V	Wire Dia.	Trans. Ratio	Frequency Range	Intrinsic Error ± (% rdg. + mA)
AC-DC current sensors with voltage output, mV/A						
Z201A	0.01 ... 30 A⎓ 0.01 ... 20 A~	III at 300	19 mm dia.	100 mV/A	DC ...400 Hz ...20 kHz	1%
Z202A	0.1 ... 30/300 A⎓ 0.1 ... 20/200 A~	III at 300	19 mm dia.	10 mV/A 1 mV/A	DC ...2 kHz ...10 kHz	1% + 0.03 A 1% + 0.3 A
Z203A	1 ... 300/1000 A⎓ 1 ... 200/1000 A~	III at 300	31 mm dia.	1 mV/A	DC ...10 kHz	1% +0.5 A
Z13B	0.5 ... 60/600 A⎓ 0.2 ... 40/400 A~	IV at 300	50 mm dia.	10 mV/A 1 mV/A	DC ...65 Hz ...10 kHz	1.5 % 2%
AC current sensors with voltage output, mV/A						
WZ12B	0.01 ... 100 A_{AC}	III at 300	15 mm dia.	0.1 mV/mA	45...65 ...500 Hz	1.5% +0.1 mA
WZ12C	0.001 ... 15 A_{AC} 1 ... 150 A_{AC}	III at 300	15 mm dia.	1 mV/mA 1 mV/A	45...65 ...500 Hz	3%+0.15 mA 2%+0.1 A
WZ11B	0.5 ... 20 A_{AC} 5 ... 200 A_{AC}	III at 600	20 mm dia.	100 mV/A 10 mV/A	30...48...65 Hz ...500 Hz	1 ... 3%
Z3512A	0 ... 1000 A_{AC}	III at 600	52 mm dia.	1 mV 1 V/A	10...48...65 Hz ...3 kHz	0.2% ... 0.7%
AC current transformers with current output, mA/A						
WZ12A	15 ... 180 A_{AC}	III at 300	15 mm dia.	1 mA/A	45...65 ...400 Hz	3%
WZ12D	0.03 ... 150 A_{AC}	III at 300	15 mm dia.	1 mA/A	45...65 ...500 Hz	2.5% +0.1 mA
WZ11A	1 ... 200 A_{AC}	III at 600	20 mm dia.	1 mA/A	48...65 ...400 Hz	1 ... 3%
Z3511	4 ... 500 A_{AC}	III at 600	30 x 63 mm	1 mA/A	45...65 Hz ...1 kHz	3% +0.4 A
Z3512	0.5 ... 1000 A_{AC}	III at 600	52 mm dia.	1 mA/A	30...45...65 Hz ...5 kHz	0.5% ... 0.7%
Z3514	1 ... 2000 A_{AC}	III at 600	64 x 150 mm	1 mA/A	30...45...65 Hz ...5 kHz	0.5%

Type	Data Sheet No.	Article Number		
WZ12A	3-349-017-03	Z219A		
WZ12B	3-349-017-03	Z219B		
WZ12C	3-349-017-03	Z219C		
WZ12D	3-349-017-03	Z219D		
WZ11A	3-349-017-03	Z208A		
WZ11B	3-349-017-03	Z208B		
Z3511	–	GTZ3511000R0001		
Z3512	–	GTZ3512000R0001		
Z3512A	–	Z225A		
Z3514	–	GTZ3514000R0001		
Z13B	3-349-085-03	Z213B		
Z201A	–	Z201A		
Z202A	–	Z202A		
Z203A	–	Z203A		

Flexible Ampflex Current Sensors

Current Sensors for the Measurement of Alternating Current at Difficult to Access Locations

These sensors are suited for the measurement of alternating current at difficult to access locations.
They are highly insulated and can generally be switched at a ratio of 1:10 with a range selector.
The sensors can be operated within a frequency range of up to 20 kHz.
Maximum phase error is 2.5° at a frequency of up to 1 kHz.
Supply power is provided with a 9 V battery with a service life of approximately 150 hours.

● Usable with instruments specified in the overview on page 28

Type	Measuring Range $A_{DC, AC}$	CAT at V	Loop Length	Trans. Ratio	Frequency Range Hz	Intrinsic Error ± (% rdg. + mA)
AF033A	0.5 ... 30 A : 3 V 0.5 ... 300 A : 3 V	III at 1000	600 mm	100 mV/A 10 mV/A	10 ... 100 ... 20 kHz	1% + 50 mA 1% + 5 mA
AF11A	0.5 ... 1 kA : 1 V	III at 1000	450 mm	1 mV/A	10 ... 100 ... 20 kHz	1% + 2 mA
AF33A	0.5 ... 300 A : 3 V 0.5 ... 3000 A : 3 V	III at 1000	900 mm	10 mV/A 1 mV/A	10 ... 100 ... 20 kHz	1% + 5 mA 1% + 2 mA
AF101A	0.5 ... 1 kA : 1 V 50 ... 10 kA : 1 V	III at 1000	1200 mm	1 mV/A 0.1 mV/A	10 ... 100 ... 20 kHz	1% + 2 mA 1% + 1 mA

Type	Data Sheet No.	Article Number		
AF11A	3-348-845-03	Z207D		
AF033A	3-348-845-03	Z207A		
AF33A	3-348-845-03	Z207B		
AF101A	3-348-845-03	Z207C		

Voltage Probes

For High-Voltage Measurements with a Multimeter

KS30

HV3

HV30

KS30:
Probe for up to 1000 V in power installations
- The high impedance KS30 voltage probe offers additional protection against overvoltages and operator error for measurements at high energy voltage sources.

HV3:
3kV/3V high-voltage probe
- The HV3 probe is suitable for measurements of up to 3 kV. It simultaneously serves as a low pass filter for frequency converter signals.

HV30:
30kV/30V high-voltage probe
- The HV30 high-voltage probe (VDE approved) can be used for safe measurement of direct voltages of up to 30 kV.

● Usable with instruments specified in the overview on page 28

Type	Data Sheet No.	Article Number		
KS30	–	GTZ3204000R0001		
HV3	–	GTZ3431011R0001		
HV30	–	GTZ3431001R0001		

High Frequency Probe

High Frequency Probe: 100 kHz to 750 MHz, 0.25 ... 50 V_{AC}

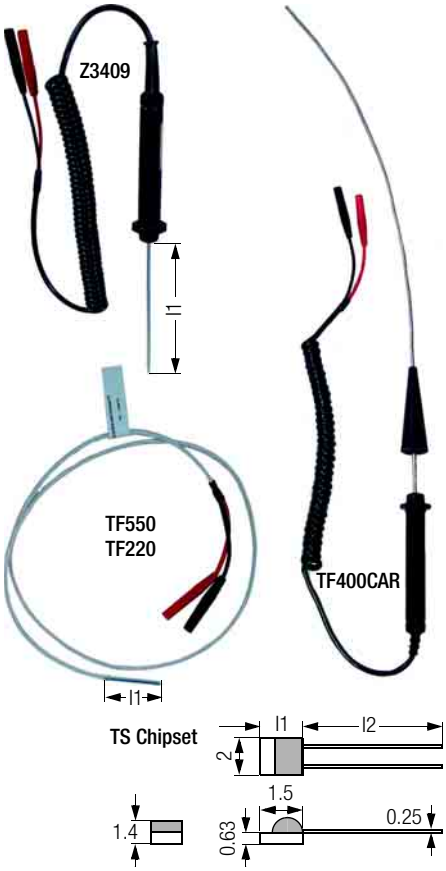
In combination with a multimeter, the Z3431-2 high frequency probe allows for measurement of alternating voltages with amplitudes of 0.25 V to 50 V within a frequency range of 100 kHz ... 750 MHz.
The probe rectifies alternating voltages at a ratio of 1:1.
The measuring instrument must have an input impedance of 10 MΩ.

● Usable with instruments specified in the overview on page 28

Type	Data Sheet No.	Article Number		
Z3431-2	–	GTZ3431002R0001		

Temperature Sensors

Pt100/Pt1000 Temperature Sensors



Standard Z3409 sensor for surface and immersion measurements from -40° C to +600° C.
TF550 oven sensor for temperature measurements in ovens, refrigeration units etc. from -50° C to +550° C.
TF220 waterproof sensor for temperature measurements in gases and liquids, e.g. water temperature in washing machines, oil temperature in automotive transmissions and air temperature in freezers and air conditioners.
TF400CAR dipstick oil temperature sensor for motor oil temperature measurement in automotive applications.
The TS chipset includes 10 miniature adhesive sensors for spot measurements at small measuring points within a range of -50° C to +550° C.

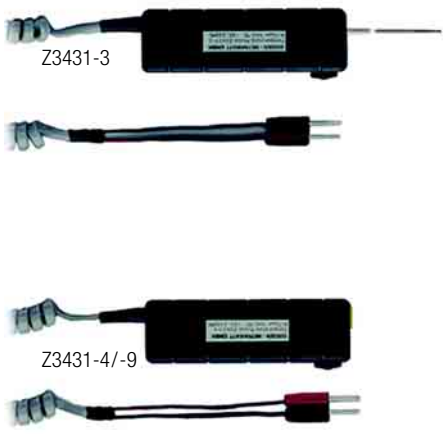
Type	Z3409	TF550	TF220	TF400CAR	TS Chipset
Sensor element	Pt100		Pt1000		Pt100
Sensor element length (l1) mm	130	40	39	810	2.3
Sensor length (l2) mm	1000	1500	1500	2310	10
Temperature range, °C	-40...+ 600	-50...+ 550	-50...+ 220	-50...+ 500	-50...+ 550
Accuracy per DIN EN60751/IEC 751	Class A	Class B			
Intrinsic error at 0 °C	0.15 K	0.3 K		–	0.4 K
Intrinsic error for °C	600: 1.35K	550: 3.1K	220: 1.4K	–	550: 3.1K
Transient recovery, T_{90} water	5 s	8 s		–	0.3 s
Transient recovery, T_{90} air	30 s	33 s		–	15 s
Lead	Strand, 2 ea. 0.35 square mm			–	0.25 dia./Ni-Pt
Outer jacket	PVC	V4A	Teflon	–	–
Insulation	PVC	Glass	Teflon	–	–

● **Usable with instruments specified in the overview on page 28**

Type	Data Sheet No.	Article Number		
Z3409	–	GTZ3409000R0001		
TF550	–	GTZ3408000R0001		
TF220	–	Z102A		
TF400CAR	–	Z102C		
TS Chipset	–	GTZ3406000R0001		

Temperature Probes

Temperature Probes (type K / NiCr-Ni)



The Z3431-3 temperature probe is equipped with a permanently mounted, standard immersion sensor.
Measuring sensors Z3431-5 through 8 can be plugged into probes Z3431-4 and Z3431-9.
They are suitable for temperature measurements within a range of -25° C to + 1150° C.
The measurement output is connected to the mV/V measurement input at the multimeter.

Type	Z3431-3	Z3431-9	Z3431-4
Measuring range	-20° C to +350° C		-25° C to +1150° C
Sensor type	NiCr-NiAl, type K thermocouple		
Accuracy (without sensor)	± (0.5% rdg. + 0.5° C)		± (1% rdg. + 1° C)
Required multimeter input impedance	> 10 kΩ		
Output voltage	1 mV / °C		
Operating temperature	5° C ... 45° C		
Dimensions (without sensor)	118 x 37 x 211 mm		
Weight (without sensor)	140 gr.	110 gr.	
Power Supply	1.5 V baby cell, 250 hour service life		

- Z3431-5: standard plug-in immersion sensor, to +1100° C
- Z3431-6: plug-in surface sensor, to +850° C
- Z3431-7: high-temperature plug-in sensor tape, to +450° C
- Z3431-8: flexible, insulated plug-in sensor, to +250° C

● **Usable with instruments specified in the overview on page 28**

Type	Data Sheet No.	Article Number		
Z3431-3	–	GTZ3431003R0001		
Z3431-4	–	GTZ3431004R0001		
Z3431-5	–	GTZ3431005R0001		
Z3431-6	–	GTZ3431006R0001		
Z3431-7	–	GTZ3431007R0001		
Z3431-8	–	GTZ3431008R0001		
Z3431-9	–	GTZ3431009R0001		

Z3450 Leakage Current Measuring Adapter

Leakage Current Measuring Adapter, DIN VDE 0107 / DIN VDE 0750

The Z3450 leakage current adapter is used with RMS multimeters for the measurement of contact voltage per DIN VDE 0107, paragraph 10, and for the measurement of continuous leakage and patient auxiliary current per DIN VDE 0750 part 1, IEC 601-1 and EN 60 601-1.1990.

● **Usable with instruments specified in the overview on page 28**

Type	Data Sheet No.	Article Number		
Z3450	–	GTZ3450000R0001		

SM16/PMA16 Measuring Adapter

Current Measuring Adapter / Power Measuring Adapter

SM16 current measuring adapter for safe, trouble-free measurement of power consumption at consumers connected to the mains with a plug. The attached cable with contact-protected connectors can be connected directly to the current measurement sockets at the multimeter.

The PMA 1 power measuring adapter includes an additional, second cable for connection to the voltage path of the METRA HIT 29S.

● **Usable with instruments specified in the overview on page 28**

Type	Data Sheet No.	Article Number		
SM16	–	GTM9070190E0002		
PMA16	–	Z228A		

METRA HIT EMA1

Energy Measuring Adapter for Ferraris Meters

The EMA1 is a plug-in adapter for the METRA HIT 29S digital multimeter for energy measurement at Ferraris meters without altering the electrical installation.

The EMA1 is an inexpensive, optimized accessory for acquisition, evaluation and optimization of energy curves in combination with the METRA HIT 29S and METRAwin 10.

A METRA HIT 29S can be connected to a Ferarris meter via the EMA1 for the measurement and recording of 3-phase energy curves. The meter pulse is acquired optically and is evaluated and recorded with a programmable factor. Recorded data are displayed as a peak value curve with METRAwin 10 software.

- Dimensions (W x H x D): control unit : 97 x 135 x 39 mm, weight: 110 gr.

● **Usable with instruments specified in the overview on page 28**

Type	Data Sheet No.	Article Number		
EMA1	3-348-994-03	Z112A		

METRA HIT FMA1

E and B Field Measuring Adapter for Measurement of Low Frequency Alternating Fields

METRA HIT field measuring adapter for measuring and recording electrical and magnetic fields (recommended for use with the following instruments: METRA HIT 26M, 28S and 29S)

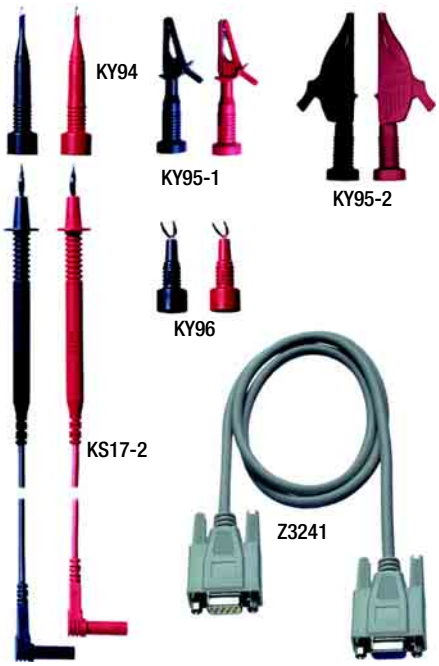
- Compact, handy measuring instrument adapted to battery powered multimeters including METRA HIT 26S/26M ... 29S
- Suitable for short and long-term recording of EM fields and measurement data analysis at the PC in combination with METRAHit 26M and 29S, and with the SI232 memory interface
- Orientation measurements in accordance with federal regulations (BIMSCHG)
- Testing for radiation at CRT monitor workstations in accordance with MPRII and TCO
- Easy to use
- High dynamic range assures reliable measurement values, even at 100% over-ranging
- Fluctuating field strengths can be recorded in combination with METRA HIT multimeters and METRAwin software, and peak values can be analyzed
- Dimensions (W x H x D): control unit: 97x135x39 mm, weight: 210 gr. with batteries: 2ea.1.5 V IEC LR 6 (AA mignon)
  Probe: 43x130x28 mm, weight: 130 gr.

● **Usable with instruments specified in the overview on page 28**

Type	Data Sheet No.	Article Number		
FMA1	3-348-854-03	Z108A		

Measuring Accessories

Cable Sets, Clips, Interface cables and Extension Cables



A cable set with permanently mounted test probes and contact-protected angle plugs is available for safe measurement.
Hook clips, alligator clips or push-on lugs can be attached to the test probes for special measuring tasks.

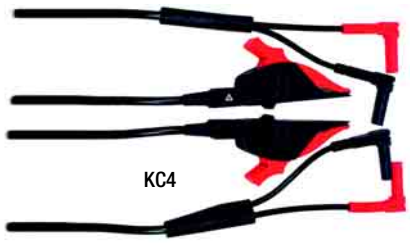
- KS17-ONE cable set: 600 V CAT III 16 A (no photo)
- KS17-2 cable set: consisting of 1 pair of measurement cables, 1.5 m, 1000 V/CAT III, 600 V/CAT IV
- KS17S cable set: with 2 mm diameter steel tips and 120 cm cable, 1000 V / CAT III (no photo)
- KY94 hook clips (1 pair) for KS17-2
- KY95-1 alligator clips (1 pair) for KS17-2, 300 V/CAT III
- KY95-2 alligator clips (1 pair) for KS17-2, 1000 V CAT III 19 A
- KY96 push-on lugs (1 pair) for KS17-2
- Z3241 interface cable: RS 232 interface cable, 2 m

● **Usable with instruments specified in the overview on page 28**

Type	Data Sheet No.	Article Number		
KS17-ONE	–	Z110K		
KS17-2	–	GTY3620034P0002		
KS17S	–	Z110H		
KY94	–	GTY3610094P01		
KY95-1	–	GTZ3215000R0002		
KY95-2	–	Z110J		
KY96	–	GTY3610096P01		
Z3241	–	GTZ3241000R0001		

Kelvin Clips

Kelvin Clips for Connecting Low-Impedance Resistors to Ohmmeters



Kelvin clips are used for connecting low impedance resistors (e.g. contact resistors, shunts etc.) to an ohmmeter with 4-wire connection. This allows for compensation of cable resistance.

- KC4: Kelvin clips (1 set of 2 ea.) for 4-pole connection of low-resistance DUTs, 120 cm cable length, clip for connection to DUTs with diameters of up to 30 mm
- KC27: Kelvin probes (1 set of 2 ea.) with 2 stainless steel tips for 4-pole connection of low-resistance DUTs, 120 cm cable length

● **Can be used with METRA HIT 30M, 27M and 27I (see overview on page 28)**

Type	Data Sheet No.	Article Number		
KC4 Set	–	Z227A		
KC27 Set	–	Z227B		

NA4/500, NA5/600 Power Packs

Mains Power Packs – Mains Adapters

Mains power packs for METRA HIT instruments allow for battery saving mains operation, in particular for continuous measurements using multimeters with internal memory.

- NA4/500: Power pack, 230 V/4.5 V, for METRA HIT 22M, 26M, 27M, 27I, 28C, 28S, 29S and 30M **manufactured through 2003**
- NA5/600: Power pack, 230 V/5 V/600 mA, for METRA HIT 27M, 27I, 28C, 28S, 29S and 30M (due to modified plug connectors) **manufactured as of 2004**

● **Usable with instruments specified in the overview on page 28**

Type	Data Sheet No.	Article Number		
NA4/500	–	Z218A		
NA5/600	–	Z218F		

BD232

Interface Adapter for METRA HIT Multimeters

Can be snapped onto all METRA HIT multimeters. The infrared interface allows for electrically isolated data transmission between PC and multimeter. Data transmission is indicated visually by means of two LEDs.

The BD232 interface adapter is especially recommended for measuring instruments with integrated memory (METRA HIT 22M, 26M, 29S, 30M). The BD-Pack 1 is available as a user-friendly complete package for single-channel operation. The package includes the BD232 interface adapter, an RS 232 bus cable, METRAwin 10 software and installation instructions.
METRAwin 10 is used for data analysis and display (see page 36). It cannot be used for online recording with type SI232-II adapters. In order to expand to 2, 3 or 4-channel operation, one BD232 is required for each channel, as well as additionally required multimeters.
Accessories: Type Z3241 = RS 232 interface cable, 2 m, (included with 1-Ch. Pack, 4-Ch. Pack and Z3231)

- Dimensions: 135 x 97 x 39 mm

● **Usable with instruments specified in the overview on page 28**

➲ **See page 91 for training seminar: GTT1219B**

Type	Data Sheet No.	Article Number		
BD232	3-349-026-03	GTZ3242100R0001		
BD-Pack 1	3-349-026-03	Z215A		
Z3241 interface cable	–	GTZ3241000R0001A1		

SI232 II

Memory Adapter, Single-Channel / 4-Channel Memory Pack for METRA HIT Multimeters

Can be snapped onto all METRA HIT multimeters. Convert IR measurement data received from the instrument and control signals received from the PC. Measurement data are recorded to the integrated memory with reference to real-time, and are transmitted to the PC after measurement has been completed. The 128 kB memory can be partitioned into blocks as desired. The sampling interval can be set within a range of 50 ms to 10 minutes, or sampling can be triggered in a signal dependent fashion for optimum memory usage.

The SI 232-II memory adapter is especially recommended for measuring instruments **without** integrated memory (METRA HIT 22S through 28S). The 1-Ch. pack is available as a user-friendly complete package for single-channel operation.
The pack includes the SI232 II memory adapter, an RS 232 bus cable, METRAwin 10 software and installation instructions.
METRAwin 10 is used for data analysis and display (see page 36).
In order to expand to 2, 3 or 4-channel operation, one SI 232-II is required for each channel, as well as additionally required multimeters. The 4-Ch. Pack is recommended for simultaneous recording with 4 multimeters.
Accessories: Type Z3241 = RS 232 interface cable, 2 m, (included with 1-Ch. Pack, 4-Ch. Pack and Z3231)

- Dimensions: 135 x 97 x 39 mm, weight: approx. 0.25 kg with battery
- Batteries: 2 ea. 1.5 V IEC LR 6 (AA mignon)

● **Usable with instruments specified in the overview on page 28**

➲ **See page 91 for training seminar: GTT1219B**

Type	Data Sheet No.	Article Number		
SI232 II	3-349-026-03	GTZ3242020R0001		
1-Ch. Pack II	3-349-026-03	GTZ3231020R0001		
4-Ch. Pack II	3-349-026-03	GTZ3234020R0001		
Z3241 interface cable	–	GTZ3241000R0001A1		

USB-Hit

USB Interface Adapter for METRA HIT Multimeters

Bidirectional IR-USB interface adapter for METRA HITs

Can be snapped onto all METRA HIT multimeters.
Data are transmitted from the multimeter to the adapter in a electrically isolated, bidirectional fashion, and to the USB interface for PCs and laptops.

● **USB pack: set consisting of USB-HIT interface adapter, USB cable and METRAwin 10/METRAHit software**

● **Usable with instruments specified in the overview on page 28**

➲ **See page 91 for training seminar: GTT1219B**

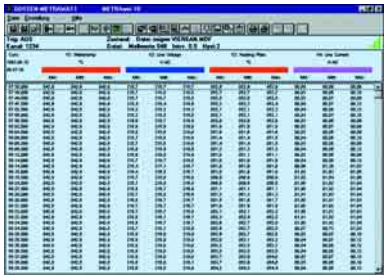
Type	Data Sheet No.	Article Number		
USB-Hit	–	Z216A		
USB-Pack	–	Z216B		

METRAwin® 10/METRA HIT

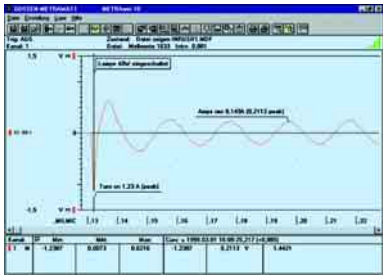
Measurement Data Recording and Parameters Configuring Software for METRA HIT Multimeters

①

②



③



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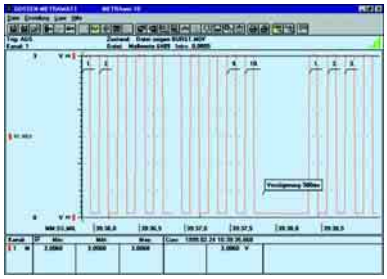


⑤

⑥

Together with a BD232 interface adapter or an SI232 memory adapter, METRAwin 10/METRA HIT turns any METRA HIT multimeter into a professional, PC-based universal recording system. Measured values are queried from the multimeters, managed at the PC and displayed as diagrams (up to 6 channels), XY diagrams (up to 4 channels) or in tabular form (up to 10 channels) with METRAwin 10/METRAHit.

In the online mode, measurement data are displayed live in diverse formats, e.g. at up to 4 virtual indicator instruments or digital displays (with adjustable limit values).
High performance, online arithmetic functions allow for data analysis and evaluation.
The sampling interval can be set within a broad range depending upon device type and measuring function:
50 ms – 100 ms – 200 ms – 500 ms – 1 s ... 60 minutes online, or off-line to device memory to min. 0.5 ms (for METRA HIT 29S).

Measurement data can be easily imported to other Windows PC applications such as Word and Excel via the clipboard.
METRAwin 10/METRA HIT software is included with the memory and interface adapter packs, and is not offered separately.
The article number shown below includes updates.

Multimeter and Indicator Instruments (1 and 2)

Uploaded measured values are displayed at the screen both digitally and at an analog scale.

Data Logger (3)

Acquired measurement data are displayed chronologically at the screen in easy to read tabular form.

Arithmetic Functions

Measurement data from different channels can be linked and processed with high performance arithmetic functions.

Yt Diagram (4 and 5)

Acquired measurement data are displayed at the screen as a time graph with a horizontal time axis, and are measured off with two cursors. Stored signals can be expanded or compressed along amplitude or time axes (zoom function). The time axis can be scaled in absolute time, or in relative measuring time.

Continuous Line Recorder

Up to 10 channels can be printed out continuously as a Yt line graph at a color printer.

XY Diagram (6)

Acquired data are displayed as an XY graph and are measured off with the cursors.
As is the case with all display formats, all scales can be freely adjusted.

Sampling

Sampling can be started either manually (mouse click), automatically with an adjustable interval (50 ms to 1 hour) or as a function of the signal with adjustable signal hysteresis (0 to 500 digits). The minimum sampling interval for devices with integrated memory is 0.5 ms (see figure 6).
Data can be controlled with time and window triggers, and can be saved automatically as multiple data files.

System Requirements for METRAwin 10 as of Version 5.0

Operating system:

- MS Windows 95, 98, ME, NT, 2000 or XP

Hardware

- IBM compatible Windows PC, Pentium CPU or better with at least 32 MB RAM
- VGA monitor with a resolution of at least 800 x 600 pixels
- Hard disk with at least 20 MB available memory
- 3½" floppy disk drive for 1.4 MB floppies
- Microsoft compatible mouse or other pointing device
- A Windows supported printer if required
- 1 RS 232 serial port, COM1 ... COM8

Installation

A Setup.exe file is included on the floppy disk / CD ROM. Upon executing this file, METRAwin 10 software is installed in dialog with the user. The installation directory and the program file folder can be selected as desired.
METRAwin 10 software is available in a variety of versions for various measuring instruments. These software variants can be installed to the same directory, as long as only the last digit of the respective version numbers vary from each other (e.g. 5.04 and 5.01). However, the version with the highest number must be installed last.

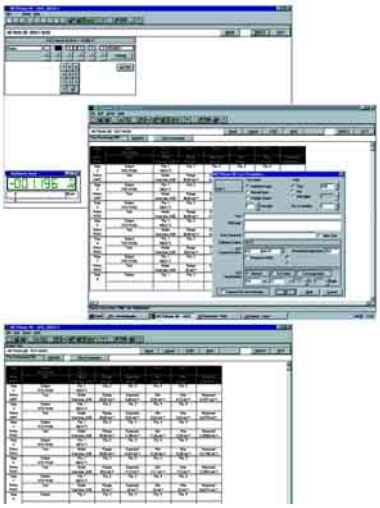
Operation

METRAwin 10 software is equipped with an online help function. It includes operating instructions and explanations regarding software, as well as communication with the measuring instrument.

Type	Data Sheet No.	Article Number		
METRAwin 10 Software Update	3-349-026-03	GTZ3240000R0001		

METRAwin® 90-2

Calibration software for METRA HIT 18C and METRA HIT 28C



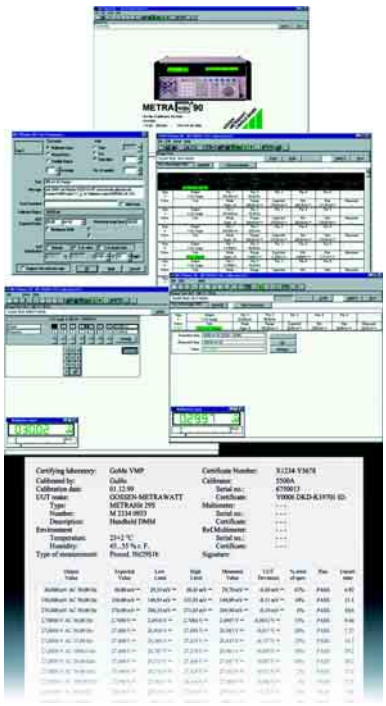
The handheld METRA HIT 18C or 28C calibrator with multimeter is transformed into a professional, PC-based calibration system for measuring transducers, indicators and recording instruments with the help of METRAwin 90-2 and a BD232 interface adapter.

Calibration procedures are created with METRAwin software.
Specified analog values are transmitted from the PC via the BD232 adapter to the calibrator, and are fed to the device to be calibrated from the analog output at the calibrator.
The analog output value from the device to be calibrated is then measured by the multimeter, and is returned to the PC for evaluation via the interface.
If the measurement results remain within the specified tolerances, each consecutive calibration step is initialized automatically until the entire procedure has been run.
Calibration data can be easily imported into other Windows applications (e.g. Word or Excel).

