



Testing, Measuring and Safety Instruments

Quality for industry, trade and service

Innovative developments and consistent manufacturing quality

Innovative developments and consistent manufacturing quality are the basis for the excellent international reputation of BENNING products. Their design and implementation are based on the requirements of professional users.

The appliance testers

BENNING ST 760 / ST 755 / ST 725 / ST 710

allow safe and time-saving safety and periodic testing of electrical appliances in compliance with the standards VDE 0701-0702, EN 62353 and EN 60974-4. **Measuring adapters**, such as the **BENNING MA 4** support standard-compliant testing.

Installation testers and insulation multimeters

The installation testers **BENNING IT 130 / IT 115 / IT 105** and the insulation multimeter **BENNING IT 101** are intended for safety testing of low-voltage electrical installations according to the standard IEC/EN 60364. The **BENNING CM E1 earth measuring clamp** is intended for quick and safe measurements without using rods.

Digital multimeters and digital current clamps

The product range offers the ideal solution for all requirements and applications. We manufacture both devices using the conventional averaging measuring method (RMS) and the TRUE RMS measuring method up to the highest measuring category CAT IV. For demanding measuring tasks, measuring instruments with data logger, Bluetooth®, PC software and app are also available.

Measuring devices for photovoltaics

BENNING offers a range of measuring devices and accessories for commissioning tests, periodic testing and performance assessment of grid-connected PV systems in compliance with the standards IEC/EN 62446 and IEC/EN 61829. (**BENNING PV 1-1 / PV 2 / PV 3 / SUN 2 / SOLAR Manager**)

Voltage, continuity and phase sequence testers

The **DUSPOL®** and **DUTEST®** product range is intended for voltage, phase, polarity, phase sequence, continuity and semiconductor testing.



Factory II, Robert-Bosch-Straße 20, D-46397 Bocholt, Germany

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Any further questions?

Choose your contact person

Product Advice (Sales Department)

Tel. +49 / (0) 2871 / 93 111 · E-Mail: duspol@benning.de

Do you need support for selecting the right testing, measuring and safety equipment as well as the right accessories? Don't hesitate to call us! We would be pleased to advise you.

Would you like to be up-to-date regarding our latest news, promotions etc.? Simply subscribe to our newsletter "Testing, Measuring and Safety Equipment" at www.duspol.de. You can unsubscribe from the newsletter at any time.

Technical Support (After Sales Service)

Tel. +49 / (0) 2871 / 93 555 · E-Mail: hotline@benning.de

You have problems regarding application, questions on software, etc.? Don't hesitate to contact our After Sales Service. Many years of experience, in-depth product knowledge and access to data sheets as well as internal documents help to ensure expert assistance.

Returns Management, Calibration, Repairs

Tel. +49 / (0) 2871 / 93 554 · E-Mail: returns@benning.de

Warranty/ repairs

If you have any questions regarding warranty/repairs, please don't hesitate our returns management team.

Please send faulty or damaged testing, measuring and safety instruments to the address stated below via your specialized trade.

Calibration

Benning guarantees compliance with the technical and accuracy specifications stated in the operating manual for the first 12 months after the delivery date. Für die Einhaltung einer angemessenen The user is responsible for ensuring that the devices are recalibrated in due time.

The manufacturer's calibration of the safety devices BENNING ST 710 / ST 725 / ST 750 A / ST 755 / ST 760, BENNING IT 101 / IT 105 / IT 115 / IT 130 as well as BENNING PV 1-1 / PV 2 / PV 3 can be provided by us in the Bocholt factory. It includes installing the latest updates for the appliance testers BENNING ST 750 A / ST 755 / ST 760.

Testing, measuring and safety instruments that have not been calibrated by BENNING or require a "DKD/DAkkS" calibration, will be sent to our partner for calibration services ELMTEC. You can also send the devices directly to ELMTEC yourself.

Hinweis:

Always send faulty or damaged testing, measuring and safety instruments requiring calibration directly to BENNING. This is the only way to ensure that no unnecessary expenditure incurs that will be associated with additional costs or a longer processing time.

ELMTEC Ingenieurgesellschaft mbH · Kattreppeln 28 · 38154 Königslutter Germany · Tel. +49 / (0) 5353/ 9545-0 · E-Mail: info@elmtec.de

Address for general returns/calibrations:

BENNING Elektrotechnik und Elektronik GmbH & Co. KG
Quality Service / Returns Management · Robert-Bosch-Str. 20
46397 Bocholt · Germany



Discover the following innovations in this catalogue

BENNING MA 4

item no.: 044162
page 9



For active and passive testing of single-phase and three-phase electrical appliances and extension cables

BENNING IT 105

item no.: 044105
page 18



Multifunction Installation Tester

- unbeatable price/performance ratio
- easy operation

BENNING CM E1

item no.: 044684
page 19, 41



Earth measuring clamp for quick and safe earth resistance measurements without using rods

BENNING PV 3

item no.: 050428
page 24



Tester for photovoltaic systems for testing of solar parks, power plants and large installations with 1500 V technology

BENNING CM 10-PV

item no.: 044683
page 25, 40



TRUE RMS Digital Current Clamp Multimeter with Bluetooth® and app, up to 2000 V DC/ 1500 V AC
Measuring functions for photovoltaics, HVAC, service and industry

BENNING MM 10-PV

item no.: 044089
page 25, 34



TRUE RMS Digital Multimeter with Bluetooth® and app, up to 2000 V DC/ 1500 V AC
Measuring functions for photovoltaics, industry, service and crafts

BENNING VT 2, VT 1

item no.: 044055, 020054
page 31



VT 2: Non-contact phase indicator and magnetic field tester

VT 1: Non-contact phase tester and cable break detector

BENNING MM 10-1

item no.: 044687
page 34



TRUE RMS Digital Multimeter with Bluetooth® and app, up to 1000 V AC/DC
Measuring functions for HVAC, service and industry

BENNING CM 10-1

item no.: 044688
page 40



TRUE RMS Digital Current Clamp Multimeter with Bluetooth® and app, up to 1500 A AC/DC
Measuring functions for industry, service and crafts

BENNING CM 9-1

item no.: 044682
page 10, 42



TRUE RMS Leakage Current Clamp with multimeter functions

BENNING CM 9-2

item no.: 044685
page 42



TRUE RMS Leakage Current Clamp with Bluetooth® and app

BENNING CM 1-4

item no.: 044686
page 43



TRUE RMS multimeter with open current clamp, LED step indicator, phase and phase sequence test

Appliance Tester - testing of electrical and medical electrical device

PRCDs and arc welding equipment



Modern, powerful testing devices organize entire test procedures.

Intuitive software creates test reports, overviews and statistics.



WLAN, LAN, Bluetooth®, USB interfaces enable updates and the integration of I/O devices.



Measuring adapters and cases for active and passive testing of three-phase equipment



Workshops with expert speakers and application specialists help with professional testing and refresh expert knowledge.



Appliance Tester

testing of electrical appliances, medical electrical devices and welding equipment

Testing according to

- VDE 0701-0702:2008 for electrical appliances (ÖVE/ÖNORM E 8701, NEV, NEN 3140)
- IEC/EN 62353 for medical electrical devices (VDE 0751-1:2015, ÖVE/ÖNORM E 8751-1)
- IEC/EN 60974-4 for welding equipment (only ST 760) (VDE 0544-4:2017, ÖVE/ÖNORM EN 60974-4)

BENNING ST 760 – standard-compliant testing of arc welding equipment

- measuring the crest value and TRUE RMS value of open-circuit voltage and contact current of the welding circuit
- testing the functionality of three-phase welding equipment via optional BENNING MA 4 or BENNING MA 2-16 measuring adapter (see page 9)
- scope of services of the BENNING ST 755

Features

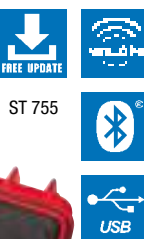
- testing of PRCDs of types S, S+, K, 2-pin/3-pin
- testing of RCDs type AC, A, F, B, B+ in mobile power distributions
- testing of arc welding equipment (only ST 760)
- standard, enhanced and customer-specific visual inspections
- management of customers and equipment in databases
- creation and assignment of individual test procedures and intervals
- test procedures can be dynamically optimized with regard to their duration
- low operating costs, free updates via WLAN, LAN, USB
- multiple measurements (e. g. Rpe test repetitions) and other additional functions can be enabled by “On/Off sliders”
- touchscreen can be mirrored on PC or tablet
- external test data access to network-connected appliance testers
- powerful switching relays (80 A) are designed for a long service life



Only in German and English language

ST 760

Only in German and English language



ST 755

Only in German and English language



+ EN 60974-4 booglastoestellen



Barcode scanner (009369)



PC software PC-WIN ST 750-760 (047002)



Barcode labels (756301)



Test badges (756212)

Appliance Tester

	BENNING ST 760	BENNING ST 755
display	5.7" capacitive color touchscreen	
protective conductor resistance (R _{PE})	0.5 Ω - 10 Ω (> 600 mA + 10 A test current)	
insulation resistance (R _{INSU})	0.1 MΩ - 100 MΩ (100 V - 1000 V test voltage)	
protective conductor current (I _{PE})	0.03 mA - 25 mA (differential, direct, alternative)	
contact current (I _{CONT})	0.03 mA - 25 mA (differential, direct, alternative)	
testing of electrical appliances	•	•
testing of PRCD types	•	•
testing of medical electrical devices	•	•
testing of welding equipment	•	–
voltage/current	1 V - 360 V/0.1 A - 16 A	
effective power/apparent power	20 W - 2300 W	
interfaces	WLAN, Bluetooth®, 4 x USB, Mini-USB, RJ45	
dimensions/weight	405 x 330 x 165 mm/ca. 5.0 kg	
scope of delivery	tester in break-proof case (IP 67), set of measuring leads/crocodile clips, 2-pin test cable, appliance cable, SD card	
item no.	050324	050322

See page 14 for further accessories

Measuring range indications refer to ranges from highest resolution to the final measuring range value.

Optional accessories

	item no.
PC software BENNING PC-Win ST 750-760	047002
1D USB barcode scanner for 1D barcodes	009369
barcode labels with consecutive numeric representation (1000 pieces), further number ranges available	756301
test badges „next test“ (300 pieces)	756212

NEW!

BENNING PC-Win ST 750-760

Database software for documentation and management of equipment and customers

- management, documentation and evaluation of test results
- explicit database structure with customer, department and test sample ID
- database merging for tests with several appliance testers
- creation of individual test procedures and visual inspections
- integrated "ReportDesigner" enables report layout adjustments
- import of test sample databases from external systems via MS Excel®
- direct conversion of SDF databases of the BENNING ST 750 A
- database export function including all attributes and results
- free software updates per download
- search function for appliance testers integrated in the network with memory access
- remote control of appliance testers via MS Cerhost®

BENNING MA 4

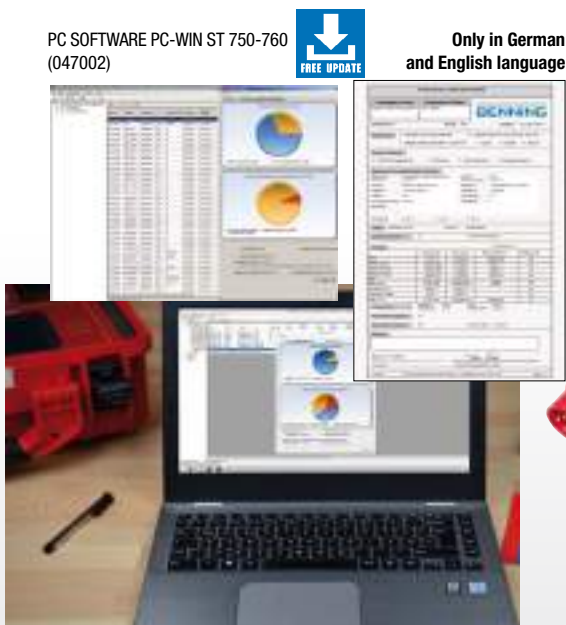
Active measuring adapter case up to 32 A

- suitable for equipment with CEE connection
- rotary switch positions "Cable" and "Function" with self-test
- complies with IEC/EN 61010-1 and EN 61557-16
- supports the following tests/measurements:
 - protective conductor and insulation resistance
 - alternative leakage current, differential current and direct protective conductor current
 - cable test, functional test and phase sequence test
 - testing of PRCDs and arc welding equipment

BENNING MA 2-16

Active measuring adapter up to 16 A

measurements: R_{PE}, R_{INSU}, I_{PE/CONT} (differential, direct, alternative)



Mains connection cable to the MA 4 (044163)



Measuring adapter case MA 4 (active/passive) (044162)

- for tests in combination with appliance testers
- current carrying capacity up to 32



Measuring adapter MA 2-16 (active/passive) (044160)

- current carrying capacity up to 16 A

Optional accessories

	item no.
PC software BENNING PC-Win ST 750-760	047002

See page 14 for further accessories

	item no.
measuring adapter BENNING MA 4 (16 A + 32 A CEE 5-pin, 16 A CEE 3-pin) suitable for appliance testers BENNING ST 725/ 750/ 750A/ 755/ 760 and third-party devices which actively connect a mains voltage of 230 V	044162
mains connection cable to the BENNING MA 4 16 A/ 400 V CEE plug - 32 A/ 400 V CEE coupling, length: 1 m	044163
measuring adapter BENNING MA 2-16 (16 A CEE 5-pin) suitable only for BENNING ST 755/ 760	044160

Passive measuring adapters for single-phase and three-phase equipment up to 32 A

leakage current, fault current and load current measurements by means of leakage current clamp

NEW!

BENNING MA 3 measuring adapter

- easy to use for efficient and quick testing
- connection for equipment with CEE connector
- suitable for appliance testers BENNING ST 725/ 750A/ 755/ 760
- test functions in combination with appliance testers:
- protective conductor resistance and insulating resistance
- functional test and phase sequence test of CEE cables
- alternative leakage current measurements

BENNING triple CEE measuring adapter

- connection for equipment with CEE connector
- suitable for all common appliance testers
- test functions in combination with appliance testers:
 - protective conductor resistance and insulating resistance
 - alternative leakage current measurements

BENNING CM 9-1

TRUE RMS leakage current clamp

When using passive test adapters for testing in compliance with DGUV Regulation 3, an additional active leakage/fault current measurement may be required. For this, current clamps with a suitable filter and low resolution can be used.

- leakage/fault current measurement from 0.001 mA AC (1 μ A AC)
- preset filter (1 kHz) for appliance testing
- connectable low-pass filter LPF (40 Hz to 70 Hz)
- load current measurement up to 60.00 A AC
- voltage measurement: 0.01 V - 600,0 V AC/DC
- resistance measurement up to 600 k Ω
- continuity test

Intermediate adapters are required for current measurement and for correct contacting for differential current measurement, direct protective conductor current measurement or load current measurement (see table below).



