



 IEC/EN 61243-3  
DIN VDE 0682-401



**Testing, Measuring and  
Safety Instruments**



## The new generation of DUSPOL® voltage testers safe voltage testing up to 1000 V

### The international standard for voltage testers IEC/EN 61243-3 (DIN VDE 0682-401):2011 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 (DIN VDE 0682-401):2011. The standard creates uniform testing and safety criteria on an international level and remarkably which concentrates on user safety.

The new 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, photo-voltaic systems and wind power plants as well as of hybrid automotive engineering.



Stand-by case  
010911  
(see page 30)

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 underlines 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.

### DUSPOL® voltage testers The original!

#### Product safety at the highest level:

- safe voltage testing up to 1000 V AC/DC
- direct display without actuating a push-button (high-impedance testing)
- load connection via push-button (low-impedance testing)
- battery-independent voltage indication from 50 V AC/DC on
- vibration alert in the test handle
- robust round housing with rubberized gripping surface for outdoor use (protection category IP 65)
- tested and approved in compliance with the current DIN EN 61243-3 (VDE 0682-401):2011 standard

# DUSPOL® voltage testers – the testers with the VDE mark of conformity safe, reliable and powerful

## The new generation of 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
- 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

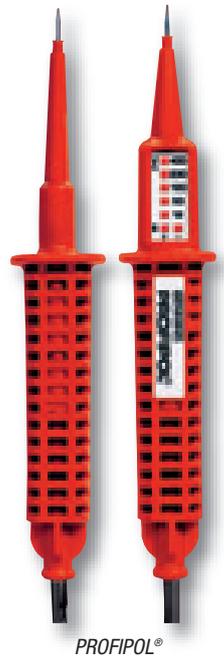
## Additionally for DUSPOL® digital:

- 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



## Voltage and Continuity Tester

	DUSPOL® analog	DUSPOL® expert	DUSPOL® digital	PROFIPOL®
<b>indication</b>	plunger system (illuminated)/LED	LED	LED/LCD (illuminated)	LED
<b>indication steps</b>	12 – 1000 V AC/DC	12 – 1000 V AC/DC	1.0 – 1000 V AC/1200 V DC	6 – 400 V AC/DC
<b>frequency range</b>	–	–	1 – 1000 Hz	–
<b>acoustic and visual continuity test</b>	–	buzzer + yellow LED 0 – 100 kΩ	buzzer + yellow LED 0 – 100 kΩ	–
<b>diode test</b>	–	conducting-state/ non-conducting direction	0.3 – 2.0 V	–
<b>resistance measuring range</b>	–	–	0.1 kΩ – 300 kΩ	–
<b>phase-sequence test</b>	LCD (“R” symbol)	green LEDs (right/left)	green LEDs (right/left)	–
<b>single-pole outer conductor test</b>	LCD (“R” symbol)	red “lightning” LED	red “lightning” LED	–
<b>polarity test</b>	LED (+/-)	LED (+/-)	LCD (+/-)	LED (+/-)
<b>cable break detector</b>	–	yellow LED (flashing)	yellow LED (flashing)	–
<b>load connection via push button</b>	I <sub>s</sub> = 600 mA (1000 V) 30 mA RCD trip	I <sub>s</sub> = 550 mA (1000 V) 30 mA RCD trip	I <sub>s</sub> = 550 mA (1000 V) 30 mA RCD trip	–
<b>vibrating alarm</b>	yes	yes	yes	–
<b>measuring point illumination</b>	–	white LED	white LED	–
<b>protection class</b>	IP 65	IP 65	IP 65	IP 65
<b>item no.</b>	050261	050262	050263	020022





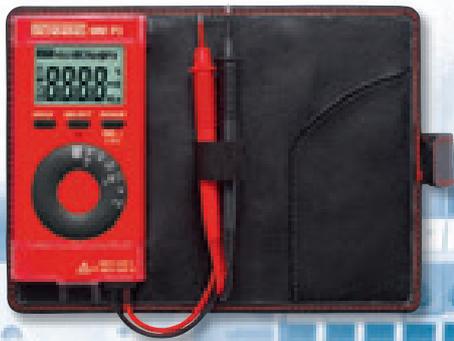
# Digital Multimeter BENNING MM P3, MM 1-1 – MM 1-3, MM 1 – MM 4 reliable and precise in each and every situation

## BENNING MM P3 Pocket-Size Digital Multimeter

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

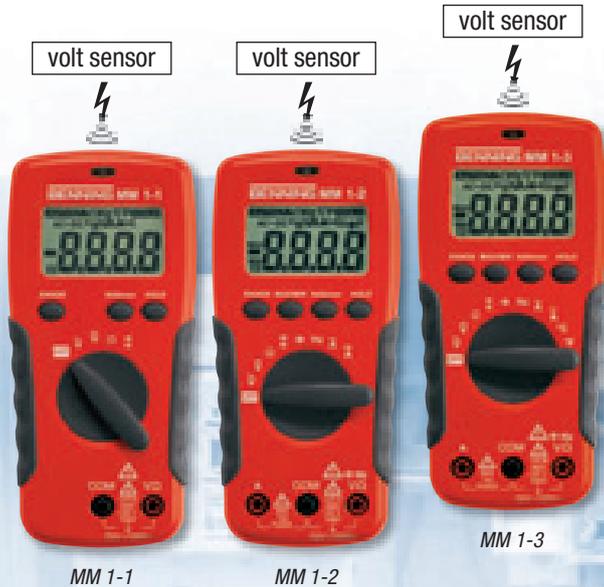


MM P3



## BENNING MM 1-1, MM 1-2 and MM 1-3 Digital Multimeters with Volt Sensor Function

- the integrated Volt sensor signals phase voltages by means of an acoustic signal and a red LED signal
- it localizes cable breaks and defective lamps in exposed cables (cable reel, light chains) via the feeding side of the phase