Type	Data Sheet No.	Article Number		
METRAwin 90-2	3-349-098-03	Z211A		

METRAwin 90F / FJ

METRAwin 90-F: Calibration Software for Fluke 55xx Benchtop Calibrators
METRAwin 90-FJ: Calibration and Adjusting Software



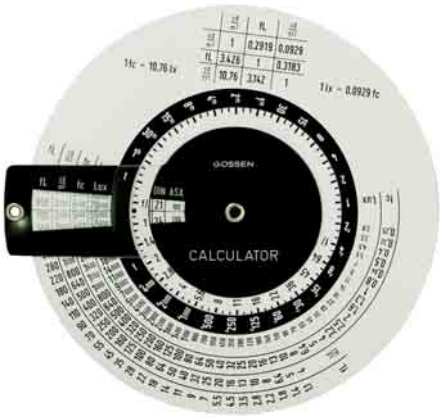
With METRAwin 90F, an IEEE-488 interface at the PC and a Fluke 5500A, 5520A or 5700A calibrator, a universal, professional, automated closed-loop calibration system can be set up for METRA HIT series multimeters.
However, it is also suitable for universal use for calibrating analog and digital multimeters, recording instruments, power meters, power measuring transducers, amplifier modules, transducers etc. Calibration procedures are generated with METRAwin90-F. Specified analog values are transmitted from the PC via the IEEE 488 interface to the calibrator and are fed to the device to be calibrated from the analog output at the calibrator. A BD232 adapter is coupled to the computer via an RS 232 cable for automatic transmission of measurement results from the METRA HIT multimeter to the computer. In the case of measuring transducers, the analog output value from the device to be calibrated is measured by a METRA HIT multimeter, and is returned to the PC for evaluation via the interface. If the measurement results remain within the specified tolerances, each consecutive calibration step is initialized automatically until the entire procedure has been run step by step.

- Automated calibration of METRA HIT ..S / ..M / ..A series handheld multimeters with infrared interface
- **New**: Adjustment of METRA HIT 22-29S/M hand-held multimeters via RS 232 interface
- Quick and simple generation, testing and documentation of calibration procedures
- Uncomplicated operation: even semiskilled workers can execute qualified calibration tasks.
- Outstanding applications flexibility with calibration signal feeding by means of key entry or via the interface
- Documentation printouts as standard calibration report, or as a user-specific certificate
- Dynamic data exchange with Microsoft Excel and Word
- Documentation includes all entries required for certificates in accordance with EN ISO 9000
- “Determination of measuring uncertainty” in accordance with DKD-3 after a specified number of measurements
- Specification of calculated measuring uncertainty in accordance with DKD-3 or TUR (test uncertainty ratio) included in the report

Type	Data Sheet No.	Article Number		
METRAwin 90-F	–	Z211C		
METRAwin 90-FJ	–	Z211F		

MAVOLUX 5032 C / ..B *USB*

Precision Digital Measuring Instrument for Measuring Illuminance in Lux or Footcandles



Digital luxmeter for inspecting light sources and street illumination, for monitoring the illumination of workstations and public buildings, as well as sports and parking facilities, quality control for light sources, quality assurance for the production of lamps and light fixtures. Very strong light can be measured with these instruments without the use of any accessories. With a very high initial sensitivity of 0.01 lux, the MAVOLUX 5032 B USB is very well suited for measuring minimal illumination intensities as well, for example emergency lighting. High precision in accordance with class B allows for use in certification applications and for inspection.

- Precision digital measuring instrument for measuring illuminance in lux or footcandles
- Luminance measurement in cd/m², or in footlamberts with luminance attachment as accessory
- Large measuring ranges – high resolution – classified in accordance with DIN 5032-7 and CIE no. 69
- The silicon photodiode is color corrected, i.e. its spectral sensitivity is matched to that of the human eye V(l). The main difference between the MAVOLUX 5032C and MAVOLUX 5032B is the accuracy with which this matching has been executed.
- Cosine correction for obliquely incident light
- Storage of up to 100 measured values – USB 1.1 interface
- Automatic and manual measuring range selection
- Rugged device design, simple operation
- Dimensions: basic device: 65 x 120 x 19 mm, probe: 31 x 105 x 30 mm, approx. weight: 200 gr. without battery
  Cable between device and probe:
  MAVOLUX 5032 C USB: coil cable, permanently attached, length: 1.5 m
  MAVOLUX 5032 B USB: coil cable with plug, length: 1.5 m
  Available for an additional charge: straight cable (not coiled), length: 3, 5 or 10 m

● **Included:** **Carrying case, CD ROM with software for displaying measured values, acquiring measured values and device control, USB cable, battery and operating instructions**

● **Optional accessories:** **Luminance attachment, calculating disc for time/f-stop combinations and other magnitudes for photography, adapter disc for measurements at LCD monitors for the avoidance of obliquely incident light**

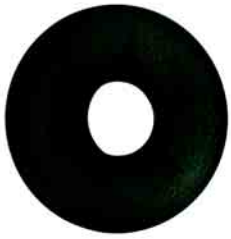
● **Factory certificate upon request**
The traceability of measurement results to the national standard maintained by the PTB (German Federal Institute of Physics and Metrology) is assured by means of the Wi 41G standard lamp.
The factory certificate is required for all applications for which measurements and testing in accordance with legal directives and regulations are required.

MAVOLUX 5032 C *USB*					
Measured Quantity	Measuring Range			Resolution	
	MR	Lux (lx)	Footcandle (fc)	Lux (lx)	Footcandle (fc)
Illuminance	I	0.1 ... 199.9	0.01 ... 19.99	0.1	0.01
	II	1 ... 1999	0.1 ... 199.9	1	0.1
	III	10 ... 19990	1 ... 1999	10	1
	IV	100 ... 199900	10 ... 19990	100	10
	MR	Candela/m² (cd/m²)	Footlambert (fL)	cd/m²	Footlambert (fL)
Luminance (with attachment)	I	1 ... 1999	0.1 ... 199.9	1	0.1
	II	10 ... 19990	1 ... 1999	10	1
	III	100 ... 199900	10 ... 19990	100	10
	IV	1000 ... 1999000	100 ... 199900	1000	100
MAVOLUX 5032 B *USB*					
	MR	Lux (lx)	Footcandle (fc)	Lux (lx)	Footcandle (fc)
Illuminance	I	0.01 ... 19.99	0.001 ... 19.99	0.01	0.001
	II	0.1 ... 199.9	0.1 ... 199.9	0.1	0.01
	III	1 ... 1999	1 ... 1999	1	0.1
	IV	10 ... 19990	10 ... 19990	10	1
	V	100 ... 199900	100 ... 199900	100	1
	MR	Candela/m² (cd/m²)	Footlambert (fL)	cd/m²	Footlambert (fL)
Luminance (with attachment)	I	0.1 ... 199.9	0.01 ... 19.99	0.1	0.01
	II	1 ... 1999	0.1 ... 199.9	1	0.1
	III	10 ... 19990	1 ... 1999	10	1
	IV	100 ... 199900	10 ... 19990	100	10
	V	1000 ... 1999000	100 ... 199900	1000	100

Type	Data Sheet No.	Article Number		
MAVOLUX 5032 C *USB*	GFLDOKU010410GB	M502G		
MAVOLUX 5032 B *USB*	GFLDOKU010410GB	M503G		
Factory certificate (net price)	GFLDOKU010410GB	H997B		
Luminance attachment	GFLDOKU010410GB	5908V0120		
Calculating disc	GFLDOKU010410GB	5999V0380		
Adapter disc	GFLDOKU010410GB	M499G		

MAVO-MONITOR *USB*

Precision Digital Measuring Instrument for Measuring Luminance in Candela/m² or Footlamberts



The precision digital measuring instrument for measuring luminance is placed directly onto self-luminous surfaces, or surfaces through which light is passed, such as monitors (CRT/LCD, background illumination), TV screens, light tables, trough luminaires, illuminated advertising surfaces, traffic signs and viewing screens. A handy, special measuring instrument for professional use in industrial, commercial and service applications, for special testing and inspection in accordance with existing safety regulations, for example at workstations with monitor screens, and in the fields of medical engineering and office technology.

- Precision measurement of luminance classified in accordance with DIN 5032-7 class B and CIE no. 69
- The silicon photodiode is color corrected, i.e. its spectral sensitivity is matched to that of the human eye V(l).
- Measurement of luminance in cd/m² or fL
- Easy operation
- 3½ place display
- Storage of up to 100 measured values
- USB 1.1 interface
- Automatic and manual measuring range selection

● **Included:** Carrying case, CD ROM with software for displaying measured values, acquiring measured values and device control, USB cable, battery and operating instructions

● **Optional accessories:** Adapter disc for measurements at LCD monitors for the avoidance of obliquely incident light

● **Factory certificate upon request**
The traceability of measurement results to the national standard maintained by the PTB (German Federal Institute of Physics and Metrology) is assured by means of the Wi 41G standard lamp.
The factory certificate is required for all applications for which measurements and testing in accordance with legal directives and regulations are required.

MAVO-MONITOR *USB*					
Measured Quantity	Measuring Range			Resolution	
	MR	Candela/m² (cd/m²)	Footlambert (fL)	cd/m²	Footlambert (fL)
Luminance	I	0.01 ... 19.99	0.001 ... 1.999	0.01	0.001
	II	0.1 ... 199.9	0.01 ... 19.99	0.1	0.01
	III	1 ... 1999	0.1 ... 199.9	1	0.1
	IV	10 ... 19990	1 ... 1999	10	1

Type	Data Sheet No.	Article Number		
MAVO-MONITOR *USB*	GFLDOKU010410GB	M504G		
Factory certificate (net price)	GFLDOKU010410GB	H997B		
Adapter disc	GFLDOKU010410GB	M499G		

Accurate lux measurements are a must for architects and lighting designers. The MAVOLUX 5032 *USB* is also available with a class B probe for this purpose.

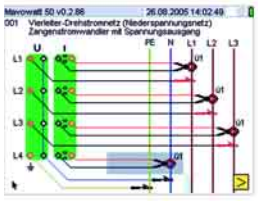
Please send RFQs, orders and requests for additional information to the address listed below, or visit our website.

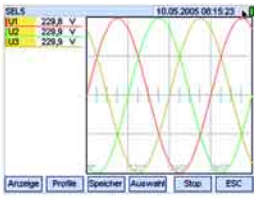
GOSSEN
Foto- u. Lichtmesstechnik GmbH
Photometry Sales
Thomas-Mann-Str. 16 - 20
90471 Nürnberg, Germany

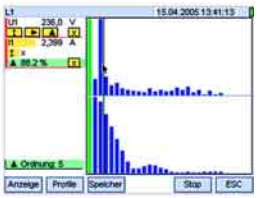
Phone: +49 911 / 8602-170
Fax: +49 911 / 8602-142
e-mail: info@gossen-photo.de
http://www.gossen-photo.de

MAVOWATT 50

3-Phase Energy and Power Disturbance Analyzer







The MAVOWATT 50 energy and power disturbance analyzer measures electrical quantities in DC systems, as well as in single and three-phase AC systems with any load.
Broadband measurement is laid out for line frequencies of up to 1 kHz, and covers everything from railway power at 16 2/3 Hz through mains power with 50 or 60 Hz, right on up to onboard electrical systems with 400 Hz.
Eight isolated measuring circuits – four each for voltage and current – prevent equalizing current and allow for simultaneous measurement of phase and neutral conductor voltage and current.
By connecting a suitable measuring transducer, the fourth channel can be used alternatively for the measurement of other physical quantities, e.g. the temperature of a motor or transformer, or wind speed at a wind power turbine.
Measurements at frequency converter outputs are also possible within a broad range.

The broad spectrum of possible applications ranges from acquisition, display and recording of mains quantities to logging and analysis of energy consumption, right on up to calculation and statistical analysis of characteristic voltage quality from power supply systems in accordance with EN50160.
In industrial applications, the precision measuring instrument is used to determine characteristic quantities of electrical consumers and generators in steady-state, as well as during dynamic processes. It also functions as a test instrument and compares harmonic current generated by electrical equipment, as well as voltage fluctuation, with specified limit values.

Thanks to its compact, rugged design, the MAVOWATT 50 is not only suitable for stationary use, but rather for mobile applications as well. The integrated rechargeable battery supplies power to the measuring instrument for periods of up to several minutes in the event of power failure.

- Complete power disturbance analysis with simultaneous measurement of all relevant mains quantities
- Power and energy analysis in power supply systems, as well as at the outputs of frequency converters
- Harmonic analysis up to the 50th harmonic including sub-harmonics
- Mains quality per EN50160 with statistical bar graph (Quick View)
- Flicker analysis in accordance with EN 61000-4-15
- 8 isolated measuring circuits (4 voltage and 4 current), 100 kHz sampling rate per measuring circuit
- Color touch-screen display, 5½", ¼ VGA
- Storage of measurement data and settings to plug-in CF memory card or USB memory stick
- USB interface for PC – external memory expansion
- Ethernet TCP/IP with integrated web server for remote control and read-out
- 4 digital status inputs for indicating consumer operating states
- 4 digital control inputs for synchronizing the measuring interval, and as meter inputs
- 1 relay output for alarms
- Power supply output for active current sensors
- Integrated rechargeable battery with charging controller for power failures
- Worldwide use is made possible with a broad range variable power pack (85 to 250 V AC-DC)
- Functionally covered standards: EN 50160, EN 61000-3-2, /-3-3, /-3-12, /-4-7, /-4-15, /-4-30

● **Included:** **3-phase energy and power disturbance analyzer, to 1 kHz, 8 electrically isolated measuring channels, set of measurement cables, mains cable, USB cable, network cable (crossed), convenient carrying case**

● **Optional accessories:** **Z201A, Z202A, Z203A, Z821B clip-on current-voltage transformers. WZ11B, Z13B, Z3512A clip-on current sensors, CF3x45, AF033A, AF33A, AF101A, AF11A flexible current sensors**
See page 41 for Z860A, Z861A, Z862A, Z863A shunt resistors.
See page 48 for Z501L: USB → RS232 interface converter.

➲ **Seminar: GTT1643**

Type	Data Sheet No.	Article Number		
MAVOWATT 50	3-349-342-03	M816A		
DKD calibration certificate	–	–		

Current Measuring Accessories for the MAVOWATT 50

Clip-on current-voltage transformers, current sensors, shunt resistors

Type	Description	Max. Wire Dia.	Application ➲	Meas. Cat.	Range Usable for MAVOWATT 50	Output Signal
CF3x45	3-phase set, C-*FLEX* flexible AC current sensor, switchable, 10 Hz to 20 kHz, with battery and power pack	3 ea. 45 cm circumf.	a, b, c	600 V CAT III	5 … 200 A~ 5 … 2000 A~ 50A~ … 20 kA~	10 mV/A 1 mV/A 0.1 mV/A
AF033A	Amp*FLEX* flexible AC current sensor, switchable, 10 Hz to 20 kHz, with 9 V battery (operating hours: approx. 150)	45 cm circumf.	(a), b, c	1000 V CAT III	0.5 … 30 A~ 0,5 … 300 A~	100 mV/A 10 mV/A
AF33A	Amp*FLEX* flexible AC current sensor, switchable, 10 Hz to 20 kHz, with 9 V battery (operating hours: approx. 150)	60 cm circumf.	(a), b, c	1000 V CAT III	0.5 … 300 A~ 5 … 3000 A~	10 mV/A 1 mV/A
AF101A	Amp*FLEX* flexible AC current sensor, switchable, 10 Hz to 20 kHz, with 9 V battery (operating hours: approx. 150)	120 cm circumf.	(a), b, c	1000 V CAT III	5 … 1000 A~ 50A~ … 10 kA~	1 mV/A 0.1 mV/A
AF11A	Amp*FLEX* flexible AC current sensor, 10 Hz to 20 kHz, with 9 V battery (operating hours: approx. 150)	45 cm circumf.	(a), b, c	1000 V CAT III	5 … 1000 A~	1 mV/A
Z821B	Clip-on AC current sensor, 30 Hz to 5 kHz	64 mm	a, b, (c)	600 V CAT II	3 … 3000 A~	0.33 mV/A
Z3512A	Clip-on AC current sensor, switchable, 10 Hz…3 kHz	52 mm	a, b, c	600 V CAT III	0.001 ... 1.2 A~ 0.01 ... 120 A~ 0.1 ... 120 A~ 1 ... 1200 A~	1000 mV/A 100 mV/A 10 mV/A 1 mV/A
WZ11B	Clip-on AC current sensor, switchable, 30 Hz…500 Hz	20 mm	a, (c)	600 V CAT III	0.5 … 20 A~ 5 … 200 A~	100 mV/A 10 mV/A
Z13B	Active AC-DC clip-on current sensor, switchable, DC…10 kHz, with 9 V battery (operating hours: approx. 50)	50 mm	b, c	300 V CAT IV.	0.2 … 40 A~/60 A– 0.5… 400 A~/600 A–	10 mV/A 1 mV/A
Z201A	Active AC-DC clip-on current sensor, DC…20 kHz, with 9 V battery (operating hours: approx. 30)	19 mm	b, c	300 V CAT III	0.01… 20 A~/30 A–	100 mV/A
Z202A	Active AC-DC clip-on current sensor, switchable, DC…10 kHz, with 9 V battery (operating hours: approx. 50)	19 mm	b, c	300 V CAT III	0.1 … 20 A~/30 A– 1 … 200 A~/300 A–	10 mV/A 1 mV/A
Z203A	Active AC-DC clip-on current sensor, switchable, DC…10 kHz, with 9 V battery (operating hours: approx. 50)	31 mm	b, c	300 V CAT III	1 … 200 A~/300 A– 1 …1000 A~/1000 A–	1 mV/A
Z860A	Plug-in shunt 50 Ω, 0.2%, 1.5 W	–	a, b	600 V CAT III	50 µA … 20 mA	50 mV/mA
Z861A	Plug-in shunt 1 Ω, 0.2%, 1.5 W	–	a, b	600 V CAT III	1 mA … 1.2 A	1000 mV/A
Z862A	Plug-in shunt 0.05 Ω, 0.2%, 1.5 W	–	a, b	600 V CAT III	0.02 … 6 A	50 mV/A
Z863A	Plug-in shunt 0.01 Ω, 0.2%, 1.5 W	–	a, b	600 V CAT III	0.1 … 16 A	10 mV/A

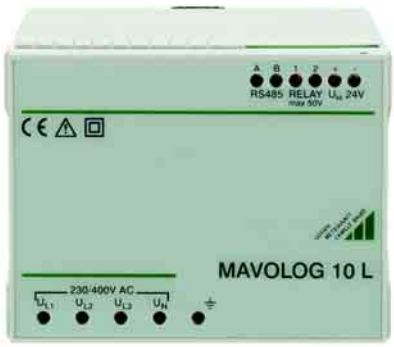
➲ a = Long-term measurement b = Harmonic measurement c = Frequency converter measurement

Refer to data sheet 3-349-342-03 for additional information regarding current measuring accessories.

Type	Data Sheet No.	Article Number		
CF3x45	3-349-342-03	Z824A		
AF033A	3-349-342-03	Z207A		
AF33A	3-349-342-03	Z207B		
AF101A	3-349-342-03	Z207C		
AF11A	3-349-342-03	Z207D		
Z821B	3-349-342-03	Z821B		
Z3512A	3-349-342-03	Z225A		
WZ11B	3-349-342-03	Z208B		
Z13B	3-349-342-03	Z213B		
Z201A	3-349-342-03	Z201A		
Z202A	3-349-342-03	Z202A		
Z203A	3-349-342-03	Z203A		
Z860A	3-349-342-03	Z860A		
Z861A	3-349-342-03	Z861A		
Z862A	3-349-342-03	Z862A		
Z863A	3-349-342-03	Z863A		

MAVOLOG®10L/N/S

3-Phase Mains Quality Analyzer and Test Instrument for Testing per EN 50160 in Standard Combination Housing



3-phase mains quality analyzer and test instrument for testing per EN 50160 in standard combination housing including harmonic and flicker analysis

- Monitors voltage quality and simultaneously records 3-phase alternating quantities, records 3-phase AC quantities
- Internal analysis of voltage quality for short-term, daily and long-term intervals per EN 50160 and other industrial standards
- 640 k internal memory, memory capacity can be partitioned for various measuring and test tasks in a user-specific fashion.
- RS 485 fieldbus with multi-drop connection for up to 32 devices, alarm output for events indication
- Dimensions: 100 x 75 x 105 mm, weight: 360 gr.

Analyzer Variants

MAVOLOG series instruments have been designed to allow for the selection of ideal configurations for all types of applications, from power generation to consumer applications, in combination with multiple instruments or as a stand-alone. Even the basic model, the MAVOLOG 10L+FFT/FSA, provides for comprehensive disturbance recording and line voltage quality analysis with integrated harmonic analysis (FFT) and flicker measurement (FSA). Equipped with an LCD and additional current inputs, the top of the line MAVOLOG 10S+FFT/FSA is a universal measuring instrument which can be used for recording the characteristics of almost any conceivable measured quantities in 3-phase systems, and simultaneously acquiring power disturbances and characteristics for the analysis of voltage quality.

● **See page 30 for optional accessories: Z3512, Z3514 clip-on current sensor.**

● **See optional software on page 44.**

➲ **See page 91 for training seminar: GTT1642**

Features	MAVOLOG			
	10L+FFT/FSA	10N+FFT/FSA	10S+FFT/FSA	10S
Voltage				
Measurement inputs	3 x U_{L-L} / U_{L-N} & U_{N-PE}			
Dips, failures	>10 ms	>10 ms	>10 ms	>10 ms
Swells	>10 ms	>10 ms	>10 ms	>10 ms
Asymmetry	●	●	●	●
Frequency	●	●	●	●
Harmonics	1 to 40 and THD	1 to 40 and THD	1 to 40 and THD	–
Flicker (Pst, Plt)	●	●	●	
EN 50160 analysis	●	●	●	
Current				
Measurement inputs	–	–	3xI_L & I_N	3xI_L & I_N
Characteristics for voltage dips	–	–	Resolution: 10 ms	Resolution: 10 ms
Harmonics	–	–	1-40&THD	–
Power / Energy				
Active power P1, P2, P3, PΣ	–	–	●	●
Apparent power SΣ	–	–	●	●
Reactive power QΣ	–	–	●	●
Power factor PFΣ	–	–	●	●
Active energy WPΣ	–	–	●	●
Reactive energy WQΣ	–	–	●	●
Alphanumeric LCD				
Measured values, analyses	–	10, selectable	10, selectable	10, selectable
Parameters configuration	–	●	●	●

MAVOLOG 10 Mobile Set

The practical solution for mobile use consisting of the following components:
MAVOLOG 10S+FFT/FSA mains quality analyzer, MAVOLOG PS/C power pack with interface converter and MAVOLOG BP battery pack, wired and installed in a stable carrying case (46 x16 x 35 cm).

Included accessories:

- Connector cables for mains power and voltage measurement inputs including alligator clips and RS 232 interface
- METRAwin 10 for MAVOLOG parameters configuring and analysis software

The case also provides space for storing optional clip-on current transformers such as 3 each Z3512 (1000/1 A).

➲ **See page 91 for training seminar: GTT1642**

Type	Data Sheet No.	Article Number		
MAVOLOG 10L+FFT/FSA	3-349-028-03	M830S		
MAVOLOG 10N+FFT/FSA	3-349-028-03	M830P		
MAVOLOG 10S+FFT/FSA	3-349-028-03	M830R		
MAVOLOG 10S	3-349-028-03	M830V		
MAVOLOG 10 Mobile Set	–	M830W		

MAVOLOG®PS/C

230 V~ / 24 V – Power Pack for MAVOLOG Instruments and the MAVOLOG BP, Additionally Integrated RS 485-232 Interface Converter

The MAVOLOG PS/C module (PS = power supply / C = converter) includes a mains power pack with 24 V DC output for supplying power to as many as five MAVOLOG 10 instruments and one MAVOLOG BP, as well as a bidirectional RS 232-485 interface converter for communications between a PC and MAVOLOG control software. Up to 32 MAVOLOG 10 instruments can be connected to the RS 485 bus, which can have a length of up to 1 km, and which functions at a maximum data transmission rate of 115 kBaud.
The standard version is laid out for an input voltage of 230 V AC.
- Dimensions: 75 x 55 x 111 mm (H x W x D), weight: approx. 800 gr.

The MAVOLOG PS/C universal variant (no photo) has a broad range input for 60 to 230 V AC / DC.
- Dimensions: 75 x 100 x 111 mm (H x W x D), weight: approx. 350 gr.

Type	Data Sheet No.	Article Number		
MAVOLOG PS/C	3-349-045-03	Z863D		
MAVOLOG PS/C universal	–	Z863G		

MAVOLOG®BP

Battery Pack as Emergency Backup for MAVOLOG Instruments in the Event of Power Failure

The MAVOLOG BP (BP = battery pack) is an uninterruptible DC power supply which, in combination with the MAVOLOG PS/C, automatically supplies power to connected MAVOLOG 10 instruments in the event of mains power failure.
Depending upon the number and type of instruments, they can be operated with a fully charged backup battery for up to 10 hours.
Integrated electronics regulate and monitor the charging process, assuring reliable availability of supply power and long backup battery service life.

- Dimensions: 75 x 55 x 109 mm (H x W x D), weight: approx. 480 gr.

Type	Data Sheet No.	Article Number		
MAVOLOG BP	3-349-044-03	Z863E		

MAVOLOG®Dial-Up

Analog Modem for Long Distance Data Transmission in Standard Combination Housing

The MAVOLOG analog dial-up modem connects the installed MAVOLOG mains monitoring system to a master computer via public telephone lines for remote parameters configuration, control and data queries.
An SMS message can be transmitted to a cell phone, a fax machine etc. in the event of power disturbance.

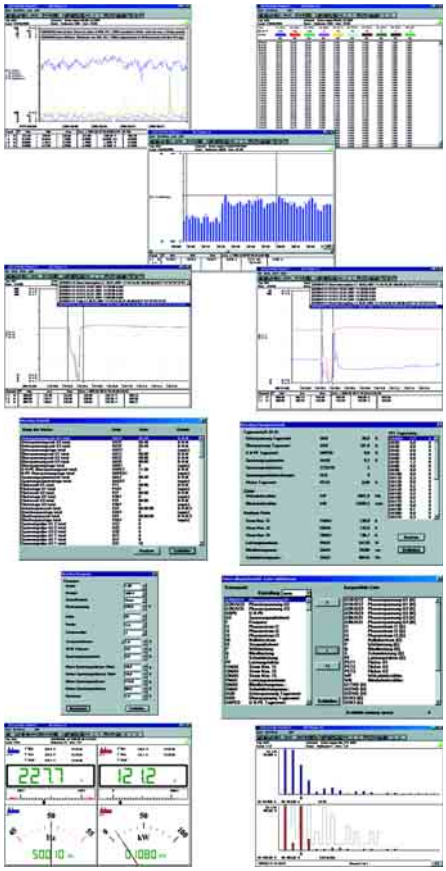
- Dimensions: 75 x 45 x 110 mm (H x W x D), weight: approx. 230 gr.
- Power supply: 10 ... 60 V–, e.g. with the MAVOLOG PS/C

Additional modems upon request, e.g. for ISDN, GSM and Ethernet

Type	Data Sheet No.	Article Number		
MAVOLOG Dial-Up	–	Z864C		

METRAwin 10/MAVOLOG

Parameters Configuration and Visualization Software



METRAwin for MAVOLOG 10 software is used for configuring parameters and visualizing data from the MAVOLOG 10. It includes the following functions:

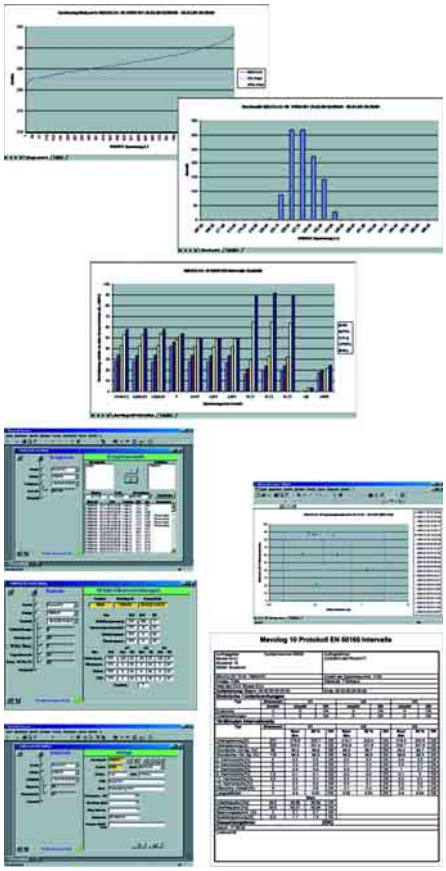
- Configuration of device parameters (hook-up configuration, memory parameters)
- Memory mode initialization
- Read-out and printout of complete statistics, as well as daily statistics
- Read-in and graphic representation of interval data
- Read-in and representation of events data in list format, as well as graphic representation of 10 ms RMS values for the respective event curves
- Read-in and graphic representation of harmonics
- Online visualization of selected measured quantities
- Interval data or measurement series recorded online are displayed at the monitor as a line diagram or a bar graph with horizontal time axis and can be analyzed with two pointers.
- The data logger display shows time and measured values numerically in an easy to read table, and allows for data export to other programs with the Windows clipboard.
- Event data read out from one or several MAVALOGs are listed in the order in which they occurred and can be printed as an events list.
- In the event of voltage dips, failure or swells, these are displayed in a time sequence which can be measured off with cursors. If the current signal is simultaneously available, conclusions may be drawn regarding the cause of the disturbances.
- Complete statistics and daily maximum values provide information concerning all important factors at a single glance.
- Parameters configuration for interconnected instruments as regards the measuring circuit, recording parameters, memory configuration etc., is accomplished by means of a menu-driven process.
- In the online mode, up to ten selectable measured quantities can be scanned and recorded once every second.

System requirements: MS Windows 95, 98, ME, NT, 2000 or XP

Type	Data Sheet No.	Article Number		
METRAwin10 / MAVOLOG	–	Z852D		

PC.doc-ACCESS/MAVOLOG

Software for the Generation of Reports and Graphics



PC.doc-ACCESS for MAVOLOG 10 is a database program based on MICROSOFT OFFICE products including WinWord, Excel and Access for the management, presentation and documentation of data recorded with the MAVOLOG 10. The database software allows for the management of data from any number of MAVOLOG 10 instruments, and for interactive or automatic, time controlled querying with the help of a scheduler. In this way, the software allows for comprehensive, detailed long-term analysis of mains quality within a power supply system with numerous measuring stations.