Optional accessories

	item no.
measuring adapter BENNING MA 3 (16 A CEE 3-pin, 16 A/32 A CEE 5-pin) for testing CEE extension cables (R _{PE} , R _{INSU} , I _{PE/CONT} , functional test and phase sequence test) and single-/ three-phase loads (passive)	044159
triple CEE measuring adapter 16 A 3-pin, 16 A/32 A 5-pin for passive testing of three-phase loads (R _{PE} , R _{INSU} , I _{PE/CONT} (alternative leakage current measurement method))	044147

See page 14 for further accessories

Leakage Current Clamp and suitable Measuring Adapter

	item no.
TRUE RMS leakage current clamp BENNING CM 9-1 ideal for supporting active leakage and fault current measurements during appliance testing	044682
measuring adapters with individual lines led through for current measurements on CEE equipment	
single-phase , shock-proof plug/coupling	044131
three-phase , 16 A/ 400 V CEE plug/ coupling	044127
three-phase , 32 A/ 400 V CEE plug/ coupling	044128

Barcode, QR code

Test sample identification via barcodes with corresponding scanners has proven useful in daily use.

- 1D-USB barcode scanner for reading barcodes such as Code 39, Code 128, ...
- 1D/2D barcode scanner for barcodes and QR codes, Data Matrix codes, ...
 - corded with USB interface
 - cordless for connection to the Bluetooth® and radio interfaces of the BENNING ST 755/ ST 760
- barcode labels with consecutive numbering on reels (reels of 1000 pieces), further number ranges available

RFID technology

ideal in dirty and rough environments

- RFID reader (125 kHz/13.56 MHz) for reading the UID no.
- RFID tag, self-adhesive for attachment onto the housing
- RFID tag, tag-type for attachment by means of cable ties

Input keyboards support operation

Two keyboards are available for coupling to the BENNING ST 755/ ST 760 appliance testers.

- industrial keyboard with trackball and mouse buttons, compact design, dustproof and splash-proof (USB)
- wireless keyboard with touchpad and mouse buttons (2.4 GHz radio transmission via USB dongle)

BENNING PT 1 - direct printing at the test object

If direct log printing is required, e. g. for order or repair reports, the portable direct thermal printer is an on-site solution.

- portable direct thermal printer
- ideal for printing test records rapidly on site
- high printing speed
- data transmission via Bluetooth®
- compact dimensions (47 x 92 x 108 mm), with storage-battery mode

1D USB scanner (009369)

1D/2D USB scanner (009373)

1D/2D cordless scanner (009374)



(figure similar)

RFID reader with USB interface (009372)



RFID tag self-adhesive (044156)



RFID tag tag-type (044158)



Industrial keyboard (044154)
Wireless keyboard (044161)



(figure similar)

Brush probe (10217861)



Bluetooth® printer PT 1 (044150)



Roll of thermographic paper (044151)



Optional accessories

	item no.
1D USB scanner for barcodes	009369
1D/2D USB scanner for barcodes and QR-/Data Matrix codes	009373
1D/2D cordless scanner for barcodes and QR-/Data Matrix codes	009374
multifrequency RFID reader with USB interface (125 kHz+13.56 MHz)	009372
RFID tag self-adhesive (125 kHz) 100 tags, Ø 18 mm	044156
RFID tag tag-type (125 kHz) 100 tags, l x w: 43 x 34 mm	044158

See page 14 for further accessories

	item no.
industrial keyboard with USB interface	044154
wireless keyboard with USB receiver (2.4 GHz)	044161
printer BENNING PT 1 with Bluetooth®	044150
roll of thermographic paper (20 pieces)	044151
4 mm brush probe for gentle contacting of accessible conductive parts, such as sensitive metal surfaces and rotating/vibrating parts, e. g. drill chucks, orbital sanders, etc.	10217861

VDE 0701-0702 Appliance Tester

testing of electrical appliances under operating conditions

BENNING ST 725

mains-operated and battery-operated appliance tester for mobile testing of electrical devices

- testing in compliance with VDE 0701-0702, ÖVE/ÖNORM E 8701, NEV, NEN 3140
- quick – testing within a few seconds
- all-in-one – appliance tester and RCD tester in one single device
- unique – testing of single-phase and three-phase devices under operating conditions

Application

Testing of devices with mains voltage-dependent switching elements/ mains-supply units/relays such as controlled devices/tools, devices of information and communication technology as well as of devices which can be tested completely with mains voltage only. In mains operating mode, the protective conductor current/contact current is measured by means of the required **differential current/direct measurement method**.

Features

- measuring result with “pass/fail” information
- limiting values preset in compliance with VDE standard
- storage locations for 999 test samples
- data transmission to the PC
- measured values support the creation of test certificates in MS Excel®
- keys for storing, calling and printing the measured values

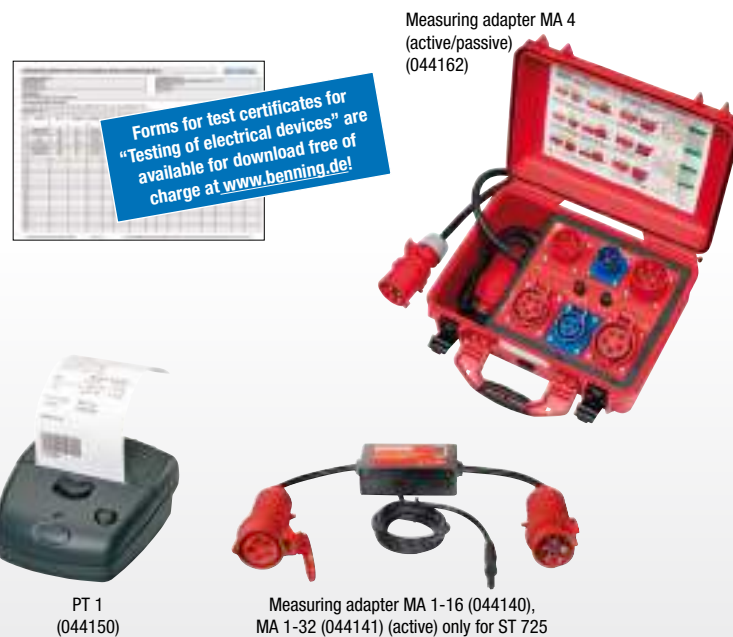
Measuring functions

- protective conductor resistance (200 mA pulsed testing current, max. 2 x 90 sec.)
- testing of RCDs with 30 mA with indication of tripping time
- reduction of the ISO testing voltage to 250 V / 500 V
- mains operating mode: protective conductor current/contact current by means of differential current/direct measurement method (max. 2 x 5 min.)
- battery operating mode: protective conductor current/contact current by means of alternative leakage current measurement method
- optional measuring adapters for passive/active testing of three-phase appliances with CEE connector (page 14)



ST 725

Scope of delivery



PT 1 (044150)

Measuring adapter MA 1-16 (044140), MA 1-32 (044141) (active) only for ST 725

Measuring adapter MA 4 (active/passive) (044162)

Forms for test certificates for “Testing of electrical devices” are available for download free of charge at www.benning.de!

Appliance Tester

	BENNING ST 725
display	graphic display
protective conductor resistance (R _{PE})	0.05 Ω - 20 Ω
insulation resistance (R _{INSU})	0.1 MΩ - 20 MΩ (250 V/500 V DC)
protective conductor current/contact current by means of	
- differential current	0.25 mA - 20 mA
- alternative leakage current	0.25 mA - 20 mA
- direct measurement method	0.1 mA - 2 mA
line test	R _{PE} , R _{ISO} , short-circuit test and continuity test of phase conductor (L) and neutral conductor (N)
testing current of RCD	30 mA + 150 mA
tripping time	10 ms - 500 ms
protective conductor current of three-phase test objects under operating conditions (optional)	0.25 mA - 10 mA
voltage	50 V - 270 V
measured value memory	999 storage locations
interfaces	micro USB for PC, PS/2 for printer BENNING PT 1

Measuring range indications refer to ranges from highest resolution to the final measuring range value.

	BENNING ST 725
scope of delivery	carrying case, test cable with alligator clip, mains connection cable, appliance cable, batteries, micro USB data cable, download software (CD)
item no.	050316

Optional accessories

	item no.
measuring adapter BENNING MA 4 for active and passive testing of single-/three-phase loads (page 9)	044162
measuring adapter for appliances with 3-pin/5-pin CEE connector	
measuring adapter BENNING MA 1-16, 5-pin, active	044140
measuring adapter BENNING MA 1-32, 5-pin, active	044141
portable log printer BENNING PT 1 incl. serial PS/2 data cable	044150
roll of thermographic paper (20 pieces)	044151

See page 14 for further accessories

BENNING ST 710

battery-operated appliance tester for mobile testing of electrical devices

- testing in compliance with VDE 0701-0702, ÖVE/ÖNORM E 8701, NEV, NEN 3140
- easy - operation by means of three keys
- quick - complete testing within 10 seconds
- mobile - testing can be made network-independently

Application

Safety-related testing of electrical devices/work equipment such as e.g. electrical devices/tools with ON/OFF switch, motorized equipment, lamps, cable reels, multiple distributors and household appliances. The protective conductor current/contact current is measured by means of the **alternative leakage current measurement method**.

Features

- automatic testing procedure for devices of class I, class II/III and line test
- testing of cable reels, multiple distributors and device connecting cables with rubber connector
- measuring result with "pass/fail" information
- limiting values preset in compliance with VDE standard
- indication in case of incorrect operation and if the test sample is not switched on
- sufficient battery capacity for > 2500 test samples
- three-phase test objects can be tested by means of optional measuring adapter

Measuring functions

- protective conductor resistance with a testing current of 200 mA DC and automatic polarity reversal
- insulating resistance with a testing voltage of 500 V DC
- protective conductor current and contact current by means of alternative leakage current measurement method
- voltage measurement on external shock-proof socket (L-N, L-PE, N-PE)



Forms for test certificates for "Testing of electrical devices" are available for download free of charge at www.benning.de!

ST 710
(050309): with socket of type E (BE/FR/CZ/SK/PL)
(050315): with socket of type CH (CH)

Scope of delivery



CM 9-1

Appliance Tester

	BENNING ST 710
display	graphic display
protective conductor resistance (R _{PE})	0.05 Ω - 20 Ω
insulation resistance (R _{iso})	0.1 MΩ - 20 MΩ (500 V DC)
protective conductor current/contact current by means of alternative leakage current measurement method (I _{EA})	0.1 mA - 20 mA
line test	R _{PE} , R _{iso} , short-circuit test and continuity test of phase conductor (L) and neutral conductor (N)
voltage	50 V - 270 V
scope of delivery	carrying case, test cable with alligator clip, appliance cable, batteries
item no.	050308

Measuring range indications refer to ranges from highest resolution to the final measuring range value.

Optional accessories

	item no.
TRUE RMS leakage current clamp BENNING CM 9-1 for the measurement of differential current, protective conductor current and load current of single-phase and three-phase loads (see page 10, 42)	044682
measuring adapters for TRUE RMS leakage current clamp BENNING CM 9-1	
single-phase, shock-proof plug/coupling	044131
three-phase, 16 A CEE-CEE, 5-pin	044127
three-phase, 32 A CEE-CEE, 5-pin	044128

See page 14 for further accessories




Accessories for Appliance Tester

safe – functional – indispensable



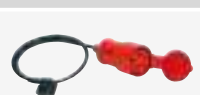

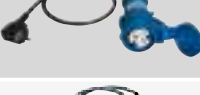
14

	Description	Product data	Item no.	ST 760	ST 725	ST 710
				ST 755		



Measuring adapter for single-phase and three-phase loads

	BENNING MA 4 measuring adapter , 16 A + 32 A CEE 5-pin, 16 A CEE 3-pin (active and passive testing of single-phase/three-phase loads and CEE extension cables), testing of three-phase welding equipment, also suitable for third-party devices that actively connect a mains voltage of 230 V	RPE, RINSU, IPE/ICONT with alternative leakage, differential and direct current measuring method	044162	•	•	
	Measuring adapter BENNING MA 3 , 16 A/32 A CEE 5-pin, 16 A CEE (testing of CEE extension cables and passive testing 1-/3-phase loads, 16 A CEE 3-pin (active testing)	RPE, RINSU, IPE/ICONT (for three-phase loads only with alternative leakage current measurement method) extension cables with functional test/phase sequence test	044159	•	•	
	Measuring adapter triple 16 A/32 A CEE 5-pin, 16 A CEE 3-pin (passive testing with L1-L2-L3 bridged)	RPE, RINSU, IPE/ICONT by means of alternative leakage current measurement method for three-phase loads	044147	•	•	•




Measuring adapter for three-phase loads

	Measuring adapter BENNING MA 2-16 , 16 A CEE 5-pin (active testing under operating conditions or passive testing with L1-L2-L3 bridged), testing of 3-phase welding equipment	RPE, RINSU, IPE/ICONT. by means of alternative leakage current/differential current/direct measurement method	044160	•		
	Measuring adapter BENNING MA 1-16 , 16 A CEE 5-pin (active testing under operating conditions)	RPE, IPE by means of direct measurement method	044140		•	
	Measuring adapter BENNING MA 1-32 , 32 A CEE 5-pin (active testing under operating conditions)	RPE, IPE by means of direct measurement method	044141		•	
	Measuring adapter 16 A CEE 5-pin (passive testing with L1-L2-L3 bridged)	RPE, RINSU, IPE/ICONT. by means of alternative leakage current measurement method	044122	•	•	•
	Measuring adapter 32 A CEE 5-pin (passive testing with L1-L2-L3 bridged)	RPE, RINSU, IPE/ICONT. by means of alternative leakage current measurement method	044123	•	•	•

Measuring adapter for single-phase loads

	Measuring adapter 16 A CEE 3-pin (passive testing)	RPE, RINSU, IPE, ICONT.	044143	•	•	•
	Measuring adapter 32 A CEE 3-pin (passive testing)	RPE, RINSU, IPE, ICONT.	044144	•	•	•
	Measuring adapter 4 mm stackable safety plug on shock-proof plug	RPE, RINSU, IPE, ICONT.	044142		•	•


Test cable for BENNING ST 760/ST 755

	5 m test cable (2-pin) with 4 mm test probe	RPE, RINSU, ICONT.	10154024	•		
	2 m test cable (2-pin) with 4 mm test probe	RPE, RINSU, ICONT.	10150829	•		
	4 mm brush probe for gentle contacting of accessible conductive parts, such as sensitive metal surfaces and rotating/vibrating parts, e. g. drill chucks, orbital sanders, etc.	4 mm safety jack for connecting the test probe of the appliance tester, length: 185 mm, brush length/diameter: 60 mm/20 mm	10217861	•	•	•

Hard case

	Robust hard case with foam insert, separate shelf and lid compartment for accessories and small parts. Safe transport protection for high-quality testing and measuring instruments.	Made of ABS material, dust and waterproof, dimensions 375 x 190 x 250 mm	10198412		•	•
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Ceramic fuse

	16 A fuses packaging unit 10 pieces	fast-acting, rated current 16 A, breaking capacity 500 A, rated voltage 250 V, dimensions 5 x 20 mm	10019440		•	
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* figure similar

Installation Tester - testing of stationary electrical installations

safety testing in compliance with the standard IEC 60364

BENNING installation testers allow easy operation and excel due to clear functional and menu structures.