MM 1-1

MM 1-2

MM 1-3



MM 1



MM 2



MM 3

## BENNING MM 1, MM 2, MM 3 and MM 4 Digital Multimeter

### Technology that inspires, Quality that convinces

- basic measuring for current, voltage, resistance, continuity, diode, capacity and frequency
- automatic and/or manual measuring range selection
- safe current measuring up to 300 A AC via attachable current clamp adapter (MM 4)



MM 4

### Digital Multimeter

	BENNING MM P3	BENNING MM 1-1	BENNING MM 1-2	BENNING MM 1-3	BENNING MM 1	BENNING MM 2	BENNING MM 3
indicating range	5000	2000	2000	2000	3200	2000	2000
basic accuracy	0.6 %	0.5 %	0.5 %	0.5 %	0.5 %	0.5 %	0.5 %
AC voltage	0.1 mV – 600 V	0.1 mV – 750 V	0.1 mV – 750 V	0.1 mV – 750 V	1 mV – 600 V	0.1 mV – 750 V	0.1 mV – 600 V
DC voltage	0.1 mV – 600 V	0.1 mV – 1000 V	0.1 mV – 1000 V	0.1 mV – 1000 V	0.1 mV – 600 V	0.1 mV – 1000 V	0.1 mV – 600 V
AC current	–	–	1 mA – 10 A	1 mA – 10 A	–	0.1 µA – 20 A	0.1 µA – 20 A
DC current	–	–	1 mA – 10 A	1 mA – 10 A	0.1 µA – 3.2 mA	0.1 µA – 20 A	0.1 µA – 20 A
resistance	0.1 Ω – 40 MΩ	0.1 Ω – 20 MΩ	0.1 Ω – 20 MΩ	0.1 Ω – 20 MΩ	0.1 Ω – 32 MΩ	0.1 Ω – 20 MΩ	0.1 Ω – 20 MΩ
continuity/diode	yes/yes	yes/yes	yes/yes	yes/yes	yes/yes	yes/yes	yes/yes
frequency	1 mHz – 5 MHz	–	1 Hz – 20 MHz	1 Hz – 20 MHz	–	–	1 Hz – 200 kHz
capacity	10 pF – 100 µF	–	1 pF – 2 mF	1 pF – 2 mF	–	–	1 pF – 200 µF
temperature	–	–	–	-20 °C up to +800 °C	–	–	–
volt sensor	–	yes	yes	yes	–	–	–
interface	–	–	–	–	–	–	–
software	–	–	–	–	–	–	–
memory	HOLD	HOLD	HOLD, MAX/MIN	HOLD, MAX/MIN	HOLD	–	–
Data Log function	–	–	–	–	–	–	–
measuring method	RMS	RMS	RMS	RMS	RMS	RMS	RMS
measuring category	CAT III 300 V	CAT III 600 V	CAT III 600 V	CAT III 600 V	CAT III 600 V	CAT III 600 V	CAT III 300 V
item no.	044084	044081	044082	044083	044027	044028	044029

# Digital Multimeter **BENNING 7-1 – MM 11** safety and functional diversity without any compromises

## **BENNING MM 7-1** Digital Multimeter offering highest safety for industrial applications

- TRUE RMS measuring method for precise measuring results even for non-sinusoidal signal characteristics
- 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 capacitively/inductively induced voltages
- integrated Volt sensor for non-contact signalling of phase voltages and cable breaks in lines
- LC display with bargraph indication and background lighting



CAT IV 600 V  
TRUE RMS

MM 7-1

## **BENNING MM 9, MM 10** Digital Multimeter of the highest measuring category CAT IV

- highest measuring category CAT IV 600 V allows measurements direct at the source of the low-voltage installation
- precise due to TRUE RMS measuring method
- transmitting measuring results via optical USB interface
- delivery including software *BENNING PC-Win MM 10*



CAT IV 600 V  
TRUE RMS

MM 9



CAT IV 600 V  
TRUE RMS

MM 10



TRUE RMS

MM 11

## **BENNING MM 11** Precision Digital Multimeter with extraordinary features of performance

- highest measuring accuracy of 0.06 % due to TRUE RMS measuring method and 20000 digit resolution
- an ideal measuring device for recording of measuring processes
- large memory capacity of 1000 storage locations and 40000 storage locations for Data Log functions
- transmitting measuring results via optical USB interface
- delivery including software *BENNING PC-Win MM 11*