Graphics Processing with MS Excel

- Sorting of measured values according to time of occurrence, size (ascending/descending) and frequency distribution
- Data analysis (with minimum values/mean values/95%/maximum values) in compliance with EN 50160, and with adjustable limit values
- Time sorted lists of recorded events from several MAVOLOG 10 instruments during an adjustable observation period
- Analysis of voltage dips relative to standard limits/classes (ITIC=CBEMA, NRS048)
- Printout of events list with explanatory remarks
- Analysis of statistical data with reference to EN 50160 and adjustable limit values
- Report printing with Go/No-Go evaluation in MS Word
- Scheduler for time controlled remote read-out from MAVOLOG 10 instruments with the help of METRAwin 10 software via RS 232 interface or modem, or via Ethernet with a slave PC as gateway

System requirements: MS Windows 95, 98, ME, NT, 2000 or XP

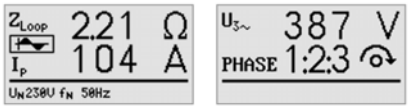
MS-Office Professional 97/2000

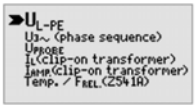
Type	Data Sheet No.	Article Number		
PC.doc-ACCESS / MAVOLOG	–	Z852F		

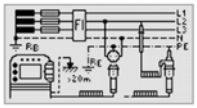
PROFiTEST® 0100S-II

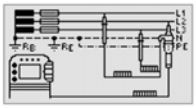
International Test Instrument for Electrical Systems with True Two-Hand Operation

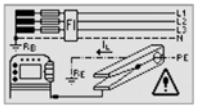
PROFITEST 0100S-II with Optional PSI Module
PROFITEST PSI-BC

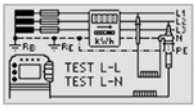


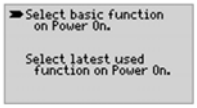


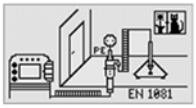












All protective safety measures required by DIN VDE 0100 part 610, as well as the corresponding international regulations (e.g. IEC 364-6-61, HD 364-6-61.S1), can be tested with the PROFiTEST 0100SII:

- Insulation resistance measurement per DIN VDE 0413 part 2 / EN 61557-2
- Loop impedance measurement per DIN VDE 0413 part 3 / EN 61557-3
- Low-resistance measurement per DIN VDE 0413 part 4 / EN 61557-4
- RCD testing per DIN VDE 0413 part 6 / EN 61557-6 (complete test)
- Earthing resistance measurement per DIN VDE 0413 part 5 / EN 61557-5
- Phase sequence testing per DIN VDE 0413 part 7 / EN 61557-7
- Line impedance and standing surface insulation resistance
- Earth leakage resistance, voltage, frequency, biasing current, leakage current, circulating current, current to 150 A

Additional functions:

- Energy meter start-up testing, cable length determination, recommended fuse types

Special features:

- Loop impedance measurements to 550 V with display of allowable overcurrent protective devices
- Current measurements with clip-on ammeters as of 1 mA
- Low-resistance measurement with calculation of cable lengths
- Universal connector system – interchangeable plug inserts and 2-pole plug-in adapter assure worldwide compatibility
- Integrated processor-controlled charger for rechargeable NiCd and NiMH batteries
- Large voltage and frequency ranges. The range of applications includes all alternating current and 3-phase systems from 60 to 800 V with frequencies from 15.4 to 420 Hz
- Large, easy to read display with background illumination: Menus, schematic diagrams, online help, measured, reference and nominal values etc. appear in plain text at a dot matrix display.
- Indication of connection errors and limit value violations, meter start-up direction
- Always current with software updates via IRDA interface
- Direct measurement of leakage current with clip-on ammeter, indirect with rising test current
- Temperature and humidity measurement with the Z541A adapter as an accessory
- Clear-cut, concise operation with a single function selector switch and three keys, as well as remote control
- Online help and schematic diagrams can be queried for all basic functions and sub-functions
- Immediate printout of measured value tables via PSI plug-in module
- Data transmission to the PC via RS 232 interface and report generation with PC.doc-win, PC.base-m and PS3 software
- 6 different languages can be selected, and additional languages can be uploaded via the IRDA interface.

● **Standard equipment for following versions:**

- **PROFiTEST 0100S-II:** VDE 0100 test instrument with the following languages: German, English, French, Italian, Spanish, Dutch, including socket, earth contact plug, 2-pole adapter, cable for expansion to 3-pole adapter, 2 alligator clips, set of batteries, operating instructions and test report, **without PSI module**
- **PROFiTEST 0100S-UK-II**: UK version with the following languages: English, Danish, Swedish, Finnish, German, Dutch
- **PROFiTEST 0100S-E-II**: Iberian version with languages: Spanish, Catalan, Gallic, Basque, Portuguese, English
- **PROFiTEST** 0100S-O-II: Slavic version with the following languages: Czech, Slovak, Hungarian, German, Polish

● **Optional accessories as of page 47, or see table on page 75.**

➲ **See page 91 for training seminar: GTT1210, GTT1224B, GTT1224G, GTT1226**

Type	PROFiTEST 0100S-II	
RCCB testing with or w/o tripping:	– With nominal residual current	10, 30, 100, 300, 500 mA
	Contact voltage	0 ... 70 V
	Time to trip	0 ... 1000 ms
	– With rising residual current	
	Contact voltage	0 ... 50 V
	Tripping current	0.3 ... 1.3 x $I_{\Delta N}$
Overcurrent protective devices	Loop resistance (... 550 V)	0 ... 10 Ω
	Short-circuit current	0 A ... 50 kA
Earthing measurements	Earth resistance	0.15 Ω ... 10 kΩ
	Earth electrode voltage	0 ... 253 V
	Standing surface insulation res.	0 ... 1 MΩ
Insulation resistance measurement	Insulation resistance	0 ... 300 MΩ
	Nominal voltage	100 / 250 / 500 V
	Nominal Current	1 mA
	Insulation and earth leakage res.	50 kΩ ... 100 MΩ
Low-value resistance		0 ... 100 Ω
Alternating Voltage		0 ... 253 / 500 / 850 V
Frequency		15 ... 420 Hz
Current measurement with clip		1 mA ... clip measuring range
Nominal ranges of use	Voltage	60 ... 500 V
	Frequency	15.4 ... 420 Hz
Power supply	6 ea. 1.5 V mignon cell per IEC LR 6 (AA)	
Dimensions / weight	240 x 340 x 62 mm / 2.5 kg	

Type	Data Sheet No.	Article Number		
PROFiTEST 0100S-II	3-348-888-03	M520A		
PROFiTEST 0100S-UK-II	3-348-888-03	M520B		
PROFiTEST 0100S-E-II	3-348-888-03	M520C		
PROFiTEST 0100S-O-II	3-348-888-03	M520D		
Factory calibration certificate	–	–		

PROFITEST ONE

Universal Protective Measure Test Instrument per VDE 0100 for Daily Use

CE

All types of protective measure testing for electrical systems can be executed with the PROFiTEST ONE in accordance with VDE 0100, part 610, and VDE 0413, parts 1 through 7.

Testing of residual current devices (RCCBs)
- Measurement of contact voltage without tripping the RCCB. Contact voltage is measured with reference to nominal residual current using 1/3 of the nominal residual current value.
- Tripping test with nominal residual current, measurement of tripping time

Special tests for equipment and RCCBs
- Testing of equipment and RCCBs with rising residual current including indication of tripping current and contact voltage at the moment the RCCB is tripped.
- Testing of RCCBs (10 and 30 mA) with 5 x $I_{\Delta N}$
- Testing of RCCBs which are suitable for pulsating residual direct current; testing is conducted with positive or negative half-waves.
- Testing of RCCBs with adjustable residual current for determining contact voltage and tripping current

Testing of special RCCBs
- Selective S, SRCDs, PRCDs (Schukomat, Sidos and similar), type G
- Testing of RCCBs in IT systems

Special features:
- Display of approved fuse types for electrical systems
- Energy meter start-up testing
- Calculation of cable lengths for common cross-sections for copper wire
- Measurement of biasing current, leakage current and circulating current of up to 1 A, as well as working current of up to 150 A with the Clip 0100S clip-on current sensor as an accessory
- Phase sequence measurement (including highest line-to-line voltage)
- Temperature and humidity measurement with the Z541A adapter as an accessory

● **Included:** **PROFITEST ONE test instrument, 3-pole measuring adapter, neck strap, batteries, operating instructions, WinProfi software for communications between the test instrument and the PC**

● **Optional accessories as of page 47, or see table on page 75.**

➲ **See page 91 for training seminar: GTT1210, GTT1224B, GTT1224G, GTT1226**

Type	Data Sheet No.	Article Number		
PROFITEST ONE	3-349-329-03	M520G		
Factory calibration certificate	–	–		

PGS... Test Sets

Test Sets in Carrying Case for Testing per DIN VDE 0100

In addition to the PRO*Fi*TEST 0100S-II, test sets include all essential accessories required for testing electrical systems in accordance with DIN VDE 0100 packed in a carrying case.
Included with individual test sets:

Designation	Type	PGS ...					
		117T	210	211	215	216	2000
Universal carrying pouch	F2000				✔	✔	
Carrying case	K2000	✔	✔	✔			
Metal case	Z504J						✔
PRO*Fi*TEST 0100S-II	M520A	✔	✔	✔	✔	✔	✔
PRO*Fi*TEST PSI-E	M522A		✔				✔
PRO*Fi*TEST PSI-BC	M522D	✔		✔	✔	✔	
Digital multimeter	METRAmax 12						✔
Software, interface cable	WinProfi	✔	✔	✔	✔	✔	✔
Adapter	DA-II						✔
Earth spike	SP350		✔	✔			✔
Test probe extension	Telearm1		✔	✔			
Variable plug adapter set	Z500A	✔	✔	✔			✔
Plug insert	PRO-RLO	✔	✔	✔			✔
Plug insert	PRO-Schuko					✔	
Measurement cable, 25 m	TR25	✔	✔	✔			✔

➲ **See page 91 for training seminar: GTT1210**

Type	Data Sheet No.	Article Number		
PGS 117T	3-348-888-03	M509T		
PGS 210	3-348-888-03	M509L		
PGS 211	3-348-888-03	M509M		
PGS 215	3-348-888-03	M509R		
PGS 216	3-348-888-03	M509S		
PGS 2000	3-348-888-03	M509P		

PRO*Fi* TEST® PSI-E/PSI-BC/SI-BC

PSI Module for PRO*Fi* TEST 0100S-II or PROFITEST ONE

PRO*Fi*TEST PSI-E

The PSI module (printer, storage, interface) functions simultaneously as printer, memory and interface. It is attached to the test instrument and secured with two snap-hooks. Values measured with the PRO*Fi* TEST 0100S-II are transmitted to the PSI module by means of infrared light, where they are stored to memory. It offers sufficient capacity for approximately 4400 measurement values from 200 electrical circuits.
The measurement values from all of the recorded electrical circuits can be read out to the test instrument display in tabular form, and can be printed out onto a recording chart along with date and time by simply activating a key. The measurement value table can, for example, be attached directly to an approval report.
The PSI module is equipped with an RS 232 interface. Stored data can be transmitted via the interface to a PC and processed with PC.doc and PC.base software independent of the test instrument at a later point in time. Reports can be generated directly at a Centronics printer from the PSI module in A4 format with the DA-II printer adapter (optional).

- 3 functions with a single device: printer, memory and interface
- Report generating functions: numeric entry of buildings and electrical circuits
- Reports can be printed out in A4 format at Centronics printers with the help of a printer adapter (accessory).
- Power supply: 4 ea. mignon cell per IEC LR 6 (AA)

PRO*Fi*TEST PSI-BC: same as PRO*Fi*TEST PSI-E with:

- Expanded report generating functions: alphanumeric entry of buildings, distributors, RCDs, electrical circuits and defects, or data entry with B3261 barcode scanner (see page 73)

PROFiTEST SI-BC: same as PRO*Fi*TEST PSI-BC, but without printer

● **Included:** **PROFiTEST PSI-E or BC, 2 rolls paper chart, 1 ribbon cartridge, batteries and operating instructions**
PROFiTEST SI-BC, batteries, operating instructions

Type	Data Sheet No.	Article Number		
PROFiTEST PSI-E	3-348-976-03	M522A		
PROFiTEST PSI-BC	3-348-976-03	M522D		
PROFiTEST SI-BC	3-348-976-03	M522E		
RS 232 interface cable, Z3241	–	GTZ3241000R0001A1		

PRO*Fi*TEST DC II

Add-On Device for the Measurement of Loop Resistance in TN Systems

This add-on device allows for the measurement of loop resistance in TN systems which are equipped with RCCBs with the PRO*Fi*TEST 0100S-II.
The add-on device suppresses tripping of RCCBs.
The PRO*Fi*TEST DC II can also be used for measuring DC components, tripping current and time to trip for DC sensitive RCCBs (selective DC versions as well).

- Accessories: Adapter with 3 test leads for PROFiTEST DC-II in systems without earthing contact sockets
- Dimensions: 205 x 120 x 100 mm (H x W x D), weight: 1.5 kg without connector cable

Type	Data Sheet No.	Article Number		
PROFi TEST DC II	3-348-974-03	M523A		
3-pole adapter for DC-II	3-348-974-03	Z523A		

Z541A

Adapter for Temperature and Atmospheric Humidity Measurement

Adapter for temperature and atmospheric humidity measurement with infrared interface to the measuring instrument.

For determining ambient temperature and atmospheric humidity during floor measurements including:

- Leakage, insulation and surface resistance
- Temperature range: -10 to +50° C
- Relative humidity measuring range: 10 to 90%

Type	Data Sheet No.	Article Number		
T/H sensor		Z541A		

IrDa-USB Converter

IR Interface Adapter for Connecting a Test Instrument to a PC: IrDa-USB

IrDa-USB converter:
Electrically isolated infrared interface for data transmission between test instrument and a PC (USB).
Data transfer to and from the IrDa interfaces of our PROFiTEST 0100S-II, PROFiTEST C, METRISO C and GEOHM C test instruments with modern PCs which are equipped with USB ports only.

- **The cable is furnished with a CD ROM including the required device drivers for Windows 98SE, ME, 2000 and XP.**

Type	Data Sheet No.	Article Number		
IrDa-USB converter	–	Z501J		

RS 232 – USB Converter

Adapter Cable for Connecting the RS 232 Interface to the USB Port at a PC

The interface converter is used to connect any desired device with RS 232 interface to PCs which are equipped with USB ports only.

- **The cable is also furnished with a CD ROM including the required device drivers.**

Type	Data Sheet No.	Article Number		
RS 232 – USB converter	–	Z501L		

CEE-CHECK 32/400

Test Instrument for Power Installations with 230/400 V, 50 to 60 Hz

Power installations can be tested quickly and efficiently for correct function and electrical safety with the test instrument. The instrument is suitable for power circuits with type CEE 32A 6h 3-phase outlets carrying a voltage of 230/400 V, 50 to 60 Hz.
If the power installation to which the power circuit belongs is equipped with a residual current protective device, it must also be tested for correct functioning with a test instrument in accordance with EN 61 557-6 / IEC 61 557-6.
A warm-up period of at least 5 minutes must be observed after connecting the instrument at ambient temperatures of less than -10° C.

- Phase and phase sequence testing
- Neutral conductor testing
- Detection of reversal of neutral and protective conductors
- Testing the protective conductor for absence of voltage
- Earthing resistance test
- Dimensions (L x W x H): 160 x 80 x 65 mm, weight approx. 750 gr.

- **Included:** **CEE-CHECK 32/400 test instrument in HC20 case, operating instructions**

Type	Data Sheet No.	Article Number		
CEE-CHECK 32/400	3-349-124-03	M662C		

Test Instrument Accessories – DIN VDE 0100 / IEC 364-6-61

Adapters, Plug Inserts, Power Packs, Clip-On Current Sensors, Cables, Carrying Pouches, Cases etc.

3-pole adapter for DC-II:	Adapter for PROFi TEST DC-II in systems without earthing contact sockets
PRO-A3:	Measuring adapter for systems, 3-phase current, phase sequence with the PROFi TEST 0100S-II (included with the PROFiTEST 0100S-II)
PRO-Schuko:	Plug insert for PROFiTEST 0100S-II in Germany and other countries with appropriate plug systems
PRO-CH:	Plug insert for PROFiTEST 0100S-II in Switzerland per SEV
PRO-GB:	Plug insert for PROFiTEST 0100S-II in Great Britain per British Standard
PRO-RSA:	Plug insert for PROFiTEST 0100S-II in South Africa
PRO-UNI:	Plug insert with 3 connector cables for any connection standards
PRO-RLO:	Plug insert with 10 m cable for PE measurements and the like
Battery set 0100S:	6 special rechargeable NiMH batteries in a battery holder (1300 mAh)
NA 0100S:	Charger for battery set 0100S
Clip 0100S:	Clip-on current sensor for measuring fault current with 3.5 mm jack plug
Z3512A:	Clip-on current sensor, selectable measuring range: 0 ... 1/100/1000A~ AV~ ± (0.7% ... 0.2%)
Clip-on adapter cable:	Cable for connecting clip-on ammeters with banana plugs to the jack socket at the PRO*Fi*TEST 0100S-II
F2000:	Universal carrying pouch for PROFiTEST 0100S-II, PROFiTEST 204, METRISO 5000A/AK and SECUTEST ...
K2000:	Aluminum case for PROFiTEST 0100S-II and accessories
Z504J:	Metal case

Type	Data Sheet No.	Article Number		
3-pole adapter for DC-II	–	Z523A		
PRO-A3	–	GTZ3214000R0001		
PRO-Schuko	–	GTZ3228000R0001		
PRO-CH	–	GTZ3225000R0001		
PRO-GB	–	GTZ3226000R0001		
PRO-RSA	–	Z501A		
PRO-UNI	–	GTZ3214000R0003		
PRO-RLO	–	GTZ3214000R0002		
Battery set 0100S	–	Z501B		
NA 0100S	–	Z501D		
Clip 0100S	–	Z501E		
Z3512A	–	Z225A		
Clip-on adapter cable	–	Z501G		
F2000	–	Z700D		
K2000	–	Z504K		
Z504J	–	Z504J		

PROFi TEST C

Test Instruments – DIN VDE 0100 / IEC 364-6-61

Protective measures test instrument for loop resistance measurement, calculation of short-circuit current and display of suitable fuse ratings. In addition to complete testing for the effectiveness of RCCBs, the instrument is also capable of phase sequence analysis, as well as the measurement of voltage and frequency.

- The extremely rugged 2-component housing with integral impact guard makes this instrument perfect for use by on-site installation teams, and it supplements the PROFITEST 204 in accordance with the new EN 60204 in an ideal fashion.
- A large, illuminated, anti-glare graphic display allows for clear, intuitive, menu-driven operation.
- Operation is quick and easy with a total of only 5 keys.
- The integrated measured value memory can be read out via the infrared data interface, which is included as standard equipment.
- Printouts and reports can also be read out via the IR interface, and it can be used for updates to assure that the instrument is always current.
- Stored measured values can be accurately assigned to their respective electrical circuits, distributors and buildings with the alphanumeric keypad.
- Unambiguous Go/No-Go decisions are made possible with LEDs and display messages.
- The desired language can be selected.
- A phase tester is integrated into the instrument.
- A carrying strap, a stand, holders for test probes and cables and a recharging socket for NiCd/NiMH batteries round out the convenient and safe PROFITEST C.
- Dimensions: 275 x 140 x 65 mm (H x W x D), weight: 1.2 kg with batteries
- Power supply: 4 ea. mignon cell per IEC LR 14

● **Software:**
- PS3: software for test instruments including systems and equipment management, and reports generating (see page 77)
- PC.doc-WORD / PC.doc-ACCESS: documentation and management software for measurements per DIN VDE 0701/ 0702 and 0100 (see page 76)
  WinProfi: for communications between the test instrument and the PC (included)

● **Included:**
M521A: PROFITEST C test instrument, operating instructions, factory calibration certificate
M521B: Same as M521A with plug for Switzerland (SEV)
M508A: Set consisting of PROFiTEST C, METRISO C, 3-pole adapter, IrDa 0100 adapter cable, KS17 measurement cables, in HC 40 hard case
M508B: Same as M508A with plug for Switzerland (SEV)

● **Optional extras:**
PROFITEST DC-II, IrDa 0100S, IrDa-USB converter, see page 48

● **Optional accessories:**
NA 0100S charger, see page 49 or table on page 75
HC30-C and HC40: hard case with blister inserts for 1 or 2 series C test instrument with accessories
Z521A: 3-phase measuring adapter with earth contact plug, Z521B: 3-phase measuring adapter with Swiss plug, Z521C: 3-phase measuring adapter with UK plug

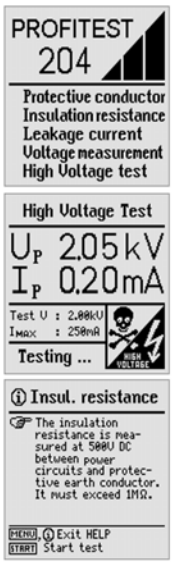
➲ **See page 91 for training seminar: GTT1210, GTT1224B, GTT1224G, GTT1226**

Function	Measured Quantity	Measuring Range (display range I_K)	Intrinsic Error	Nominal Range of Use
$U_{L-PE\,(N)}$ U_{N-PE}	U_{L-PE} / U_{N-PE} / U_{L-N}	0 ... 300 V / (0 ... 600 V)	± (2% rdg. + 2 d)	108 ... 253 V
	f	15.0 ... 650 Hz	± (0.1% rdg. + 1 d)	15 ... 70 Hz
U_3~	U_3~	0 ... 500 V / (0 ... 600 V)	± (2% rdg. + 2 d)	108 ... 440 V
I_Δ	$U_I\Delta N$	0 ... 99.9 V	± (12.5% rdg. + 2 d) + (2.5% rdg. - 2 d)	5 ... 70 V
	R_E / $I_\Delta N$ = 10 mA	10 Ω ... 9.99 kΩ	–	Calculated value
	. . .	. . .		
	R_E / $I_\Delta N$ = 500 mA	0.2 Ω ... 380 Ω		
	I_Δ / $I_\Delta N$ = 10 mA	3.0 mA ... 13.0 mA	± (5% rdg. + 2 d)	3.0 mA ... 13.0 mA
	. . .	. . .		
	I_Δ / $I_\Delta N$ = 500 mA	150 mA ... 650 mA		150 mA ... 650 mA
	$U_I\Delta$ / U_L = 25 mA	0 V ... 25.0 V	+ (12.5% rdg. + 2 d) + (2.5% rdg. – 2 d)	0 ... 25.0 V
	$U_I\Delta$ / U_L = 50 mA	0 V ... 50.0 V		0 V ... 50.0 V
	t_A ($I_\Delta N$ / 5 · $I_\Delta N$)	0 ms ... 999 ms	± 3 ms	0 ms ... 1000 ms
Z_{Loop}	Z_{Loop}	0.01 Ω ... 30.0 Ω	± 5 D ± (6% rdg. + 3 d)	0.25 Ω ... 30 Ω
R_E	R_E	0 Ω ... 9.99 Ω		0.25 Ω ... 9.99 Ω
		10.0 Ω ... 9.99 kΩ	± (4% rdg. + 3 d)	10.0 Ω ... 9.99 kΩ

Type	Data Sheet No.	Article Number		
PROFiTEST C	3-349-075-03	M521A		
PROFiTEST C-CH	3-349-075-03	M521B		
Set PROFiTEST C / METRISO C	3-349-075-03/-086-03	M508A		
Set PROFiTEST C / METRISO C-CH	3-349-075-03/-086-03	M508B		
3-pole adapter	–	Z521A		
3-pole adapter / CH	–	Z521B		
3-pole adapter / UK	–	Z521C		
HC30-C	–	Z541C		
HC40	–	Z541D		

PROFITEST 204 / 204L

Device for Testing in Accordance with VDE 0113 / EN 60204 Including RS 232 Interface and CENTRONICS Socket Connector for External Printer



The PROFITEST 204 is used for rapid, safe testing of electrical and electronic equipment and systems at machinery in accordance with DIN EN 60204-1 and VDE 0113 with nominal voltages to 1000 V.
According to the regulations, the following initial and periodic tests must be performed:

- Testing for continuous electrical bonding of the protective conductor system with a 10 A test current
- Insulation resistance testing, voltage tests (HP or HV option) and testing for residual voltage
- Further tests/measurements: leakage current testing, as well as voltage and frequency measurements
- All of the values required for approval reports can be measured with this instrument.

Instrument Features:

- Clear-cut operating menus, illuminated display, two 4 m measurement cables (4-wire connection)
- Remote operation for easy use and limit value settings
- Convenient memory and report functions, data interfaces for PC and printer
- Can be expanded for rapid, on-site alphanumeric data entry and report printing
- Can be upgraded for high-voltage tests

Display: LCD dot matrix at which menus, setting options, measurement results and instructions are displayed.
Help key: Information regarding the currently selected menu item can be queried with this key.
Function selector switch: Test, report and data management functions are selected with the rotary switch.
Limit values: Limit values can be specified for each measurement.
Memory: Depending upon the number of systems stored to memory (max. 254), up to 2800 measurements can be saved.
Remote operation: The test probe with integrated control panel allows for remote triggering of protective conductor and insulation resistance measurements, as well as storage of respective measured values. Integrated lamps indicate progress of the currently running measurement. All PROFITEST 204 control functions can also be activated via the RS 232 interface. Signal and display values can be read out as well.
RS 232 interface for PC and printer: This port allows for power supply and data transmission to the optionally available SECUTEST PSI printer. Other devices can also be connected to this port with the help of an interface cable, e.g. a PC.
Centronics parallel port: for connecting commercially available printers (except for postscript printers).
Reporting facilities: The following options are available:

- Print out measurement data with the attachable SECUTEST PSI printer (accessory)
- Upload report form templates to the test instrument with the help of a PC and the included PROTOCOL program
- Select one of three report form templates included in the test instrument
- Print out measurement data with a commercially available printer with Centronics parallel port
- Transmit measurement data to a PC and process with PC.base or Excel
- PROFITEST 204, dimensions (W x D x H): 255 x 133 x 240 mm, weight: approx. 5.1 kg

● **Software:**

- Remote: control software for series testing at a PC
- PS3: modular universal software (see page 77)
- WinProfi: for transmitting the desired language from a PC to the test instrument (included)

● **Included:**

PROFITEST 204: **Basic instrument with 2 test probes permanently connected by means of 4 meter long measurement cables, 1 plug-on cable lug, mains cable with earthing contact plug, floppy disk (D, GB, I, E, NL, DK, CZ) with download program for report templates, test report, operating instructions**

PROFITEST 204L: **Test instrument same as PROFi TEST 204 with permanently connected 12 m long measurement cable, with Start/Store function activation in the test plug**

● **Optional extras:** **PROFITEST 204HP-2.5 kV, ...204HP-5.4 kV, SECUTEST PSI (see page 52)**

● **See optional accessories on page 53.**

➲ **See page 91 for training seminar: GTT1215, GTT1224C**

Technical Data

Measured Quantity	Measuring Range	Nominal Range of Use	Resolution	Nominal voltage U_N	Open-Circuit Voltage U_0	Nom. Current I_N	Short-Circuit Current I_K	Measuring Error	Intrinsic Error
Protective conductor resistance R_{SL}	0 ... 85 mΩ	10 ... 330 mΩ	100 µΩ	–	12 V ~	10 A	12 A	±(8.6%rdg. +6 d)	±(3% rdg. + 5d)
	85...999 mΩ		1 mΩ						
	1 ... 9.99 Ω	–	10 mΩ			–	–		±(3% rdg. +10 d)
	10...25 Ω		100 µW						
ΔU	0 ... 9.99 V	–	0.01 V	–	12 V ~	10 A	12 A	–	±(2% rdg. +3 d)
	10 ... 12 V		0.1 V			–	–		±(10% rdg. +3 d)
Insulation Resistance R_{ISO}	0 ... 999 kΩ	0.050 ... 50 MΩ	1 kΩ	100/250/ 500/1000 V	Max. 1.3 x U_N	1 mA	Max. 1.6 mA	±(5.5% rdg. + 4 d) of 0.05 ... 50 MΩ	±(3% rdg. +2 d)
	1...9.99 MΩ		10 kΩ						
	10...99.9 MΩ		100 kΩ						
	100...499 MΩ	–	1 MW	250 V				–	±(8% rdg. +2 d)
				500 / 1000 V					±(5% rdg. +2 d)
	500...999 MΩ								±(10% rdg. +2 d)
	1 ... 3 GΩ		10 MΩ	1000 V					±(20% rdg. +2 d)
Leak. cur. ΔI	0 ... 9.99 mA	0.2...9.9 mA	0.01 mA	–	–	–	–	±(8.6% rdg. + 9 d)	±(5% rdg. + 5d)
Voltage U DC/AC	0 ... 99.9 V	1 ... 1000 V	0.1 V	–	–		–	±(8.6% rdg. + 9 d)	±(5% rdg. + 5d)
	100 ... 999 V		1 V						
	1 ... 1.2 kV		0.01 kV						
Frequency f~	8 ... 99.9 Hz	10 ... 1000 Hz	0.1 Hz	–	–	–	–	±(8.6% rdg. + 2 d)	±(2% rdg. + 1 d)
	100 ... 999 Hz		1 Hz						

Type	Data Sheet No.	Article Number		
PROFITEST 204	3-348-802-03	GTM5027000R0001		
PROFITEST 204L	3-348-802-03	M505C		
Factory calibration certificate	–	–		

MetraMachine 204/2.5
MetraMachine 439/5.4

MetraMachine 204/2.5: Test System for Testing per VDE 0113, EN 60204-1
MetraMachine 439/5.4: Test System for Testing per VDE 0660, EN 60439-1

MetraMachine 204/2.5
Portable test system for all tests in accordance with EN 60204-1 (VDE 0113) and similar regulations (e.g. VDE 0701, 0700 etc.) for machines and their electrical systems. PC communication, measured value storage and reports.

MetraMachine 439/5:
Portable test system for testing low-voltage switchgear combinations per VDE 0660 T. 500, EN 60439-1.