The BENNING IT 130/ IT 115 supports electricians in evaluating the measured values.

Accessories for the BENNING IT 130 include a PC software which is intended for logging and the creation of reports. Up to 1800 measurements can be managed in a structure comprising four levels.



The BENNING IT 105 meets all requirements for standard installation tests and is popular with providers of facility management and building service providers.



The low-impedance and insulating resistance multimeter BENNING IT 101 is used for troubleshooting and fault analysis in electrical systems of any kind. It is often used to equip service specialists in industrial and modern automotive engineering.

TRUE RMS Installation Testers

testing of electrical systems in compliance with the standards

BENNING IT 130, IT 115

TRUE RMS installation testers

Complete testing and efficient troubleshooting of electrical systems according to IEC 60364 with unambiguous "PASS"/"FAIL" indication by means of green/red LEDs

- measurement of the protective conductor line and of the equipotential bonding line with a testing current of 200 mA, with null balance of the measuring leads
- measurement of the insulation resistance with testing voltages of 50 V, 100 V, 250 V, 500 V and 1000 V
- line impedance and loop impedance measurement (optional without tripping of the RCD) with calculation of the shortcircuit current (PFC/PSC), sub-function: voltage drop
- testing of RCDs with nominal fault currents of 10/30/100/300/500/1000 mA by means of measurement of contact voltage (without tripping), tripping time and tripping current (ramp test)
- voltage measurement with frequency and phase sequence test
- earthing measurement by means of three-wire measuring method (optional earthing kit)
- delivery includes calibration certificate

Additional functions BENNING IT 130

- testing of universal current-sensitive RCDs of type B/B+ and type EV (charging equipment for electric vehicles), MI (mobile installations)
- measured value memory covering four levels (object/block/fuse/measuring point) for up to 1800 measurements
- bidirectional USB/ RS 232 interfaces
- BENNING PC-Win IT 130 software included
- including "Commander" probe tip with "TEST" and "MEM" keys as well as bright LED measuring point illumination
- connection for barcode scanner for identifying the measuring point and renaming the storage location
- current measurement (TRUE RMS) by means of current clamp adapter (optional)
- illumination measurement by means of lux sensor (optional)



IT 130



TRUE RMS

Scope of delivery IT 130



IT 115



TRUE RMS

Scope of delivery IT 115



TRUE RMS Installationsprüfgeräte

	BENNING IT 130	BENNING IT 115
display	graphic display (illuminated)	
low-impedance resistance/continuity	0.01 Ω - 2000 Ω	
insulation resistance	10 kΩ - 1000 MΩ	
line impedance/voltage drop	0.01 Ω - 10 kΩ	
loop impedance	0.01 Ω - 10 kΩ	
short-circuit current	0.01 A - 200 kA	
RCD testing	AC/A/F/B/B+/EV/MI	AC/A/F
phase sequence	•	
voltage (TRUE RMS), frequency	1 V - 550 V, 14 Hz - 500 Hz	
earth resistance	yes, by means of 044113	
current (TRUE RMS)	yes, by means of 044038	
luminous intensity	yes, by means of 044111	
measured value memory	up to 1800	
interfaces	USB, RS 232	
logging software	•	
item no.	044103	044104

Measuring range indications refer to ranges from highest resolution to the final measuring range value.

optional accessories

Logging software with test log BENNING PC-Win IT 130

- creation and transmission of installation structures to the BENNING IT 130 for efficient periodic testing
- download of measured values and logging by means of test reports and test certificates

Features IT 130, IT 115

- all measuring functions can be selected directly by means of a rotary switch
- graphic display and help function with connecting diagram
- complete measuring result with measuring parameters, limiting value and symbols for "PASS"/"FAIL"
- current supply by means of 6 NiMH storage batteries (AA) with charger

Earthing set

- The earthing kit enables the three-wire measuring method to determine the earth resistance at main earthing systems, lightning arresters and local earth connections.

BENNING Luxmeter type B

- The luxmeter type B allows measurements of the luminous intensity for planning and testing interior and exterior lighting systems (only BENNING IT 130).

BENNING CC 3

- The BENNING CC 3 AC/DC current clamp adapter is intended for measuring a load current up to 300 A (only BENNING IT 130).

BENNING TA 5

- The BENNING TA 5 is a 40 m cable reel, ideal for low-impedance measurements.

"Commander" probe tip* (044155)



Test log



„Commander“ test plug (044149)

Earthing set (044113)



AC/DC current clamp adapter CC 3 (044038)



Luxmeter type B (044111)



40 m measuring cable TA 5 (044039)



Scope of delivery

	BENNING IT 130	BENNING IT 115
Scope of delivery	padded carrying case, test cable with shock-proof plug, universal three-wire test cable, set of test probes/ alligator clips, carrying strap, rechargeable storage batteries (6x NiMH AA), charger, calibration certificate	
	„Commander“ probe tip (switchable with TEST key), RS 232 PS/2, USB interface cable, batteries (2x AAA), PC software (CD)	-

Optional accessories for IT 130 / IT 115

	item no.
"Commander" probe tip* with "PASS"/"FAIL" indication by means of green/red LED, "TEST" key and bright LED measuring point illumination	044155
"Commander" test plug for shock-proof socket, with "PASS"/"FAIL" indication by means of green/red LED and "TEST" key	044149
earthing set for earthing measurement, 2 earth rods, 3 test cables (2 x 20 m, 1 x 4.5 m)	044113
BENNING TA 5 40 m measurement cable with winder and strap	044039
CEE measuring adapter 16 A, 5-pin voltage/phase-sequence (rotary field), frequency	044148

* Included in the scope of delivery of the BENNING IT 130

See page 20 for further accessories

Installation Testers

unbeatable price/performance ratio

BENNING IT 105

Multifunction Installation Tester

Easy and efficiently tests of electrical installations after construction, modification or as periodic inspection according to IEC 60364

- low-impedance resistance with testing current of 200 mA
- insulating resistance with testing voltages of 250 V, 500 V and 1000 V
- loop impedance (L-PE) without RCD tripping and line impedance (L-N/L) with high testing current
- testing of RCDs (tripping current, tripping time)
- voltage, frequency measurement and phase sequence testing
- easy operation, all measuring functions can be selected directly by means of a rotary switch
- large LC display with illumination
- delivery incl. calibration certificate

Features

- unbeatable price/performance ratio
- easy operation, all measuring functions can be selected directly by means of a rotary switch
- large LC display with illumination
- test probe with TEST key for starting the measuring process
- AUTO start function for low-impedance, loop and line impedance measurements
- LOCK function (permanent measurement) of the insulating resistance
- compensation (null balance) of the der measuring lines up to 10 Ω

IT 105



(figure similar)

Scope of delivery IT 105



(figure similar)

TA 5
(044039)

Installation Tester

	BENNING IT 105
display	graphic display (illuminated)
low-impedance resistance	0.15 Ω - 199 Ω
insulation resistance	200 kΩ - 199 MΩ
line impedance	0.2 Ω - 1999 Ω
loop impedance	0.2 Ω - 1999 Ω
short-circuit current	up to 26 kA
RCD testing	tripping time (1/2x, 1x, 5x IΔN, AUTO) tripping current (ramp)
testing current	sinusoidal (AC), pulsating (A) 10/30/100/300/500 mA
phase sequence	•
voltage, frequency	1 V - 440 V, 45 Hz - 65 Hz
item no.	044105

See page 20 for further accessories

Measuring range indications refer to ranges from highest resolution to the final measuring range value.

Scope of delivery

	BENNING IT 105
Scope of delivery	hard-top case, test probe with „TEST“ key, set of measuring leads/ alligator clips, test cable with shock-proof plug, carrying strap, batteries (6 x 1.5 V LR6/ type AA), calibration certificate

Optional accessories

	Art.-Nr.
BENNING TA 5 40 m measuring lead with retractor and wrist strap, for the measurement of protective and bonding conductors, connection Ø 4 mm test socket/plugs	044039

NEW!

BENNING IT 101 insulation and resistance measuring device

- measurement of the insulating resistance with testing voltages of 50 V, 100 V, 250 V, 500 V and 1,000 V
- measurement of polarization index (PI) and dielectric absorption rate (DAR)
- selectable limiting values for ISO measurement, green LED for "PASS", red LED for Δ testing voltage/external voltage
- resistance measurement with a testing current of 200 mA for testing protective conductor connections with null balance of the measuring leads
- switchable probe tip for triggering the measuring process
- internal memory for 100 measuring values per measuring function
- TRUE RMS voltage measurement with low-pass filter
- including case, switchable probe tip, silicone measuring leads, magnetic hook, alligator clips, rubber protective frame and batteries

BENNING CM E1 TRUE RMS earth measuring clamp for earth loop resistance and leakage current measurement

- earth loop resistance measurement RE in multiply earthed earthing systems
- easy use, no need to disconnect the earthing conductor or to set earth rods and probes
- optical and acoustic alarm function in case of excessive earthing resistances
- measurement of leakage and load currents using the TRUE RMS measuring method
- large measuring clamp diameter of 38 mm
- measured value memory and data logger for 116 measured values
- automatic calibration during start-up
- supplied in a hard-top case with reference resistance loop



Insulation and Resistance Measuring Device, Earth Measuring Clamp

	BENNING IT 101	BENNING CM E1
indicating range	4000 digit (illuminated)	9999
low-impedance resistance	0.01 Ω - 40 Ω	-
insulation resistance	50 k Ω - 20 G Ω	-
earth loop resistance	-	0.025 Ω - 1500 Ω
resistance	0.01 Ω - 40 k Ω	-
voltage (AC/DC)	0.1 V - 600 V AC TRUE RMS/DC	-
current (AC)	-	0.3 mA - 35 A
supplementary function	leakage current, polarization index (PI), dielectric absorption rate (DAR), automatic discharge function, null balance of the measuring leads	adjustable upper and lower alarm limit, data logger function (interval 1s - 255 s), reference resistance loop for self-test
measured value memory	500 measuring results	116 measuring results, HOLD
measuring method	TRUE RMS	TRUE RMS
clamp opening	-	38 mm
measuring category	CAT IV 600 V	CAT III 300 V
item no.	044033	044684



See page 20 for further accessories

Measuring range indications refer to ranges from highest resolution to the final measuring range value.










Accessories for Insulation and Resistance Measuring Device/ Installation Testers

professional accessories



20

Description	Product data	Item no.	IT 130	IT 115	IT 105	IT 101
 Robust hard case with foam insert, separate shelf and lid compartment for accessories and small parts. Safe transport protection for high-quality testing and measuring instruments.	Made of ABS material, dust and waterproof, dimensions 375 x 190 x 250 mm	10198412	•	•	•	•
 Stand-by case size M dimensions: 240 x 180 x 70 mm	made of hard-wearing nylon fabric	010913				•


Measuring accessories

 BENNING TA 3 set of measuring leads, eight pieces	Ø 4 mm plug-in technology, red/black, professional equipment, CAT III 1000 V, consisting of: measuring leads (silicone), test probes (slender measuring tip), claw clamps, crocodile clips	044126				•
 BENNING TA 4 magnetic holder, three pieces	For attachment of multimeters to switching cabinets, machine and system parts. Consisting of: magnetic holder, adapter and belt	044120				•
 BENNING TA 5 40 m measuring cable	With practical winder and strap, for the measurement of protective and bonding conductors, connection Ø 4 mm test socket/plugs	044039	•	•	•	•
 Ø 4 mm safety measuring leads with 2 mm measuring tip , two pieces	Red/black, L = 1.40 m, with Ø 2 mm measuring tip (L = 18 mm), CAT IV 600 V/CAT III 1000 V (with protective caps), CAT II 1000 V (without protective caps)	044146				•
 Ø 4 mm safety measuring leads with 4 mm measuring tip , two pieces	Red/black, L = 1.40 m, with Ø 4 mm measuring tip (L = 18 mm), CAT IV 600 V/CAT III 1000 V (with protective caps), CAT II 1000 V (without protective caps)	044145				•
 earthing set for earthing measurement	Three-wire measuring method. Consisting of: 2 earth rods, 3 test cables (2 x 20 m, 1 x 4.5 m)	044113	•	•		
 CEE measuring adapter 16 A CEE 5-pin	For measurement of voltage/phase-sequence (rotary field), frequency	044148	•	•		
 “Commander” test plug for shock-proof socket	with “TEST”/“MEM” key, LED measuring point illumination, “PASS”/“FAIL” indication by means of green/red LED, PE contact electrode for protective conductor connection	044149	•	•		
 “Commander” probe tip switchable	with “TEST”/“MEM” key, LED measuring point illumination, “PASS”/“FAIL” indication by means of green/red LED, PE contact electrode for protective conductor connection (BENNING IT 130 delivery including “Commander” probe tip!)	044155	•	•		


Current Clamp Adapters

 BENNING CC 3 AC/DC current clamp adapter	basic accuracy: 1 % - 2 % current: 0.2 A - 300 A AC/DC output: 1 mV/10 mV AC/DC per 1 A AC/DC	044038	•			
 BENNING CFlex 1 AC current transformer	basic accuracy: 3 % current: 0.3 A - 3000 A AC output: 100 mV/10 mV/1 mV AC per 1 A AC	044068	•			




illumination sensor

 BENNING Luxmeter type B	Adapter, measuring range 0.01 lx - 20 klx, accuracy 5 %. Precise illumination measurement for the planning and testing of interior and exterior lighting	044111	•			
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Barcode scanner

 Barcode scanner with PS/2 connector	For identifying the measuring point and renaming the storage location	009371	•			
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Ceramic fuse

 315 mA fuses packaging unit 10 pieces	superfast-acting (FF), breaking capacity 10 kA, rated voltage 1000 V, dimensions 6.3 x 32 mm	757213				•
 315 mA fuses packaging unit 10 pieces	F1, medium slow-acting (M), rated voltage 250 V, dimensions 5 x 20 mm	757211	•	•		
 1,6 A fuses packaging unit 10 pieces	superfast-acting (FF), breaking capacity 30 kA, rated voltage 1000 V, dimensions 6.3 x 32 mm	10194027			•	

* figure similar

Installation Tester for photovoltaic systems and curve tracer

testing in compliance with EN 62446 and EN 61829



The photovoltaic installation testers by BENNING are the ideal solution for quick and professional testing of PV systems. The BENNING PV 2 SET for installation testing in compliance with

EN 62446 also offers curve measurement in compliance with EN 61829 and corresponding documentation by means of the software BENNING Solar Manager.



The PV tester BENNING PV 3 can be used in photovoltaic systems with system/string voltages up to 1500 V. Voltages up to 1500 V and short-circuit currents up to 40 A DC can be

documented depending on the current solar radiation and temperature.