### Digital Multimeter

	<b>BENNING MM 4</b>	<b>BENNING MM 7-1</b>	<b>BENNING MM 9</b>	<b>BENNING MM 10</b>	<b>BENNING MM 11</b>
<b>indicating range</b>	4200	6000	6000	6000	20000
<b>basic accuracy</b>	0.5 %	0.08 %	0.5 %	0.5 %	0.06 %
<b>AC voltage</b>	1 mV – 600 V	10 µV – 1000 V	0.1 mV – 750 V	0.1 mV – 750 V	1 µV – 750 V
<b>DC voltage</b>	1 mV – 600 V	10 µV – 1000 V	0.1 mV – 1000 V	0.1 mV – 1000 V	1 µV – 1000 V
<b>AC current</b>	0.1 A – 300 A	10 µA – 10 A	1 mA – 10 A	1 mA – 10 A	1 µA – 10 A
<b>DC current</b>	–	10 µA – 10 A	0.1 µA – 10 A	0.1 µA – 10 A	1 µA – 10 A
<b>resistance</b>	0.1 Ω – 42 MΩ	0.1 Ω – 40 MΩ	0.1 Ω – 60 MΩ	0.1 Ω – 60 MΩ	10 mΩ – 2 GΩ
<b>continuity/diode</b>	yes/yes	yes/yes	yes/yes	yes/yes	yes/yes
<b>frequency</b>	–	0.01 Hz – 100 kHz	1 Hz – 60 MHz	1 Hz – 60 MHz	0.01 Hz – 1 MHz
<b>capacity</b>	–	1 nF – 10 mF	1 pF – 6 mF	1 pF – 6 mF	1 pF – 40 mF
<b>temperature</b>	–	-40 °C up to +400 °C	–	–	-200 °C up to +1200 °C
<b>volt sensor</b>	–	yes	–	–	–
<b>interface</b>	–	–	–	USB	USB
<b>software</b>	–	–	–	<i>PC-Win MM 10</i>	<i>PC-Win MM 11</i>
<b>memory</b>	HOLD	HOLD, MAX/MIN	HOLD, MAX/MIN	HOLD, MAX/MIN	1000 memory locations
<b>Data Log function</b>	–	–	–	–	40000 memory locations
<b>measuring method</b>	RMS	TRUE RMS	TRUE RMS	TRUE RMS	TRUE RMS
<b>measuring category</b>	CAT III 300 V	CAT IV 600 V	CAT IV 600 V	CAT IV 600 V	CAT III 600 V
<b>item no.</b>	044073	044085	044078	044079	044080

## **BENNING PC-Win MM 10/MM 11** Software for logging and analysis

- software for reading and logging of measurement series
- visualisation of measurement series via line diagram and table
- scanning rate variable from 0.5 sec. up to 10 min.
- storage of measurement series as text file



Software *PC-Win MM 10/MM 11*



All Digital Multimeters including protective case, safety leads and battery set.



# Digital Current Clamp Multimeter

## BENNING CM 1-1 – CM 1-3, CM 2, CM 3, CC 1 – CC 3

### BENNING CM 1-1, CM 1-2 and CM 1-3

#### Digital Current Clamp Multimeter for AC current

#### Innovative technology, practical design

- safe current measuring up to 400 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 (CM 1-3)
- it localizes cable breaks and defective lamps in exposed cables (cable reel, light chains) via the feeding side of the phase (CM 1-3)

### BENNING CM 2 and CM 3

#### Digital Current Clamp Multimeter for AC/DC current

- safe and non-contact measuring of high currents
- DC and AC current measuring up to 600 A AC/DC
- measurement of low currents (automotive, photovoltaics, industry) (CM 2)
- measuring inputs for voltage, resistance and continuity test (CM 2)
- precise due to TRUE RMS measuring method (CM 2)



### BENNING CC 1, CC 2 and CC 3

#### AC and AC/DC current clamp adapters

- safe AC current measuring up to 200 A/400 A
- connection via 4 mm safety measuring leads



### Digital Current Clamp Multimeter/Current Clamp Adapter

	BENNING CC 1	BENNING CC 2	BENNING CC 3	BENNING CM 1-1	BENNING CM 1-2	BENNING CM 1-3	BENNING CM 2	BENNING CM 3
indicating range	–	–	–	2000	2000	2000	4000	2000
basic accuracy	1.9 %	1 % – 3 %	1 % – 2 %	2 %	1 %	1 %	0.5 %	1.9 %
AC voltage	–	–	–	–	0.1 V – 600 V	0.1 V – 750 V	1 mV – 600 V	–
DC voltage	–	–	–	–	0.1 V – 600 V	0.1 V – 1000 V	0.1 mV – 600 V	–
AC current	1 A – 400 A	0.5 A – 200 A	0.2 A – 300 A	10 mA – 400 A	0.1 A – 400 A	0.1 A – 200 A	100 mA – 300 A	0.1 A – 600 A
DC current	–	–	0.2 A – 300 A	–	–	–	10 mA – 300 A	0.1 A – 600 A
resistance	–	–	–	–	0.1 Ω – 20 MΩ	0.1 Ω – 20 MΩ	0.1 Ω – 40 MΩ	–
continuity/diode	–/–	–/–	–/–	–/–	yes/–	yes/yes	yes/–	–/–
frequency	–	–	–	–	–	–	–	–
effective power	–	–	–	–	–	–	–	–
power factor (cos φ)	–	–	–	–	–	–	–	–
temperature	–	–	–	–	–	–	–	–
volt sensor	–	–	–	–	–	yes	–	–
memory	–	–	–	HOLD, MAX	HOLD	HOLD	HOLD, MAX	HOLD
measuring method	–	–	–	RMS	RMS	RMS	TRUE RMS	RMS
max. clamp opening	30 mm	21 mm	25 mm	30 mm	30 mm	16 mm	25 mm	38 mm
measuring category	CAT III 300 V	CAT III 600 V	CAT III 600 V	CAT III 600 V	CAT III 600 V	CAT IV 600 V	CAT III 300 V	CAT III 300 V
item no.	044037	044110	044038	044061	044062	044063	044035	044031