- **Included:**
  M504D (MetraMachine 204/2.5): PROFITEST 204, PROFITEST 204HP, Signal 204, Leadex 204, Caddy 204, test report
  M504E (MetraMachine 204/2.5I): PROFi TEST 204, PROFi TEST 204HP, Caddy 204, test report
  M504F (MetraMachine 439/5.4): PROFi TEST 204, PROFi TEST 204HV, Signal 204, Leadex 204, Caddy 204, test report

➲ **See page 91 for training seminar: GTT1215, GTT1224C**

Type	Data Sheet No.	Article Number		
MetraMachine 204/2.5	3-348-802-03	M504D		
MetraMachine 204-I/2.5	3-348-802-03	M504E		
MetraMachine 439/5.4	3-348-802-03	M504F		
Factory calibration certificate	–	–		

PROFITEST 204HP-2.5 kV
PROFITEST 204HV-5.4 kV

High-Voltage Module for PROFITEST 204

Add-on features: PROFITEST 204HP-2.5 kV and 204HV-5.4 kV
- Test voltage can be selected in 50 V steps
- Rise time (ramp) adjustable from 0.1 to 99 s, test duration adjustable from 1 to 120 s
- Floating test voltage outputs, electronically controlled test sequence, test sequence can be started with test pistol
- Display of breakdown voltage and phase angle, pulse control operation, measured values can be saved to memory
- Acoustic and visual error indication
- Protection against unauthorized start-up with key switch, connector terminals for external signal lamps

Add-on features: PROFITEST 204HP
- Voltage testing in accordance with EN 60204 / VDE 0113, test power: 500 VA (short-term)
- Breaking current can be selected in 1 mA steps

Add-on features: PROFITEST 204HV
- Test power: 50 VA
- Breaking current can be selected in 0.5 mA steps

High-voltage modules which can be mounted to the base of the instrument allow for high-voltage testing.
Voltage, current and phase angle are measured with permanently attached measurement cables.
A bidirectional infrared interface at the base of the PROFITEST 204 controls the high-voltage module and transmits measured values to the basic instrument.
- Dimensions: 254 x 130 x 285 mm, fully mounted to the caddy: 380 x 250 x 650 mm, weight: approx. 8 kg

Type	Data Sheet No.	Article Number		
PROFi TEST 204HP-2.5kV	3-348-802-03	M505A		
PROFi TEST 204HV-5.4kV	3-348-802-03	M505B		

SECUTEST PSI

Integratable Printer/Memory Module for SECUTEST..., PROFITEST 204, METRISO 5000D-PI and MAVOWATT 45 for Rapid On-Site Report Generation

Test results are transmitted via ribbon cable to the PSI module, which can be integrated into the instrument's lid, and are automatically saved to memory. All measured values for 200 to 1000 test reports can be stored to this memory. Test results can be printed out on-site in the form of concise, documented reports which can be furnished with date, time and text entered at the keypad.
- Dimensions: 240 x 81 x 40 mm (without knurled screws and ribbon cables), weight: approx. 0.8 kg
- Batteries: 4 ea. 1.5 V IEC LR 6 (AA mignon) if operated with batteries

Consumable materials: PS-10P = pack of 10 six meter recording charts, Z3210 = pack of 10 printer ribbon cartridges

Type	Data Sheet No.	Article Number		
SECUTEST PSI	3-348-785-03	GTM5016000R0001		
PS-10P	3-348-785-03	GTZ3229000R001		
Z3210	3-348-785-03	GTZ3210000R001		

Accessories for PROFITEST 204

Signal 204, Cable Lug 204, Leadex 204, Caddy 204, Stop 204, Claim 204, PROFI-MFII, RS 232-USB Converter, F2000

Signal 204
- Combination signal lamp on a magnetic base plate for high-voltage tests in accordance with DIN VDE 0104

Cable Lug 204 (no photo)
- Plug-on cable lug for secure attachment of the test probe to terminals
- Adapter for PE and insulation tests with the PROFiTEST 0100S-II and the PROFiTEST 204

Leadex 204 (no photo)
- 12 m extension for cable with test probe to which the measuring circuit fuse is installed

Caddy 204
- Trolley for basic instrument combined with high-voltage module, includes cover with side pockets

Stop 204 (no photo)
- Emergency stop switch for MetraMachine 204

Claim 204
- Set of various items used to warn unauthorized persons and for securing large areas, machines or machine components during the performance of high-voltage testing

PROFI-MFII
- Interface adapter for PC keyboards

RS 232-USB converter
- Interface adapter cable for connecting the RS 232 interface at the PROFITEST 204 test instrument to the USB port of a PC for transferring data between the PC and the test instrument, e.g. for software updates at the test instrument

F2000
- Universal carrying pouch for PROFiTEST 0100S-II, PROFiTEST 204, METRISO 5000A/AK and SECUTEST...

Type	Data Sheet No.	Article Number		
Signal 204	3-348-802-03	Z504D		
Cable Lug 204	3-348-802-03	Z504E		
Leadex 204	3-348-802-03	Z504C		
Caddy 204	3-348-802-03	Z504A		
STOP 204	3-348-802-03	Z504F		
Claim 204	3-348-802-03	Z504G		
PROFI-MFII	3-348-802-03	Z504H		
RS 232-USB converter	3-348-802-03	Z501L		
F2000	3-348-802-03	Z700D		

Remote 204

PROFITEST 204 Control Software

Programming software in 3 languages for controlling the PROFiTEST/MACH 204 from a PC (replacement for PROFI-SPS 204)

Type	Data Sheet No.	Article Number		
Remote 204	3-348-802-03	Z532A		

MINITEST | BASE, ... | Pro

MINITEST BASE: Test Instrument for DIN VDE 0702
MINITEST PRO: Test Instrument for DIN VDE 0701/0702

The test instrument is intended for testing and measuring repaired or modified devices.

MINITEST Base

MINITEST Pro

Testing electrical safety of electrical equipment
per DIN VDE 0701-1: 2000 and DIN VDE 0702: 2004 with the following measurements:

- Protective conductor resistance
- Insulation resistance
- Protective conductor current – differential current method
- Contact current – direct measurement method

per DIN VDE 0701, part 240, by testing for:

- Absence of voltage by means of current measurement
- Indication of limit value violations by means of color LEDs
- The probe cable is protected by means of a fuse link.

Additional features included with the MINITEST Pro:

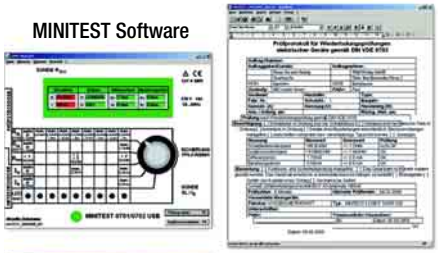
- All measured values are also clearly read out at a large, digital display.
- USB interface for data logging
- MINITEST software on CD ROM
- Extensive safety features
- An RCCB is integrated into the plug on the mains cable.

● **Included:** **Test instrument, probe cable, operating instructions**
Additional features included with the MINITEST Pro:
USB connector cable, CD ROM with "MINITEST" software

● **Optional accessories:** **Brush probe – Z745G – see page 61**
SECU-cal 10 calibration adapter – Z715A – see page 60
Case – Z740B

➲ **See page 91 for training seminar: GTT1212, GTT1216**

MINITEST Software



Z740B Case

Type	Data Sheet No.	Article Number		
MINITEST Base	3-349-357-03	M712C		
MINITEST Pro	3-349-357-03	M712D		
Factory calibration cert. for basic device	–	–		
Case for MINITEST	3-349-357-03	Z740B		
SECU-cal 10 calibration adapter	3-349-357-03	Z715A		
Brush probe	3-349-357-03	Z745G		

METRATESTER® 5

Instruments for Electrical Safety Testing of Electrical Equipment in Accordance with DIN VDE 0701 and DIN VDE 0702

Instrument for electrical safety testing of electrical equipment per DIN VDE 0701 and 0702

- Large digital LCD, mains connection testing with finger contact and indicator lamp
- Differential current measurement: Measurement of differential current complies with DIN VDE 0701 and 0702.
- New: 0702:2004 binding as of 1 January 2005
- Display functions: All measured values are clearly displayed at a large, digital display.
  Exceeded limit values are also indicated optically, and in some cases acoustically as well.
- Dimensions (W x H x D): 190 x 140 x 95 mm, weight: approx. 1.3 kg
- Panel mount variant: METRATESTER 5-F-E

● **Included: test instrument, operating instructions**

● **See optional accessories on page 75.**

➲ **See page 91 for training seminar: GTT1212, GTT1216**

Technical Data:

Test	Measuring Range
Protective conductor resistance	0 ... 19.99 Ω
Insulation resistance	0 ... 19.99 MΩ
Equivalent leakage current	0 ... 19.99 mA ~
Absence of Voltage	0 ... 1.999 mA ~

Test	Measuring Range
Differential current	0.01 ... 19.99 mA~
Line voltage	207 V ... 253 V ~
Load current	0 ... 16.00 A ~

Type	Data Sheet No.	Article Number		
METRATESTER 5	3-348-817-03	M700D		
METRATESTER 5-F-E	3-348-817-03	M700T		

METRATESTER®5-3P

Test Case for Testing Devices in Accordance with DIN VDE 0701 and 0702, can also be used as a workshop test panel per DIN VDE 0104

For testing the electrical safety of single and 3-phase electrical equipment

The METRATESTER 5-3P performs the following tests in accordance with the **regulations**:
- Protective conductor resistance – insulation resistance
- Equivalent leakage current – differential current – contact current – protective conductor current

The METRATESTER 5-3P test case complies with **guidelines for equipment required for electrical installation operations** issued by the Federal Committee for Electrical Installations, ZVEH, WFE and the electrical power utilities.
- **Mains connection**: The test case can either be connected to an earthing contact outlet with the two included power cables, or to a 16 A CEE mains outlet.
- **Test types**: DIN VDE tests without mains operation: protective conductor resistance, insulation resistance, equivalent leakage current.
  DIN VDE tests with mains operation at all single and 3-phase devices: differential current, contact current. Function tests with measurement of current consumption and voltage in phases L1, L2 and L3.
  Protective conductor measurement is performed correctly in accordance with DIN VDE 0104.
- **Contact surface for finger contact**: Protective conductor potential can be tested by means of a contact surface for finger contact. The PE signal lamp lights up if a potential difference of more than 100 V is detected between the contact surface and the protective contact at the mains plug.
- **Differential current measurement**: The measurement of differential current complies with regulations for periodic testing in accordance with DIN VDE 0702.
- **Convenient testing**: All safety and function tests are executed in a practical fashion by switching mains voltage or the individual phases to the device under test with selector switches.
- **Display functions**: All measured values are clearly displayed at a large, digital display.
  Exceeded limit values are also indicated optically, and in some cases acoustically as well.
- **Rugged case design**: The test case consists of an aluminum frame with a lockable lid which can be removed. Ample space is provided for the included connection adapters and operating instructions.
- Dimensions: approx. 380 x 300 x 220 mm (with lid), weight: approx. 8 kg

● **Included:**
Test case with METRATESTER 5-F-E test instrument, mains cables (1 ea. with earthing contact plug) and connector socket (1 ea. with 5-pole CEE16 A plug and coupling socket) and operating instructions

● Optional accessories:

Z600B: VL2 test adapter
The test adapter expands the functions of the METRATESTER 5-3P and SECUTEST 21F test panels.
Portable operation is possible. After connection to one of the test panels, the test adapter allows for the testing of electrical devices and extension cables by trained electricians after repair or modification in accordance with DIN VDE 0701, as well as for periodic testing per DIN VDE 0702.
Also allows for: Function testing for conductor continuity, short-circuit, reversed polarity (clockwise rotation)
- Connection via CEE plug, 3-pole + N + PE
- Nominal line voltage: 230 / 400 V
- Dimensions: 330 x 230 x 130 mm, weight: approx. 1.7 kg

Z745G: brush probe
- Probe for measuring protective conductor resistance, e.g. at rotating devices under test

Z745A: CEE adapter
The Z745A CEE adapter allows for quick and efficient testing of devices equipped with a CEE plug in accordance with VDE 0701/0702.
- CEE attachment outlets: 16 A/3-pole, 16 A/5-pole, 32 A/5-pole
- Safety outlets for 3-phase devices without permanently attached plug
- Protective conductor continuity test and insulation test for each phase, and combined phases, with rotary switch

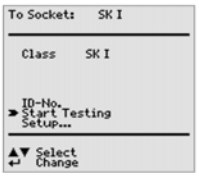
GTY3624065P01: KS13 cable set
Cable set for connecting test instruments such as the METRATESTER 5 and the SECUTEST SII (with feature F01) to the mains without using a an earthing contact outlet, and for connecting DUTs. Consists of coupling socket with 3 permanently connected cables, 3 measurement cables, 3 plug-on pick-up clips and 2 plug-on test probes.

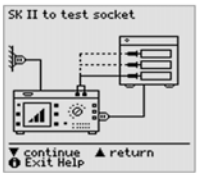
Type	Data Sheet No.	Article Number		
METRATESTER 5-3P	–	M700S		
VL2 test adapter	–	Z600B		
Z745G brush probe	–	Z745G		
Z745A CEE adapter	–	Z745A		
KS13 cable set	–	GTY3624065P01		

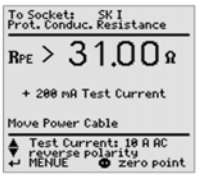
SECUTEST®SII

Test Instrument for BGV A3 and MPG

SECUTEST SII with Optional PSI Module
SECUTEST PSI







Universal test instrument for testing the electrical safety of portable electrical equipment in commercial and medical applications. In order to evaluate electrical safety, tests are performed for protective conductor connections, insulation resistance and leakage current (differential current, equivalent leakage current, device leakage current, patient leakage current, contact current).

Technical safety tests for, amongst others:

- Electrical equipment per DIN VDE 0701 part 1, 2000-9 edition, part 200
- Data processing and IT devices and equipment per DIN VDE 0701, part 240
- Periodic testing per DIN VDE 0702 (BGV A3) – new 0702:2004 valid as of 1 June 2004
- Electrical medical devices per DIN VDE 0751

Expanded functionality

- Automatic recognition of safety class (I, II) and mains connection errors
- Menu-driven test sequences: fully automated or manual
- Patient leakage current: AC and DC components measured separately
- Equivalent leakage current measurement with 230 V test voltage
- Convenient memory and report generating functions (optional)
- Data interface for PC, printer and barcodes
- Safety for the user thanks to integrated personal protection – suitable for persons with basic electro-technical instruction
- DKD calibration certificate (optional)
- Dimensions: 292 x 130 x 243 mm, weight: 4.5 kg

● **Included:** **SECUTEST SII – standard models (available from stock) including:**
M7030-V001: SECUTEST S II standard model, M7030 with all 00 basic features (B00 through KE00) and additional test sockets (feature F01), 200 mA test current for protective conductor resistance
M7030-V002: SECUTEST S II standard model, M7030 with all 00 basic features (B00 through KE00) and D07 (test sequence for hospital beds)
M7030-V003: SECUTEST S II standard model, M7030 with all 00 basic features (B00 through KE00) and E01 (SECUTEST PSI)
M7030-V005: SECUTEST S II standard model, M7030 with all 00 basic features (B00 through KE00) and E01 (SECUTEST PSI) plus F01 (additional test sockets)

● **Included:** **SECUTEST SII basic device, M7030: all 00 features**
Specify the designation of the basic M7030 instrument in your order, as well as any features which deviate from feature 0!

● **See optional accessories on page 75.**

➲ **See page 91 for training seminar:**
GTT1211, GTT1212, GTT1213, GTT1214, GTT1216, GTT1224A, GTT1224D, GTT1224F, GTT1226

Type	Data Sheet No.	Article Number		
M7030-V001	3-349-229-03	M7030-V001		
M7030-V002	3-349-229-03	M7030-V002		
M7030-V003	3-349-229-03	M7030-V003		
M7030-V005	3-349-229-03	M7030-V005		
SECUTEST SII basic instrument, 00 features	3-349-229-03	M7030		
Connector plug, France	3-349-229-03	M7030B03		
Connector plug, Switzerland	3-349-229-03	M7030B09		
Adapter set for international use	3-349-229-03	M7030B11		
Online instructions in English	3-349-229-03	M7030C01		
Test sequence for hospital beds	3-349-229-03	M7030D07		
Test sequence per customer requirement	3-349-229-03	M7030DXX		
With SECUTEST PSI printer module	3-349-229-03	M7030E01		
With additional test sockets	3-349-229-03	M7030F01		
Integrated database for up to 99 device-specific test sequences/reports	3-349-229-03	M7030KB01		
Software for acoustic indication including special 5 m cable	3-349-229-03	M7030KD01		
Direct printing after every measurement with automated test sequence	3-349-229-03	M7030KE01		
DKD calibration certificate	3-349-229-03	M7030L01		

VDE Tests

Test	Prot. Conductor Res.	Insulation Resistance	Eq. Leakage Current	Absence of Voltage	Load Current	Differential Current
Measuring range	0 ... 31 Ω	0 ... 310 MΩ	0 ... 120 mA	0 ... 3.5 mA	0 ... 16 A	0 ... 31 mA
Intrinsic error	±(2.5% rdg. + 5 d)					±(5% rdg. + 5 d)

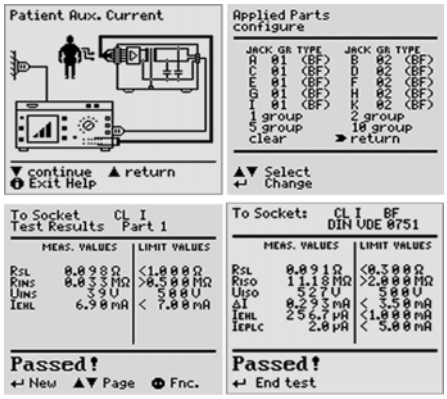
General Service Measurements

(line) Voltage	Current	Temperature	Resistance	Active Power	Apparent Power	Power Factor
0 ... 253 V	0 ... 10 A / 120 A with clip-on ammeter	– 200 ... + 850° C with Pt100 sensor	0 ... 150.0 kΩ	0 ... 3700 W	0 ... 4000 VA	0 ... 1.00
±(2.5% rdg. + 5 d)	±(3% rdg. + 10 d)	±(2% rdg. + 1° C)	±(1% rdg. + 3 d)	±(5% rdg. + 10 d)		

SECUTEST®SIII

DKD optional CE

SECUTEST SIII with Optional PSI Module
SECUTEST PSI



Test Instrument per BGV A3 (previously VBG 4), MPG Medical Device Legislation, and for Routine Tests and Type Testing

Universal test instrument for testing the electrical safety of portable electrical equipment in commercial and medical applications after initial manufacture or repair, and for periodic testing

Technical safety measurements for, amongst others:

- Electrical equipment per DIN VDE 0701 part 1, 2000-9 edition, part 200, part 260 1990 edition
- Data processing devices and equipment per DIN VDE 0701, part 240, and DIN EN 60950
- Periodic testing per DIN VDE 0702 (BGV A3), new 0702:2004 valid as of 1 June 2004
- Electrical medical devices per DIN VDE 0751 and EN 60601 (supplement)
- Electrical equipment for measurement, control and laboratory use per EN 61010
- Electrical household appliances per EN 60335

Expanded functionality thanks to:

- Function test with power analysis
- Temperature measurement
- Current measurement (with optional clip-on ammeter)
- Voltage and resistance measurement
- Report generation with printer module (PSI module), DA-II printer adapter or PC software
- Complete measuring system with automated measuring sequences
- User interface in various languages: English, French, German, Italian, Spanish, Czech, Dutch
- Parallel test sockets for devices under test without mains plug
- Safety for the user thanks to integrated personal protection – suitable for persons with basic electro-technical instruction
- DKD calibration certificate (optional)

Options:

- Mains connectors for England, France, Germany, Italy, Switzerland, Denmark, USA, China, Australia and adapter set
- High-voltage test
- 25 A_{AC} test current for protective conductor measurement
- DBmed database, modem operation, remote control, direct printing
- Configuration in accordance with customer specifications
- Measurements in accordance with EN 60601, calibration certificate
- 10 test sockets for patient application parts
- 2 test sockets for equipotential bonding conductor / operational earth electrode
- Configuration for safety class 2 hospital beds (preset)
- Software: PS 3, PC.doc-WORD/-ACCESS, ELEKTROmanager
- Dimensions: 292 x 130 x 243 mm, weight: 4.5 kg

● **Included:** **SECUTEST SIII – standard models (available from stock) including:**
M7010-V010: SECUTEST SIII for Germany with all basic features (B00 through L00)
M7010-V001: SECUTEST SIII for Germany, additionally with B01 service socket and J01 patient ports

● **See optional accessories on page 75.**

● **See characteristic values on next page.**

➲ **See page 91 for training seminar:**
GTT1211, GTT1212, GTT1213, GTT1214, GTT1216, GTT1224A, GTT1224D, GTT1224F, GTT1226

Type	Data Sheet No.	Article Number		
M7010-V010	3-349-112-03	M7010-V010		
M7010-V001	3-349-112-03	M7010-V001		
SECUTEST SIII basic instrument, = features 00	3-349-112-03	M7010		
Service outlet	3-349-112-03	M7010B01		
Adapter set for international use	3-349-112-03	M7010B11		
SECUTEST PSI printer module	3-349-112-03	M7010E01		
HV test, setpoint: max. 4 kV AC	3-349-112-03	M7010F02		
25 A 50/60 Hz AC test current	3-349-112-03	M7010G01		
Patient ports	3-349-112-03	M7010J01		
Measurements per EN 60601/IEC 601	3-349-112-03	M7010KA01		
Integrated database	3-349-112-03	M7010KB01		
Data transmission via modem	3-349-112-03	M7010KC01		
Acoustic signaling via software+SK5	3-349-112-03	M7010KD01		
Direct printing	3-349-112-03	M7010KE01		
Calibration certificate per DKD	3-349-112-03	M7010L01		
F2000 universal carrying pouch	3-349-126-02	Z700D		
K2010 carrying case	–	Z504L		
WZ12C clip-on current sensor	3-349-017-03	Z219C		
Z864A shunt	–	Z864A		
Z3409 Pt100 temperature sensor	–	GTZ3409000R0001		

SECUTEST SIII – Characteristic Values

Measured Quantity	Measuring Range / Nominal Range of Use	Resolution	Nominal Voltage U_N	Open-Circuit Voltage U_0	Nominal Current I_N	Short-Circuit Current I_K	Internal Resistance R_I	Reference Resistance R_{REF}	Measuring Error	Intrinsic Error	Overload Capacity Value	Overload Capacity Time
Device protective conductor resistance R_{PE}	0.000 ... 2.100 Ω	1 mΩ	—	4.5 ... 9 V DC	—	> 200 mA DC	—	—	±(5% rdg.+ 10 d) > 10 D	±(2.5% rdg.+ 5 d) > 10 digits	253 V	Cont.
	2.11 ... 31.00 Ω	10 mΩ										
	0.000 ... 2.100 Ω	1 mΩ	—	< 6 V AC	—	> 10 A AC[4] >5 s	—	—			No protection [5]	
Insulation resistance R_{ISO}	0.050 ... 1.500 MΩ	1 kΩ	50 ... 500 V DC	1.0 • U_N ... 1.5 • U_N	> 1 mA	< 10 mA	—	—	±(5% rdg.+10 d)	±(2.5% rdg.+5 digits) > 10 digits	253 V	Cont.
	1.01 ... 10.00 MΩ	10 kΩ										
	10.1 ... 310.0 MΩ	100 kΩ							±(10% rdg.+10 d)	±(10% rdg.+10 digits)		
Equivalent leakage current I_{EL}	0.00 ... 21.00 mA	10 µA	—	230 V ~ –20 / +10%	—	< 3.5 mA	> 72 kΩ	2 kΩ	±(5% rdg.+10 d)	±(2.5% rdg.+5 digits) > 10 digits	253 V	Cont.
	20.1 ... 120.0 mA	100 µA										
Contact current (absence of voltage) I_{Probe}	0 ... 3.500 mA	1 µA	—	—	—	—	2 kΩ	—	±(5% rdg.+10 d)	±(2.5% rdg.+5 digits) > 10 digits	253 V	Cont. [2]
Residual current ΔI between L and N per DIN VDE 0702	0.000 ... 3.100 mA ~	1 µA	—	—	—	—	—	—	±(10% rdg.+10 d) > 10 digits	±(5% rdg.+5 digits) > 10 digits	[1]	[1]
	3.00 ... 31.00 mA ~	10 µA										
Equivalent device or patient leakage current I_{EGA} or I_{EPA}	0.0 ... 310.0 µA	0.1 µA	—	230 V ~ –20 / +10%	—	< 3.5 mA	> 72 kΩ	1 kΩ ±50 Ω	±(5% rdg.+10 d)	±(2.5% rdg.+5 digits) > 10 digits	253 V	Cont. [1, 3]
	0.000 ... 2.100 mA	1 µA										
	2.101 ... 21.00 mA	10 µA										
	20.1 ... 120.0 mA	100 µA										
Leakage current I_{ABL} [2]	0.0 ... 310.0 µA	100 nA	110% of highest line voltage [6]	—	—	—	1 kΩ	—	±(5% rdg.+10 d)	±(2.5% rdg.+5 digits) > 10 digits	253 V	Cont. [1, 3]
Total leakage current I_{ABL}	0.210 ... 3.600 mA	1 µA										
	3.10 ... > 15.00 mA	10 µA										

Function	Measured Quantity	Measuring Range / Nominal Range range	Resolution		Open-Circuit Voltage U_0		Short-Circuit current I_K	Internal Resistance R_I		Measuring Error	Intrinsic Error	Overload Capacity Value	Overload Capacity Time
Function Test	Line voltage $U_{L–N}$	103.5 V ... 126.5 V 207.0 ... 253.0 V ~	0.1 V		—		—	—		—	±(2.5% rdg.+5 digits)	253 V	Cont.
	Load current I_L	0 ... 16.00 A RMS	10 mA		—		—	—		—	±(2.5% rdg.+5 digits)	20 A	10 min.
	Active power P	0 ... 3700 W [8]	1 W		—		—	—		—	±(5% rdg.+10 digits) > 20 digits	253 V	Cont.
												20 A	10 min.
	Apparent power S	0 ... 4000 VA	1 VA	Calculated value, $U_{L–N}$ • I_V							±(5% rdg.+10 digits) > 20 digits		
	Power factor LF with sinusoidal waveshape: cos φ	0.00 ... 1.00	0.01	Calculated value, P / S, display > 10 W							±(10% rdg.+5 digits)		
	Residual current ΔI between L and N per DIN VDE 0702	0.00 ... 31.00 mA ~	10 µA		—		—	—		±(10% rdg.+10 d) > 10 digits	±(5% rdg.+5 digits)	[1]	[1]
$U_{AC/DC}$	Voltage	0 ... 253.0 V ⎓, ~ and ≂	0.1 V		—		—	—		—	±(2.5% rdg.+5 digits) > 10 digits	253 V	Cont.
	Extra-low voltage, safety class III									±(5% rdg.+10 d)			
U_{Probe}	Probe voltage	0 ... 253.0 V ⎓, ~ and ≂	0.1 V		—		—			—	±(2.5% rdg.+5 digits) > 10 digits	253 V	Cont.
R	Resistance	0 ... 150.0 kΩ	100 Ω		< 20 V –		1.1 mA	—		—	±(1% rdg.+3 digits)	253 V	Cont.
I_{Clip}	Current via Clip-on current-Voltage transformer WZ12C	0.000 ... 10.00 A ~	1 mA		—		—	1.5 MΩ		—	±(3% rdg.+10 digits) > 10 digits without clip	253 V	Cont.
		0 ... 100 A ~	1 A		—		—	1.5 MΩ		—		253 V	Cont.
Temp	Temperature with Pt100/Pt1000 sensor	– 200 ... – 50° C	1° C		< 20 V –		1.1 mA	—		—	±(2% rdg.+1° C)	10 V	Cont.
		– 50.1 ... + 300.0° C	0.1° C								±(1% rdg.+1° C)	10 V	Cont.
		+300 ... +850° C	1° C								±(2% rdg.+1° C)	10 V	Cont.

1 As of 25 mA: shutdown within 100 ms as a result of differential current measurement
2 Exception: earth leakage current, only 0.000 … 3.100 mA
3 The measuring path becomes highly resistive, indication appears at the display
4 Measurement with AC test current is not possible at sockets 1 through 3; feature G01: > 25 A; when using the SK5 probe cable, short-circuit current is less than 25 A.
5 Maximum test duration: 40 seconds, protection against overheating: measurement cannot be restarted until after waiting for 1 minute.
6 Calculated value
7 AC and DC are measured in the case of patient leakage and patient auxiliary current.
8 Measured value P and calculated value S are compared, and the smaller of the two is displayed.

Key: rdg. = reading (measured value), d = digit(s)
I_{ABL} = Patient, housing and earth leakage current, as well as patient auxiliary current

SECUTEST 3PL

Test Instrument for Periodic Testing at Single and 3-Phase Devices in Accordance with DIN VDE 0701 and DIN VDE 0702

Testing electrical safety of electrical equipment per BGV A3, GUV-V A2

The test instrument is used for fast, safe periodic testing of electrical devices in accordance with DIN VDE 0701 and DIN VDE 0702. The following are measured in accordance with the regulations:

- Protective conductor resistance, insulation resistance, protective conductor current for SC1 devices, contact current for SC2 devices, absence of voltage at exposed conductive parts (= contact current)

Measuring methods:

- Direct measurement, equivalent leakage current, differential current

Testing the electrical safety of extension cables

- Protective conductor resistance, insulation resistance, continuity, short-circuit and reversed polarity

Function test with power analysis for single phase DUTs

Suitable for high power DUTs with up to 16 A.

The device under test can be subjected to a function test with mains voltage via the integrated single pole earth contact outlet. The function test can be executed immediately after electrical safety testing has been successfully completed.

The following are measured, or calculated automatically:

- Line voltage, differential current, current consumption, active and apparent power, power factor, electrical energy and duty cycle

Report generating functions

All of the values required for approval reports or device logbooks for electrical equipment (e.g. per ZVEH) can be measured with this instrument. All measured data can be documented and archived thanks to the measurement and test report which can be printed from, or stored to a PC.

● **Included:**
Test instrument with automated test sequence, interface, online instructions in German, extensive connection options with plug connectors, probe cable with test probe and plug-on alligator clip, test report, operating instructions and condensed operating instructions

➲ **See page 91 for training seminar: GTT5010**

Type	Data Sheet No.	Article Number		
SECUTEST 3PL	–	M704B		
DKD calibration certificate	–	–		

SECUTEST PSI

Integratable Printer/Memory Module for SECUTEST..., PROFITEST 204, METRISO 5000D-PI and MAVOWATT 45 for Rapid On-Site Report Generation

Test results are transmitted via ribbon cable to the PSI module, which can be integrated into the instrument's lid, and are automatically saved to memory. All measured values for 200 to 1000 test reports can be stored to this memory. Test results can be printed out on-site in the form of concise, documented reports which can be furnished with date, time and text entered at the keypad.

- Dimensions: 240 x 81 x 40 mm (without knurled screws and ribbon cables), weight: approx. 0.8 kg
- Batteries: 4 ea.1.5 V IEC LR 6 (AA mignon) if operated with batteries

Consumable materials: PS-10P = pack of 10 six meter recording charts, Z3210 = pack of 10 printer ribbon cartridges

Type	Data Sheet No.	Article Number		
SECUTEST PSI	3-348-785-03	GTM5016000R0001		
PS-10P	3-348-785-03	GTZ3229000R001		
Z3210	3-348-785-03	GTZ3210000R001		

Z745A CEE adapter

Adapter for 3-Phase Consumers

The Z745A CEE adapter allows for quick and efficient testing of devices equipped with a CEE plug in accordance with VDE 0701/0702.