Installation Tester for photovoltaic systems

commissioning tests, periodic inspection and curve measurement of PV systems

BENNING PV 1-1, PV 2 installation tester for photovoltaic systems for testing grid-connected PV systems

- tests in compliance with EN 62446 standard
- easy – operation by means of keys with AUTO test procedure
- quick – testing within a few seconds only
- safe – contacting by means of PV connectors

Features

- automatic test procedure for U_{o/c}, I_{s/c} and R_{iso}
- insulating resistance with a testing voltage of 250 V, 500 V and 1000 V
- memory of measured values with real-time clock (date/time stamp)
- wireless connection BENNING SUN 2 (insolation/ temperature)
- USB interface and download software BENNING SOLAR Datalogger
- delivery including calibration certificate

BENNING PV 2 installation tester for photovoltaic systems and curve tracer

- testing in compliance with EN 62446 and EN 61829 for documenting the performance data
- measurement of the current-voltage characteristic (I-V) and the power characteristic (P-V)
- indication of U_{mpp}, I_{mpp} and filling factor (FF)

Features

- automatic test procedures for curve measurement and R_{iso} testing
- separate R_{iso} measurement via 4 mm measuring leads
- optional PC software BENNING SOLAR Manager for the creation of test reports and documentation of characteristics
- free app BENNING PV Link (requires Android device with NFC)



Installation Tester for PV systems

	BENNING PV 1-1	BENNING PV 2
display	graphic display (illuminated)	
protective conductor resistance (R _{PE})	0.05 Ω – 199 Ω	
open-circuit voltage with polarity (U _{o/c})	5 V – 1000 V DC	
short-circuit current (I _{s/c})	0.5 A – 15 A DC	
insulating resistance (R _{iso})	0.05 MΩ – 199 MΩ (250/500/1000 V)	
insulating resistance (2-pin)	-	0.05 MΩ – 300 MΩ
AUTO measurement 1	+/-, U _{o/s} , I _{s/c} , R _{iso}	+/-, U _{o/s} , I _{s/c} , R _{iso}
AUTO measurement 2	-	characteristic (I-V, P-V)
AUTO measurement 3	-	measurement 1 + 2
DC string current/AC current	0.2 A – 40 A DC/AC (by means of BENNING CC 3)	
insolation	100 W/m ² – 1250 W/m ² by (means of BENNING SUN 2)	
PV module/ambient temperature	-30 °C – +125 °C (by means of BENNING SUN 2)	
voltage (2-pin)	30 V – 440 V AC/DC	
measured value memory	200	999
interfaces	USB/radio	USB/radio/NFC
dimensions/weight	270 x 115 x 55 mm/ca. 2.6 kg	
item no.	050421	050422

Scope of delivery

	BENNING PV 1-1	BENNING PV 2
scope of delivery	carrying case, measuring/MC4/Sunclix leads, batteries, alligator clips, download software (CD), micro USB cable, calibration certificate	demo version of PC software BENNING SOLAR Manager (CD)

SET offer

BENNING PV 2 SET		
BENNING PV 2		item no. 050427
BENNING SUN 2		
PC software BENNING SOLAR Manager		
Bag with neck strap PV		

Optional accessories

	item No.
PC software BENNING SOLAR Manager license key for a single-user license	050423
Bag with neck strap for PV suitable for BENNING PV 1-1/PV 2	050426

See page 26 for further accessories

BENNING SUN 2 insolation and temperature measuring instrument

- insolation measurement (W/m^2) via PV reference cell
- PV module temperature and ambient temperature ($^{\circ}C$)
- digital compass and inclinometer
- with wireless transmission (433 MHz) to the BENNING PV 1-1/ PV 2, the current insolation and temperature values of the measuring result are stored
- data logger (5000 data records), including insolation and module/ ambient temperature
- integrated real-time clock with date/time stamp
- USB interface and download software for the preparation of test certificates in MS Excel[®]

BENNING SOLAR Manager PC-Software (Windows[®])

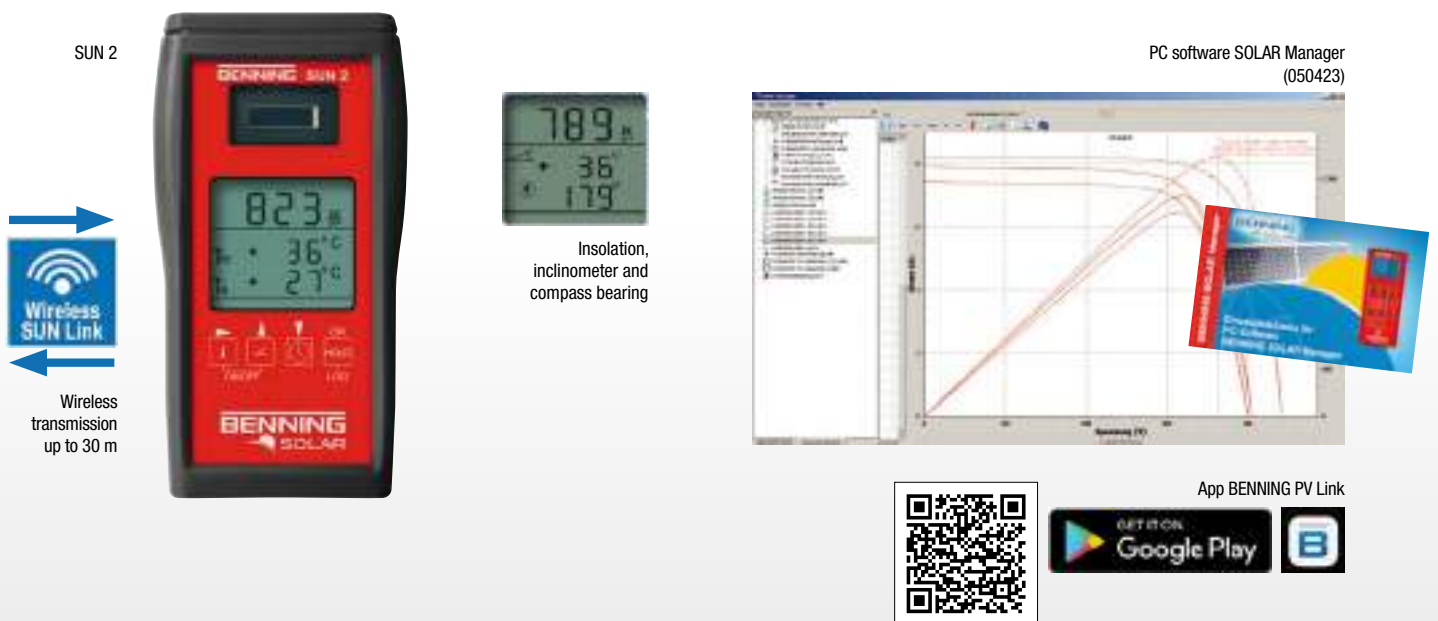
- documentation of the I-V and P-V characteristics measured by the BENNING PV 2
- STC conversion/ comparison with characteristic via integrated PV module database
- demo version available for download can be used free of charge for 14 days

App BENNING PV Link

- displaying of curves via Android device with NFC interface
- STC comparison with characteristic via integrated PV module database
- available free of charge for the BENNING PV 2 in the Android Playstore

BENNING SOLAR Datalogger download software

- download of measured values from the BENNING PV 1-1/PV 2 in CSV format
- further processing of measured values possible in MS Excel[®] möglich



Insolation and temperature measuring instrument

	BENNING SUN 2
insolation	100 W/m^2 – 1250 W/m^2
PV module/ambient temperature	-30 $^{\circ}C$ – +125 $^{\circ}C$
compass bearing	0 $^{\circ}$ – 360 $^{\circ}$
inclinometer (module/roof pitch)	0 $^{\circ}$ – 80 $^{\circ}$
real-time clock	date/time stamp
measured value memory for W/m^2 and $^{\circ}C$	5000 data records
interface/radio range	1 x USB/approx. 30 m for unobstructed view conditions
dimensions/weight	150 x 80 x 33 mm/350 g
scope of delivery	case, protective rubber holster, module/ambient temperature sensor, batteries, USB cable, download software (CD), calibration certificate
item no.	050420

See page 26 for further accessories

Measuring range indications refer to ranges from highest resolution to the final measuring range value.

Recommended accessories

	Item No.	BENNING PV 1-1	BENNING PV 2
BENNING SUN 2	050420	recommended	necessary for curve measurement
PC software BENNING SOLAR Manager	050423	-	necessary for documentation
Temperature sensor (suction cup) (SUN 2) (see page 26)	050424	recommended	recommended
PV module holder (SUN 2) (see page 26)	050425	recommended	recommended
AC/DC current clamp adapter BENNING CC 3 (see page 26)	044038	recommended	recommended
40 m measuring lead BENNING TA 5 (see page 26)	044039	recommended	recommended
Download software BENNING SOLAR Datalogger	free	download of measured values in CSV format	download of measured values in CSV format
App BENNING PV Link for presentation of characteristic	free	-	requires Android devices with NFC interface

Tester for photovoltaic systems

testing of solar parks, power plants and large installations with 1500 V technology

NEW!

BENNING PV 3

PV tester for PV systems with 1500 V technology

Rational testing of solar parks, power plants and large installations

- efficient - open-circuit voltage measurement for modern 1500 V DC systems
- powerful - short-circuit current measurement at PV strings up to 40 A DC
- safe – contacting by means of PV connectors

Measuring functions

- polarity test of the PV generator/ PV cabling
- open-circuit voltage measurement for modern 1500 V DC systems
- short-circuit current measurement at PV strings up to 40 A DC
- insolation measurement (W/m^2) and PV module temperature and ambient temperature ($^{\circ}C$) by means of BENNING SUN 2 (optional)

Features

- automatic test procedure (+/-, V_o/c , I_s/c) with reverse polarity protection (incl. W/m^2 , $^{\circ}C$ with integrated SUN 2)
- powerful short-circuit current measurement, reserve is up to 4 x larger than for conventional PV testers with 10 A limitation
- reduced testing times and effort for disassembly, as the individual PV strings no longer have to be separated and tested one after the other
- reduces the risk of failure due to overload during testing of PV strings of unknown power
- memory of measured values with real-time clock (date/time stamp)
- wireless connection BENNING SUN 2 (insolation/temperature)
- USB interface and download software BENNING SOLAR Datalogger
- large LC display with illumination
- optimum transport and storage protection (IP 64)
- delivery incl. calibration certificate

PV 3



Scope of delivery PV 3



Installation Tester for PV systems

	BENNING PV 3
display	graphic display (illuminated)
polarity test	automatic
open-circuit voltage (U_o/c)	5 V - 1500 V DC
resolution/accuracy	max. 0.1 V / \pm (0.5 % + 2 digit)
short-circuit current (I_s/c)	0.5 A - 40 A DC (max. 45 kW)
resolution/accuracy	max. 0.01 A / \pm (1 % + 2 digit)
insolation	100 W/m^2 – 1250 W/m^2 (via BENNING SUN 2)
PV module/ambient temperature	-30 $^{\circ}C$ - +125 $^{\circ}C$ (via BENNING SUN 2)
measured value memory	999
interfaces	USB type B
batteries	3 x 3.7 V 18650 lithium-ion batteries
dimensions/weight	340 x 300 x 152 mm/approx. 5 kg
protection class	IP 40 (open), IP 64 (closed)
item no.	050428

Measuring range indications refer to ranges from highest resolution to the final measuring range

Scope of delivery

	BENNING PV 3
scope of delivery	PV tester in robust protective case (IP 64), set of PV measuring leads (MC4), set of measuring leads with probe tip and alligator clips, charger with 3 pieces 3.7 V lithium-ion batteries and calibration certificate

Optional accessories

	Art.-Nr.
BENNING SUN 2 insolation and temperature measuring instrument (see page 23)	050420
Temperature sensor (suction cup) suitable for BENNING SUN 2 (see page 26)	050424
PV module holder suitable for BENNING SUN 2 (see page 26)	050425

TRUE RMS Digital Current Clamp/ Multimeter

safe voltage measurement up to 1500 V AC/ 2000 V DC via BENNING TA PV

NEW!

BENNING CM 10-PV digital current clamp meter for photovoltaic systems and applications with high voltages

- current measurement up to 600 A AC/DC with max. 10 mA resolution
- microampere and temperature measuring range for HVAC technology
- INRUSH function for measuring inrush currents
- measuring input for flexible current transformer BENNING CFlex 1 (044068) up to 3000 A AC (optional)
- non-slip and break-proof SoftGrip housing

BENNING MM 10-PV digital multimeter for photovoltaic systems and applications with high voltages

- universally applicable with 10 A current measuring range
- LC display with bargraph indication for the detection of measuring trends
- rubber holster with magnetic hanger
- compact design for one-hand operation

Common features of BENNING CM 10-PV, MM 10-PV

- safe voltage measurement up to 1500 V AC/ 2000 V DC via TA PV
- data logger, memory function and Bluetooth® Low Energy 4.0 interface
- app “BENNING MM-CM Link” for download, storage and sharing measured values via smartphone/ tablet
- low-pass filter (HFR) for measurements at pulsed motor drives
- Volt sensor for non-contact signalling of phase voltages and cable breaks in lines (red LED)
- continuity test and single-pole phase test via buzzer and red LED
- delivery including case, batteries, measuring leads, measuring adapter TA PV, crocodile clips and wire temperature sensor



TRUE RMS Digital Current Clamp/ Multimeter

	BENNING CM 10-PV	BENNING MM 10-PV
indicating range	6000 (illuminated)	6000 (illuminated) with bar graph
basic accuracy	1.0 %	0.5 %
voltage AC	0.1 V - 1000 V (1500 V via TA PV)	0.1 mV - 1000 V (1500 V via TA PV)
voltage DC	0.1 mV - 1000 V (2000 V via TA PV)	0.1 mV - 1000 V (2000 V via TA PV)
current AC	0.1 µA - 4000 µA, 10 mA - 600 A	1 mA - 10 A
current DC	0.1 µA - 4000 µA, 10 mA - 600 A	1 mA - 10 A
resistance	0.1 Ω - 600 kΩ	0.01 Ω - 40 MΩ
continuity/diode	• / •	• / •
frequency	0.01 Hz - 10 kHz	0.01 Hz - 100 kHz
capacity	0.1 µF - 1 mF	1 nF - 10 mF
temperature	-40 °C up to 400 °C	-40 °C up to 400 °C
volt sensor	•	•
interface	Bluetooth®	Bluetooth®
software	app (IOS, Android)	app (IOS, Android)
filter function	HFR filter (800 Hz)	HFR filter (800 Hz)
memory	HOLD, MIN/MAX, INRUSH, ZERO	HOLD, MAX/MIN, REL, SAVE
data log function	4000 measuring values (interval: 1 s - 60 s)	4000 measuring values (interval: 1 s - 60 s)
measuring method	TRUE RMS	TRUE RMS
clamp opening	37 mm	-
measuring category	CAT IV 600 V	CAT IV 600 V
item no.	044683	044089

See page 26 for further accessories

Measuring range indications refer to ranges from highest resolution to the final measuring range value