# Digital Current Clamp Multimeter

## BENNING CM 4 – CM 9

### BENNING CM 4, CM 6, CM 7

#### Digital Current Clamp Multimeter of the highest measuring category

- precise due to TRUE RMS measuring method
- safe current measuring up to 1000 A AC/DC
- highest measuring category CAT IV 600 V offering optimum safety

**AUTOTEST-function**



CAT IV 600 V  
TRUE RMS

CM 5-1

CAT IV 600 V  
TRUE RMS

CM 7  
(CM 6 fig. similar)

### BENNING CM 5-1

#### Digital Current-Clamp Multimeter

- automatic selection of the correct measuring function for TRUE RMS voltage/current (AC/DC), resistance, continuity and diode test
- safe and easy operation – measuring errors due to incorrect measuring range selection are excluded
- short response time due to 5 scanning values per second
- voltage measurement with low input impedance (LoZ) to suppress capacitively/inductively induced voltages

### BENNING CM 8

#### Power Current-Clamp Multimeter

#### Power analysis for single-phase and three-phase mains

- TRUE-RMS measurements up to 600 V, 600 A AC/DC
- effective power measurements up to 360 kW
- calculation of the power factor  $\cos \phi$
- indication of the load type (inductive, capacitive)
- bipolar phase sequence test in three-phase mains
- measuring inputs for voltage, resistance, continuity, diode, frequency and temperature
- measurement of inrush currents (motors etc.)



TRUE RMS

CM 8  
(CM 4 fig. similar)

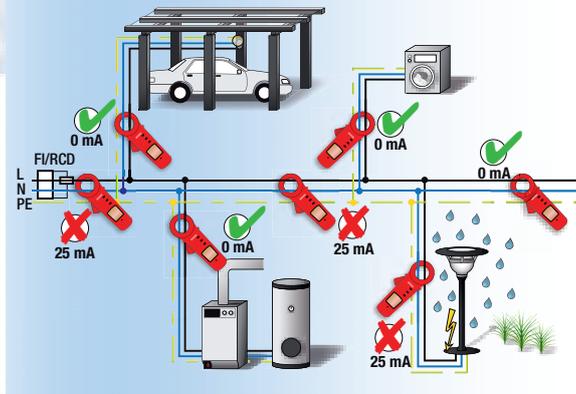
### BENNING CM 9

#### TRUE RMS Leakage Current Clamp with a Resolution of 1 $\mu$ A

#### The alternative solution for insulation measurements

- measurement of leakage currents and differential currents in electrical systems (VDE 0100) and devices (VDE 0701-0702, BGV A3, BetrSichV (= German Health and Safety at Work Regulations))
- highest resolution of 1  $\mu$ A in the 6 mA measuring range
- measurement without switch-off during normal operation of the system/device, the perfect solution for preventive maintenance
- precise and reproducible measuring results up to 100 A
- optimum screening against external magnetic fields

#### Differential current measurement method with BENNING CM 9



Leakage

TRUE RMS

CM 9

### Digital Current Clamp Multimeter

	BENNING CM 4	BENNING CM 5-1	BENNING CM 6	BENNING CM 7	BENNING CM 8	BENNING CM 9
indicating range	4000	9999	4000	4000	6000	6000
basic accuracy	0.7 %	0.9 %	0.7 %	0.7 %	0.7 %	1 %
AC voltage	0.1 V – 600 V	1.3 V – 750 V	0.1 V – 750 V	0.1 V – 750 V	10 mV – 600 V	–
DC voltage	0.1 V – 600 V	0.7 V – 1000 V	0.1 V – 1000 V	0.1 V – 1000 V	10 mV – 600 V	–
AC current	0.1 A – 600 A	0.9 A – 600 A	0.1 A – 1000 A	0.1 A – 1000 A	0.1 A – 600 A	1 $\mu$ A – 100 A
DC current	–	0.9 A – 600 A	–	0.1 A – 1000 A	0.1 A – 600 A	–
resistance	0.1 $\Omega$ – 400 $\Omega$	1 $\Omega$ – 10 k $\Omega$	0.1 $\Omega$ – 400 $\Omega$	0.1 $\Omega$ – 400 $\Omega$	0.1 $\Omega$ – 20 k $\Omega$	–
continuity/diode	yes/–	yes/yes	yes/–	yes/–	yes/yes	–/–
frequency	1 Hz – 400 Hz	–	1 Hz – 400 Hz	1 Hz – 400 Hz	20 Hz – 4 kHz	–
effective power	–	–	–	–	1 W – 360 kW	–
power factor ( $\cos \phi$ )	–	–	–	–	$\pm 0.00$ – 1.00	–
temperature	–	–	–	–	-50 °C up to +1000 °C	–
volt sensor	–	–	–	–	–	–
memory	HOLD, MAX/MIN PEAK	HOLD	HOLD, MAX/MIN PEAK	HOLD, MAX/MIN PEAK, ZERO	HOLD, MAX/MIN PEAK, INRUSH	HOLD, PEAK
measuring method	RMS	TRUE RMS	RMS	TRUE RMS	TRUE RMS	TRUE RMS
max. clamp opening	37 mm	35 mm	53 mm	53 mm	40 mm	40 mm
measuring category	CAT III 600 V	CAT IV 600 V	CAT IV 600 V	CAT IV 600 V	CAT III 600 V	CAT III 300 V
item no.	044056	044066	044058	044059	044064	044065



differential current measurement method



# BENNING ST 710 Appliance Tester (VDE 0701-0702) mobile and network-independent testing of electrical appliances

## BENNING ST 710

### Battery-operated Appliance Tester for mobile testing of electrical devices

- testing in compliance with DIN VDE 0701-0702 (EN 62638), BGV A3, BetrSichV (German Health and Safety at Work Regulations), ÖVE/ÖNORM E 8701, 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 BENNING ST 710

- automatic testing procedure for devices of class I (key 1), class II/III (key 2) and line test (key 3)
- 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 DIN VDE standard
- indication of correct function key in case of incorrect operation and if the test sample is not switched on
- sufficient battery capacity (6 x 1.5 V, mignon, AA, IEC LR6) 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](http://www.benning.de)!