- CEE attachment outlets: 16 A/3-pole, 16 A/5-pole, 32 A/5-pole
- Safety outlets for 3-phase devices without permanently attached plug
- Protective conductor continuity test and insulation test for each phase, and combined phases, with rotary switch

Type	Data Sheet No.	Article Number		
Z745A	–	Z745A		

VL2 Test Adapter

Test Adapter for Testing Devices and Extension Cables with Test Instruments for DIN VDE 0701/0702

The test adapter is intended for the performance of measurements and testing at electrical devices and extension cables with CEE plug connectors in combination with test instruments in accordance with the following standards:
DIN VDE 0701-1:2000 (testing after repair)
DIN VDE 0702 (periodic testing).
The following quantities can be tested with the adapter in combination with test instruments which are intended for the performance of the respective tests:

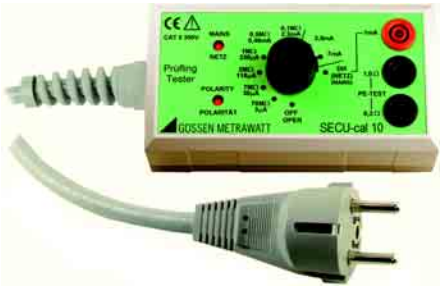
Electrical devices
- Protective conductor resistance
- Insulation resistance (measurement of L1, L2, L3 and N short-circuited to PE)
- Equivalent leakage current

Extension cables
- Protective conductor resistance
- Insulation resistance (measurement of L1, L2, L3 and N short-circuited to PE)
- Easy function test for single and 3-phase extension cables including testing for conductor continuity, short circuiting and polarity reversal (clockwise rotation) with rotary selector switch

Type	Data Sheet No.	Article Number		
VL2	3-349-241-03	Z600B		

SECU-cal 10

Calibration Adapter for SECUTEST, METRATESTER, MINITEST and SECUSTAR



The calibration adapter is used for testing test instruments per DIN VDE 0701/0702 for measuring safety.
As a rule, these instruments must be tested once each year, as well as for certification in accordance with the ISO 9000 quality standard, as set forth by accident prevention regulation BGV A3 (VBG 4).
All limit values for the required tests per DIN VDE, as well as protective conductor resistance, insulation resistance, equivalent leakage current, and residual and/or contact current must be tested.

Type	Data Sheet No.	Article Number		
SECU-cal 10	–	Z715A		

SK2
SK5

Probe Cable for Protective Conductor Measurement

SK2: test probe and 2 m cable without spiral, suitable for high-voltage testing, for SECUTEST...

SK5: software for acoustic signaling including 5 m probe cable, for SECUTEST...
- 5 meter probe cable for protective conductor measurement
- Automatic recognition of changing measuring points as software upgrade on floppy disk
- Go/No-Go indication with various displays

Type	Data Sheet No.	Article Number		
SK2	–	Z745D		
SK5	–	Z745K		

Clip-On Current Sensor

Clip-On Current Sensor for Easy, Safe Measurement of Current Flowing within a Conductor

The following advantages result:
- Electrical circuits need not be interrupted
- No electrical connection to the conductor
- Measurement of current up to 2000 A
- No multimeter overloading as a result of current surges

Type	Measuring Range	CAT at V	Cross-Section	Transformation Ratio	Frequency Range	Intrinsic Error ± (% rdg. + mV/A)
WZ12C	1 mA ... 15 $A_{AC,DC}$ 1 A ... 150 A_{AC}	III at 300	15 mm dia.	1 mV/mA 1 mV/A	45...65 ...500 Hz	3%+0.15 mA 2%+0.1 A

Type	Data Sheet No.	Article Number		
WZ12C	3-349-017-03	Z219C		

Brush Probe

Brush Sensor for SECUTEST, METRATESTER, MINITEST and SECUSTAR

Contacting for:
- Leakage current measurement (contact current)
- Protective conductor resistance measurement

The brush probe is suitable for contacting exposed conductive parts which rotate during operation, e.g. drill chucks, vibrating sanders and tool mounts.
The brush must be plugged onto test probe.

Type	Data Sheet No.	Article Number		
Brush probe	–	Z745G		

PA 4

Patient Connector Cable for SECUTEST SIII

Patient connector cable, 1.5 meters long, 12 conductors each with 4 mm plug

Type	Data Sheet No.	Article Number		
PA4	–	Z745L		

AT3-IIS Safety Tester

Test Adapter for Connection to SECUTEST SII (with feature F01), and SIII Test Instruments for Tests per DIN VDE 0701, 0702, 0751

The safety tester is used in combination with SECUTEST test instruments for testing 3-phase devices after repair (DIN VDE 0701), as well as for periodic testing (DIN VDE 0702).
It allows for fully automated or manual testing in accordance with the menu-driven test sequences included with the test instruments, with transmission of test results to, and analysis at SECUTEST test instruments.

Test types:

DIN VDE tests without mains operation
- Protective conductor resistance, insulation resistance, equivalent leakage current

DIN VDE tests with mains operation
- Differential current, contact current
- Equipped with 5-pole CEE 32 A (max. 20 A) and CEE 16 A
- Dimensions: 290 x 120 x 105 mm (without cables and grommets), weight: 2.4 kg

Type	Data Sheet No.	Article Number		
AT3-IIS	–	Z745T		

AT3-IIIE Safety Tester

Test Case for Connection to SECUTEST SII (with feature F01) and SIII Test Instruments for Testing in Accordance with DIN VDE 0701, 0702 and 0751

The safety tester is used for measuring and testing single and 3-phase electrical devices and extension cables in combination with SECUTEST SII and SIII test instruments. These tests must be performed by a qualified electrician with an appropriate test instrument after repair or modification in accordance with DIN VDE 0701, and are also required for periodic testing per DIN VDE 0702 or 0751.
According to these regulations, protective conductor resistance, insulation resistance, equivalent leakage current and differential current must be measured, depending upon the device under test and its application. Testing per EN 60601-1 is only possible to a certain extent.
- Connection of single and 3-phase devices and extension cables without reconnecting devices under test in operating modes with and without mains power via the test sockets and the test plug at the AT3-IIIE
- Tests according to menu-driven test sequences included with SECUTEST test instruments, fully automatic or manual
- Transfer of test results to test instruments with evaluation performed by SECUTEST series test instruments
- Additional protection provided by electronic residual current monitoring with mains disconnect for defective devices under test for fault currents of greater than 20 mA, and optical error indication
- Trip control with “residual current tripping” test key
- Prevention of short-circuits and blown mains fuses during testing of defective single and 3-phase extension cables
- The EL1 adapter function (SECUTEST test instrument accessory) for testing single phase extension cables is included with the AT3-IIIE as an integral component.
- Dimensions: 405 x 300 x 220 mm (with lid), weight: approx. 6.7 kg

Type	Data Sheet No.	Article Number		
AT3-IIIE	3-349-156-03	Z745S		

METRAOHM 413

Digital Low-Resistance Measuring Instrument

Digital low-resistance measuring instrument in accordance with DIN VDE 0 413 part 4 and EN 61 557 parts 1 and 4

- Two measuring ranges: 0.01 ... 20 Ohm / 0.1 ... 200 Ohm
- Zero balancing for measurement cables
- Compact and rugged – for service calls and laboratory use
- Overvoltage protection – protects the instrument in the event of inadvertent connection to mains power
- Indication of interference voltage
- IP 65 protection

● **Included:** **Low-value resistance measuring instrument, 1 plug-in measurement cable, 9 volt block battery per IEC 6 LR61, operating instructions**

● **Optional Accessories:** **F837: ever-ready case for METRISO 500D, 1000D, 1000IR ..., Telearm 1: telescoping rod for PE measurement, TR50: metal drum with 50 m measurement cable, TR25: reel with 25 m measurement cable (see also as of page 75)**

Type	Data Sheet No.	Article Number		
METRAOHM 413	3-348-810-03	M630A		

METRISO C

Digital Insulation and Resistance Measuring Instrument, 1000 V

The following functions are included for measurements in electrical systems, as well as at insulating and conducting floor coverings and walls:

- Measurement of insulation resistance and high-resistance with display of the measured value and the actual, respective measuring voltage
- Measurements at bonding and protective conductors with low-resistance measurement
- Measurement of contact current, voltage and frequency
- Optional measurement of temperature and relative atmospheric humidity
- All measurements are in compliance with the following regulations:
  DIN VDE 0100 part 610, DIN VDE 0413 (=EN 61557) parts 1, 2, and 4, DIN VDE 0701 part 240, EN 344, EN 1081, IEC 1340-4-1, IEC 1340-5-1
- Unambiguous limit value and Go/No-Go indication by means of LEDs, and display of useful information
- All measurement values are stored to memory with reference to their respective electrical circuit designations
- Rugged 2-component housing for everyday use
- Dimensions: 275 x 140 x 65 mm (H x W x D), weight: 1.2 kg with batteries
- Power supply: 4 ea. mignon cell per IEC LR 14

● **Included:** **M541A: Insulation measuring instrument with factory calibration certificate**
M508A: Set consisting of PROFiTEST C, METRISO C, 3-pole adapter, IrDa 0100 adapter cable and KS17 measurement cables, in HC 40 hard case

● **Optional accessories:** **Charger for NA 0100S battery set, HC30-C hard case as of page 75, special KS-C cable set including 1 measurement cable and 1 high-resistance measurement cable**

● **Optional software:** **PS3 – software for test instruments: systems and equipment management, and report generation (see page 77)**

➲ **See page 91 for training seminar: GTT1210, GTT1224B, GTT1224G, GTT1226**

Characteristic Values

Function	Measuring Range	Measuring Voltage	Nominal Current
Insulation resistance R_{ISO}	000 kΩ ... 99.9 GΩ	100 V ... 1000 V	1 mA (R_N=1 kΩ/V)
Resistance R_{LO}	0.00 Ω ... 99.9 Ω	4.5 V (U_0)	≥ 200 mA (R < 10 Ω)
Voltage U_{ISO} / U~	0 V ... 1200 V	–	–
Contact current I_B	0.00 mA ... 9.99 mA	–	–

Type	Data Sheet No.	Article Number		
METRISO C	3-349-086-03	M541A		
Set PROFiTEST C/METRISO C	3-349-086-03	M508A		
KS-C	–	Z541F		

METRISO® 500D

Digital Insulation Measuring Instrument, 500 Volt

Traditional digital insulation measuring instrument for electrical systems with up to 500 V per EN 61 557 parts 1, 2 and 4 (DIN VDE 0413 parts 1 and 4), with 500 V measuring voltage

- Digital and analog display
- Warning for hazardous shock voltages
- Quick-test with signal lamp in test probe
- Measuring voltage: 500 V
- Measuring ranges up to 30 GΩ
- Low-resistance measurement to 30 Ω per DIN VDE 0413, part 4

● **Included:** **Insulation measuring instrument with permanently connected measurement cables, 2 plug-on alligator clips, 1 carrying strap with 2 test probe holders, 1 set of batteries (6 mono-cells), 1 replacement fuse, operating instructions**

● **Optional Accessories:** **F837: ever-ready case for METRISO 500D, 1000D, 1000IR ..., Telearm 1: telescoping rod for PE measurement, TR50: metal drum with 50 m measurement cable, TR25: reel with 25 m measurement cable, KS24: cable set for test instruments (see also as of page 71)**

Type	Data Sheet No.	Article Number		
METRISO 500D	3-349-115-03	GTM5040000R0001		
F837 ever-ready case	–	GTZ3312000R0001		
DKD calibration certificate	–	–		

METRISO® 1000D (1000IR)

Digital Insulation Measuring Instrument, 1000 Volt

Digital insulation measuring instrument for electrical systems with up to 1000 V per EN 61 557 parts 1, 2 and 4 (VDE 0413 parts 1 and 4)

- Digital and analog display
- Three nominal voltages: 100 V (1000IR: 250 V), 500 V, 1000 V
- Warning for hazardous shock voltages
- Voltage measurement to 1000 V
- Quick-test with signal lamp in test probe
- Low-resistance measurement per DIN VDE 0413, part 4
- Three measuring voltages: 100 V, 500 V, 1000 V
- Measuring ranges up to 30 GΩ
- Low-value resistance measurement up to 30 Ω

● **Included:** **Insulation measuring instrument with permanently connected measurement cables, 2 plug-on alligator clips, 1 carrying strap with 2 test probe holders, 1 set of batteries (6 mono-cells), 1 replacement fuse, operating instructions**

● **Optional Accessories:** **F837: ever-ready case for METRISO 500D, 1000D, 1000IR ..., Telearm 1: telescoping rod for PE measurement, Sonde 1081: floor probe, TR50: metal drum with 50 m measurement cable, TR25: reel with 25 m measurement cable, KS24: cable set for test instruments (see also as of page 75)**

Type	Data Sheet No.	Article Number		
METRISO 1000D	3-349-115-03	GTM5050000R0001		
METRISO 1000IR	3-349-115-03	GTM5050000R0002		
F837 ever-ready case	–	GTZ3312000R0001		
DKD calibration certificate	–	–		

Characteristic Values

Type	METRISO 500D	METRISO 1000 D	METRISO 1000 IR	METRISO 1000 A	METRAOHM 413
Display	Digital			Analog	Digital
Insulation resistance	0 ... 3 GΩ	0 ... 30 GΩ		0 ... 400 MΩ	–
Number of ISO measuring ranges	6	7		15	
Intrinsic error	± (1.5% + 2 digits)				± (1.5% + 4 digits)
Max. nominal voltage	500 V	100 V/500 V/1000 V	250 V/500 V/1000 V	50 V ... 1000 V	
Nominal current	1 mA			≥ 1 mA / 200 mA	200 mA (20 mA)
Limit value signal Signal lamp	●	●	●	●	●
Limit value signal Acoustic	●	●	●	–	●
Low-resistance measuring range	0.1 ... 30 Ω			0 ... 4 Ω	0.01...20 Ω (200 Ω)
Voltage (AC / DC)	0 to 500 V	0 ... 1000 V	0 ... 1000 V	0 ... 1000 V	Interference voltage display
Power Supply	6 ea. 1.5 V mono-cell, IEC R 20				1 ea. 9 V block, IEC 6 LR 61
Dimensions	165 x 125 x 110 mm				60 x 230 x 40 mm
Weight	1.85 kg			1.6 kg	0.25 kg

METRISO® 5000 D-PI

Digital High-Voltage Insulation Measuring Instrument to 5000 V_{DC}

DKD CE

METRISO 5000D-PI with Optional PSI Module SECUTEST PSI

Instrument for traditional insulation measurement with selectable voltages of up to 5000 V –, designed for all known types of long-term insulation measurement as well

Features

Test Voltages to 5000 V
The instrument is suitable for non-destructive measurement of insulation resistance in electrical systems, as well as at machines, transformers, cables and electrical equipment utilized in, for example, locomotives, street cars and ocean going vessels, with selectable test voltages of up to 5 kV.

Voltage Measurement to 1000 V
Testing for absence of voltage at the device under test in systems of up to 1 kV can be performed with the voltage measuring range.

Discharging Capacitive Devices Under Test
Capacitive devices under test such as cables and coils, which may be charged by the test voltage, are discharged by the measuring instrument. The falling voltage value can be observed at the display.

Measurements per EN 61 557 Parts 1 and 2 (VDE 0413)
Nominal current amounts to 1 mA at a test voltage of 100 V, 250 V, 500 V or 1000 V.

Highly Insulated Measuring Cables
The highly insulated measuring cables are permanently connected for safety reasons, and as a result of technical measuring considerations. Danger resulting from an inadvertently disconnected cable, for example in the event of charging caused by capacitive devices under test, is thus avoided.

Polarization Index
A polarization index test is recommended for electrical machines. This procedure involves expanded testing of insulation resistance. DC measuring voltage from the METRISO®5000 D-PI is applied to the insulation for a duration of 10 minutes. Measured values are documented after one minute, and after ten minutes. If the insulation is good, the value measured after ten minutes is higher than the value measured after one minute. The relationship between the two measurement values is the polarization index. Charged material within the insulation is aligned due to the application of measuring voltage over a long period of time, resulting in polarization. The polarization index indicates whether or not the charged material contained in the insulation can still be moved, thus allowing for polarization. This, in turn, is an indication of the condition of the insulation.

- Extensive measuring range from 0.1 MΩ to 1 TΩ
- Variable test voltage, or in fixed steps: 100 V, 250 V, 500 V, 1 kV, 1.5 kV, 2 kV, 2.5 kV, 5 kV
- Polarization index and absorption ratio
- Voltage measurement to 1000 V
- Frequency measurement from 15 Hz to 1 kHz
- Capacitance measurement from 0.1 to 5 µF
- Measurement of electrical discharge
- Guard terminal for the elimination of surface current
- 5 m extension cable as accessory
- Supply power from mains, battery pack or external 12 V power supply
- Backlit dot matrix display
- Digital display of measured values and limit values, characteristic curve display for polarization index
- Timer function: 1 s to 100 min.
- DKD calibration certificate

● **Standard equipment for standard models (available from stock) including: M5810-V001: M5810 with German online instructions (A01) and rechargeable battery (C1), including DKD calibration certificate**

● **Specify the designation of the basic M5810 instrument in your order, as well as any features which deviate from feature 0.**
Online instructions also in 2 languages: A02 = international English, A04 = French, A05 = Dutch, A07 = Spanish, A10 = Italian, A14 = Czech, A15 = Swiss German, A43 = American English

● **Optional accessories: DA-II: printer adapter for connection of printers with Centronics interface, KY 5000A: 2 alligator clips (5kV version), ISO calibrator 1: calibration adapter for test voltages up to 1000 V and F2000 carrying pouch (see also as of page 75)**

Optional Accessories

Guard 5000A

KY 5000A

DA-II

F2000

Type	Data Sheet No.	Article Number		
METRISO 5000D-PI	3-349-209-03	M5810-V001		
METRISO 5000D-PI Basic instrument = all features 00	3-349-209-03	M5810		
PROFITEST 204HP/2.5 kV (not with C1)	3-348-802-03	M5810B1		
PROFITEST 204HP/5.4 kV (not with C1)	3-348-802-03	M5810B2		
Rechargeable battery (not with B1, B2)	–	M5810C1		
Caddy 2047 (not with B0)	3-348-802-03	M5810D1		
Signal 204, external signal lamp	3-348-802-03	M5810F1		
Guard 5000A, measurement cable	–	M5810G1		
LEADEX 5000, 5 m extension cable	–	M5810H1		
SECUTEST PSI, printer module	3-348-785-03	M5810I1		
DA-II	–	Z745M		
KY 5000A	–	Z580B		
ISO calibrator 1	–	M662A		
F2000 carrying pouch	3-349-126-02	Z700D		

METRISO® 1000A

Analog Insulation Measuring Instrument, 1000 Volt

Low-cost analog insulation measuring instrument for electrical systems with up to 1000 V in accordance with EN 61 557 parts 1, 2 and 4 (DIN VDE 0413 parts 1 and 4)

- Five nominal voltages: 50 V, 100 V, 250 V, 500 V, 1000 V
- Voltage measurement to 1000 V
- Signal lamp for battery level
- Low-resistance measurement per DIN VDE 0413, part 4 / EN 61557 -1 / -2 / -4

● **Included:** Insulation measuring instrument with carrying pouch, operating instructions

● **Optional Accessories:** F837: ever-ready case for METRISO 500D, 1000D, 1000IR ...,
Sonde 1081: floor probe,
KS24: cable set for test instruments (see also as of page 75)

Type	Data Sheet No.	Article Number		
METRISO 1000A in carrying pouch	3-348-807-03	M540C		
KS24 extension cable	–	GTZ3201000R0001		
1081 probe	–	GTZ3196000R0001		
F837 ever-ready case	–	GTZ3312000R0001		
Factory calibration certificate	–	–		

METRISO® 5000A

Analog Insulation Measuring Instrument, 5000 Volt

METRISO 5000A

+

Generator 5000A

=

METRISO 5000AK

METRISO 5000A: analog high-voltage insulation measuring instrument with 4 measuring voltages: 100, 250, 500 and 1000 V (per EN 61 557 part 2) and 1500, 2000, 2500 and 5000 V
METRISO 5000AK: The battery powered METRISO 5000 A is converted into the muscle powered METRISO 5000AK by replacing the battery module with a crank generator.

- Extensive measuring range: 10 kΩ ... 1 TΩ
- Measuring range: 100 kΩ ... 100 MΩ (1000 V)
- Measuring voltages: 100 V, 250 V, 500 V, 1000 V, 1500 V, 2000 V, 2500 V, 5000 V
- Measurements to 1000 V per DIN VDE 0413
- Voltage measurement to 2000 V ⎓, ~
- Concise logarithmic display
- Guard terminal for the elimination of surface current

● **METRISO 5000A:** High-voltage insulation measuring instrument with permanently connected measurement cables and test probes, 2 alligator clips (5 kV version) and battery module including batteries, 1 carrying strap, operating instructions

METRISO 5000AK: High-voltage insulation measuring instrument with permanently connected measurement cables and test probes, 2 alligator clips (5 kV version) and crank generator, 1 carrying strap, operating instructions

METRISO 5000A set: METRISO 5000A + KY 5000A + GUARD 5000A in F2000 universal carrying pouch

METRISO 5000AK set: METRISO 5000AK + KY 5000A + GUARD 5000A in F2000 universal carrying pouch

● **Optional accessories:** 5000A generator: crank generator for Metriso 5000A,
KY 5000A: 2 alligator clips for Metriso 5000A,
Guard 5000A: 1 guard cable and 1 alligator clip for METRISO 5000A,
Leadex 5000: 5 m extension cable,
F2000 carrying pouch (see also as of page 75)

Technical Data:

Type	METRISO 5000A
Insulation resistance	1 TΩ
Open-circuit voltage	100 V, 250 V, 500 V, 1000 V, 1500 V, 2000 V, 2500 V, 5000 V
Voltage (AC / DC)	0 ... 2000 V
Power supply	6 ea. 1.5 V mono-cell, IEC R 20 (D size)
Dimensions	290 x 250 x 140 mm
Weight	3.4 kg (with batteries)

Type	Data Sheet No.	Article Number		
METRISO 5000A	3-348-858-03	M580A		
METRISO 5000AK	3-348-858-03	M580C		
METRISO 5000A-Set	3-348-858-03	M580S		
METRISO 5000AK-Set	3-348-858-03	M580T		
Generator 5000A	3-348-858-03	Z580A		
KY 5000A	–	Z580B		
Guard 5000A	–	Z580C		
Leadex 5000	–	Z580D		
F2000 carrying pouch	3-349-126-02	Z700D		
Factory calibration certificate	–	–		

METRISO 5024

Analog Insulation Measuring Instrument / Low-Resistance Measuring Instrument / Voltmeter with Buzzer

The analog insulation measuring instrument for quick two-hand operation in accordance with VDE 0413, parts 1, 2 and 4, and voltmeter

- Insulation measurement with 100, 250 and 500 V measuring voltages
- With analog display
- Low-resistance measurements for protective conductor and equipotential bonding conductor resistance, and continuity
- Buzzer indicates alarm status for erroneous and implausible measurements, blinking LED serves same purpose
- Fluttering pointer as last resort warning function

● **Included:** **Insulation and resistance measuring instrument with carrying pouch, replacement fuse, operating instructions**

● **Optional accessories:** **KS24 cable set for test instruments, ISO calibrator 1: calibration adapter**
See also as of page 75.

Characteristic Values:

Insulation measurement, measuring voltage: 100 / 250 / 500 V

Measuring Range	Intrinsic Error	Overload	Measuring Current	Short-Circuit Current
0.1 … 400 MΩ	2.5%	600 V AC	> 1 mA	< 10 mA

* Measuring error under reference conditions relative to scale length (l = 84.6 mm)

Low resistance measurement, measuring voltage: 4.5 V

Measuring Range	Intrinsic Error	Overload	Measuring Current
0 … 4 Ω	2.5%	250 V DC	> 200 mA

* Measuring error under reference conditions relative to upper range value (l = 74.9 mm)

Voltage measurement, DC / AC (40 … 200 Hz)

Measuring Range	Intrinsic Error	Overload	Internal Resistance
0 … 500 V	2.5%	600 V AC	450 kΩ

* Measuring error under reference conditions relative to scale length (l = 73.3 mm)

Mechanical Design:
IP 40 protection per DIN VDE 0470, part 1 / EN 60 529, dimensions: 98 x 310 x 40 mm, weight: approx. 0.5 kg with batteries

Power Supply:
Batteries: 4 ea. 1.5 V mignon batteries per IEC LR6 (4 ea. size AA)

Type	Data Sheet No.	Article Number		
METRISO 5024 in pouch	3-349-212-03	M540E		
KS24	–	GTZ3201000R0001		
ISO calibrator 1	–	M662A		

ISO CALIBRATOR 1

Calibration Adapter for Insulation and Resistance Measuring Instruments

Calibration adapter for rapid, efficient testing of the accuracy of measuring instruments for insulation resistance and low-value resistors

Type	Data Sheet No.	Article Number		
ISO calibrator 1	–	M662A		

GEOHM C

Battery Powered Earth Tester (also for measurement of soil resistivity)

Compact, menu-driven instrument for the measurement of earthing resistance for 3 or 4-wire connection.
Continuous monitoring of interference voltage, as well as auxiliary earth electrode and probe resistance with indication if allowable limit values are violated.
Complete display of all required values at a large dot matrix display, or warning with 4 LEDs.
Easy concise operation with only 4 keys.

- Measurement of earthing resistance in 5 ranges to 50 kΩ
- Voltage measurement from 10 to 250 V, frequency measurement from 45 to 200 Hz
- Battery monitoring and self-test, integrated memory with IrDA interface, factory calibration certificate
- Extremely rugged 2-component housing, earth tester in accordance with DIN VDE 0413, part 5
- Measurement of ohmic resistance, automatic measurement of probe and auxiliary earth electrode resistance
- Automatic monitoring of interference voltages in the ground
- Helpful hints appear plainly at the display, automatic battery monitoring
- Storage of all measured values to memory
- Dimensions: 275 x 140 x 65 mm (H x W x D), weight: 1.2 kg with batteries
- Power supply: 4 ea. mignon cell per IEC LR 14

For the measurement of earthing resistance in electrical systems in accordance with:
- DIN VDE 0100, set-up of power installations with nominal voltages of up to 1000 V
- DIN VDE 0141, grounding in AC systems with nominal voltages of greater than 1 kV
- DIN VDE 0800, set-up and operation of telecommunications systems including data processing equipment
- DIN VDE 0185, lightning protection systems
- DIN VDE 0413 (=EN 61557) parts 1 and 5, devices for testing, measuring or monitoring protective measures and earth resistance

WinProfi PC program for communication with the GEOHM C.
WinProfi is included on the PS3 CD ROM along with the following contents and functions:
- Up-to-date test instrument software
  – For loading a different language
  – For loading a more up-to-date software version
- Transfer of measurement data between the test instrument and the PC
- Create and edit templates for test reports at the PC, and transfer them to the test instrument
- Create, print and archive test reports at the PC

● **Included:** **GEOHM C test instrument, neck strap, batteries, WinProfi PC software, comprehensive operating instructions covering the following topics:**

Measurement of earth resistivity
- With description of 3 and 4-wire methods
- With physical considerations regarding the potential gradient area
- Earth electrode resistance of earthing systems of various scope
- Important tips regarding measurements in unfavorable terrain

Measurement of soil resistivity
- With geologic evaluation and calculation of earth electrode resistance

Measurement of ohmic resistance

● **Optional accessories:** **NA 0100S: charger for battery set**
HC30-C: hard case with blister inserts for one test instrument with accessories
IrDa-USB converter: IR interface for connection to the USB port of a PC for transferring data between the PC and the GEOHM C
See also as of page 75.

Type	Data Sheet No.	Article Number		
GEOHM C	3-349-088-03	M590A		
NA 0100S	–	Z501D		
HC30-C	–	Z541C		
IrDa-USB converter	–	Z501J		

Technical Data:

Function	Measuring Range	Resolution	Measuring Voltage	Test Current	Accuracy	Operating Error
Resistance	0.01 Ω ... 20 kΩ	0.01 Ω ... 10 Ω	Max. 50 V_{RMS} / 128 Hz	10 m A_{RMS} ...100 µA_{RMS}	±(3% rdg. + 3 d)	±(10% + 6 D)
	Manual: ... 50 kΩ					±(16% + 10 D)
Voltage	0 V ... 250 V	–	–	–	–	–

GEOHM®33D

Earth Tester with Crank Generator

CE

Discontinued model:
Only available until current stock is depleted.

Earth testers are used for the measurement of earth resistance in electrical systems per DIN VDE 0100, 0141, 0800 and 0185. This measurement is required for the determination of earthing system dimensions.
The testers can also be used for geological ground surveys and for the planning of earthing systems.
Interference voltage and auxiliary earth electrode resistance are continuously monitored.
A signal is generated automatically if allowable limit values are exceeded.
The testers function in accordance with the current-voltage measuring method per DIN VDE 0413 part 7, and in accordance with the compensation measuring method per DIN VDE 0413 part 5.