Accessories for Testers for PV- Systems

professional accessories

26

	Description	Product data	Item no.	PV 1-1	PV 2	SUN 2	PV 2 SET	PV 3
PC software								
	BENNING SOLAR Manager	License key for a single-user license. Documentation of the PV system as well as of I-V and P-V characteristic curves STC calculation and comparison of characteristic curves via integrated PV module database.	050423		•			
Current Clamp Adapter								
	BENNING CC 3 AC/DC current clamp adapter	For DC operating currents and AC currents up to 40 A. Basic accuracy : 1 % - 2 %	044038	•	•		•	
Stand-by cases								
	Stand-by case size S dimensions: 220 x 110 x 50 mm	with belt loop on the back, made of hard-wearing nylon fabric	010912			•		
	Bag with neck strap for PV dimensions: 280 x 135 x 50 mm (without device)	Allows hands-free working on measuring points that are dangerous or difficult to access. With shoulder strap and large viewing window for easy operation of the keys and viewing the display. Made of hard-wearing nylon fabric.	050426	•	•			
Hard case								
	Robust hard case with foam insert, separate shelf and lid compartment for accessories and small parts. Safe transport protection for high-quality testing and measuring instruments.	Made of ABS material, dust and waterproof, dimensions 375 x 190 x 250 mm	10198412	•	•	•	•	
Measuring accessories								
	BENNING TA 1 crocodile clips, two pieces	Ø 4 mm plug-in technology, red/black, professional equipment, CAT III 1000 V	044124	•	•		•	
	BENNING TA 2 set of measuring leads, six pieces	Ø 4 mm plug-in technology, red/black, professional equipment, consisting of: measuring leads (silicone) CAT III 1000 V, test probes (Ø 4 mm measuring tip) CAT II 1000 V, crocodile clips CAT III 1000 V	044125	•	•		•	
	BENNING TA 3 set of measuring leads, eight pieces	Ø 4 mm plug-in technology, red/black, professional equipment, CAT III 1000 V, consisting of: measuring leads (silicone), test probes (slender measuring tip), claw clamps, crocodile clips	044126	•	•		•	
	BENNING TA 5 40 m measuring cable	With practical winder and strap, for the measurement of protective and bonding conductors, connection Ø 4 mm test socket/plugs	044039	•	•		•	
Temperature sensor								
	Temperature sensor with suction cup	For attachment of the module temperature sensor to the module back Contact sensor version. Cable length 2 m	050424			•		
PV module holder								
	PV module holder	For safe attachment of the SUN 2 to the PV module	050425			•		
Ceramic fuse								
	500 mA fuses packaging unit 10 pieces	fast-acting, breaking capacity 1 kA, rated voltage 1000 V, dimensions 6.3 x 32 mm	749771	•	•		•	

* figure similar

Voltage Tester and Continuity Tester

Socket Tester and Phase Sequence Indicator

- DUSPOL® Voltage Tester – the original since 70 years
- PROFIPOL®+ Voltage Tester – a plus in functionality
- DUTEST® pro Continuity and Line Tester with LED torch
- BENNING SDT 1 Socket Tester
- TRITEST® pro Phase Sequence Indicator with LED torch
- TRITEST® easy non-contact Phase Sequence and Phase Tester
- BENNING VT 2 non-contact phase indicator and magnetic field tester
- BENNING VT 1 non-contact Phase Tester and Cable Break Tester



The generation DUSPOL® Voltage Testers


safe voltage testing up to 1000 V


The international standard for voltage testers IEC EN 61243-3 (VDE 0682-401) increases safety for work under voltage


Your work as an expert requires safe testing. Therefore, you should not make any compromises concerning safety! Voltage testers which are used on electrical systems of up to 1000 V have to comply with the standard IEC/EN 61243-3 (VDE 0682-401):2015. The standard creates uniform testing and safety criteria on an international level and remarkably which concentrates on user safety.


The generation of DUSPOL® voltage testers exceeds the demands of the standards concerning both the protection category for housings (IP 65) and overvoltage protection (CAT IV 600 V). The nominal voltage range has been increased to a minimum of 1000 V AC/DC in order to ensure safe testing of increased system voltages of industrial applications, photovoltaic systems and wind power plants as well as of hybrid automotive engineering.


- 1**
phase-sequence test
(counter-clockwise/clockwise)



- 2**
sensor of non-contact
cable break detector



- 3**
single-pole
phase test


- 4**
measuring point
illumination


- 5**
acoustic and optical
continuity test


- 6**
frequency indication


- 7**
LC display with
background lighting



DUSPOL® digital
1000 V AC
1200 V DC
CAT IV 600 V

7
voltage indication
1 – 1000 V AC TRUE RMS
1 – 1200 V DC



resistance measurement and
diode test with conducting state
voltage indication



8
load connection via
push buttons



9
vibrating alert in
the test handle



10
housing with protection
against dust and water jets



DUSPOL® expert
1000 V
AC/DC
CAT IV 600 V

DUSPOL® analog
1000 V
AC/DC
CAT IV 600 V



All DUSPOL® voltage testers are equipped with a direct display system without loading the test point. In case of need, a load circuit can be connected via a push-button which suppresses inductive and capacitive reactive voltages. Thus, it is possible to clearly distinguish between high-energy and low-energy electric circuits.

A vibrating motor can be activated additionally. The vibrating power of this motor increases proportionally to the applied voltage. This is an additional indication of voltage being applied.

The DUSPOL® voltage testers underline once again the BENNING expertise in the field of testing, measuring and safety technology. With a DUSPOL® voltage tester you acquire an innovative product which has been tested and approved by the independent VDE Test and Certification Institute.

The generation DUSPOL® voltage testers

- safe voltage testing up to 1000 V AC/DC
- load connection with vibration alert
- intentional tripping of a 30 mA RCD
- phase sequence test in a three-phase mains
- single-pole external conductor test (phase)

Additionally for DUSPOL® expert, DUSPOL® digital:

- acoustic continuity test with loud test buzzer and visual indication by means of yellow LED (continuity tests even of live components, such as e. g. fuses in “intermeshed” systems).
- measuring point illumination by means of white high-power LED
- phase sequence test by means of green LED (left/right)
- detector for non-contact localization of cable breaks on exposed and live lines

Additionally for DUSPOL® digital:

- voltage testing up to 1000 V AC TRUE RMS/1200 V DC
- TRUE RMS measuring method
- low-volt range: 1.0 V to 11.9 V
- frequency indication up to 1000 Hz
- resistance measurement up to 300 kΩ
- conducting-state voltage measurement of diodes
- automatic LC display illumination by means of a light sensor

Set offer:

Set DUSPOL® digital with premium case

DUSPOL® digital Set
item no. 050264



The PROFIPOL®+ voltage tester with additional functions and convenient design

- slim and compact design
- test handle lock for one-hand operation on sockets and for safe storage
- indicating steps from 12 V to 690 V AC/DC, fully operational even with batteries being exhausted or removed
- acoustic continuity test with loud buzzer and visual indication by means of yellow LED (continuity tests even of live components, such as e. g. fuses in “intermeshed” systems).
- single-pole external conductor test (phase) and polarity test
- non-contact cable break detector (yellow LED)



Voltage and Continuity Tester

	DUSPOL® digital	DUSPOL® expert	DUSPOL® analog	PROFIPOL® +
indication	LED/LCD (illuminated)	LED	plunger system (illuminated)/LED	LED
voltage range	1.0 V - 1000 V AC/1200 V DC	12 V - 1000 V AC/DC	12 V - 1000 V AC/DC	12 V - 690 V AC/DC
frequency range	1 - 1000 Hz	–	–	–
acoustic and visual continuity test	buzzer + yellow LED 0 - 100 kΩ	buzzer + yellow LED 0 - 100 kΩ	–	buzzer + yellow LED 0 - 100 kΩ
diode test	0.3 - 2.0 V	conducting-state/ non-conducting direction	–	–
resistance measuring range	0.1 kΩ - 300 kΩ	–	–	–
phase-sequence test	green LEDs (right/left)	green LEDs (right/left)	LCD (“R” symbol)	–
single-pole external conductor test	red “lightning” LED	red “lightning” LED	LCD (“R” symbol)	red “lightning” LED
polarity test	LCD (+/-)	LED (+/-)	LED (+/-)	LED (+/-)
cable break detector	yellow LED (flashing)	yellow LED (flashing)	–	yellow LED
load connection via push button	I _s = 550 mA (1000 V) 30 mA RCD trip	I _s = 550 mA (1000 V) 30 mA RCD trip	I _s = 550 mA (1000 V) 30 mA RCD trip	–
vibrating alarm	•	•	•	–
measuring point illumination	white LED	white LED	–	–
protection class	IP 65	IP 65	IP 65	IP 54
item no.	050263	050262	050261	020023

See page 32 for further accessories

Professional Continuity Tester

Socket Tester with contact sensor

DUTEST® pro continuity and line tester for testing high-impedance and low-impedance resistances

- continuity and semiconductor test by means of LEDs and loud buzzer
- visual indication by means of three LED steps: 0 - 100 Ω/1 kΩ/10 kΩ
- acoustic indication via buzzer up to approx. 100 Ω
- external-voltage indication: 6 V to 400 V AC/DC (LEDs/ buzzer)
- polarity test, single-pole external conductor test (phase) and non-contact cable break detector (volt sensor)
- buzzer volume and brightness of the torch are adjustable
- precise and powerful LED torch
- integrated magnetic holder and belt clip at the rear of the housing

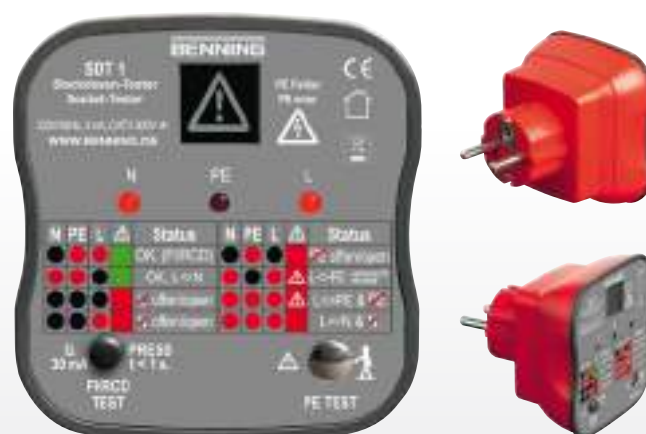
BENNING SDT 1 socket tester with contact sensor for active PE error detection

- quick and easy testing of shock-proof sockets for correct connection
- wiring errors such as missing PE, N and L conductors as well as an inversion of the L and PE conductors are clearly indicated via three LEDs
- contact sensor warns of a dangerous contact voltage at the PE contact via the LC display
- unambiguous indication via LEDs and LC display
- FI/RCD TEST key for testing the tripping function of 30 mA RCDs
- an easily understandable status table provides information about the correct connection (OK, green) and the type of existing errors (red) at the shock-proof socket

DUTEST® pro



SDT 1



Continuity and Line Tester

	DUTEST® pro
LED indication	3 x yellow, 2 x red
acoustic continuity test	loud test buzzer up to 100 Ω
visual continuity test	0 - 100 Ω/1 kΩ/10 kΩ (yellow LEDs)
voltage range	6 V - 400 V AC/DC (50 Hz/60 Hz)
single-pole external conductor test	•
polarity test	•
cable break detector	•
luminous LED torch	yes, adjustable to four levels
safety	IEC/EN 61010-1
measuring category	CAT III 300 V
batteries	3 x 1.5 V batteries of type AA (LR6)
scope of delivery	incl. set of measuring leads
item no.	050156

See page 32 for further accessories

Socket Tester

	BENNING SDT 1
indication	3 red LEDs for N, PE, L conductor and LC display "△"
voltage range	230 V AC, ± 10 %
frequency range	50 Hz - 60 Hz
PE test response threshold	U _b < 50 V AC to earth
RCD testing current	I _{ΔN} approx. 30 mA
power supply	via test object (no batteries required)
safety	IEC/EN 61010-1, IEC/EN 61010-2-033
measuring category	CAT II 300 V
appliance dimensions	80 x 72 x 78 mm (L x B x H)
appliance weight	70 g
item no.	020053

Phase Sequence Indicator for three-phase mains

non-contact Phase/Phase Sequence and Magnetic Field Tester

NEW!

TRITEST® pro phase sequence indicator with high-power LED torch and magnetic suspension

- indication of “clockwise” and “counter-clockwise” phase sequence by means of green/red LED
- indication of phase voltages L1, L2 and L3 by means of red LED
- voltage range: 400 V to 500 V AC (50 Hz to 60 Hz)
- luminous high-power LED torch
- integrated magnetic holder and belt clip at the rear of the housing
- including three attachable 4 mm probe tips and alligator clip

TRITEST® easy, BENNING VT 2 and VT 1 non-contact phase/phase sequence and magnetic field tester

- easy phase sequence testing in three-phase mains by means of green/red LED probe tip (clockwise/counter-clockwise) (TRITEST® easy)
- magnetic field testing of valves, switches, relays, pumps, solenoid coils (VT 2)
- testing of permanent, AC-induced and DC-induced magnetic fields (VT 2)
- phase testing on sockets, distribution boxes, automatic circuit breakers
- testing insulated lines (cable reel, chains of lights) of cable breaks
- phase test by means of red probe tip and buzzer
- the flashing frequency of the LED probe tip as well as the frequency of the acoustic signal increase with the voltage applied increasing as well
- capacitive measuring method requires no current flow, auto Power Off
- incl. batteries and pen clip

TRITEST® pro



TRITEST® easy VT 2 VT 1



CAT IV 600 V CAT IV 600 V CAT IV 600 V Phase sequence testing green = clockwise

Testing a solenoid valve

Phase Sequence Indicator, non-contact Phase, Phase Sequence and Magnetic Field Tester

	TRITEST® pro	TRITEST® easy	BENNING VT 2	BENNING VT 1
indication	4 x red, 1 x green LEDs	green/red LED probe tip/buzzer		red LED probe tip/buzzer
phase sequence indication	green/red LED for clockwise/counter-clockwise phase sequence	green/red LED probe tip for clockwise/counter-clockwise phase sequence	–	–
single-pole external conductor test	–	red LED probe tip flashing/buzzer		
voltage range	400 V - 500 V AC	200 V - 1000 V AC	12 V - 1000 V AC	200 V - 1000 V AC
frequency range	50 Hz - 60 Hz	45 Hz - 65 Hz		
cable break detector	–	•	•	•
luminous LED torch	yes, single-level	–	–	–
safety	IEC/EN 61010-1, IEC/EN 61557-1, IEC/EN 61557-7	DIN EN 61010-1		
measuring category	CAT III 300 V	CAT IV 600 V, CAT III 1000 V		
batteries	3 x 1.5 V batteries of type AA (LR6)	2 x 1.5 V batteries of type AAA (LR03)		
scope of delivery	incl. set of measuring leads/test probes, alligator clip	incl. batteries, pen clip		
item no.	020052	020051	044055	020054