Test badges



Shock-proof socket onto shock-proof plug for CM 9

16 A/32 A CEE coupling onto CEE plug, 5-pin, for CM 9

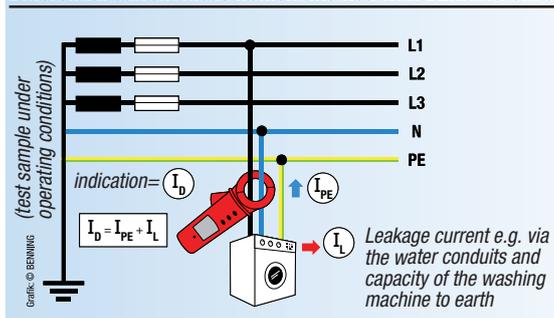
Leakage CM 9

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

### BENNING ST 710 Battery-operated Appliance Tester

	BENNING ST 710
indication	graphic display
protective conductor resistance	0.05 Ω – 20 Ω
insulating resistance (500 V DC)	0.1 MΩ – 20 MΩ
protective conductor current/contact current by means of alternative leakage current measurement method	0.1 mA – 20 mA
line test	R <sub>PE</sub> , R <sub>ISO</sub> : 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, battery set
item no.	050308

### Differential current measurement method with BENNING CM 9



### Optional accessories for BENNING ST 710/ST 720/ST 750 A

- test badges "next test" (300 pieces) item no. 756212
- measuring adapters for three-phase loads (passive) (see page 9) item no. 044122/044123
- leakage Current Clamp BENNING CM 9 for the measurement of differential current, protective conductor current and load current of single-phase and three-phase loads (see page 7) item no. 044065
- measuring adapters for leakage current clamp BENNING CM 9
  - single-phase, conductors led through individually and with double insulation shock-proof socket/shock-proof plug item no. 044131
  - three-phase, conductors led through individually and with double insulation 16 A CEE coupling-CEE plug, 5-pin item no. 044127
  - 32 A CEE coupling-CEE plug, 5-pin item no. 044128

See page 30 + 31 for further accessories



Scope of delivery BENNING ST 710

# BENNING ST 720 Appliance Tester (VDE 0701-0702) testing of electrical appliances under operating conditions

## BENNING ST 720

### Mains-operated and battery-operated Appliance Tester for mobile testing of electrical devices

- testing in compliance with DIN VDE 0701-0702 (EN 62638), BGV A3, BetrSichV (German Health and Safety at Work Regulations), ÖVE/ÖNORM E 8701, 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 BENNING ST 720

- mains operating mode for tests under operating conditions
- battery operating mode for mobile testing
- automatic testing procedure for devices of class I (key 1), class II/III (key 2) and line test (key 1)
- reduction of the ISO testing voltage to 250 V/ 500 V for devices with overvoltage arresters/electronic devices
- testing of RCDs with 30 mA
- measuring result with “pass/fail” information
- limiting values preset in compliance with DIN VDE standard
- indication of correct function key in case of incorrect operation, overload and if the test sample is not switched on
- sufficient battery capacity (6 x 1.5 V, mignon, AA, IEC LR6) for > 2500 test samples

### Measuring functions

- protective conductor resistance with a testing current of 200 mA DC and automatic polarity reversal
- insulating resistance with a testing voltage of 250 V/500 V DC
- mains operating mode: protective conductor current/contact current by means of differential current/direct measurement method with automatic mains pole reversal
- battery operating mode: protective conductor current/contact current by means of alternative leakage current measurement method
- tripping time measurement of RCDs with 30 mA
- voltage measurement on external shock-proof socket (L-N, L-PE, N-PE)
- active testing of three-phase devices under operating conditions by means of optional measuring adapters (item no. 044140/044141)

• differential current measurement method  
• testing of RCDs with 30 mA  
• active testing of three-phase loads  
• ISO testing voltage of 250 V



16 A/32 A CEE 5-pin, active, for ST 720



16 A/32 A CEE coupling, 5-pin onto shock-proof plug (passive) for ST 710/ST 720/ST 750 A



16 A/32 A CEE coupling, 3-pin onto shock-proof plug for ST 710/ST 720/ST 750 A



Shock-proof 4 mm plug for devices without shock-proof plug for ST 710/ST 720



ST 720 050313: with socket of type E (B/F/CZ/SK/PL)

### BENNING ST 720 Mains-operated and battery-operated Appliance Tester

	BENNING ST 720
indication	graphic display
protective conductor resistance	0.05 Ω – 20 Ω
insulation resistance (250 V/500 V DC)	0.1 MΩ – 20 MΩ
protective conductor current/contact current by means of - differential current measurement method	0.25 mA – 20 mA
- alternative leakage current measurement method	0.25 mA – 20 mA
- direct measurement method	0.1 mA – 2 mA
line test	R <sub>PE</sub> , R <sub>ISO</sub> , short-circuit test and continuity test of phase conductor (L) and neutral conductor (N)
testing current of RCD	30 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
scope of delivery	carrying case, test cable with alligator clip, mains connection cable, appliance cable, battery set
item no.	050312