- Digital LCD
- Limit value monitoring
- Easy to turn crank generator
- Rugged mechanical design

● **Included:** GEOHM 33D earth tester with 4 adapters for connecting cable lugs, wire ends or banana plugs, operating instructions

● **Optional accessories:** F833 carrying pouch

Technical Data:

Feature	GEOHM 33D
Display	Digital
Measuring ranges	0 ... 20 / 200 / 2000 / 20000 Ω
Intrinsic error	± (2% rdg. + 3 digits)
Power supply	Crank generator
Dimensions / weight	210 x 128 x 125 mm / 1.4 kg

Type	Data Sheet No.	Article Number		
GEOHM 33D	1-2.5-416.02	GTM5033000R0001		
F833 carrying pouch	–	GTZ3301001R0001		

General Accessories for Earth Testers

Description	Type	Data Sheet No.	Article Number		
Reel with 25 m measurement cable	TR25	–	GTZ3303000R0001		
Drum with 50 m measurement cable	TR50	–	GTY1040014E34		
Earth drill, 35 cm long	SP350	–	GTZ3304000R0001		

GEOHM Accessories E-Set 5

Measuring Accessory Set for Earth Testers

Extensively equipped earth measurement case with space for device and accessories

Earth measurement case consisting of:

- Imitation leather case
- 1 drum with 25 m measurement cable
- 2 drums with 50 m measurement cable each
- 3 measurement cables, 0.5 m each
- 1 measurement cable, 2 m long
- 1 test clamp
- 4 earth drills, 350 mm long
- 1 dust cloth
- 2 pads with forms

Type	Data Sheet No.	Article Number		
E-Set 5	–	Z590B		

GEOHM Accessories E-Set 3

Measuring Accessory Set for Earth Testers

Moderately priced measuring accessories for measurements with earth spikes

Contents:

- 2 reels
- 2 measurement cables, 25 m each
- 1 measurement cable, 40 m long
- 2 measurement cables, 3 m each
- 4 earth spikes (zinc plated)
- 2 spike pullers
- 1 hammer

Type	Data Sheet No.	Article Number		
E-Set 3	–	GTZ3301005R0001		

GEOHM Accessories E-Set 4

Measuring Accessory Set for Earth Testers

Measuring accessories for earth measurements, same as E-Set 3 but with earth drills instead of spikes

Contents:

- 2 reels
- 2 measurement cables, 25 m each
- 1 measurement cable, 40 m long
- 2 measurement cables, 3 m each
- 4 earth drills

Type	Data Sheet No.	Article Number		
E-Set 4	–	Z590A		

MetraPhase 1

Phase Sequence Indicator with Electronic Rotary Dial, Frequency Display and Display of Nominal Line Voltage

Phase sequence indicator with electronic rotary dial, frequency display, nominal line voltage display and phase sequence indicator in compliance with safety regulations.
We've equipped or new METRAPHASE1 phase sequence indicator with an electronic rotary dial which eliminates mechanical components and saves space.
LEDs arranged in a circular array not only indicate the direction of rotation, but rather line frequency as well by means of LEDs which light up in various colors.
The presence of voltage at each phase is indicated with additional LEDs, as well as nominal line voltage.
This new phase sequence indicator can be used as a 3-pole or a 2-pole indicator.

- Power supply: 4 ea. mignon cell per IEC LR 6

● **Included:** **Phase sequence indicator, 3 plug-in measurement cables with contact-protected plugs, 3 test probes for plugging onto contact-protected plugs, 1 alligator clip for plugging onto contact-protected plugs, 4 batteries, carrying case, operating instructions**

● **Optional accessories:** **GH18: protective rubber cover**
Z500A: variable plug adapter set, 3.5 to 12 mm dia., set of 3
NA4/500: power pack, 230 V / 4 V, with safety connector cable

Type	Data Sheet No.	Article Number		
MetraPhase 1	MetraPhase 1	M620A		
M620A	–	GTZ3212000R0001		
GTZ3212000R0001	–	Z500A		
Z500A	–	Z218A		

PhaseCop 2

Phase Sequence Indicator with LEDs and Contact Protected Plugs

Instrument for determining direction of rotation, or phase sequence in three-phase systems

- 3 LEDs indicate whether or not the 3 phase conductors are live
- Very large voltage and frequency range
- Simple operation, rugged design
- Permanently connected cables with contact-protected connector plugs, three plug-on test probes and one plug-on alligator clip

● **Included:** **Phase sequence indicator, 3 permanently connected cables with contact-protected connector plugs, 3 plug-in test probes, 1 plug-in alligator clip**

● **Optional accessories:** **F801: ever-ready case**

Type	Data Sheet No.	Article Number		
PhaseCop 2	3-348-846-03	GTM5202000R0001		
F801 ever-ready case	–	GTY3172070P01		

Technical Data

Feature	METRAPHASE 1	PhaseCop 2
DIN VDE 0413 / EN 61557 compliant	●	●
Phase sequence display	LEDs	LED
Phase display	●	●
Display of nominal line frequency	●	-
Display of nominal line voltage	●	-
Nominal range of use	70 ... 690 V / 50 ... 400 Hz	90 ... 660 V / 45 ... 1000 Hz
Dimensions	84 x 195 x 35 mm	70 x 105 x 38.5 mm
Weight	0.3 kg	0.3 kg

DA-II

RS 232 – Centronics Printer Adapter for Connecting External Printers

- RS 232 – Centronics printer adapter
- Printer driver in SECUTEST SIII for all common printers with parallel interface
- No external power supply required, report generation without PC

Type	Data Sheet No.	Article Number		
DA-II	–	Z745M		

A3-16 / A3-32 / A3-63

3-Phase Current Adapters

A3-xx: A3-16, A3-32 and A3-63 3-phase adapters for connecting test instruments to 5-pole CEE outlets.
The adapters correspond to 5-pole CEE sockets with 16 A, 32 A and 63 A nominal current.
Phase sequence testing with signal lamps, testing the effectiveness of protective measures with five 4 mm contact protected sockets

Type	Data Sheet No.	Article Number		
A3-16	–	GTZ3602000R0001		
A3-32	–	GTZ3603000R0001		
A3-63	–	GTZ3604000R0001		

Z500A Variable Plug Adapter Set

Variable Plug Adapter set

Self-retaining, contact protected test probes for the connection of measurement cables with 4 mm banana plugs, or with contact protected plugs for sockets with an opening of 3.5 mm to 12 mm, e.g. CEE, and Perilex sockets.
For example, the test probes also fit the square PE jacks on Perilex sockets.
Maximum allowable operating voltage: 600 V per IEC 61010.

Type	Data Sheet No.	Article Number		
Variable plug adapter set (3 pieces)	–	Z500A		

KS13 / KS17-2 / KS24

Cable Sets

KS17-2: Cable set with permanently mounted test probes and contact-protected angle plugs for safe measuring.

KS13: Cable set for connecting test instruments such as the METRATESTER 4/5/5-F, SECUTEST 0701/0702S II or the SECUTEST SII to the mains without using a an earthing contact outlet, and for connecting DUTs. Consists of coupling socket with 3 permanently connected cables, 3 measurement cables, 3 plug-on pick-up clips and 2 plug-on test probes.

KS24: The KS24 cable set includes a 4 m long extension cable with a permanently attached test probe at one end and a contact protected socket at the other end, as well as two alligator clips which can be plugged onto the test probe.

Type	Data Sheet No.	Article Number		
KS13	–	GTY3624065P01		
KS17-2	–	GTY3620034P0002		
KS24	–	GTZ3201000R0001		

EL1
PRO-... Plug Insert

Adapter for Testing Single-Phase Extension Cables

EL1:

- For testing extension cables
- Earth contact and inlet connector plug inserts included
- Additional country-specific inserts available as well

PRO-CH: plug insert for using the EL1 adapter in Switzerland

PRO-GB: plug insert for using the EL1 adapter in Great Britain

PRO-RSA: plug insert for using the EL1 adapter in South Africa

Type	Data Sheet No.	Article Number		
EL1	–	Z723A		
PRO-CH	–	GTZ3225000R0001		
PRO-GB	–	GTZ3226000R0001		
PRO-RSA	–	Z501A		

TR25 / TR50

TR25: Reel with 25 m Measurement Cable
TR50: Metal Drum with 50 m Measurement Cable

TR25: Reel with 25m measurement cable, cable ends are equipped with banana plugs.

TR50: 50m measurement cable coiled onto a metal drum. Connection to the inside end of the cable is made possible with a socket integrated into the drum. The other end is equipped with a banana plug.
The drum axle with handle can be removed for space saving storage.

Type	Data Sheet No.	Article Number		
TR25	–	GTZ3303000R0001		
TR50	–	GTY1040014E34		

Z3409 Temperature Sensor

Pt100 Temperature Sensor

Standard Z3409 sensor for surface and immersion measurements from -40° C to +600° C

Feature	Z3409
Sensor element	Pt100
Sensor element length (l1) mm	130
Sensor length (l2) mm	1000
Temperature range °C	– 40...+ 600
Accuracy per DIN EN60751/IEC 751	Class A
Intrinsic error at 0 °C	0.15 K
Intrinsic error for °C	600: 1.35K
Transient recovery, T_{90} water / air	5 s / 30 s
Cable / outer jacket / insulation	Strand, 2 ea. 0.35 sq. mm / PVC

Type	Data Sheet No.	Article Number		
Z3409	–	GTZ3409000R0001		

Telearm 1, SP350, 1081 Probe

Telescoping Rod, Earth Drill, Floor Probe

Telearm1 Telescoping Rod: Telescoping rod with test probe (working length can be locked within a range of 53 to 120 cm), and with a socket in the handle at the other end for quick and safe testing of, for example, lamps installed at excessive heights for the measurement of protective conductor resistance. Max. allowable voltage to earth: 1000 V.

SP350 Earth Drill: Earth drill, 35 cm long, with connector for 4 mm banana plug.
Can also be used as a probe or auxiliary earth electrode for earth measurements, testing RCCBs etc.

1081 Floor Probe: This metallic tripod-type measurement electrode can be used for:

- Determination of electrical resistance at elastic floor coverings in accordance with EN 1081
- Resistance measurement for insulating floors and walls in accordance with DIN VDE 0100 part 610

Type	Data Sheet No.	Article Number		
Telearm1	–	GTZ3232000R0001		
SP350	–	GTZ3304000R0001		
1081 probe	–	GTZ3196000R0001		

B3261 Barcode Scanner
Z721D Barcode Printer

Barcode Scanner for Direct Connection to the SECUTEST PSI and the PROFITEST PSI-BC Barcode and Label Printer with Software

Barcode scanner:

- Trouble-free scanning of all common barcode types
- Insertion of decoded characters to any desired cursor position
- Plug for direct connection to the SECUTEST PSI and the PROFITEST PSI-BC

Barcode printer:

- For the identification of equipment with barcode labels
- Prints smudge-proof, scratch resistant labels in all common sizes
- MS Windows software
- Ideal for use with the B3261 barcode scanner

Label set for Z721D barcode and label printer:

- Z722D, number x width: 3 ea. 24 mm, 1 ea. 18 mm, 1 ea. 9 mm, 8 m long
- Z722E, number x width: 5 ea. 18 mm, 8 m long

Type	Data Sheet No.	Article Number		
B3261 barcode scanner	–	GTZ3261000R0001		
Z721D barcode printer	–	Z721D		
Z722D label set	–	Z722D		
Z722E label set	–	Z722E		

IrDa-USB Converter

IR Interface Adapter for Connecting a Test Instrument to a PC: IrDa-USB

IrDa-USB converter:
Electrically isolated infrared interface for data transmission between test instrument and PC (USB)
Data transfer to and from the IrDa interfaces of our PROFITEST 0100S-II, PROFITEST C, METRISO C and GEOHM C test instruments with modern PCs which are equipped with USB ports only.

● **The cable is furnished with a CD ROM including the required device drivers for Windows 98SE, ME, 2000 and XP.**

Type	Data Sheet No.	Article Number		
IrDa-USB converter	–	Z501J		

RS 232 – USB Converter

Adapter Cable for Connecting the RS 232 Interface to the USB Port at a PC

The interface converter is used to connect any desired device with RS 232 interface to PCs which are equipped with USB ports only.

● **The cable is also furnished with a CD ROM including the required device drivers.**

Type	Data Sheet No.	Article Number		
RS 232 – USB converter	–	Z501L		

F2000
K2000, K2010

Universal Carrying Pouch for PROFiTEST 0100S-II, ...204, SECUTEST..., METRISO 5000A/AK
Metal Case for Test Instruments and Test Instrument Sets

F2000

F2000: Padded plastic carrying pouch with adjustable carrying strap.
The cover and carrying strap are equipped with snap fasteners.

- Device is secured with a variable support which is fastened with a Velcro strip for various dimensions from 20 to 38 cm.
- Side pocket dimensions: 3 cm deep x 20 cm high
- Fastened with Velcro, removable, elastic holders for 3 test probes
- Pouch dimensions: 38^{+4} cm wide x 31^{+3} cm high x 20^{+2} cm deep

K2000 / K2010

K2000: aluminum case for PROFiTEST 0100S-II, PROFiTEST ONE and accessories

- Foam insert with adjustable compartments for test instrument and accessories
- Suitable for test sets PGS117T, 210, 211
- Case dimensions: 59 cm wide x 47.5 cm high x 12.5 cm deep

K2010: aluminum case for SECUTEST ..., SECUSTAR FM and accessories

- Foam insert with adjustable compartments for test instrument and accessories
- Case dimensions: 64.5 cm wide x 53.5 cm high x 16 cm deep

Z504J

Z504J: aluminum case for PGS 2000

- Foam insert with adjustable compartments for test instrument and accessories
- Case dimensions: 47 cm wide x 37.8 cm high x 16.8 cm deep

Type	Data Sheet No.	Article Number		
F2000	3-349-126-02	Z700D		
K2000	–	Z504K		
K2010	–	Z504L		
Z504J	–	Z504J		

Test Instrument Accessories – Overview

Overview of Accessories for Test Instruments

Type	Designation	PROFITEST 0100S-II	PROFITEST ONE	PROFi TEST C	PROFITEST 204	METRATESTER 5/5-F	METRATESTER 5-3P	SECUTEST S II	SECUTEST S III	METRISO C	METRISO 500D	METRISO 1000D	METRISO 1000IR	METRISO 5000 D-PI	METRAOHM 413	METRISO 1000A	METRISO 5000A/AK	METRISO 5023	GEOHM C	GEOHM 33D	METRAtest 36 ASi
	Suitable for use with following test instruments ➡																				
	Modules, adapters, plugs, plug inserts, cable sets																				
SECUTEST PSI	PSI module (printer, memory, RS 232 interface)				✔			✔	✔					✔							
DA-II	Printer adapter for external printer	✔						✔	✔												
CEE Adapter	3-phase adapter for 3 x CEE					✔		✔	✔												
A3-16	5-pole 3-phase adapter for 16 A CEE outlets	✔	✔	✔																	
A3-32	5-pole 3-phase adapter for 32 A CEE outlets	✔	✔	✔																	
A3-63	5-pole 3-phase adapter for 63 A CEE outlets	✔	✔	✔																	
3-pole adapter	3-phase measuring adapter for all PROFiTEST C testers with earth contact plug			✔																	
VL2	Test adapter for testing electrical devices and extension cables					✔	✔	✔	✔												
Z500A	Variable plug adapter set, set of three, 3.5 to 12 mm diameter	✔	✔	✔	✔																
Telearm1	Telescoping rod for PE measurement	✔	✔							✔	✔	✔	✔		✔	✔					
TR25	Reel with 25 m measurement cable	✔	✔							✔	✔	✔	✔		✔	✔			✔	✔	
TR50	Drum with 50 m measurement cable	✔	✔							✔	✔	✔	✔		✔	✔			✔	✔	
SP350	Earth drill, 35 cm long	✔	✔																✔	✔	
Z580A	Crank generator																✔				
KY 5000A	Alligator clips, 2 ea.													✔			✔				
Guard 5000A	Guard cable, 1 ea. with 1 alligator clip													✔			✔				
Leadex 5000	Extension cable, 5 m													✔			✔				
KS13	Cable set					✔		✔	✔												
KS17-2	Cable set							✔													
KS24	Extension cable, 4 m	✔	✔							✔	✔	✔	✔			✔		✔			
PA4	Patient connector cables								✔												
EL1	Adapter for testing extension cables							✔	✔												
PRO-CH	Plug insert for using the EL1 adapter in Switzerland	✔	✔					✔	✔												
PRO-GB	Plug insert for using the EL1 adapter in Great Britain	✔	✔					✔	✔												
PRO-RSA	Plug insert for using the EL1 adapter in South Africa	✔	✔					✔	✔												
SECU-cal 10	Calibration adapter for test instruments per DIN VDE 0701/0702 with test report							✔	✔												
IrDa-USB	IR interface for connection to the USB port at a computer	✔	✔	✔						✔									✔		✔
RS 232 – USB	Interface adapter cable from RS 232 at a test instrument to USB at a PC	✔	✔		✔			✔	✔					✔							
	Clip-on ammeters, temperature sensors																				
WZ12C	Clip-on current sensor, 1 mA-10 A~, 1 mV/mA-1 A-120 A~, 1 mV/A							✔	✔												
Z3409	Temperature sensor, Pt100, -40 ... + 600° C							✔	✔												
	Probes																				
SK2	Special cable with test probe, 2 m							✔	✔												
SK5	Software for acoustic signaling including 5 m probe cable					✔	✔	✔	✔												
Z745G	Brush probe							✔	✔												
1081 probe	Triangular probe for floor measurements per EN 1081/DIN VDE 0100 T. 610	✔	✔							✔		✔				✔		✔			
	Barcode scanner / printer	✔																			
B3261	Barcode scanner	✔	✔		✔			✔	✔												
Z721D	Barcode printer	✔	✔		✔			✔	✔												
Z722D	Label set for barcode and label printer (W: 3 x 24 / 1 x 18 / 1 x 9 mm, L: 8 m each)	✔	✔		✔			✔	✔												
Z722E	Label set for barcode and label printer (W: 5 x 18 mm, L: 8 m each)	✔	✔		✔			✔	✔												
	Safety tester																				
AT3-IIS	AT3-IIS safety tester							✔	✔												
AT3-IIIE	AT3-IIIE safety tester					✔	✔	✔	✔												
	Pouches, cases																				
F2000	Universal pouch	✔	✔		✔			✔	✔					✔			✔				
K2000	Aluminum case for PROFi TEST 0100S-II and accessories	✔	✔																		
K2010	Carrying case for SECUTEST... and accessories							✔	✔												
	Consumable materials																				
PS-10P	Recording chart paper for PSI module, package of 10 rolls of 6 meters each	✔			✔			✔	✔												
Z3210	Printer ribbon cartridges for PSI module, package of 10	✔			✔			✔	✔												

Support Software for Test Instruments – Overview

Software	METRATESTER		SECUTEST		PROFI TEST				METRISO		GEOHM
	5-F	5-3P	SII	SIII	C	0100S-II	ONE	204	5000 D-PI	C	C
PS3			●	●	●	●	●	●		●	
PC.doc-WORD / -ACCESS	●	●	●	●	●	●	●	●		●	●
WinProfi					●	●	●	●	●	●	●
Remote 204								●			
SECU-Up			●	●							
ELEKTROmanager			●	●		●		●			

PC.doc-WORD
PC.doc-ACCESS

Report Software
Report Generation and Test Data Management

PC.doc-WORD: report software as a supplement to Microsoft Word

PC.doc-WORD inserts test results and data entered at the test instrument input module into test or list forms. These can then be supplemented and printed out with Word.

- For SECUTEST SII, SIII, METRATESTER 5-F, PROFITEST 0100S-II, PROFITEST C and METRISO C test instruments
- For Windows 95, 98, 2000, XP and Word 97, 2000, XP

PC.doc-ACCESS: report generating and test data management software as a supplement to Microsoft Office

PC.doc-ACCESS manages device, machine, equipment, master and test data. Available test instrument data are automatically entered to master data and test data lists which are assigned to individual customers. Data are represented in accordance with the respective test regulation. Data are displayed as lists or in data sheet format, and can be sorted and filtered in a variety of different ways. Complete test data management is thus made possible. Reports and deadline lists can be printed out for selectable ID number ranges.

- For SECUTEST SII, SIII, METRATESTER 5-F, PROFITEST 0100S-II, PROFITEST C and METRISO C test instruments
- For Windows 95, 98, 2000, XP and Access 2000, XP

➲ See page 91 for training seminar: GTT1226

Type	Data Sheet No.	Article Number		
PC.doc-WORD	–	Z714A		
PC.doc-ACCESS	–	Z714B		
PC.doc-upgrade	–	Z714C		
PC.base-upgrade	–	Z714D		

SK5

Remote Control for SECUTEST Test Instruments

Upgrade program for enabling the “remote control” feature

- A function for “automatic recognition of measuring point change” is added to the protective conductor measurement.
- During protective conductor measurement, the test instrument recognizes whether or not the test probe is in contact with the protective conductor, which is indicated by means of two different acoustic signals.
- This function is very useful where several protective conductor connections need to be tested.

Type	Data Sheet No.	Article Number		
SK5	–	Z745K		

SECU-Up

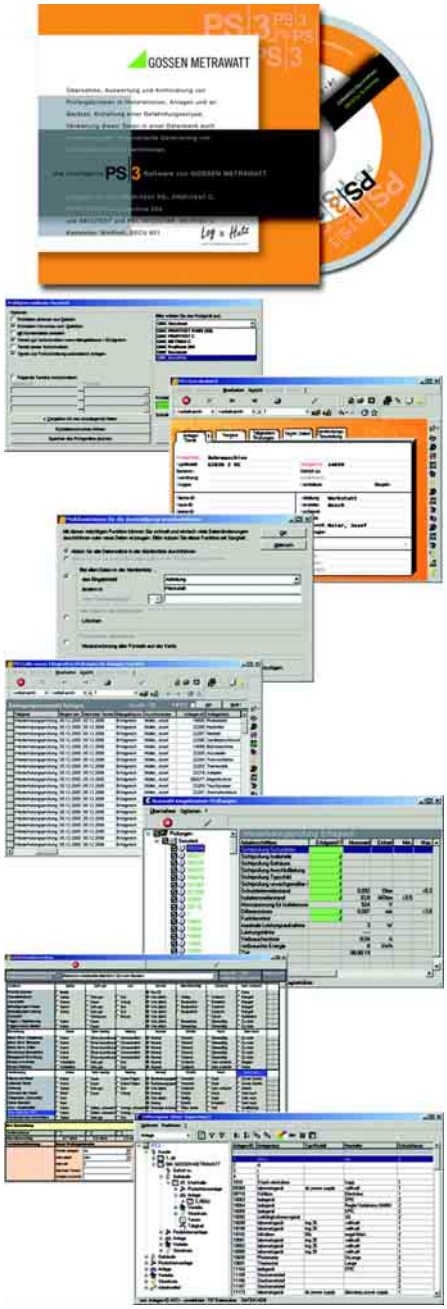
Software Upgrade for Older Series SII and SIII Instruments

Software upgrade to new standards DIN VDE 0701-1:2000-09 and DIN VDE 0751-1:2000-10for older series SII and SIII devices (prerequisite: article no. M7xxx)

Type	Data Sheet No.	Article Number		
SECU-Up	–	Z713C		

PS | 3

Modular, Universal Software for Test Instruments – Systems, Equipment and Service Management, Plus Report Generation



Automatic read-in and analysis of measured values from testing conducted on systems and equipment. Systems and equipment management with respective test results stored to a database. Automatic generation of test reports in accordance with recommendations issued by the trade associations.

PS3 Compact
Report generation and test data management for electrical devices and equipment with SECUTEST..., PROFi TEST 0100S-II, PROFITEST C and METRISO C

PS3 GM:
Basic module and device driver, allows for the read-out of measured values from PROFi TEST 0100S-II, PROFiTEST C, METRISO C, PROFiTEST 204 and SECUTEST... test instruments (all variants).

PS3 AM:
PS3 AM (device driver, basic module and add-on module) for expansion with the following modules:
- Equipment management
- Remote
- Maintenance management
- Barcode printing

PS3 add-on modules:
- PS3 Navigator – LHNavigator and LHViewer (prerequisite: PS3 AM)
- PS3 Client – client options (prerequisite: PS3 AM)
- PS3 Hazard Analysis – hazard analysis (prerequisite: PS3 AM)

PS3 update:
- Update to PS3 AM, version 9, including hazard analysis, – Basic software: PS3 add-on module (version 3 or 4)

PS3 upgrade:
Upgrade to PS3 AM including hazard analysis
- Basic software: SE-Q.base
- Basic software: PC.base
- Basic software: PS3 compact (any version)
- Basic software: PS3 basic module (any version)

Maintenance contracts:
PS3 maintenance contract upon request

➲ See page 91 for training seminar: GTT1224A ... G

Type	Data Sheet No.	Article Number		
PS3 Compact	–	Z530K		
PS3 GM	–	Z530E		
PS3 AM	–	Z531N		
PS3 Navigator	–	Z531C		
PS3 Client	–	Z531D		
PS3 Hazard Analysis	–	Z531M		
PS3 Update	–	Z530S		
PS3 Upgrade	–	Z530T		
PS3 Maintenance Contract	–	Z530X		

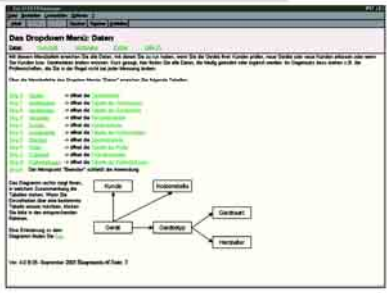
Winprofi

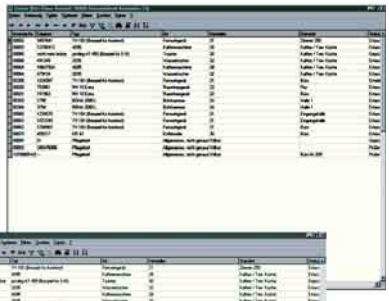
Software for Communication Between the Test Instrument and the PC

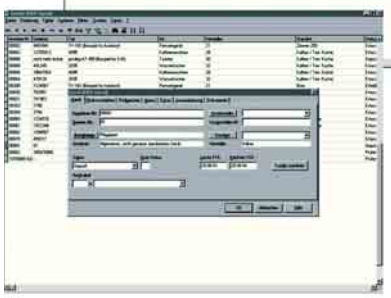
This software is used to update the following test instruments:
PROFITEST 0100SII, PROFITEST C, METRISO C, GEOHM C, PROFITEST 204 and METRAtest 36ASi.
The software is freeware and runs under Windows 95, 98, NT4 and 2000.
It provides the following functions:
- Update test instrument firmware
- Download measured values
- Upload test reports
- Generate simple reports
- Can be installed free of charge from any PS3 CD ROM.

ELEKTROmanager

Software for Measurement and Documentation of Electrical Devices and Electrical Installations







Software for execution and analysis of tests in accordance with German occupational safety law (BetrSichV)1, BGV A3 (previously VBG 4), DIN VDE 0100-T610, DIN VDE 0105, DIN VDE 0701, DIN VDE 0702 and DIN VDE 0113

ELEKTROmanager represents a new software generation for data logging and data management, as well as for controlling test sequences used by electricians concerned with effectiveness, technical competence and legal security. Use of ELEKTROmanager is easy to learn and self-explanatory to a great extent.

All common measuring instruments supplied by many manufacturers can be read out, and many can even be controlled with ELEKTROmanager.

- The software automatically controls measurement or calibration, and generates a complete test report.
- All test regulations can be freely edited.
- Windows user interface
- Any measuring instrument can be incorporated with the help of a device driver (add-in).
- Different measuring instruments can be used concurrently for measurement of a terminal device or a production sequence.
- Simultaneous inventory management saves additional expense.
- Test reports can be individualized (e.g. with company logo).
- The software is capable of recognizing devices which have already been measured (transponder technology).
- The entire instrument inventory becomes transparent providing an exact overview of all utilized devices and test reports, their current status, as well as maintenance and repair costs.
- Unrestricted network compatibility
- Measuring instruments can be controlled with PDAs using PalmOS. Measurements are started at the PDA, and measurement results are uploaded automatically from the measuring instruments and subsequently transferred to the ELEKTROmanager.

➲ See page 91 for training seminar: GTT1227A, GTT1227B

Type	Article Number		
ELEKTROmanager 4.0	Z610A		
Add-in software for reading out device memory from the following test instruments			
Device driver for PROFITEST 204 and MetraMachine 204/439	Z610C		
Device driver for PROFITEST 0100-SII (via PSI module)	Z610E		
Device driver for Secutest SII / SIII (via SECUTEST PSI)	Z610I		
Add-in software for direct read-out and remote control of the following test instruments (without installed PSI module) from the PC			
Device driver for SECUTEST 0701/0702 SII, SECUTEST 0751/601 P/S	Z610K		
Device driver for SECUTEST SII	Z610M		
Device driver for SECUTEST SIII	Z610N		
Bed testing regulations	Z610P		
GEPI 1.0 – hazard analysis / ascertainment of test intervals	Z610Q		
eTROLL software for communication between PDA/RDA and the test instrument	Z610O		
ELEKTROmanager 4.5	Z610R		
Add-in software for reading out device memory from the following test instruments			
Device driver for PROFITEST 204 and MetraMachine 204/439	Z610G		
Device driver for PROFITEST 0100-SII (via PSI module)	Z610T		
Device driver for Secutest SII / SIII (via SECUTEST PSI)	Z610U		
Add-in software for direct read-out and remote control of the following test instruments (without installed PSI module) from the PC			
Device driver for SECUTEST 0701/0702 SII, SECUTEST 0751/601 P/S	Z610V		
Device driver for SECUTEST SII	Z610W		
Device driver for SECUTEST SIII	Z610X		
Bed testing regulations	Z611I		
GEPI 2.0 – hazard analysis / ascertainment of test intervals	Z610Z		
eTROLL software for communication between PDA/RDA and the test instrument	Z610Y		
ELEKTROmanager upgrade from 4.0 to 4.5, including 2 add-ins	Z611H		
ASCII import 4.5	Z611K		
Palm OS handhelds and accessories			
MEAZURA RDA laser barcode scanner, serial connection	Z611A		
MEAZURA RDA RFID 125 kHz (transponder), serial connection	Z611F		
MEAZURA RDA, serial connection	Z610H		
MEAZURA serial connector cable	Z611C		
MEAZURA charging and transmission station, USB connection	Z611B		
Adapter cable / adapter, specially designed for connecting PDA to device	Z611D		

METRATESTER®5-3P

Workshop Test Panel for Testing Devices in Accordance with DIN VDE 0701/0702, DIN VDE 0104

The METRATESTER 5-3P test panel can be used as a portable or a stationary device for the measurement and testing of electrical devices after repair or modification in accordance with DIN VDE 0701, as well as for periodic testing per DIN VDE 0702. According to these regulations, protective conductor resistance, insulation resistance, differential current, equivalent leakage current and, for data processing systems and office machinery, absence of voltage at exposed parts accessible to the user must be measured.
Measurement of operating voltage and current at the DUT, as well as testing of extension cables for conductor continuity and polarity reversal represent further applications for the substantiation of correct functioning of electrical equipment. The VL2 test adapter allows for quick, safe testing of extension cables. The protective conductor at the mains connection can also be tested for the absence of voltage, and line voltage can be measured. Protective conductor measurement is performed correctly in accordance with DIN VDE 0104.

- Dimensions: 380 x 300 x 220 mm (with lid)
- Weight: approx. 8 kg

See page 55 for further details and accessories.

Type	Data Sheet No.	Article Number		
METRATESTER 5-3P	–	M700S		
VL2 test adapter	3-349-241-03	Z600B		

SECUTEST®21F

Workshop Test Panel for Testing Devices in Accordance with DIN VDE 0701/0702

The SECUTEST 21F test panel has been designed for the set-up of test stations at shops specialized in electrical work. It is used for measurement and testing of electrical devices after repair or modification in accordance with DIN VDE 0701, as well as for periodic testing per DIN VDE 0702.
The test panel is designed for wall mounting. It is equipped with a mains switch with undervoltage trigger and lock. Load currents of up to 25 A and line voltages of up to 500 V can be measured. Compliance with DIN VDE 0104 also assures flawless protective conductor measurements.