See page 32 for further accessories

Accessories for Voltage Testers, Continuity and Line Tester, Phase Sequence Indicator

functional and indispensable

	Description	Product data	Item no.	DUSPOL®	PROFIPOL®+	DUTEST® pro	SDT 1	TRITEST® pro	TRITEST® easy	VT 1
Hard case / stand-by cases										
	Robust hard case with foam insert, separate shelf and lid compartment for accessories and small parts. Safe transport protection for high-quality testing and measuring instruments.	Made of ABS material, dust and waterproof, dimensions 375 x 190 x 250 mm	10198412	•	•	•	•	•	•	•
	Premium case DUSPOL® HardCase, dimensions: 330 x 105 x 65 mm High protection despite low weight	With handle, counter-rotating zipper (outside), padded mesh pocket with zipper, flexible fastening loops with Velcro.	010914	•	•					
	Stand-by case DUSPOL® dimensions: 330 x 100 x 60 mm	With belt loop on the back, made of hard-wearing nylon fabric	010911	•	•					
	Stand-by case size S dimensions: 220 x 110 x 50 mm	With belt loop on the back, made of hard-wearing nylon fabric	010912			•		•	•	•
Test probe cap										
 figure 1:1	4 mm test probe cap (GS 38) packaging unit = 10 test probe caps (sufficient for 5 voltage testers)	Rubberized test probe cap (GS 38) for reducing the test probe contact to a length of 4 mm	10184809	•	•					

Digital Multimeter with safety and function without any compromises

TRUE RMS measuring method to satisfy highest demands on accuracy

For precise measurements in trade, service and industry:

- BENNING MM 12 with data logger, Bluetooth®, PC software and app
- BENNING MM 10-PV for photovoltaic systems and applications with 1500 V AC/ 2000 V DC
- BENNING MM 10-1 with microampere measuring range for HVAC
- BENNING MM 7-1, MM 6-2 maximum safety thanks to highest measuring category

Digital Multimeter with proven quality and technology:

- BENNING MM 2/MM 3 precise current measuring ranges of 200 μ A up to 20 A
- BENNING MM P3 a variety of function in pocket size



TRUE RMS Digital Multimeter

with data logger, Bluetooth® and free app

BENNING MM 12

TRUE RMS logging multimeter for professional use

- large digital display with secondary display and bargraph indication
- AUTO SAVE function, storage without key operation
- TRUE RMS measuring method (AC, AC+DC)
- optical PC interface with USB cable
- including PC software, crocodile clips and calibration certificate

BENNING MM 10-PV

NEW!

for photovoltaic systems and for applications with high voltages

- safe voltage measurement up to 1500 V AC/ 2000 V DC via measuring adapter TA PV
- universally applicable with 10 A current measuring range
- continuity test and single-pole phase test via buzzer and red LED

BENNING MM 10-1

NEW!

for HVAC and for service use in harsh environments

- microampere measuring range for testing flame sensors and sacrificial anodes of heating systems/water storage tanks
- continuity test and single-pole phase test via buzzer and red LED

Common features BENNING MM 12, MM 10-PV, MM 10-1

- data logger, memory function and Bluetooth® Low Energy 4.0 interface
- app "BENNING MM-CM Link" for download, storage and sharing measured values via smartphone/ tablet
- low-pass filter (HFR) for measurements at pulsed motor drives
- "AutoV" and "LoZ" function for automatic AC/DC voltage and to suppress reactive voltages (MM 12/MM 10-1)
- Volt sensor for non-contact signalling of phase voltages and cable breaks in lines via red LED (MM 10-PV/MM 10-1)
- delivery including case, rubber holster, wire temperature sensor, batteries, measuring leads



TRUE RMS Digital-Multimeter

	BENNING MM 12	BENNING MM 10-PV	BENNING MM 10-1
indicating range	40000 (illuminated) with bar graph	6000 (illuminated) with bar graph	6000 (illuminated) with bar graph
basic accuracy	0.5 %	0,5 %	0.5 %
voltage AC	10 mV - 1000 V	0.1 mV - 1000 V (1500 V via TA PV)	0.1 mV - 1000 V
voltage DC	10 μV - 1000 V	0.1 mV - 1000 V (2000 V via TA PV)	0.1 mV - 1000 V
current AC	10 μA - 10 A	1 mA - 10 A	0.1 μA - 400 mA
current DC	10 μA - 10 A	1 mA - 10 A	0.1 μA - 400 mA
resistance	0.1 Ω - 40 MΩ	0.01 Ω - 40 MΩ	0.01 Ω - 40 MΩ
continuity/diode	• / •	• / •	• / •
frequency	0.1 Hz - 100 kHz	0.01 Hz - 100 kHz	0.01 Hz - 100 kHz
capacity	0.01 nF - 40 mF	1 nF - 10 mF	1 nF - 10 mF
temperature	-200 °C up to 1200 °C	-40 °C up to 400 °C	-40 °C up to 400 °C
volt sensor	-	•	•
interface	Bluetooth®, USB	Bluetooth®	Bluetooth®
software	PC software, app (IOS, Android)	app (IOS, Android)	app (IOS, Android)
filter function	HFR filter (800 Hz)	HFR filter (800 Hz)	HFR filter (800 Hz)
memory	1000 measuring values, HOLD, PEAK, MAX/MIN	HOLD, MAX/MIN, REL, SAVE	HOLD, MAX/MIN, REL, SAVE
data log function	40000 measuring values (interval: 1 s - 600 s)	4000 measuring values (interval: 1 s - 60 s)	4000 measuring values (interval: 1 s - 60 s)
measuring method	TRUE RMS	TRUE RMS	TRUE RMS
measuring category	CAT IV 600 V	CAT IV 600 V	CAT IV 600 V
item no.	044088	044089	044687

See page 38 for further accessories

Measuring range indications refer to ranges from highest resolution to the final measuring range value

TRUE RMS measuring method to satisfy highest demands on accuracy

BENNING MM 7-1 for industrial applications

- highest measuring category CAT IV 600 V for highest safety
- “AutoV” function for automatic AC/DC voltage detection and low input impedance (LoZ) to suppress reactive voltages
- the integrated Volt sensor signals non-contact phase voltages and cable breaks in cables (buzzer/LCD)
- LC display with bar graph indication and illumination
- delivery including rubber holster, case, battery, measuring leads and wire temperature sensor

BENNING MM 6-2 with highest safety

- highest measuring category CAT IV 600 V for highest safety
- “AutoV” function with low input impedance (LoZ) to suppress reactive voltages
- rubber holster with integrated magnetic hanger
- Volt sensor for non-contact signaling of phase voltages and cable breaks in lines (buzzer/red LED)
- continuity test by means of red LED and buzzer
- LC display with bar graph indication and illumination
- delivery including rubber holster with magnetic hanger, case, batteries and measuring leads

BENNING MM 5-2, MM 5-1 compact, precise and innovative

- compact dimensions: 140 x 70 x 33 mm (without holster)
- rubber holster with integrated magnetic hanger
- Volt sensor for non-contact cable break detection (red LED)
- continuity test by means of red LED and buzzer
- measuring input for AC/DC current, microampere DC and temperature (MM 5-2)
- LC display with illumination (MM 5-2)
- delivery including rubber holster with magnetic hanger, case, batteries, measuring leads as well as wire temperature sensor (MM 5-2)



TRUE RMS Digital-Multimeter

	BENNING MM 7-1	BENNING MM 6-2	BENNING MM 5-2	BENNING MM 5-1
indicating range	6000 (illuminated) with bar graph	6000 (illuminated) with bar graph	6000 (illuminated)	6000 (illuminated)
basic accuracy	0.08 %	0.5 %	0.5 %	0.5 %
AC voltage	10 μ V - 1000 V	100 μ V - 1000 V	100 μ V - 600 V	100 μ V - 600 V
DC voltage	10 μ V - 1000 V	100 μ V - 1000 V	100 μ V - 600 V	100 μ V - 600 V
AC current	10 μ A - 10 A	20 mA - 10 A	20 mA - 10 A	–
DC current	10 μ A - 10 A	1 mA - 10 A	0.1 μ A - 10 A	–
resistance	0.1 Ω - 40 M Ω	0.1 Ω - 40 M Ω	0.1 Ω - 40 M Ω	0.1 Ω - 40 M Ω
continuity/diode	• / •	• / •	• / •	• / •
frequency	0.01 Hz - 100 kHz	0.01 Hz - 100 kHz	0.01 Hz - 50 kHz	0.01 Hz - 50 kHz
capacity	1 nF - 10 mF	1 nF - 10 mF	0.01 nF - 1 mF	0.01 nF - 1 mF
temperature	-40 °C up to +400 °C	–	-40 °C up to +400 °C	–
volt sensor	•	•	•	•
interface	–	–	–	–
software	–	–	–	–
filter function	–	–	–	–
memory	HOLD, MAX/MIN	HOLD, PEAK, REL	HOLD, PEAK	HOLD, PEAK
Data Log function	–	–	–	–
measuring method	TRUE RMS	TRUE RMS	TRUE RMS	TRUE RMS
measuring category	CAT IV 600 V	CAT IV 600 V	CAT III 600 V	CAT III 600 V
item no.	044085	044087	044071	044070

See page 38 for further accessories

Measuring range indications refer to ranges from highest resolution to the final measuring range value.

BENNING MM 4

with current clamp adapter

- basic measuring for AC current, voltage, resistance, continuity and diode test
- automatic and manual measuring range selection
- safe current measurement up to 300 A AC via attachable current clamp adapter (max. clamp opening 30 mm)
- delivery including case, batteries, measuring lead and measuring probes

BENNING MM 3, MM 2 and MM 1

quality that convinces

- basic measuring for current, voltage, resistance, capacity, frequency, continuity and diode test
- precise current measuring ranges (200 μ A and 2/20/200 mA) for ionization current measurement at the gas burner and for testing the sacrificial anode in the hot water tank (HVAC technicians) (MM 2/MM 3)
- automatic and/or manual measuring range selection
- delivery including rubber holster, case, battery/batteries and measuring leads

MM 4



MM 3



MM 2



MM 1



Digital-Multimeter

	BENNING MM 4	BENNING MM 3	BENNING MM 2	BENNING MM 1
indicating range	4200	2000	2000	3200 with bar graph
basic accuracy	0.5 %	0.5 %	0.5 %	0.5 %
AC voltage	1 mV - 600 V	100 μ V - 600 V	100 μ V - 750 V	1 mV - 600 V
DC voltage	1 mV - 600 V	100 μ V - 600 V	100 μ V - 1000 V	100 μ V - 600 V
AC current	0.1 A - 300 A	0.1 μ A - 20 A	0.1 μ A - 20 A	–
DC current	–	0.1 μ A - 20 A	0.1 μ A - 20 A	0.1 μ A - 3.2 mA
resistance	0.1 Ω - 42 M Ω	0.1 Ω - 20 M Ω	0.1 Ω - 20 M Ω	0.1 Ω - 32 M Ω
continuity/diode	• / •	• / •	• / •	• / •
frequency	–	1 Hz - 200 kHz	–	–
capacity	–	1 pF - 200 μ F	–	–
temperature	–	–	–	–
volt sensor	–	–	–	–
interface	–	–	–	–
software	–	–	–	–
filter function	–	–	–	–
memory	HOLD	–	–	HOLD
Data Log function	–	–	–	–
measuring method	RMS	RMS	RMS	RMS
measuring category	CAT III 300 V	CAT III 300 V	CAT III 600 V	CAT III 600 V
item no.	044073	044029	044028	044027

See page 38 for further accessories

Measuring range indications refer to ranges from highest resolution to the final measuring range value.

reliable and precise in each and every situation

BENNING MM 1-3, MM 1-2 and MM 1-1 with volt sensor function

- extremely compact housing type
- the integrated Volt sensor signals phase voltages by means of an acoustic signal and a red LED signal
- localizes cable breaks and defective lamps in exposed cables (cable reel, light chains) via the feeding side of the phase
- delivery including case, batteries, measuring leads and wire temperature sensor (MM 1-3)

BENNING MM P3 pocket-size

- top-class functionality and design
- even smaller and narrower with lower weight (130 g)
- minimum dimensions: 132 x 86 x 19 mm
- for all-purpose use with leather case, firmly connected attached measuring leads and batteries



Digital-Multimeter





















	BENNING MM 1-3	BENNING MM 1-2	BENNING MM 1-1	BENNING MM P3
indicating range	2000	2000	2000	5000
basic accuracy	0.5 %	0.5 %	0.5 %	0.6 %
AC voltage	100 μ V - 750 V	100 μ V - 750 V	100 μ V - 750 V	100 μ V - 600 V
DC voltage	100 μ V - 1000 V	100 μ V - 1000 V	100 μ V - 1000 V	100 μ V - 600 V
AC current	1 mA - 10 A	1 mA - 10 A	–	–
DC current	1 mA - 10 A	1 mA - 10 A	–	–
resistance	0.1 Ω - 20 M Ω	0.1 Ω - 20 M Ω	0.1 Ω - 20 M Ω	0.1 Ω - 40 M Ω
continuity/diode	• / •	• / •	• / •	• / •
frequency	1 Hz - 20 MHz	1 Hz - 20 MHz	–	1 mHz - 5 MHz
capacity	1 pF - 2 mF	1 pF - 2 mF	–	10 pF - 100 μ F
temperature	-20 °C up to +800 °C	–	–	–
volt sensor	•	•	•	–
interface	–	–	–	–
software	–	–	–	–
filter function	–	–	–	–
memory	HOLD, MAX/MIN	HOLD, MAX/MIN	HOLD	HOLD
Data Log function	–	–	–	–
measuring method	RMS	RMS	RMS	RMS
measuring category	CAT III 600 V	CAT III 600 V	CAT III 600 V	CAT III 300 V
item no.	044083	044082	044081	044084

See page 38 for further accessories

Measuring range indications refer to ranges from highest resolution to the final measuring range value.