### Optional accessories for BENNING ST 720

- measuring adapters for three-phase loads (active)**  
for measuring R<sub>PE</sub> and I<sub>PE</sub> under operating conditions
- 16 A CEE 5-pin active **item no. 044140**
  - 32 A CEE 5-pin active **item no. 044141**

### BENNING ST 710/ST 720/ST 750 A

- measuring adapters for three-phase loads (passive)**  
for measurement of R<sub>PE</sub>, R<sub>ISO</sub> and I<sub>EA</sub>
- 16 A CEE coupling, 5-pin - shock-proof plug **item no. 044122**
  - 32 A CEE coupling, 5-pin - shock-proof plug **item no. 044123**
- measuring adapters for single-phase loads**  
for measurement of R<sub>PE</sub>, R<sub>ISO</sub> and I<sub>EA</sub>
- 16 A CEE coupling, 3-pin - shock-proof plug **item no. 044143**
  - 32 A CEE coupling, 3-pin - shock-proof plug **item no. 044144**
- shock-proof 4 mm plug** for devices without shock-proof plug **item no. 044142**



Scope of delivery BENNING ST 720



# BENNING ST 750 A Appliance Tester (VDE 0701-0702, VDE 0751) testing of electrical appliances and medical electrical devices

AddIn for Mebedo  
test software  
**ELEKTROmanager**  
and fundamed

## BENNING ST 750 A Appliance Tester for testing electrical appliances and medical electrical devices

- testing according to
  - DIN VDE 0701-0702 (EN 62638): testing of electrical appliances/equipment
  - DIN VDE 0751-1 (EN 62353): testing of medical electrical devices, such as hospital bed
  - German Health and Safety at Work Regulation
- innovative - indication and operation via colour LCD touchscreen
- powerful - 2 GB memory card for more than 100000 tests
- all in one - one appliance tester for all VDE tests

### Features

- automatic and auto-configurable testing procedures
- complete test sample/customer database can be stored on SD card and thus is directly available at the place of inspection
- management of large test sample inventories with more than 100000 storable device tests per 2 GB SD card
- direct entry via touchscreen and external keyboard/mouse
- measuring result with "pass/fail" indication and acoustic warning signal, if the test has been failed
- help function and schematic connecting diagrams
- separate 4 mm test sockets and IEC connector
- 3 x USB interface for PC, external keyboard and RFID reader/writer
- 1 x RS 232 interface for barcode scanner, printer and SD card slot
- free firmware update possible via SD card/USB stick

### Measuring functions

- protective conductor resistance with 200 mA DC and a testing current of 10 A AC
- insulating resistance with a testing voltage of 50 V to 500 V (adjustable)
- protective conductor current/contact current via differential current measurement method, alternative leakage current measurement method or direct measurement
- functional test with indication of leakage current, mains voltage, load current, effective power, apparent power and measuring time
- testing of device connecting cables and extension cables
- testing of three-phase loads by means of optional measuring adapters
- additionally for VDE 0751-1: device leakage current, leakage current of application part type B, type BF and type CF

TRUE RMS



Leakage

CM 9

Active testing of  
three-phase loads by  
means of test procedures  
with BENNING CM 9  
differential current clamp  
and measuring adapter



044127/044128

## BENNING ST 750 A Appliance Tester (VDE 0701-0702, VDE 0751)

	BENNING ST 750 A
display	5.7" colour LCD touchscreen, ¼ VGA
protective conductor resistance	1 mΩ – 20 Ω
insulation resistance	0.1 MΩ – 100 MΩ
protective conductor current/ contact current via differential current measurement method, alternative leakage current measurement method or direct measurement	0.05 mA – 25 mA
device leakage current and leakage current of the applied part for medical electrical devices	0.05 mA – 25 mA
line test	R <sub>PE</sub> , R <sub>ISO</sub> , I <sub>PE</sub> , short-circuit test and continuity test of phase conductor (L) and neutral conductor (N)
voltage/current	1 V - 360 V/0.1 A - 16 A
effective power/apparent power	20 W - 4000 W
interface	3 x USB, 1 x RS 232
dimensions/weight	405 x 330 x 165 mm/approx. 6 kg
scope of delivery	tester in waterproof (IP 67), break-proof case, test cable with alligator clip, appliance cable, input stylus, 2 GB SD card
item no.	050310



ST 750 A



Touchscreen

Application by  
touchscreen!

### Order recommendation

- appliance tester **BENNING ST 750 A** item no. 050320
- software **BENNING PC-Win ST 750** item no. 047001
- barcode scanner item no. 009369
- barcode labels (1000 pieces) item no. 756301
- test badges "next test" (300 pieces) (see page 8) item no. 756212

### Optional accessories for BENNING ST 750 A

#### measuring adapters for three-phase loads (passive)

for measurement of R<sub>PE</sub>, R<sub>ISO</sub> and I<sub>EA</sub>

16 A CEE coupling, 5-pin - shock-proof plug item no. 044122

32 A CEE coupling, 5-pin - shock-proof plug item no. 044123

**Leakage Current Clamp BENNING CM 9** for measurement of differential current, protective conductor current, load current of loads (see pages 7/8) item no. 044065

**measuring adapters for leakage current clamp BENNING CM 9 single-phase**, conductors led through individually and with double insulation shock-proof socket/shock-proof plug item no. 044131