- Dimensions: 532 x 792 x 179 mm
- Weight: approx. 24 kg

Type	Data Sheet No.	Article Number		
SECUTEST 21F	–	M601A		

Technical Data, METRATESTER 5-3P, 21F

Measured Quantity	Line voltage	Device Protective Conductor Resistance	Insulation Resistance	Equivalent Leakage Current	Absence of Voltage	Load Current via Mains Outlet
Measuring range	207 ... 253 V~	0 ... 19.99 Ω	0 ... 19.99 MΩ	0 ... 19.99 mA	0 ... 1.999 mA⎓	0 ... 16.00 A~
Resolution	1 V	10 mΩ	1 kΩ, 10 kΩ	10 mA	1 µA	10 mA
Open-circuit voltage	–	Approx. 20 V	600 V⎓	28 V~	–	–
Internal resistance	–	–	Approx. 100 kΩ	2 kΩ		–
Short-circuit current	–	–	< 10 mA	< 20 mA	–	–
Nominal current	–	210 mA const.	–	–	–	–
Max. error at reference conditions	± (1.5% rdg. + 1 d)	± (2.5% rdg. + 2 d)	± (2.5% rdg. + 2 d) as of 10 d			

In accordance with the guidelines for "workshop equipment for electrical installation operations" issued by the ZVEH / VDEW

METRACLIP® 50 ... 71

Clip-On Meters with Analog or Digital Display for Service Technicians

Current within conductors can be conveniently measured with clip-on meters. The following advantages result:

- The electrical circuit need not be interrupted, no electrical connection to the conductor.
- Measurement of current up to 3000 A, electrical safety per IEC 61010

METRACLIP 50/51: measured value memory with mechanically (METRACLIP 50) or electrically arrested pointer (METRACLIP 51)
METRACLIP 60: 3¾-place digital display, automatic measuring range selection, data HOLD and Max-Min display
METRACLIP 61: 4½-place digital display, automatic or manual measuring range selection, data HOLD and Max-Min display
METRACLIP 70: 4½-place digital display, automatic or manual measuring range selection, data HOLD and Max-Min display
METRACLIP 71: three 4½-place digital displays with background illumination, data HOLD and Max-Min display

Type	Data Sheet No.	Article Number		
METRACLIP 50	3-349-049-03	M300A		
METRACLIP 51	3-349-049-03	M300B		
METRACLIP 60	3-348-983-03	M311C		
METRACLIP 61	3-348-983-03	M311D		
METRACLIP 70	3-349-064-03	M312A		
METRACLIP 71	3-349-061-03	M312B		

Feature	METRACLIP 50	METRACLIP 51	METRACLIP 60	METRACLIP 61	METRACLIP 70	METRACLIP 71
Clip opening	28/30x20 mm dia.	60/70x30 mm dia.	max. 24 mm dia.	40 mm dia.	42/25x25/50x5 mm dia.	50/80x5 mm dia.
Measuring category Vmax	III/600V, IV/300V	III/1 kV, IV/600 V	III	III/300 V, II/600 V	III/600 V	III / 600 V
Display	Analog	Analog	Digital	Digital	Digital (4000 digits)	Triple (3x10,000 pixels)
Resolution			0.01/0.1 A	0.01 mA/0.01 A	4½ place	4½ place
Current	1.5 ... 300 A/ac	15 A...3000 A/AC	400 A/ac	0...300 A/ac (4 ranges)	0.2...400...1000 A RMS/ac, 0.2...400...1400 A/dc	1500 A_{ss} AC
Voltage	150 V ... 600 Vac	150 V ... 600 Vac	600 V/AC	–	0.4...600V/dc/ac	1500 V_{ss} DC
Frequency range for U/I	48...52/40...100/ 40...400 Hz	40...60/40...100/ 40...400 Hz	I: 50...60 Hz U: 50...400 Hz	50...60 Hz	45...450 Hz	10 Hz ... 5 kHz
Memory	–	HOLD function	Min-Max	DATA HOLD	Min/-Max 500 ms	Min/Max 30 Hz
Frequency measurement	–	–	–	–	3 ranges: 100 Hz...4 kHz	0.5 Hz...20 kHz
Harmonic analysis	–	–	–	–	–	Harmonic dist.: CF, THD, DF
Continuity / buzzer	–	–	●	–	Ω / diode (acoustic)	–
Resistance	–	–	400...4000 Ω	–	5 ranges: 0.5 Ω ... 4 MΩ	–
Phase sequence						
Active power	–	–	–	–	–	10 W...600 kW
Apparent power	–	–	–	–	–	10 VA...600 kVA
Reactive power	–	–	–	–	–	10 var...600 kvar
Power factor	–	–	–	–	–	0 ... 1
Energy	–	–	–	–	–	–
Sampling rate	–	–	2.5/sec.	2/sec. (bar graph: 12/sec.)	(2.5/sec.)	4 kHz
Interface	–	–	–		–	–
Accuracy	Class 2.5	Class 2.5	I:±(2%+7 d) U:±(1%+5 d)	30/300 mA:±2% rdg. ±5 d 30/300A:-3/-5 rdg.±5 d	1% (typ.)	U=1% / I/P=2% (typ.)
Power Supply	–	3 V, 850 mAh	2 ea. IEC 6 LR03 (AAA micro)	2 x LR44/SR44	9 V, IEC 6 LR61	4 x IEC LR6 (AA mignon)
Dimensions / weight with battery(ies)	88x220x40 mm / 0.5 kg	112x313x60 mm / 0.9 kg	69x191x33 mm / 0.22 kg	64x176x23 mm/0.125 kg	97x254x46 mm/0.6 kg	103x275x50 mm/0.67 kg

METRACLIP®72 ... 81

Clip-On Meters with Analog or Digital Display for Service Technicians

METRACLIP 72 Power: handy, digital, RMS clip-on meter to 400 A AC-DC, power, voltage, resistance, continuity and much more, in pouch with accessories

METRACLIP 73: universal, digital clip-on power meter for up to 200 A AC / 300 A DC, voltage (TRMS), energy, resistance, continuity and much more, in case with accessories

METRACLIP 74: universal, digital clip-on power meter for up to 2000 A AC-DC, voltage (TRMS), energy, resistance, continuity and much more, in case with accessories

METRACLIP 75 Automotive: handy, digital, RMS clip-on meter to 400 A AC-DC, temperature, voltage, resistance, continuity and much more, in pouch with accessories

METRACLIP 80: bar graph and digital display, Max-Min and mean value memory, digital interface for PC, integrated 3-phase adapter

METRACLIP 81: matrix display for numeric and oscilloscope read-outs, 8 display pages can be saved to memory, Min-Max and mean value memory, data storage for 5 parameters over a period of 24 hours

Type	Data Sheet No.	Article Number		
METRACLIP 72 Power	3-349-250-03	M312E		
METRACLIP 73	3-349-253-03	M312F		
METRACLIP 74	3-349-253-03	M312G		
METRACLIP 75 Automotive	3-349-250-03	M312H		
METRACLIP 80	3-349-054-03	M312C		
METRACLIP 81	3-349-065-03	M312D		

METRACLIP 72 Power	METRACLIP 73	METRACLIP 74	METRACLIP 75 Automotive	METRACLIP 80	METRACLIP 81	Feature
< 26 mm dia.	40/7x52 mm dia.	65/22x64 mm dia.	< 26 mm dia.	55 mm dia.	60 mm dia.	Clip opening
III/600 V	IV/600 V	IV / 600 V	III / 600 V	III / 600 V	IV / 600 V	Measuring category Vmax
Digital	Digital (double)	Digital (double)	Digital	digital + bar graph	multimeter + oscilloscope	Display
4000 digits	3000 digits	3000 digits	4000 digits	4½ place	Dot matrix: 160 x 128 pixels	Resolution
0.2...400 A dc/ac RMS	0.1...200Aac/ac+dcTRMS ...300Adc	1...2000Aac/ac+dc TRMS ...2000Adc	0.2...400 A dc/ac RMS	400/1000 A/dc/ac TRMS	40/400/2000A/dc/acTRMS	Current
0.2...600 V dc/ac RMS	...1000Vdc ...750Vac/ac+dcTRMS	...1000Vdc ...750Vac/ac+dcTRMS	0.2...600 V dc/ac RMS	400/600 V dc/ac TRMS	4/40/400/600V/dc/acTRMS	Voltage
...1 kHz			...1 kHz	20 Hz...1 kHz	10 Hz...1 kHz	Frequency range for U/I
Min-Max + HOLD only			Min-Max + HOLD only	Min-Max	Min-Max / mean value / logger	Memory
10...19.99 kHz	...2 kHz	...2 kHz	–	20.0 Hz...1 kHz	10.0 Hz...1 kHz	Frequency measurement
–	–	–	–	–	Harmonic dist.: CF, THD, DE	Harmonic analysis
1 - 40 Ω	< 30 Ω	< 30 Ω	1 - 40 Ω	–	–	Continuity / buzzer
0.2 - 40 kΩ (3 ranges)	... 2000 Ω	... 2000 Ω	0.2 - 40 kΩ (2 ranges)	–	–	Resistance
2-wire at 50/60 Hz	yes	yes	–			Phase sequence
5 W to 240 kW	... 200 kW	... 2000 kW	–	10 W...600 kW	4/40/400/1200 kW/VA dc	Active power
–	... 200 kVA	... 2000 kVA	–	10 VA...600 kVA	4/40/400/1200 kW/VA dc	Apparent power
–	... 200 kVar	... 2000 kVar	–	10 var...600 kvar	0 ... 850 kvar	Reactive power
0.2 ... 1.0	0 ... 1	0 ... 1	–	0.3 cap. ... 1 ... 0.3 ind.	0.3 cap. ... 1 ... 0.3 ind.	Power factor
–	... 2000 kWh	... 2000 kWh	–	via PC	●	Energy
–	2/s	2/s	–	9 kHz	9 kHz	Sampling rate
–	–	–	–	–	special RS232	Interface
typically 1% + 2 d	–	–	typically 1% + 2 d	1% ... 2.5% rdg. ±5 d	1% ... 3% rdg. ±5 digits	Accuracy
9 V, IEC 6 LF22	9 V, IEC 6 LF22	9 V, IEC 6 LF22)	9 V, IEC 6 LF22	9 V, IEC 6 LR61	6 ea. IEC LR6	Power supply
70 x193x37 mm/0.26 kg	90 x270x50 mm/0.55 kg	90x285x50 mm/0.61 kg	70 x193x37 mm/0.26 kg	98 x251 x52 mm/0.5 kg	98x300x52 mm/0.82 kg	Dimensions / weight with battery(ies)

Voltages Testers

2-Pole Voltage Meters and Multiple Measuring Instruments with Analog or Digital Display

ProfiSafe 1

METRAVOLT 7A

METRAVOLT 12D

CAT IV.

These 2-pole voltage meters and multiple measuring instruments fulfill requirements for voltage testers per DIN EN 61243-3 / VDE 682, part 401 (previously: DIN VDE 0680, part 5).

- Easy to operate, VDE GS approved
- Measuring category III and IV devices, double indication reliability with LEDs

ProfiSafe 1

This voltage, phase, continuity and polarity tester plus phase sequence indicator has been equipped with a long-life, rechargeable lithium battery for the display of continuity and phase test results. The battery is continuously recharged with a high performance solar cell, even with minimum ambient light. This maintenance-free voltage source assures long service life and reliable operation.

- 9 LEDs for the display of voltage, continuity, phase and direction of rotation
- Phase testing, display of direction of rotation and continuity testing
- Rugged housing, hazard-free use even under damp conditions, IP 65 protection

METRAVOLT 7A

- The MetraVolt 7A is a 2-pole voltage tester with LCD indicator, high quality moving-iron measuring element and LED display. Direct and alternating current can be tested, and polarity and phase sequence can be determined within the nominal voltage range. The measuring movement is protected against impacts, water and dust by the unbreakable rubber housing. Thanks to IP 65 protection, the MetraVolt 7A can also be used in the rain, and is already in compliance with the new EN 61243-3 standard (VDE 0682, part 410).

METRAVOLT 12D

- Fully automated measuring sequence, self-test, measurement value storage, battery saving circuit
- Rugged housing, hazard-free use even under damp conditions, IP 65 protection
- Intrinsic error: 0.5% of rdg. + 1 digit

Feature	ProfiSafe 1	METRAVOLT 7A	METRAVOLT 12D
Complies with DIN VDE 0680	●	●	●
Voltage	12 ... 690 V ≂	24 ... 740 V ≂	0 ... 1200 V ≂ TRMS
Dielectric strength	> 5 kV (1.2 / 50 µs pulse wave)	12 kV (surge voltage)	>10 kV (1.2/50 µs pulse wave)
Test voltage	5 kV	6 kV	5 kV
Phase testing	●	●	●
Phase sequence indicator	●	●	●
Resistance	–	–	0 ... 1999 kΩ
Continuity test	●	–	●
Frequency range	0 ... 2000 Hz	0 ... 100 Hz	15 ... 10,000 Hz
Power supply	Lithium battery + solar cell	–	9 V flat cell battery, IEC 6F 22
Battery test	–	–	●
Dimensions	50 x 230 x 35 mm + 1 m cable	75 x 274 x 47 mm	60 x 240 x 40 mm
Weight	0.17 kg	0.46 kg	0.29 kg (with battery)

Type	Data Sheet No.	Article Number		
ProfiSafe 1	–	M630B		
METRAVOLT 7A	–	M630D		
METRAVOLT 12D	3-349-201-03	M630C		

CableCop 300

Cable Detection System for Current and Voltage-Free Cables, and Current and Voltage Conducting Cables

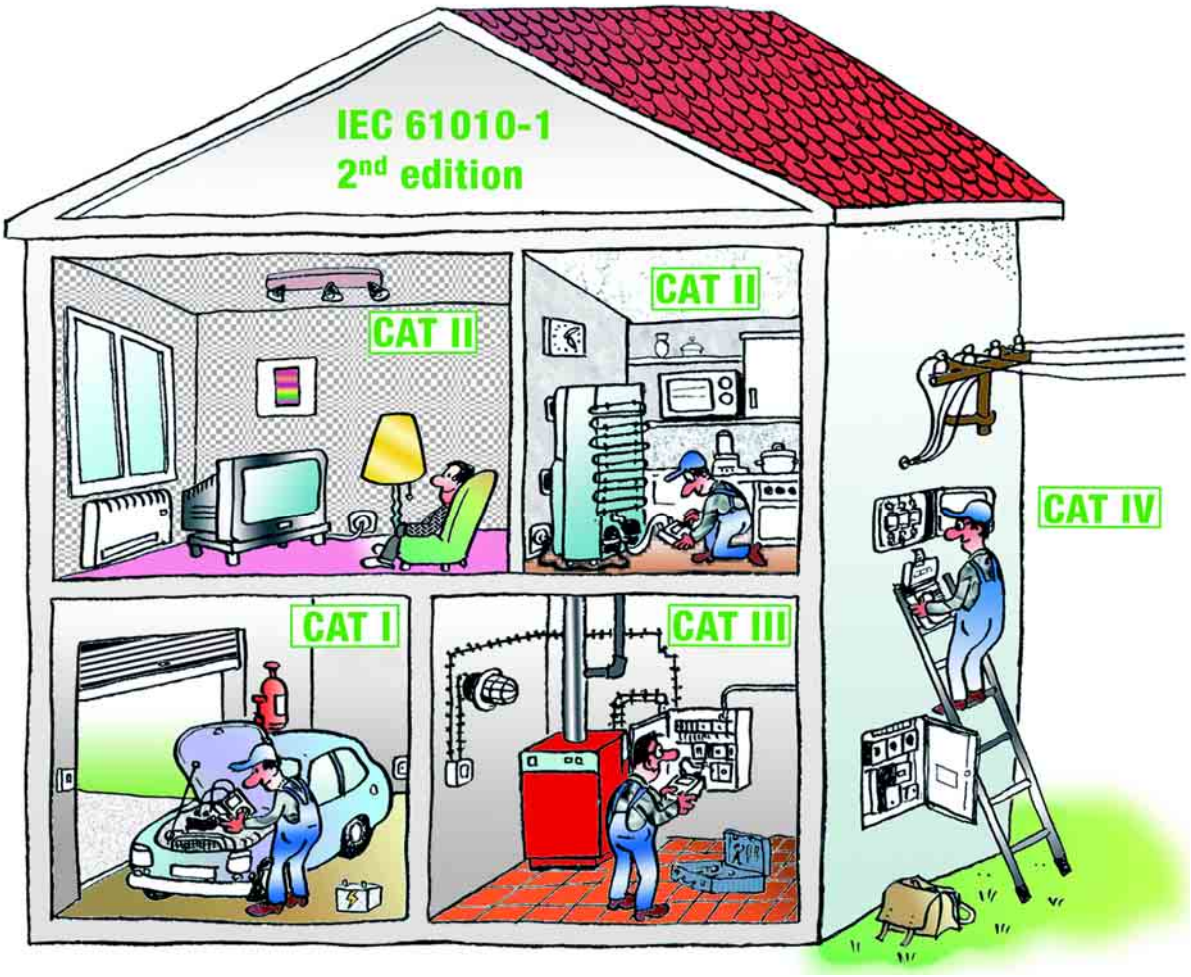
Current and voltage-free, as well as current and voltage conducting cables in electrical circuits with up to 300 V can be pinpointed with the cable detection system. Cables and conductors, electrical circuits, short-circuits and earth faults can be located, and protective conduits and coaxial cable can be traced as well without interrupting power or shutting down sensitive electronic components. Detection is possible in walls and concrete, as well as underground.

voltage range	9 ... 300 V ≂
Measuring frequency	32,768 kHz
Display / signal	LED / buzzer
Typical applications	Location of cables, switches, short-circuits and earth faults, tracing of protective conduits and coaxial cables
Range of applications	Walls, ground, concrete
Included	Case with T320 transmitter, S330 signal generator, R300 receiver, two 9 V batteries, 2 measurement cables, 2 alligator clips, 2 test probes, operating instructions
Dimensions / weight	310 x 200 x 85 mm / case and contents: approx. 1.95 kg

Type	Data Sheet No.	Article Number		
CableCop 300	–	GTM5292000R0001		

Measuring Categories

The following measuring categories have been established in accordance with the IEC 61010 standard.



CAT I	Measurements in electrical circuits which are not directly connected to the mains	*e.g. batteries etc.*
CAT II	Measurements in electrical circuits which are electrically connected to the low-voltage mains	*by means of a plug, e.g. at home, in the office or laboratory etc.*
CAT III	Measurements in building installations	*stationary consumers, distributor terminals, devices connected permanently to the distributor*
CAT IV.	Measurements at power sources for low-voltage installations	*meters, mains terminals, primary overvoltage protection*

In the case of multimeters and test instruments, the CE declaration of conformity confirms that European regulations (low-voltage directive and EMC directive) are adhered to. This declaration is a prerequisite for putting products into circulation within the European Community. Adherence is substantiated by fulfilling the following standards: IEC 61010-1 (international), EN 61010-1(German version) and VDE classification VDE 0411-1. Safety requirements for electrical equipment for measurement, control and laboratory use are described in this standard. The IEC standard was first issued in 1990. After various amendments and addendums (A1 1992, A2 1995), the most recent revision (the so-called second edition) issued in 2001 has come into force. This revision level has been adopted into the second issue of the German version: EN 61010-1. The currently valid revision level is 8/2002.

Power Supply Overview

Computer Controlled Laboratory Power Supplies	Power Max. W		Setting Range		Setting Accuracy		Residual Ripple		Interfaces			Sink mode	Overvoltage protection	Auto-ranging output	Output On/Off	Query meas. values	Sequence control
	Continuous	Intermittent	Voltage V	Current A	Voltage ± (% + mV)	Current ± (% + mA)	Voltage mV_{RMS}	Current mA_{RMS}	Analog	RS 232	IEEE 488						
Series SSP 32 N																	
32 N 20 RU 10 P	120	(200)	0...20	0...10	0.15 + 30	0.4 + 35	10	25	●	●	❍	dyn.	●	●	●	●	●
32 N 40 RU 6 P	120	(240)	0...40	0...6	0.15 + 40	0.5 + 20	10	20	●	●	❍	dyn.	●	●	●	●	●
32 N 80 RU 3 P	120	(240)	0...80	0...3	0.15 + 80	0.5 + 10	10	10	●	●	❍	dyn.	●	●	●	●	●
32 N 20 RU 20 P	240	(320)	0...20	0...20	0.15 + 40	0.5 + 70	15	50	●	●	❍	dyn.	●	●	●	●	●
32 N 40 RU 12 P	240	(360)	0...40	0...12	0.15 + 45	0.5 + 45	15	25	●	●	❍	dyn.	●	●	●	●	●
32 N 80 RU 6 P	240	(360)	0...80	0...6	0.15 + 80	0.5 + 25	15	20	●	●	❍	dyn.	●	●	●	●	●
32 N 32 RU 18 P	320	(430)	0...32	0...18	0.15 + 50	0.5 + 70	30	50	●	●	❍	dyn.	●	●	●	●	●
Series SSP 62 N/64 N																	
62 N 52 RU 25 P	500		0...52	0...25	0.1 + 17	0.2 + 25	10	15	●	❍	❍	dyn.	●	●	●	●	●
62 N 80 RU 12.5 P	500		0...80	0...12.5	0.1 + 20	0.2 + 15	10	15	●	❍	❍	dyn.	●	●	●	●	●
62 N 52 RU 50 P	1000		0...52	0...50	0.1 + 17	0.2 + 50	10	25	●	❍	❍	dyn.	●	●	●	●	●
62 N 80 RU 25 P	1000		0...80	0...25	0.1 + 20	0.2 + 25	15	20	●	❍	❍	dyn.	●	●	●	●	●
64 N 52 RU 100 P	2000		0...52	0...100	0.1 + 17	0.25 + 100	10	80	●	❍	❍	dyn.	●	●	●	●	●
64 N 80 RU 50 P	2000		0...80	0...50	0.1 + 20	0.25 + 50	15	30	●	❍	❍	dyn.	●	●	●	●	●
64 N 52 RU 150 P	3000		0...52	0...150	0.1 + 17	0.3 + 150	10	120	●	❍	❍	dyn.	●	●	●	●	●
64 N 80 RU 75 P	3000		0...80	0...75	0.1 + 20	0.3 + 80	15	60	●	❍	❍	dyn.	●	●	●	●	●
Series MSP 64 D																	
Basic unit 64 D 42 P									–	●	●						
MSP control module																	
ES 31 K 7 R 7 P plug-in module	49		0...7	0...± 7	0.05 + 4	0.1 + 4	1	3	–	Via basic instrument		●	–	–	●	●	–
ES 32 K 30 R 4 P plug-in module	120		0...30	0...± 4	0.05 + 16	0.1 + 2	3	3	–			●	–	–	●	●	–
ES 32 K 80 R 1.5 P plug-in module	120		0...80	0...± 1.5	0.05 + 40	0.1 + 1	3	2	–			●	–	–	●	●	–
ES 31 K 2x8 R 3 P plug-in module	2x24		2x0...8	2x0...± 3	0.05 + 4	0.1 + 2	1	3	–			●	–	–	●	●	–
ES 31 K 2x16 R 1.5 P plug-in module	2x24		2x0...16	2x0...± 1.5	0.05 + 8	0.1 + 1	1	2	–			●	–	–	●	●	–
ES 31 K 2x40 R 0.6 P plug-in module	2x24		2x0...40	2x0...± 0.6	0.05 + 20	0.1 + 0.5	3	2	–			●	–	–	●	●	–

Analog Controlled Laboratory Power Supplies	Power Max. W		Setting Range		Total System Error		Residual ripple		SELV safety extra-low voltage	Analog interface	Sink mode	Overvoltage protection	Auto-ranging output	Output On/Off	Output	
	Continuous	Intermittent	Voltage V	Current A	Voltage mV	Current mA	Voltage mV_{eff}	Current mA_{eff}							Front panel	Rear panel
Series SLP 32 N																
32 N 20 R 10	120	(200)	0...20	0...10	20	28	10	25	●	●	dyn.	–	I	I	I	I
32 N 40 R 6	120	(240)	0...40	0...6	15	15	10	20	●	●	dyn.	–	I	I	I	I
32 N 80 R 3	120	(240)	0...80	0...3	15	15	10	10	–	●	dyn.	–	I	I	I	I
32 N 20 R 20	240	(320)	0...20	0...20	30	38	15	50	●	●	dyn.	–	I	I	I	I
32 N 40 R 12	240	(360)	0...40	0...12	23	38	15	25	●	●	dyn.	–	I	I	I	I
32 N 80 R 6	240	(360)	0...80	0...6	23	20	15	20	–	●	dyn.	–	I	I	I	I
32 N 32 R 18	320	(430)	0...32	0...18	40	50	30	50	●	●	dyn.	–	I	I	I	I
Series LSP 33 K																
33 K 7 EU 5/2x25 R 1 D	25 + 25 + 35		0...25/25/7	0...1/1/5	15/15/17	7/7/12	0.5/0.5/0.5	0.5/0.5/2	●	●	–	--●	–	–	I	–

Laboratory Power Supplies	Output, Front Panel	Output Voltage V	Output Current A	Setting Resolution Voltage mV at V	Setting Resolution Current mA	Mains Correction, Voltage % + mV	Mains Correction, Current % + mA	Load Correction Voltage % + mV	Load Correction Current % + mA	Ripple mV_{RMS}	Mains Input V_{ac} 50/60 Hz
Series LSP 32 K											
32 K 18 R 5	1	0 ... 18	0 ... 6	1 at 0 ... 3.999 5 at 4 ...18	≤ 1	0.01 + 3 0.02 + 10	0.02 + 8	0.02 + 10	0.02 + 8	< 2	115/230
32 K 36 R 3	1	0 ... 36	0 ... 3	1 at 0 ... 3.999 10 at 4 ... 36	≤ 1	0.01 + 3 0.02 + 10	0.02 + 8	0.02 + 10	0.02 + 8	< 2	115/230
32 K 65 R 1.5	1	0 ... 65	0 ... 1.5	1 at 0 ... 3.999 20 at 4... 65	≤ 1	0.01 + 3 0.02 + 10	0.02 + 8	0.02 + 10	0.02 + 8	< 2	115/230

Electronic Loads	Load Input Front Panel	Input Power Max. W	Current Max. A_{dc}	Voltage Max. V_{dc}	Resolution, Current Sink mA	Resolution, R-Load Curve µW	Mains Input V_{ac} 50/60 Hz
Series SL 32 EL							
32 EL 150 R 30	1	150	0...30	350	10	10	115/230
32 EL 300 R 30	1	300	0...30	350	10	10	115/230

SSP KONSTANTER 32 N

Computer Controlled Laboratory Power Supplies: Series SSP 120 … 320

SSP KONSTANTER 120, 240 and 320 (single output system power supply) are single output computer controlled laboratory power supplies for universal use in R&D, production and testing.
Our innovative BET circuit technology (bidirectional energy transformation) allows for practically load independent response times < 1 ms (< 4 ms with 80 V device). The analog interface includes monitor, auxiliary power and programmable signal outputs, as well as trigger and setpoint inputs.

- Diverse functionality, extensive calibration report, minimal power loss
- Auto-ranging output with 120 W, 240 W or 320 W
- Output: voltage and current regulated, increased output power for brief intermittent periods
- Very short response times thanks to BET technology, typically 1 ms
- Dynamic sink operation, excellent dynamic control parameters
- Minimal residual ripple, output On/Off function, lockable control panel
- Master-slave operation for parallel and series connection
- Sequence controls for the generation of voltage and current sequences
- Overvoltage, overcurrent and excessive temperature protection, calibration procedure for menu-driven balancing
- RS 232 interface (complete device operation) / analog interface
- Floating output terminals at front and rear, can be electrically and mechanically combined into multi-channel units
- Dimensions: bench-top instrument (W x H x D) 221.5 x 102 x 397.5 mm, for 19" rack: ½19" x 2 standard height units x 400 mm
- Weight: approx. 2.8 kg

Optional:

- IEEE 488 interface (listener/talker for configuration and querying measured values)
- Driver software for LabView, LabWindows CVI and HPVEE

● **Optional accessories: mounting accessories for 19" racks (see table on page 89)**

Type		Data Sheet No.	Article Number		
120 W	32 N 20 RU 10 P	3-348-843-03	K320A		
	32 N 40 RU 6 P	3-348-843-03	K321A		
	32 N 80 RU 3 P	3-348-843-03	K322A		
240 W	32 N 20 RU 20 P	3-348-843-03	K330A		
	32 N 40 RU 12 P	3-348-843-03	K331A		
	32 N 80 RU 6 P	3-348-843-03	K332A		
320 W	32 N 32 RU 18 P	3-348-843-03	K334A		
	IEEE 488 interface	3-348-843-03	K380A		

SSP KONSTANTER 62/64 N

Computer Controlled Laboratory Power Supplies: Series SSP 500 … 3000

SSP KONSTANTER 500, 1000, 2000 and 3000 devices (single output system power supply) are single output computer controlled laboratory power supplies for universal use in R&D, production and testing. Special circuitry allows for jumping from 0 V to nominal voltage (and back again) under nominal load conditions within response times of less than 10 ms. The analog interface includes monitor and auxiliary power outputs, as well as programmable trigger and setpoint inputs.