Accessories for Digital Multimeter

safe – functional – indispensable

Description	Product data	Item no.	MM 12	MM 10-PV	MM 10-1	MM 7-1	MM 6-2	MM 5-2	MM 5-1	MM 4	MM 3	MM 2	MM 1	MM 1-3	MM 1-2	MM 1-1	MM P3
Current Clamp Adapters																	
 BENNING CC 1 AC current clamp adapter	basic accuracy: 1.9 % current: 1 A - 400 A AC output: 1 mV AC per 1 A AC	044037	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
 BENNING CC 3 AC/DC current clamp adapter	basic accuracy: 1 % - 2 % current: 0.2 A - 300 A AC/DC output: 1 mV/10 mV AC/DC per 1 A AC/DC	044038	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
 BENNING CFlex 1 AC current transformer	basic accuracy: 3 % current: 0.3 A - 3000 A AC output: 100 mV/10 mV/1 mV AC per 1 A AC	044068	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Hard case / stand-by cases																	
 Robust hard case with foam insert, separate shelf and lid compartment for accessories and small parts. Safe transport protection for high-quality testing and measuring instruments.	Made of ABS material, dust and waterproof, dimensions 375 x 190 x 250 mm	10198412	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
 Stand-by case size S dimensions: 220 x 110 x 50 mm	with belt loop on the back, made of hard-wearing nylon fabric	010912		•	•		•	•	•				•	•	•	•	
 Stand-by case size M dimensions: 240 x 180 x 70 mm	made of hard-wearing nylon fabric	010913	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Measuring accessories																	
 BENNING TA 1 crocodile clips, two pieces	Ø 4 mm plug-in technology, red/black, professional equipment, CAT III 1000 V	044124	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
 BENNING TA 2 set of measuring leads, six pieces	Ø 4 mm plug-in technology, red/black, professional equipment, consisting of: measuring leads (silicone) CAT III 1000 V, test probes (Ø 4 mm measuring tip) CAT II 1000 V, crocodile clips CAT III 1000 V	044125	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
 BENNING TA 3 set of measuring leads, eight pieces	Ø 4 mm plug-in technology, red/black, professional equipment, CAT III 1000 V, consisting of: measuring leads (silicone), test probes (slender measuring tip), claw clamps, crocodile clips	044126	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
 BENNING TA 4 magnetic holder, three pieces	For attachment of multimeters to switching cabinets, machine and system parts. Consisting of: magnetic holder, adapter and belt	044120	•			•					•	•	•	•	•	•	
 Ø 4 mm safety measuring leads with 2 mm measuring tip , two pieces	Red/black, L = 1.40 m, with Ø 2 mm measuring tip (L = 18 mm), CAT IV 600 V/CAT III 1000 V (with protective caps), CAT II 1000 V (without protective caps)	044146	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
 Ø 4 mm safety measuring leads with 4 mm measuring tip , two pieces	Red/black, L = 1.40 m, with Ø 4 mm measuring tip (L = 18 mm), CAT IV 600 V/CAT III 1000 V (with protective caps), CAT II 1000 V (without protective caps)	044145	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
 Set of measuring leads for BENNING MM 4 , Ø 4 mm plug-in technology, three pieces	Consisting of: measuring lead with Ø 2 mm measuring tip, 2 measuring probes with Ø 2 mm measuring tip	044119								•							
 Temperature probe, type K, insertion probe (V4A steel tube)	For flexible substances, liquids, gases and air. Measuring range: - 196 °C up to + 800 °C	044121	•	•	•	•		•						•			
Ceramic fuse																	
 440 mA fuses packaging unit 10 pieces	fast-acting, breaking capacity 10 kA, rated voltage 1000 V, dimensions 10 x 35 mm	10016655	•		•	•											
 1 A fuses packaging unit 10 pieces	fast-acting, rated current 1 A, rated voltage 500 V, dimensions 6.3 x 32 mm	749669									•	•					
 10 A fuses packaging unit 10 pieces	fast-acting, rated current 10 A, breaking capacity 50 kA, rated voltage 600 V, dimensions 10 x 38 mm	748263												•	•		
 11 A fuses packaging unit 10 pieces	fast-acting, rated current 11 A, breaking capacity 20 kA, rated voltage 1000 V, dimensions 10 x 38 mm	10218772	•	•		•	•										
 15 A fuses packaging unit 10 pieces	fast-acting, rated current 15 A, breaking capacity 50 kA, rated voltage 600 V, dimensions 10.3 x 38.1 mm	10149447						•									
 16 A fuses packaging unit 10 pieces	fast-acting, rated current 16 A, rated voltage 500 V, dimensions 6.3 x 32 mm	749770									•	•					

Digital Current Clamp Multimeter for AC/DC current

TRUE RMS measuring method to satisfy highest demands on accuracy

For precise measurements in trade, service and industry:

- BENNING CM 12 power current clamp multimeter with data logger, Bluetooth® and app
- BENNING CM 10-PV for photovoltaic systems and applications with 1500 V AC/ 2000 V DC
- BENNING CM E1 earth measuring clamp for earth loop resistance and leakage current measurement
- BENNING CM 1-4 open current clamp with digital and LED display

Particularly for troubleshooting in electrical installations and devices:

- BENNING CM 11 for process signals, automotive engineering and intrusion alarm systems
- BENNING CM 9 series for measurement of leakage currents and differential currents



TRUE RMS Digital Current Clamp Meters

with data logger, Bluetooth® and free app

BENNING CM 12

power measurement in single-phase and three-phase loads

- AC/DC effective power (W), power factor (cos φ) and harmonic measurement (THD) for evaluation of the mains quality
- bipolar phase sequence test (L1-L2-L3)

BENNING CM 10-PV

for photovoltaic systems and HVAC

- safe voltage measurement up to 1500 V AC/ 2000 V DC via measuring adapter TA PV
- microampere and temperature measuring range for HVAC

NEW!

BENNING CM 10-1

for professional service use

- precise current measurement up to 1500 A AC/DC
- “AutoV” function with low input impedance (LoZ) to suppress reactive voltages

NEW!

Common features BENNING CM 12, CM 10-PV, CM 10-1

- data logger, memory function and Bluetooth® Low Energy 4.0 interface
- app “BENNING MM-CM Link” for download, storage and sharing measured values via smartphone/ tablet
- INRUSH function for measuring inrush currents (motors etc.)
- low-pass filter (HFR high-frequency suppression) for measurements at pulsed motor drives
- measuring input for flexible current transformer BENNING CFlex 1 (044068) up to 3000 A AC (optional)
- Volt sensor for non-contact signalling of phase voltages and cable breaks in lines via red LED
- non-slip and break-proof SoftGrip housing
- delivery including case, batteries, measuring leads, CM 10-PV additional with measuring adapter TA PV, crocodile clips and wire temperature sensor



TRUE RMS Digital Current Clamp Meters

	BENNING CM 12	BENNING CM 10-PV	BENNING CM 10-1
indicating range	9999 (illuminated) with bar graph	6000 (illuminated)	6000 (illuminated)
basic accuracy	1 %	1 %	1 %
voltage AC	10 mV - 1000 V	0.1 V - 1000 V (1500 V via TA PV)	0.1 V - 1000 V (AutoV+LoZ)
voltage DC	10 mV - 1000 V	0.1 mV - 1000 V (2000 V via TA PV)	0.1 mV - 1000 V (AutoV+LoZ)
current AC	10 mA - 600 A	0.1 μA - 4000 μA, 10 mA - 600 A	10 mA - 1500 A
current DC	10 mA - 600 A	0.1 μA - 4000 μA, 10 mA - 600 A	10 mA - 1500 A
resistance	0.1 Ω - 100 kΩ	0.01 Ω - 600 kΩ	0.01 Ω - 600 kΩ
continuity/diode	• / •	• / •	• / •
frequency	0.01 Hz - 10 kHz	0.01 Hz - 10 kHz	0.01 Hz - 10 kHz
capacity	1 nF - 4 mF	1 μF - 1 mF	1 μF - 1 mF
effective power / (cos φ)	1 W - 600 kW / •	- / -	- / -
temperature	-	-40 °C up to 400 °C	-
volt sensor	•	•	•
interface	Bluetooth®	Bluetooth®	Bluetooth®
software	app (iOS, Android)	app (iOS, Android)	app (iOS, Android)
filter function	HFR filter (1000 Hz)	HFR filter (800 Hz)	HFR filter (800 Hz)
memory	1000 measuring values, HOLD, PEAK, MAX/MIN, AVG	HOLD, MIN/MAX, INRUSH, ZERO	HOLD, MIN/MAX, INRUSH, ZERO
data log function	9999 measuring values (interval: 1 s - 600 s)	4000 measuring values (interval: 1 s - 60 s)	4000 measuring values (interval: 1 s - 60 s)
measuring method	TRUE RMS	TRUE RMS	TRUE RMS
clamp opening	33 mm	37 mm	42 mm
measuring category	CAT IV 600 V	CAT IV 600 V	CAT IV 600 V
item no.	044680	044683	044688

See page 46 for further accessories

Measuring range indications refer to ranges from highest resolution to the final measuring range value

innovative, proven and powerful

BENNING CM E1

NEW!

TRUE RMS earth measuring clamp for earth loop resistance and leakage current measurement

- earth loop resistance measurement R_e in multiply earthed earthing systems
- no need to disconnect the earthing conductor or to set earth rods and probes
- optical and acoustic alarm function in case of excessive earthing resistances
- measurement of leakage and load currents using the TRUE RMS measuring method
- large measuring clamp diameter of 38 mm
- measured value memory for 116 measured values
- supplied in a hard-top case with reference resistance loop

BENNING CM 7

up to 1000 A AC/DC TRUE RMS

- safe current measurement up to 1000 A AC/DC with TRUE RMS measuring method
- highest measuring category CAT IV 600 V for highest safety
- clamp opening up to 53 mm for clamping large conductor cross-sections/busbars
- illuminated LC display with bargraph indication for the detection of measuring trends
- delivery including case, battery and measuring leads

BENNING CM 5-1

with automatic function and single-button operation

- safe current measurement max. up to 600 A AC/DC
- highest measuring category CAT IV 600 V
- automatic function (V AC/DC, A AC/DC, Ω) and measuring range selection
- safe and easy operation – measuring errors due to incorrect measuring range selection are excluded
- low input impedance (LoZ) to suppress reactive voltages
- non-slip and break-proof SoftGrip housing
- LC display with light sensor and background lighting
- delivery including case, battery and measuring leads

CM E1



TRUE RMS

CM 7



TRUE RMS CAT IV 600 V

CM 5-1



TRUE RMS CAT IV 600 V

TRUE RMS Earth Measuring Clamp, Digital Current Clamp Meters

	BENNING CM E1	BENNING CM 7	BENNING CM 5-1
indicating range	9999	4000 (illuminated) with bar graph	9999 (illuminated)
basic accuracy	1.5 %	0.7 %	0.9 %
voltage AC	–	0.1 V - 750 V	1.3 V - 750 V
voltage DC	–	0.1 V - 1000 V	0.7 V - 1000 V
current AC	0.3 mA - 35 A	0.1 A - 1000 A	0.9 A - 600 A
current DC	–	0.1 A - 1000 A	0.9 A - 600 A
resistance	R_e -lus 0.025 Ω - 1500 Ω	0.1 Ω - 400 Ω	1 Ω - 10 k Ω
continuity/diode	–	• / –	• / •
frequency	–	1 Hz - 400 kHz	–
capacity	–	–	–
effective power / (cos φ)	– / –	– / –	– / –
temperature	–	–	–
volt sensor	–	–	–
interface	–	–	–
software	–	–	–
filter function	–	–	–
memory	HOLD, REC (116 measuring values)	HOLD, MAX/MIN, PEAK, ZERO	HOLD, ZERO
data log function	116 measuring values	–	–
measuring method	TRUE RMS	TRUE RMS	TRUE RMS
clamp opening	38 mm	53 mm	35 mm
measuring category	CAT III 300 V	CAT IV 600 V	CAT IV 600 V
item no.	044684	044059	044066

See page 46 for further accessories

Measuring range indications refer to ranges from highest resolution to the final measuring range value

TRUE RMS high-precision and leakage current clamps

to satisfy highest demands on accuracy

BENNING CM 11

AC/DC current clamp with a resolution of 0.1 mA and multimeter functions

- precise AC/DC current measurement
- ideal for troubleshooting in electrical installations, devices, automotive engineering, control systems (4 to 20 mA process signals) as well as in fire and intrusion alarm systems
- multifunctional use for voltage (600 V), resistance measurements (600 kΩ) and continuity test
- compact dimensions with a clamp opening of 23 mm
- delivery including case, batteries and measuring leads

BENNING CM 9-1

NEW!

leakage current clamp with a resolution of 1 μ A AC and multimeter functions

- universally applicable for current (60 A), voltage (600 V), resistance measurement (600 kΩ) and continuity test
- LPF low-pass filter (40 Hz to 70 Hz) to suppress high-frequency interfering signals

BENNING CM 9-2

NEW!

leakage current clamp with a resolution of 1 μ A AC, Bluetooth® function and app

- Bluetooth® Low Energy 4.0 interface and app for indication, storage and sharing measured values via smartphone/ tablet
- LPF low-pass filter (50 Hz to 60 Hz) to suppress high-frequency interfering signals

Common features BENNING CM 9-1, CM 9-2

- measurements of leakage, differential and protective conductor currents in electrical systems (IEC 60364), devices and machines (EN 60204-1)
- defined protection against magnetic fields in compliance with EN 61557-13, class 2
- device filter (1 kHz) in compliance to EN 61557-16 for testing electrical appliances
- delivery including case, batteries and measuring leads (except CM 9-2)



CM 11

TRUE RMS



CM 9-1

TRUE RMS

Leakage



CM 9-2

TRUE RMS

Leakage



TRUE RMS high-precision and leakage current clamps

	BENNING CM 11	BENNING CM 9-1	BENNING CM 9-2
indicating range	6000 (illuminated)	6000 (illuminated)	6000 (illuminated)
basic accuracy	1 %	1 %	1 %
voltage AC	10 mV - 600 V	10 mV - 600 V	–
voltage DC	10 mV - 600 V	10 mV - 600 V	–
current AC	0.1 mA - 20 A	1 μA - 60 A	1 μA - 60 A
current DC	0.1 mA - 10 A	–	–
resistance	0.1 Ω - 600 kΩ	0.1 Ω - 600 kΩ	–
continuity/diode	• / –	• / –	–
frequency	–	–	–
capacity	–	–	–
effective power / (cos φ)	– / –	– / –	– / –
temperature	–	–	–
volt sensor	–	–	–
interface	–	–	Bluetooth®
software	–	–	app (iOS, Android)
filter function	–	device- (1 kHz), low pass filter (40 Hz - 70 Hz)	device- (1 kHz), low pass filter (50 Hz - 60 Hz), without filter
memory	HOLD, MIN/MAX, ZERO	HOLD, PEAK, ZERO	HOLD, MAX/MIN
data log function	–	–	app (iOS, Android)
measuring method	TRUE RMS	TRUE RMS	TRUE RMS
clamp opening	23 mm	23 mm	40 mm
measuring category	CAT IV 600 V	CAT IV 600 V	CAT IV 600 V
item no.	044067	044682	044685

See page 46 for further accessories

Measuring range indications refer to ranges from highest resolution to the final measuring range value

to satisfy highest demands on accuracy

BENNING CM 1-4 open current clamp with digital and LED display

NEW!