**three-phase**, conductors led through individually and with double insulation 16 A CEE-CEE, 5-pin item no. 044127

32 A CEE-CEE, 5-pin item no. 044128

See pages 30 and 31 for further accessories

# BENNING PC-Win ST 750 documentation software

## helpful accessories for efficient testing



Software PC-Win ST 750

### Software BENNING PC-Win ST 750

- professional PC software for the management and documentation of recorded measuring values
- explicit database structure with customer, department, test sample and test result including the test date
- easily creating and copying customers and test samples
- printing of the test results as single log and serial log
- bidirectional data transmission PC ↔ BENNING ST 750 A
- import and export function of existing test sample and customer databases via MS Excel®
- free software update to the latest version available per download

### Portable log printer BENNING PT 1 with Bluetooth®

- the perfect solution for printing test records rapidly on site
- high printing speed due to direct thermal printing process
- data transmission via Bluetooth® or RS232 interface
- power supply by means of rechargeable NiMH battery pack
- width/length of thermographic paper rolls: 58 mm/13 m
- included in delivery: 6 V battery pack, mains supply unit, belt clip, wall fastening, Bluetooth® dongle for BENNING ST 750, 2 rolls of thermographic paper and RS232 cable



BENNING PT 1 printer



Roll of thermographic paper



Barcode label

### Test sample identification via barcode scanner/labels

- particularly suited for repetitive testing and identification of large test sample inventories in offices, administrations etc.
- highly adhesive PVC barcode labels with barcode and consecutive numbering (reels of 1000 pieces)
- barcode scanner with RS 232 interface supports all conventional barcodes such as UPC/EAN/JAN, Code 39, Code 128 etc.



Barcode scanner

### Compact industrial keyboard

- high-quality functional keyboard with integrated trackball for comfortable input of test sample/customer data on site
- compact keyboard dimensions for safe transport in the BENNING ST 750 A appliance tester
- data transmission via Bluetooth® or USB interface
- increased protection against dust and splash water



industrial keyboard

### Test sample identification via RFID reader/writer or transponder

- test sample identification via radio frequency ("Radio Frequency Identification") without visual contact or direct contact of the transponder
- RFID technology stores the test sample data/measuring values directly onto a memory chip (transponder) on the test sample
- particularly suited for rough industrial environments
- tag-type transponder for attachment by means of cable ties
- ring clip transponder for attachment to the mains supply line
- epoxy resin transponder (self-adhesive) for attachment into the housing or onto the surface of the housing
- transponder frequency: HF 13.56 MHz; memory depth: 10 kbit



RFID reader/writer



Tag-type transponder



Ring clip transponder



Self-adhesive epoxy resin transponder

### Optional accessories for BENNING ST 750 A

<b>software BENNING PC-Win ST 750</b> on CD-ROM incl. USB cable	<b>item no. 047001</b>	<b>industrial keyboard</b> with USB interface	<b>item no. 044154</b>
<b>barcode scanner</b> with RS 232 interface	<b>item no. 009369</b>	<b>RFID reader/writer</b> with USB interface	<b>item no. 009370</b>
<b>barcode labels</b> with consecutive numeric representation (1000 pieces)	<b>item no. 756301</b>	<b>RFID transponder, tag-type</b> , height/width: 43 x 34 mm (100 pieces)	<b>item no. 044139</b>
<b>printer BENNING PT 1</b> with Bluetooth® and RS 232 interface	<b>item no. 044150</b>	<b>RFID transponder, ring clip</b> , inside diameter: 7.5 mm (100 pieces)	<b>item no. 044138</b>
<b>roll of thermographic paper</b> (20 pieces)	<b>item no. 044151</b>	<b>RFID transponder, self-adhesive</b> , diameter/height: 17 mm/2.5 mm (100 pieces)	<b>item no. 044137</b>

See pages 30 and 31 for further accessories



## Safety Instruments **BENNING IT 101, IT 110 and IT 120 B** testing of electrical systems in compliance with the standards

### **BENNING IT 101**

#### **Insulation and Resistance Measuring Device**

- measurement of insulating resistance and calculation of the resulting leakage current
- testing voltages of 50 V, 100 V, 250 V, 500 V and 1000 V
- selectable limiting values for ISO measurement, green LED for "PASS", red LED for testing voltage/external voltage
- resistance measurement with a testing current of 200 mA for testing protective conductor connections
- measurement of polarization index (PI) and dielectric absorption rate (DAR)
- 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



CAT IV 600 V  
TRUE RMS

IT 101



IT 110



BENNING TA 5

### **BENNING IT 101**

#### **Insulation and Resistance Measuring Device**

	<b>BENNING IT 101</b>
<b>indicating range</b>	4000 digits (illumination)
<b>low-impedance resistance</b>	0.01 $\Omega$ – 40 $\Omega$
<b>insulation resistance</b>	1 k $\Omega$ – 20 G $\Omega$
<b>resistance</b>	0.01 $\Omega$ – 40 k $\Omega$
<b>voltage</b>	0.1 V – 600 V AC/DC TRUE RMS
<b>supplementary function</b>	leakage current, polarization index (PI), dielectric absorption rate (DAR), automatic discharge function, null balance of the measuring leads
<b>measured value memory</b>	500 measuring results
<b>measuring category</b>	CAT IV 600 V
<b>item no.</b>	044033

### **BENNING IT 110, BENNING IT 120 B**

#### **Installation Testers**

#### **For safety tests on electrical systems according to DIN VDE 0100 and IEC 60364**

Multifunctional installation testers for complete testing and efficient troubleshooting of electrical systems