- Diverse functionality, minimal power loss
- Auto-ranging output with 500 W, 1000 W, 2000 W or 3000 W
- Output: voltage and current regulated, increased output power for brief intermittent periods
- Short response times thanks to special circuitry, typically 10 ms
- Dynamic sink operation, excellent dynamic control parameters
- Minimal residual ripple, output On/Off function, lockable control panel
- Sequence controls for the generation of voltage and current sequences
- Master-slave operation for parallel /series connection, overvoltage, overcurrent and excessive temp. protection
- Analog interface, output terminals at rear panel
- Dimensions: benchtop device (W x H x D) 465 x101 / 190 x 500 mm, for 19" rack: 19"x2/4 standard height units x 500 mm
- Approx. weight: 62N/500 W: 12 kg, 62N/1000 W: 13 kg, 64N/2000 W: 22 kg, 64N/3000 W: 28 kg

Optional:

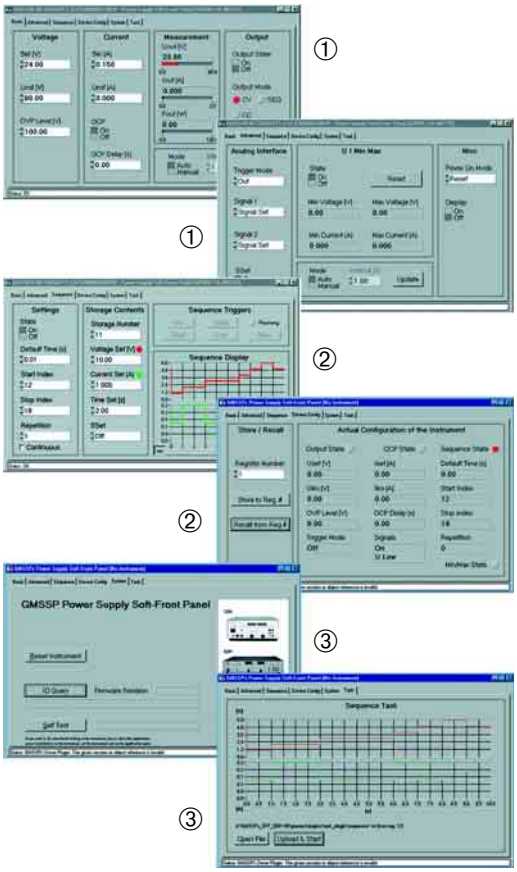
- RS 232 and IEEE 488 interfaces (listener/talker for configuration and querying measured values)
- Driver software for LabView, LabWindows CVI and HPVEE, calibration report upon request

● **For optional accessories refer to the table on page 89.**

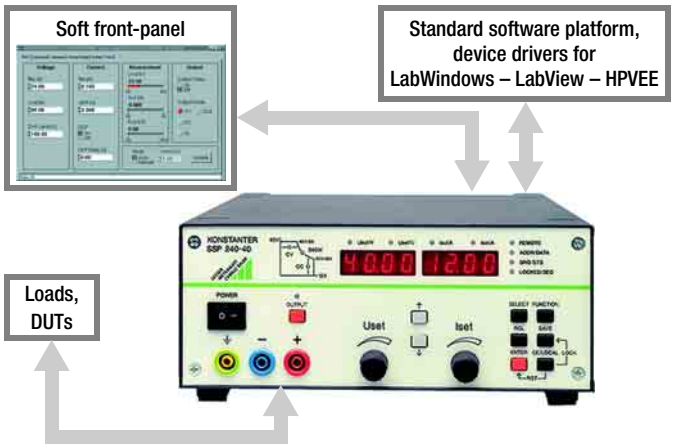
Type		Data Sheet No.	Article Number		
500 W	62 N 52 RU 25 P	3-349-078-03	K344A		
	62 N 80 RU 12.5 P	3-349-078-03	K341A		
1 kW	62 N 52 RU 50 P	3-349-078-03	K345A		
	62 N 80 RU 25 P	3-349-078-03	K343A		
2 kW	64 N 52 RU 100 P	3-349-078-03	K352A		
	64 N 80 RU 50 P	3-349-078-03	K351A		
3 kW	64 N 52 RU 150 P	3-349-078-03	K362A		
	64 N 80 RU 75 P	3-349-078-03	K361A		
IEEE488/RS 232 interface		3-349-078-03	K382A		
RS232 interface		3-349-078-03	K383A		

GM SSP-SFP

Soft Front-Panel PC User Interface for SSP Konstanters



Virtual instruments: KONSTANTER with **soft front-panel**



All SSP Konstanter functions are controlled and displayed at a PC with this software.

- Free download
- For serial as well as IEEE interface
- Runs under Windows 95, 98, NT4 and 2000

Prerequisite: NI-VISA driver or additional NI-488.2 driver for control via GPIB must be installed

- Target groups: R&D, production, test equipment fabrication, system manufacturers

① Integrated software included in our KONSTANTERs simplifies use and allows for the generation of automated sequences.

② Intuitive user interface and device drivers for standard software quickly place all of the functional options of KONSTANTER instruments at the disposal of the user, and dramatically shorten learning curves.

③ As device-specific software, our soft front-panel provides users with the advantages offered by “virtual instruments” without the need for a complex standard platform.

MSP KONSTANTER 64 D

Computer Controlled Laboratory Power Supplies, Multiple Outputs: MSP Series

The MSP KONSTANTER (multi-output system power supply) offers extensive flexibility, ease of operation and economy for universal use in R&D, production and testing.
The MSP KONSTANTER is a modular, manually operated and computer controlled DC power supply. The basic unit with integrated auxiliary power supply and cooling fan is equipped with IEEE 488 and RS 232 interfaces, and accepts up to four single or 2-channel plug-in power supply modules, and one control module. The control module allows for manual operation of all 8 channels.
The plug-in modules operate in accordance with the linear controller principle, and the outputs have a 2 quadrant operating range. Source and sink functions are possible for constant voltage as well as constant current operation. Parallel or series connection, as well as bridging for the generation of bipolar voltages is possible.

- Up to 8 independent, electrically isolated outputs
- All outputs can be used as electronic loads as well
- Minimal residual ripple and short response times
- Output On/Off function
- Outputs can be activated and deactivated individually or in groups
- Measuring function for voltage, current and power with storage of extreme values
- Online help available in various languages by simply pressing a key
- IEEE 488 and RS 232 interfaces
- Easy, flexible device configuration
- Driver software for LabVIEW, LabWindows CVI and HP VEE

● **For optional accessories refer to the table on page 89.**

Type	Data Sheet No.	Article Number		
64 D 42 P	3-349-084-03	K370A		
MSP control module	3-349-084-03	K371A		
ES 31 K 2x8 R 3 P	3-349-084-03	K372A		
ES 31 K 2x16 R 1.5 P	3-349-084-03	K372B		
ES 31 K 2x40 R 0.6 P	3-349-084-03	K372C		
ES 31 K 7 R 7 P	3-349-084-03	K372D		
ES 32 K 30 R 4 P	3-349-084-03	K373A		
ES 32 K 80 R 1.5 P	3-349-084-03	K373B		

SLP KONSTANTER 32 N

Laboratory Power Supplies, Analog Interface: SLP Series

Series SLP 120, 240 and 320 (single output laboratory power supplies) are single output, primary switched-mode laboratory power supplies for universal use in R&D, production, training and service applications.
Our innovative BET circuit technology (bidirectional energy transformation) allows for practically load independent response times.

- Compact design and minimal weight
- Auto-ranging output with 120 W, 240 W or 320 W, minimal power loss
- Output: voltage and current regulated, increased output power for brief intermittent periods
- Very short response times thanks to BET technology, typically 1 ms
- Dynamic sink operation, excellent dynamic control parameters
- Minimal residual ripple
- Output On-Off function
- Manual adjustment with ten-turn potentiometer
- Remote sensing
- Master-slave operation for parallel and series connection
- Protection against excessive temperature
- Floating output terminals at front and rear panel
- Can be electrically and mechanically combined into multi-output devices
- Mounting accessories for 19" racks
- Dimensions: bench-top instrument (W x H x D) 221.5 x 102 x 397.5 mm, for 19" rack: ½19" x 2 standard height units x 400 mm
- Weight: approx. 2.8 kg

● **For optional accessories refer to the table on page 89.**

	Type	Data Sheet No.	Article Number		
120 W	32 N 20 R 10	3-348-796-03	K220A		
	32 N 40 R 6	3-348-796-03	K221A		
	32 N 80 R 3	3-348-796-03	K222A		
240 W	32 N 20 R 20	3-348-796-03	K230A		
	32 N 40 R 12	3-348-796-03	K231A		
	32 N 80 R 6	3-348-796-03	K232A		
320 W	32 N 32 R 18	3-348-796-03	K234A		

LSP KONSTANTER 23/33 K

Laboratory Power Supplies, Analog Interface: LSP Series

KONSTANTER series LSP 85 devices (laboratory and system power supply) are compact, linear controlled three output devices with extraordinary control characteristics. They are exceptionally well suited for universal use in R&D, production, training and service applications.
Control mode indicators display current operating status.
The analog interface includes monitor, auxiliary power supply and signal outputs with status display and setpoint inputs.

- SELV (safety extra-low voltage)
- Three mutually isolated outputs (at the front panel)
- Constant voltage and constant current operation
- Extremely minimal residual ripple
- Accurate, infinite adjustment of output voltage and current
- Analog interface (for remote control)
- Outputs can be connected for parallel or series operation
- Master-slave operation
- Tracking operation
- Rugged metal housing with carrying handle, suitable for rack-mounting
- Dimensions: bench-top instrument (W x H x D) 219 x 148 x 365 mm, for 19" rack: 3/6 19" x 3 standard height units x 343 + 45 mm
- Weight: approx. 8.7 kg

● **For optional accessories refer to the table on page 89.**

Type	Data Sheet No.	Article Number		
33 K 7 EU 5/2x25 R 1 D	–	K270A		

LSP KONSTANTER 32 K

Laboratory Power Supplies, Linear Controlled, LSP 32K Series

Series 32K LSP Konstanters are high precision DC power supplies for use in R&D, production, training and service applications. Three variants are available with approximately 100 W of output power. The devices feature excellent regulating accuracy and minimal residual ripple, and outstanding ease of operation.

- Floating output with safety sockets
- Safe electrical separation
- Output can be switched on and off
- Voltage and current regulating (square wave)
- Rotary encoders for adjusting voltage and current
- Adjustment is also possible with keys
- Multifunctional LCD panel
- Setup memory for 10 device settings
- Safety devices
- Attractive design, benchtop instrument, suitable for mounting to a 19" rack
- Accessories
- Computer control is possible via RS 232 or RS 485
- Dimensions (W x H x D): ½ 19" 2 standard height units, approx. 215 x 100 x 280 mm
- Approx. weight: 6 kg

● **Optional accessories: PC interface upon request**

	Type	Data Sheet No.	Article Number		
108 W	32 K 18 R 5 ✱	3-349-254-03	K110A ✱		
	32 K 36 R 3	3-349-254-03	K111A		
97 W	32 K 65 R 1,5 ✱	3-349-254-03	K112A ✱		

✱ Upon request

SSL – Load KONSTANTER 32 EL

Laboratory Power Supplies: Series SSL – 32 EL

Series SSL Load KONSTANTER 32EL ... electronic loads are high precision direct current sinks for use in research, product development, production, service and vocational training. Two types are available with 150 and 300 W input power. The devices are distinguished by a diverse range of functions and excellent regulating accuracy, as well as outstanding ease of operation.

- Floating input
- Safe electrical separation
- Output can be switched on and off
- Characteristic current or R curve can be selected
- Settings selected by means of a rotary switch and keypad
- Multifunctional LCD panel
- Memory for device settings, load profile
- Protective functions including, amongst others, adjustable power limiting
- Attractive design, benchtop instrument, suitable for mounting to a 19" rack
- Accessories
- Computer control is possible via RS 232 or RS 485
- Dimensions (W x H x D): approx. 215 x 100 x 280 mm
- Approx. weight: 5 kg

● **Optional accessories: PC interface upon request**

Type	Data Sheet No.	Article Number		
32 EL 150 R 30	3-349-297-03	K850A		
32 EL 300 R 30	3-349-297-03	K851A		

KONSTANTER Accessories

Designation	Type	Article Number		
Mains jumper cable, 0.4 m, for KONSTANTER	K991A	K991A		
1x32N mounting kit for KONSTANTER	K990A	K990A		
2x32N mounting kit for KONSTANTER	K990B	K990B		
Bus cable, IEEE - IEEE, 2 m, for KONSTANTER	K931A	K931A		
RS 232 bus cable, 0.4 m, for KONSTANTER	K931B	K931B		
RS 232 interface cable, 2 m	Z3241	GTZ3241000R0001		

Software

Drivers for SSP Konstanter
for LabWindows, LabView V4/V5 and HPVEE
For incorporating our SSP KONSTANTER computer controllable laboratory power supplies into LabWindows, LabView V4/V5 and HPVEE software packages.

- KONSTANTERs can be used ideally with your application
- KONSTANTER functions are easy to use
- Drivers support all of the computer controllable functions of our KONSTANTERs

Download from our Website

Soft Front Panel operating software and driver for standard platforms are available for download from our website:
www.gossenmetrawatt.com ⇨ Power Supply Technology ⇨ Software for Power Supplies

Panel Mount Power Supplies
OEM Power Supplies

Power Supplies for Special Applications, or in Accordance with Customer Specifications

In addition to our standard power supply series, we also fabricate power supplies for special applications, or in accordance with customer specifications, for example:

- Fixed voltage switched-mode power supplies in European plug-in module or cartridge format
- Electronic lamp ballasts for halogen metal-vapor lamps
- 24 to 12 V DC-DC converters for commercial vehicles
- Customer-specific power supplies

Address enquiries to: Phone: +49 (0)911 8602-717
Fax: +49 (0)911 8602-102
e-mail: info@gossenmetrawatt.com

U1281...U1389, U389A/B

Electrical Energy Meters

World Class Meters

Electrical Energy Meters for Household, Industrial and Building Management Applications

- **Can be calibrated**
  Approved for official billing in accordance with calibration legislation
- **Easy to install**
  Indicates correct connection
- **Compact**
  Fits in small distributors
- **Communication functions**
  Can be connected to data logging and billing systems

● Optional accessories: U270A door mounting kit for top-hat rail meter,
ASK... or WSK... plug-on and wound-primary current transformer,
UBAT-24V battery pack for reading voltage-free meters,
(See data sheet or Industrial Measuring and Control Technology price list.)

EB 8 05

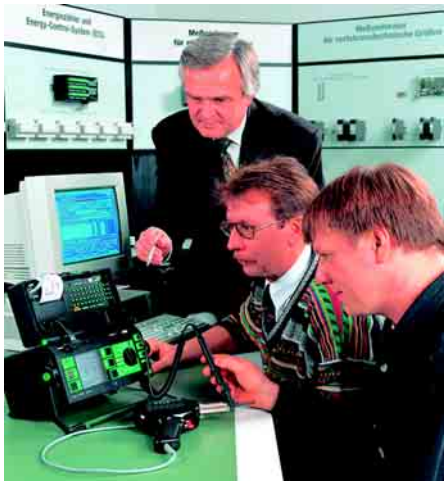
Energy Meters and Calibration from a Single Source

Calibrated meters are required for energy billing purposes in business and official applications. GOSSEN METRAWATT's federally approved EB8 test laboratory calibrates the meters directly at the factory.

❍ † order option
● † default

		Active Energy Meter with Power Display					Active Energy Meter, Drum-Type Counter	
		Direct Connection 5 (65) A		Transformer Connection 5 (6) A and 1 (6) A			Direct Connection 5 (65) A	Trans. Connection 5 (6) A and 1 (6) A
Mains type	2-wire	U1281		U1381				
	3-wire				U1387			
	4-wire		U1289			U1389	U389A	U389B
Input voltage	100 V - 110 V L-L				❍	❍		
	230 V L-N	●		●				
	400 V L-L		●		❍	❍	●	●
	500 V L-L				❍			
Transformer ratios	CT, VT adjustable			❍	❍	❍		
Multifunctional variant	With additional meas. of U, I, P, Q, S, PF, F	❍	❍	❍	❍	❍		
Class	1	●	●	●	●	●	●	●
Can be calibrated		●	●	●	●	●		
S0 pulse output	S0 standard	❍	❍	❍	❍	❍	●	●
	230 V	❍	❍	❍	❍	❍		
	Adjustable pulse rate, pulse duration	❍	❍	❍	❍	❍		
Bus connection	LON	❍	❍	❍	❍	❍		
	M-Bus	❍	❍	❍	❍	❍		
	L-bus	❍	❍	❍	❍	❍		
Can be read via voltage-free meas. circuit	With help of ext. 24 V DC aux. power	❍	❍	❍	❍	❍		

Immediately Available Standard Models	Data Sheet No.	Article Number		
Active energy meter with power display, direct connection: 5 (65) A, class 1				
for 2-wire, 230 V system, programmable S0 pulse rate	3-349-274-03	U1281-V001		
for 2-wire, 230 V system, S0: 1000 pulses per kWh, calibrated	3-349-274-03	U1281-V002		
for 4-wire system, 3 ea. 230 / 400 V, S0, 1000 pulses per kWh	3-349-274-03	U1289-V001		
for 4-wire system, 3 ea. 230 / 400 V, S0, 1000 pulses per kWh, calibrated	3-349-274-03	U1289-V002		
for 4-wire system, 3 ea. 230 / 400 V, programmable S0 pulse rate	3-349-274-03	U1289-V003		
Active energy meter with power display, transformer connection: 5 (6) A and 1 (6) A, class 1				
for 2-wire system, 230 V, 5//1 A, S0, CT / VT / programmable pulse rate	3-349-274-03	U1381-V001		
for 2-wire system, 230 V, 5//1 A, S0, 1000 pulses per kWh, CT = VT = 1, calibrated	3-349-274-03	U1381-V002		
for 3-wire system, 3 ea. 100 V, 5//1 A, S0, CT / VT / programmable pulse rate	3-349-274-03	U1387-V001		
for 3-wire system, 3 ea. 100 V, 5//1 A, S0, 1000 pulses per kWh, CT = VT = 1, calibrated	3-349-274-03	U1387-V002		
for 3-wire system, 3 ea. 400 V, 5//1 A, S0, CT / VT / programmable pulse rate	3-349-274-03	U1387-V003		
for 3-wire system, 3 ea. 400 V, 5//1 A, S0, 1000 pulses per kWh, CT = VT = 1, calibrated	3-349-274-03	U1387-V004		
for 4-wire system, 3 ea. 230 / 400 V, 5//1 A, S0, CT / VT / programmable pulse rate	3-349-274-03	U1389-V001		
for 4-wire system, 3 ea. 230 V, 5//1 A, S0, 1000 pulses per kWh, CT = VT = 1, calibrated	3-349-274-03	U1389-V002		
for 4-wire system, 3 ea. 230 / 400 V, 5//1 A, S0, CT / VT / programmable pulse rate, LON	3-349-274-03	U1389-V003		
for 4-wire system, 3 ea. 230 V, 5//1 A, S0, 1000 pulses per kWh, CT = VT = 1, LON, calibrated	3-349-274-03	U1389-V004		
Active energy meter with drum-type counter mechanism, U389A with direct connection: 5 (65) A, U389B with transformer connection: 5 (6) A and 1 (6) A, class 1				
for 4-wire system, 3 ea. 230 / 400 V, 5 (65) A, S0: 100 pulses per kWh	3-349-321-03	U389A		
for 4-wire system, 3 ea. 230 / 400 V, 5//1 A, S0: 1000 pulses per kWh	3-349-321-03	U389B		



Training and Seminars

An economic advantage can only be gained through the use of modern, high quality measuring and test instruments if they are operated by motivated, qualified employees.
As a service to the customer, GOSSEN METRAWATT offers seminars and workshops to this end, which, in addition to theoretical, technical and legal considerations, place an emphasis on practical experience as well. Imparted knowledge can be implemented directly in the actual work environment, and promotes efficient, error-free work.
We can offer seminars at our own training center in Nuremberg, at your facility or at hotels in close proximity to your offices so that you don't waste your valuable time traveling long distances.
Short travel distances and regional offerings assure minimal time loss.

Training Hotline

+49-911 8602-406

(seminar catalog, advice, registration, prices)

Type	Designation	Article Number		
	Testing of Safety Measures			
GTT1210	Measurements for testing safety measures in low-voltage systems per DIN VDE 0100/0105 and BGV A3 (VBG 4) with PROFITEST 0100S-II, PROFITEST ONE and PROFITEST C instruments (seminar duration: 2 days)	GTT1210000R0001		
GTT1211	Efficient periodic testing of portable electrical equipment according to requirements set forth by BGV A3 (VBG 4) with SECUTEST SII and SIII test instruments (seminar duration: 2 days)	GTT1211000R0001		
GTT1212	Periodic testing of electrical equipment by "trained persons" according to requirements set forth by BGV A3 with SECUTEST SII, MINITESTER 702 and METRATESTER 5 test instruments (seminar duration: 1 day)	GTT1212000R0001		
GTT1213	Safety tests for medical devices with the SECUTEST 0751 / 601 or SECUTEST SIII (seminar duration: 1 day)	GTT1213000R0001		
GTT1214	Safety test for electrically operated hospital beds with SECUTEST SII and SECUTEST SIII test instruments (seminar duration: 1 day)	GTT1214000R0001		
GTT1215	Measurements for testing electrical equipment at machinery per DIN VDE 0113 (EN 60204) with PROFITEST 204 and METRAMACHINE 204 (seminar duration: 1 day)	GTT1215000R0001		
GTT1216	Basic Electro-Technical Training – basic electro-technical knowledge, dangers of electricity for "trained persons", as a supplement to seminars GTT1212 and GTT1214 (seminar duration: 2 days)	GTT1216000R0001		
GTT1216	Basic Electro-Technical Training – basic electro-technical knowledge, dangers of electricity for "trained persons", as a supplement to seminars GTT1212 and GTT1214 (seminar duration: 3 days)	GTT1216000R0001		
GTT3010	Efficient testing for building management in accordance with BGV A3, BetrSichV, MPG and DIN VDE regulations with the SECUSTAR FM modular test system (seminar duration: 2 days)	GTT3010000R0001		
GTT5010	Testing of single and 3-phase portable equipment with the SECUTEST 3P/3PL test case (seminar duration: 1 day)	GTT5010000R0001		
	Measuring with Multimeters			
GTT1219B	Safe, correct and efficient measurement, recording and analysis with METRA HIT multimeters and METRAwin10 software (seminar duration: 1 day)	GTT1219000R0001		
	PC Analysis Software for SECUTEST ... and PROFITEST ... Test Instruments (seminar duration: 1 day each)			
GTT1224A	PS3 application software, basics, devices, software and equipment management for measurements at devices with SECUTEST ...	GTT1224000R0001		
GTT1224B	PS3 application software, basics, systems, software and test management for measurements at systems with PROFITEST ...	GTT1224000R0001		
GTT1224C	PS3 user software, basics for measurements at machines with the PROFITEST 204 and the METRAMACHINE 204	GTT1224000R0001		
GTT1224D	PS3-compact user software, basics for measurements at devices with SECUTEST ...	GTT1224000R0001		
GTT1224E	PS3-compact user software, basics for measurements in systems with PROFITEST ...	GTT1224000R0001		
GTT1226	PC.doc-ACCESS user software	GTT1226000R0001		
GTT1227A	ELEKTROmanager software for testing portable electrical equipment with SECUTEST ...	GTT1227000R0001		
GTT1227B	ELEKTROmanager software for testing low-voltage systems including permanently connected equipment with PROFITEST ...	GTT1227000R0001		
	Internet Seminar: e-Learning			
GTT1228	Internet seminar for PS3 user software, administration of test and device data for electrical equipment with SECUTEST ... (seminar duration: three 2 hour sessions)	GTT1228000R0001		
	Power Disturbance Analysis			
GTT1643	Power disturbance analysis, as well as power and energy analysis with the MAVOWATT 50 and appropriate software (seminar duration: 2 days)	GTT1643000R0001		
GTT1642	Power disturbance analysis, as well as power and energy analysis with the MAVOLOG 10 (seminar duration: 1 day)	GTT1642000R0001		

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Article Number Index

General Notes

Terms and Conditions of Sale and Delivery

The "general terms and conditions of delivery for electrical industry products and services" apply, including the supplement regarding extended reservation of proprietary rights, in its respectively most up-to-date revision.
Subject to change without notice. Errors excepted.

Prices

Specified prices are valid for Germany as of 1 January 2006.
All prices are specified in Euros. They represent non-binding recommended prices ex factory not including packaging.
Respectively applicable value added tax is invoiced as a separate item.
Prices and standard equipment included with instruments or components do not include project engineering, programming, initial start-up or the like.
Prices are subject to change without notice. The currently valid price on the day on which delivery takes place shall be invoiced.
The minimum net order value is 100.00 Euros. A surcharge of 20.00 Euros will be added to orders amounting to less than the minimum net order value.

Order Information

Please enter complete, unequivocal order information in order to avoid unnecessary enquiries and misunderstandings during the course of order processing.
Devices and components can be ordered either by entering the designation and description in plain text, or by entering the article number and all required features.

Export and Customs Documentation

One service charge will be invoiced per document for shipping instructions which deviate from normal shipping conditions within the federal Republic of Germany, for example preparation of certificates of origin, issuance of delivery notes in foreign languages, preparation of export declarations etc.




Measuring Technology – Universal

- Voltage Quality – Energy – Power
- Field Measuring Systems, Cable Detection Devices
- Resistance Thermometers / Clip-On Measuring Instruments
- Digital Multimeters
- Analog Multimeters
- Multimeter Accessories
- Calibrators
- Temperature Measuring Instruments




Testing Technology – Electrical

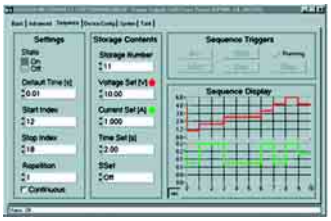
- Testing Electrical Installations and Equipment (perm. installed)
- Testing Electrical Devices (portable)
- Testing Electrical Machinery
- Earthing, Insulation, Low-Resistance
- Workshop Test Panels
- AS Interface Test Instruments



Power Supplies

- Laboratory Power Supplies
- Electronic Loads
- Customer-Specific OEM Power Supplies





Software for

- Measuring Instruments
- Test instruments
- Power Supplies

Product Spectrum

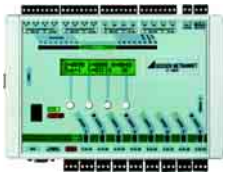





Measuring Technology – Industrial

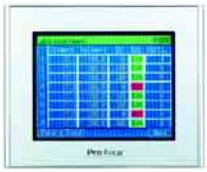
- Measuring Transducers for Temperature and DC Quantities
- Measuring Transducers for Heavy Current Quantities
- Measuring Transducers for Angle of Rotation and Position
- DC Signal Isolators, Isolating Transformers
- Power Packs, Mounting Racks
- Isolating Switch Amplifiers, Isolating Amplifiers
- Valve Control Modules, Limit Value Indicators
- Thermocouples, Resistance Thermometers
- Ex-i Equipment






Energy Management

- Energy Meters, Summators, Additional Components
- Power - Energy - Voltage Quality - Load Optimizing
- ECS – Energy Control System
- Energy Management – Engineering
- Competent Project Management Partner




Control Technology

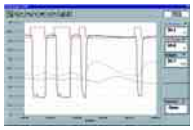
- Analog Controllers, Compact Controllers
- Controller Modules/OEM Control Systems
- Complete Solutions for Machinery Manufacturing

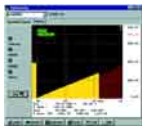




Recording Technology

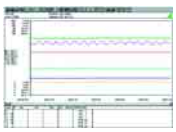
- Display Recorders
- Continuous Line Recorder
- Point Recorders

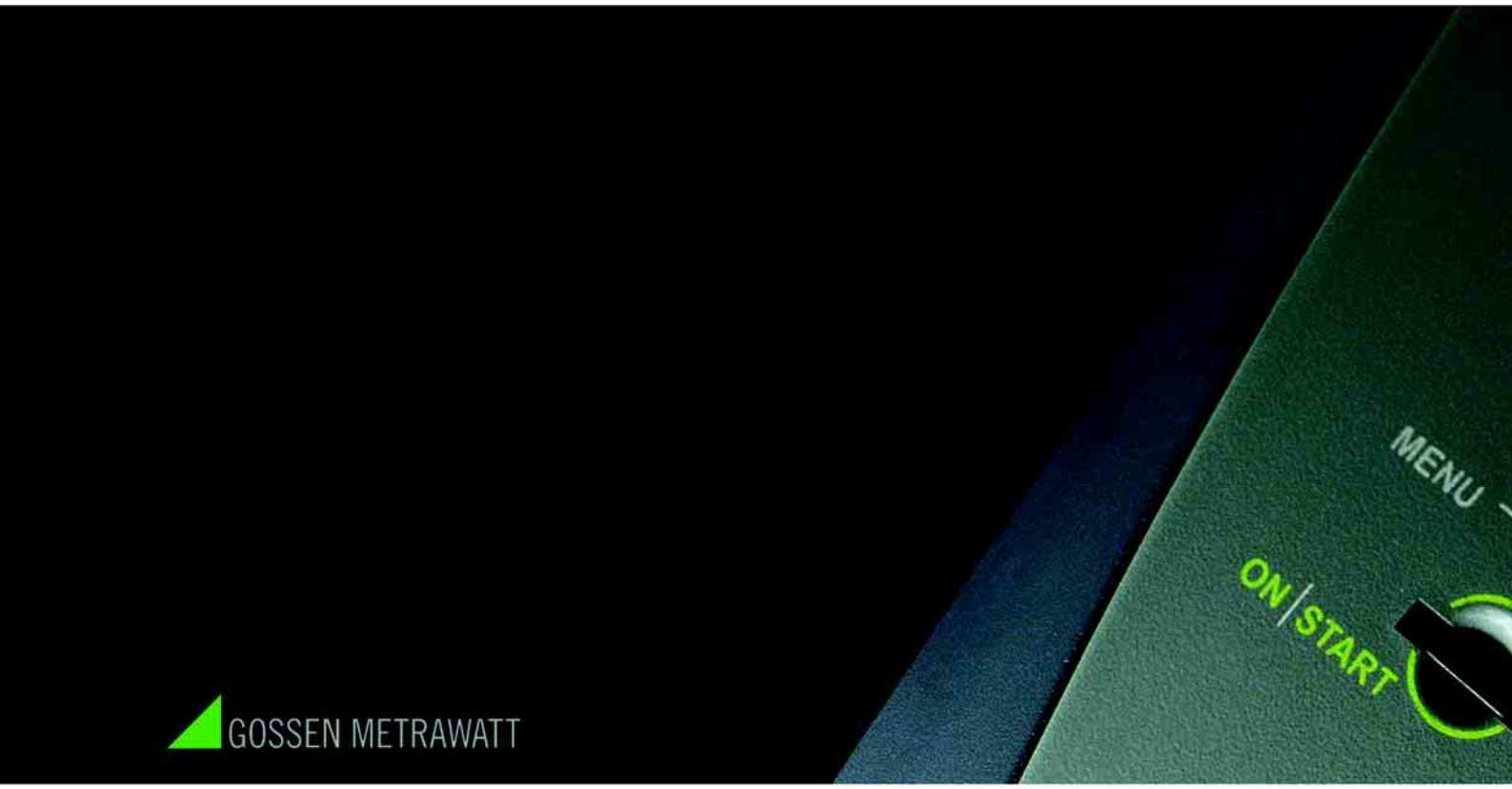





Software for

- ECS – Energy Control System
- Measuring Transducers, Isolating Amplifiers
- Controllers





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