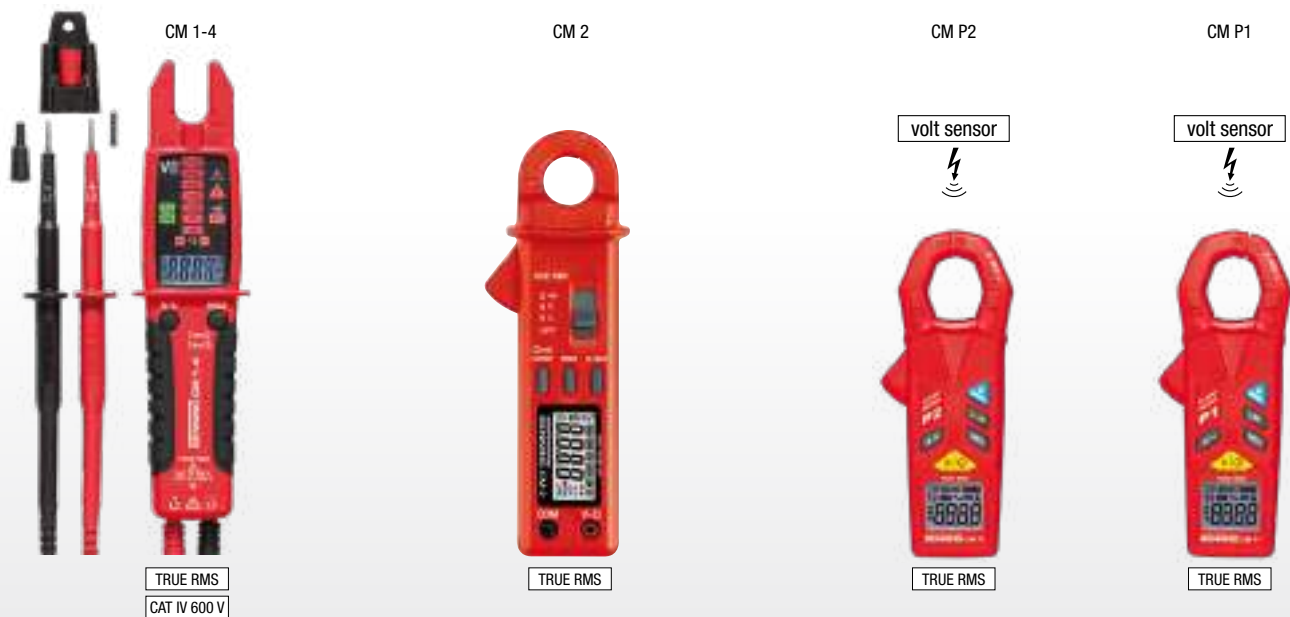
- current measurement up to 200 A AC via open current clamp
- voltage measurement up to 1000 V AC/DC (with/without acoustic signal), no batteries required from 50 V
- LED step indicator: 12, 50, 120, 230, 400, 690, 1000 V
- phase sequence test by means of green LEDs (clockwise/counter-clockwise)
- single-pole external conductor test (phase) via red LED
- continuity test via buzzer and red LED
- polarity test via +/- LED
- one-hand operation for voltage measurement at sockets (19 mm)
- LED measuring point illumination
- incl. belt holster, measuring leads, protective caps, contact tip extensions, batteries

BENNING CM 2 for various applications

- safe and non-contact measuring of high currents
- AC/DC current measurement up to 300 A AC/DC
- measurement of low currents (automotive, photovoltaics, industry)
- measuring inputs for voltage, resistance and continuity test
- delivery including case, batteries and measuring leads

BENNING CM P2 and CM P1 minimum dimensions, maximum safety

- TRUE RMS measuring method
- precise measurements of load currents up to 400 A
- maximum resolution of 10 mA in the 40.00 A measuring range
- inrush current measurement (INRUSH) in the 40 A measuring range of motors and lighting systems
- low-pass filter (LPF, approx. 160 Hz) to suppress high-frequency pulses at pulsed motor drives
- Volt sensor (NCV) for non-contact signaling of phase voltages (buzzer/LCD)
- LC display with illumination
- delivery including case and batteries



TRUE RMS Digital Current Clamp Meters

	BENNING CM 1-4	BENNING CM 2	BENNING CM P2	BENNING CM P1
indicating range	9999 (illuminated)/LED	4000	4200 (illuminated)	4200 (illuminated)
basic accuracy	1 %	0.5 %	2 %	2 %
voltage AC	6 V - 1000 V	1 mV - 600 V	–	–
voltage DC	6 V - 1000 V	0.1 mV - 600 V	–	–
current AC	0.1 A - 200 A	100 mA - 300 A	0.01 A - 400 A	0.01 A - 400 A
current DC	–	10 mA - 300 A	0.01 A - 400 A	–
resistance	1 Ω - 50 kΩ	0.1 Ω - 40 MΩ	–	–
continuity/diode	• / –	• / –	–	–
frequency	–	–	–	–
capacity	–	–	–	–
effective power / (cos φ)	– / –	– / –	– / –	– / –
temperature	–	–	–	–
volt sensor	–	–	•	•
interface	–	–	–	–
software	–	–	–	–
filter function	–	–	low-pass filter (160 Hz)	low-pass filter (160 Hz)
memory	HOLD	HOLD, MAX, ZERO	HOLD, INRUSH, ZERO	HOLD, INRUSH
data log function	–	–	–	–
measuring method	TRUE RMS	TRUE RMS	TRUE RMS	TRUE RMS
clamp opening	16 mm	25 mm	23 mm	23 mm
measuring category	CAT IV 600 V	CAT III 300 V	CAT III 600 V	CAT III 600 V
item no.	044686	044035	044679	044678

See page 46 for further accessories

Measuring range indications refer to ranges from highest resolution to the final measuring range value

Digital Current Clamps

for AC current

BENNING CM 1-3, with Volt sensor function

- safe AC current measurement with open current clamp head up to max. 200 A AC
- measuring inputs for voltage, resistance, continuity and diode test
- integrated volt sensor signals phase voltages by means of an acoustic signal and a red LED signal
- localizes cable breaks and defective lamps in exposed cables (cable reel, light chains) via the feeding side of the phase
- delivery including case, batteries and measuring leads

BENNING CM 1-2 and CM 1-1 in compact design

- safe current measurement up to 400 A AC
- maximum resolution of 10 mA in the 20 A measuring range (CM 1-1)
- measuring inputs for voltage, resistance and continuity test (CM 1-2)
- compact dimensions with a clamp opening of 30 mm
- delivery including case, battery/ batteries as well as measuring leads (CM 1-2)



Digital Current Clamp Meters

	BENNING CM 1-3	BENNING CM 1-2	BENNING CM 1-1
indicating range	2000	2000	2000
basic accuracy	1 %	1 %	2 %
voltage AC	0.1 V - 750 V	0.1 V - 600 V	-
voltage DC	0.1 V - 1000 V	0.1 V - 600 V	-
current AC	100 mA - 200 A	100 mA - 400 A	10 mA - 400 A
current DC	-	-	-
resistance	0.1 Ω - 20 MΩ	0.1 Ω - 20 MΩ	-
continuity/diode	• / •	• / -	-
frequency	-	1 Hz - 400 kHz	-
capacity	-	-	-
effective power / (cos φ)	- / -	- / -	- / -
temperature	-	-	-
volt sensor	•	-	-
interface	-	-	-
software	-	-	-
filter function	-	-	-
memory	HOLD	HOLD	HOLD, MAX
data log function	-	-	-
measuring method	RMS	RMS	RMS
clamp opening	16 mm	30 mm	30 mm
measuring category	CAT V 600 V	CAT III 600 V	CAT III 600 V
item no.	044063	044062	044061

See page 46 for further accessories

Measuring range indications refer to ranges from highest resolution to the final measuring range value

BENNING CFlex 2, CFlex 1 flexible AC current transformers up to 3000 A AC

- TRUE RMS measuring method (CFlex 2)
- measuring loop (46 cm) with high flexibility for narrow measuring points and large cable cross-sections
- length of connecting cable: 1.8 m
- simple closing mechanism which can be operated with gloves
- analog output is universally applicable for all multimeters and oscilloscopes via 4 mm safety plugs (CFlex 1)
- output 100/10/1 mV per A (CFlex 1)
- large 4 digit LC display with illumination (CFlex 2)
- delivery including case and batteries

BENNING CC 3 and CC 1 AC/DC and AC current clamp adapters

- safe AC current measurement max. up to 400 A
- connection via 4 mm safety measuring leads
- delivery including case and measuring leads as well as battery (CC 3)



Current Transformers and Current Clamp Adapters

	BENNING CFlex 2	BENNING CFlex 1	BENNING CC 3	BENNING CC 1
indicating range	6000 (illuminated)	—	—	—
basic accuracy	3 %	3 %	1 % - 3 %	1.9 %
voltage AC	—	—	—	—
voltage DC	—	—	—	—
current AC	0.1 A - 3000 A	0.3 A - 3000 A	0.2 A - 300 A	1 A - 400 A
current DC	—	—	0.2 A - 300 A	—
resistance	—	—	—	—
continuity/diode	-/-	-/-	-/-	-/-
frequency	—	—	—	—
capacity	—	—	—	—
effective power / (cos φ)	-/-	-/-	-/-	-/-
temperature	—	—	—	—
volt sensor	—	—	—	—
interface	—	—	—	—
software	—	—	—	—
filter function	—	—	—	—
memory	HOLD, MIN/MAX	—	—	—
data log function	—	—	—	—
measuring method	TRUE RMS	—	—	—
clamp opening	160 mm	160 mm	21 mm	30 mm
measuring category	CAT IV 600 V	CAT III 600 V	CAT III 600 V	CAT III 300 V
item no.	044069	044068	044038	044037

See page 46 for further accessories


Measuring range indications refer to ranges from highest resolution to the final measuring range value

Accessories for Digital Current Clamp Meter




safe – functional – indispensable

Description	Product data	Item no.	CM 12	CM 10-PV	CM 10-1	CM E1	CM 7	CM 5-1	CM 11	CM 9-1	CM 9-2	CM 1-4	CM 2	CM P2	CM P1	CM 1-3	CM 1-2	CM 1-1	CFlex 2	CFlex 1







AC current transformer

 BENNING CFlex 1 AC current transformer	basic accuracy: 3 % current: 0.3 A - 3000 A AC output: 100 mV/10 mV/1 mV AC per 1 A AC	044068	•	•	•		•	•	•	•			•				•	•			
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

Hard case / stand-by cases

 Robust hard case with foam insert, separate shelf and lid compartment for accessories and small parts. Safe transport protection for high-quality testing and measuring instruments.	Made of ABS material, dust and waterproof, dimensions 375 x 190 x 250 mm	10198412	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
 Stand-by case size S dimensions: 220 x 110 x 50 mm	with belt loop on the back, made of hard-wearing nylon fabric	010912						•	•	•			•	•	•	•	•	•			
 Stand-by case size M dimensions: 240 x 180 x 70 mm	made of hard-wearing nylon fabric	010913						•	•	•	•	•	•	•	•	•	•	•	•	•	•

Measuring accessories

 BENNING TA 1 crocodile clips, two pieces	Ø 4 mm plug-in technology, red/black, professional equipment, CAT III 1000 V	044124	•	•	•		•	•	•	•		•	•					•	•		
 BENNING TA 2 set of measuring leads, six pieces	Ø 4 mm plug-in technology, red/black, professional equipment, consisting of: measuring leads (silicone) CAT III 1000 V, test probes (Ø 4 mm measuring tip) CAT II 1000 V, crocodile clips CAT III 1000 V	044125	•	•	•		•	•	•	•		•	•					•	•		
 BENNING TA 3 set of measuring leads, eight pieces	Ø 4 mm plug-in technology, red/black, professional equipment, CAT III 1000 V, consisting of: measuring leads (silicone), test probes (slender measuring tip), claw clamps, crocodile clips	044126	•	•	•		•	•	•	•		•	•					•	•		
 Ø 4 mm safety measuring leads with 2 mm measuring tip , two pieces	Red/black, L = 1.40 m, with Ø 2 mm measuring tip (L = 18 mm), CAT IV 600 V/CAT III 1000 V (with protective caps), CAT II 1000 V (without protective caps)	044146	•	•	•		•	•	•	•		•	•					•	•		
 Ø 4 mm safety measuring leads with 4 mm measuring tip , two pieces	Red/black, L = 1.40 m, with Ø 4 mm measuring tip (L = 18 mm), CAT IV 600 V/CAT III 1000 V (with protective caps), CAT II 1000 V (without protective caps)	044145	•	•	•		•	•	•	•		•	•					•	•		
 Temperature probe, type K, insertion probe (V4A steel tube)	For flexible substances, liquids, gases and air. Measuring range: - 196 °C up to + 800 °C	044121	•																		

Measuring adapter for BENNING CM 9-1/ CM 9-2

 Measuring adapter three-phase, 16 A CEE 5-pin , conductors led through individually and with double insulation	Measurement: I _{PE} by means of differential current/direct measurement method, load current	044127																			•	•	
 Measuring adapter three-phase, 32 A CEE 5-pin , conductors led through individually and with double insulation	Measurement: I _{PE} by means of differential current/direct measurement method, load current	044128																				•	•
 Measuring adapter, single-phase, shock-proof plug/coupling , conductors led through individually and with double insulation	Measurement: I _{PE} by means of differential current/direct measurement method, load current	044131																				•	•

* figure similar

recommendation of the workshop equipment

BENNING DB 1 demonstration case for testing and measuring of primary quantities of electrical engineering

- suited for teaching and education purposes, training courses and product presentations

BENNING DB 2 demonstration case for practice-oriented training concerning installation testers

- portable case for simulation of electrical systems confirming to standards according to IEC 60364



BENNING DB 1
Item no.: 044132



BENNING DB 2
Item no.: 044133

Required test and measurement	Tester/meter complying with standard	Single unit version I	Single unit/device combination version II	Single unit/device combination version III
For enterprises of electrical engineer-craft according to Electricity Association				
two-pole voltage tester	IEC/EN 61243-2	DUSPOL® analog item no. 050261	DUSPOL® expert item no. 050262	DUSPOL® digital item no. 050263
voltage (min. 600 V) and current meter (min. 15 A)	IEC/EN 61010-1 IEC/EN 61010-2-033	MM 2 item no. 044028	MM 6-2 + CC 1 item no. 044087 + 044037	MM 12 + CC 1 item no. 044088 + 044037
current clamp meter	IEC/EN 61010-1 IEC/EN 61010-2-032	CM P2 item no. 044679	CM 2 item no. 044035	CM 12 item no. 044680
insulation tester	IEC/EN 61557-2	IT 101 item no. 044033	IT 105 item no. 044105 or IT 115 item no. 044104	IT 130 item no. 044103
loop ohmmeter	IEC/EN 61557-3	IT 105 item no. 044105		
resistance measuring device	IEC/EN 61557-4	IT 101 item no. 044033		
earthing measuring device	IEC/EN 61557-5	CM E1 item no. 044684	earthing set for IT 115 item no. 044113	earthing set for IT 130 item no. 044113
RCD meter	IEC/EN 61557-6	IT 105 item no. 044105	IT 115 item no. 044104	IT 130 item no. 044103
phase sequence indicator	IEC/EN 61557-7	TRITEST® pro item no. 020052		
instrument for testing electrical equipment (VDE 0701-0702, EN 62353)	IEC/EN 61557-16	ST 725 item no. 050316	ST 755 item no. 050322	ST 760 item no. 050324
measuring device for testing arc welding equipment (EN 60974-4)	IEC/EN 61557-16			

Additional recommendation of BENNING

differential current clamp for error current determination in electric equipment and systems	IEC/EN 61557-13 IEC/EN 61010-1 IEC/EN 61010-2-032	CM 9-1 item no. 044682	CM 9-2 item no. 044685	CM 9-1 item no. 044682 or CM 9-2 item no. 044685
mA current clamp for measuring signal currents (4 to 20 mA DC), troubleshooting in electrical installations	IEC/EN 61010-1 IEC/EN 61010-2-032	CM 11 item no. 044067	CM 11 item no. 044067	CM 11 item no. 044067
continuity tester	IEC/EN 61010-1	DUTEST® pro item no. 050156	DUTEST® pro item no. 050156	DUTEST® pro item no. 050156
illumination sensor				Luxmeter type B for IT 130 item no. 044111

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