- measurement of the protective conductor line and of the equipotential bonding line with a testing current of 200 mA
- measurement of the insulation resistance with testing voltages of 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 short-circuit current (PFC/PSC)
- complete testing of RCDs with nominal fault currents of 10/30/100/300/500/1000 mA
- measurement of contact voltage (without tripping), tripping time and tripping current (ramp test) of residual current operated device (RCD)
- phase-sequence testing in three-phase mains
- voltage measurement up to 500 V and online voltage monitoring

### **BENNING IT 110**

#### **Installation Tester**

	<b>BENNING IT 110</b>
<b>display</b>	graphic display (illuminated)
<b>low-impedance resistance</b>	0.01 $\Omega$ – 2000 $\Omega$
<b>insulation resistance</b>	1 k $\Omega$ – 1000 M $\Omega$
<b>line impedance (L-N/L)</b>	0.01 $\Omega$ – 2000 $\Omega$
<b>loop impedance (L-PE)</b>	0.01 $\Omega$ – 2000 $\Omega$
<b>short-circuit current</b>	0.01 A – 24.4 kA
<b>RCD testing</b>	tripping time, tripping current, contact voltage
<b>type AC, A</b>	yes
<b>phase sequence</b>	yes
<b>voltage, frequency</b>	1 V – 500 V, 45 Hz – 65 Hz
<b>item no.</b>	044100

#### **Optional accessories for**

#### **BENNING IT 101/IT 110/IT 120 B**

40 m measurement cable **BENNING TA 5** with practical winder, strap, for the measurement of protective and bonding conductors, connection:  $\varnothing$  4 mm safety test

item no. 044039



Scope of delivery **BENNING IT 101**

# BENNING IT 110, IT 120 B Installation Testers the perfect solution for efficient testing

## Features

### BENNING IT 110, BENNING IT 120 B

- all measuring functions can be selected directly by means of a rotary switch
- switchable probe tip for releasing the measuring process
- 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

## Additional functions

### BENNING IT 120 B

in addition to the *BENNING IT 110*:

- testing of universal current-sensitive RCDs of type B
- current measurement (TRUE RMS) by means of current clamp adapter (optional)
- illumination measurement by means of lux sensor (optional)
- earthing measurement by means of three-wire measuring method (optionally with earthing set)
- integrated measured value memory for 500 measurements
- USB and RS 232 interface
- *BENNING PC-Win IT 120 B* software included in delivery

## Logging software with Test Log according to ZVEH

### BENNING PC-Win IT 120 B

- PC software for reading the stored test data
- creation of test logs with handover and status report according to ZVEH
- structuring and export function of the test data

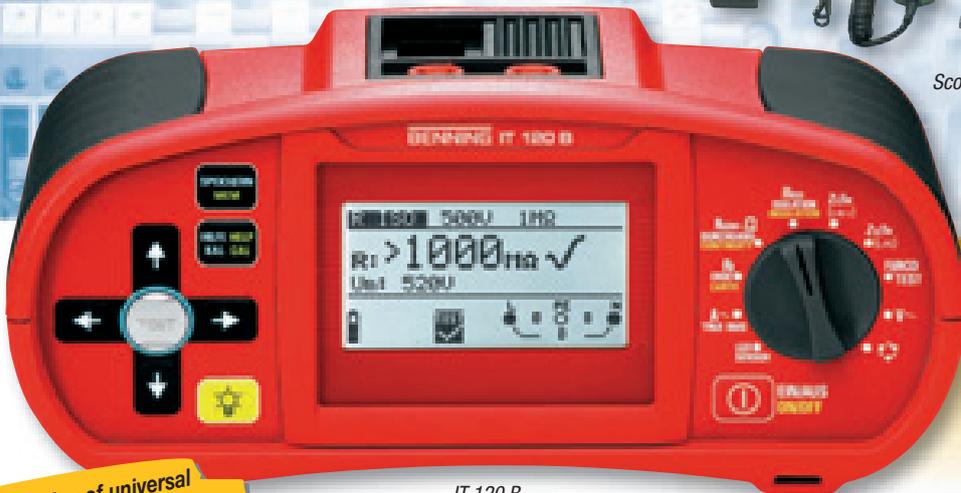


Test log according to ZVEH



Scope of delivery of the *BENNING IT 120 B*

AddIn for Mebedo test software **ELEKTROmanager** and fundamed



IT 120 B

Testing of universal current-sensitive RCDs of type B

## INFORMATION:

RCDs of type B are increasingly used for multi-phase equipment of power electronics. In case of a fault, these devices also detect smooth DC fault currents and high-frequency AC fault currents.



BENNING CC 2



BENNING luxmeter type B



Earthing set

## BENNING IT 120 B Installation Testers

	BENNING IT 120 B
display	graphic display (illuminated)
low-impedance resistance	0.01 Ω – 2000 Ω
insulation resistance	1 kΩ – 1000 MΩ
line impedance (L-N/L)	0.01 Ω – 2000 Ω
loop impedance (L-PE)	0.01 Ω – 2000 Ω
short-circuit current	0.01 A – 24.4 kA
RCD testing type AC, A, B	tripping time, tripping current, contact voltage
phase sequence	yes
voltage, frequency	1 V – 500 V, 45 Hz – 65 Hz
earth resistance	0.01 Ω – 2000 Ω
current (TRUE RMS)	0.1 mA – 20 A (by means of the clamp)
luminous intensity	0.01 lux – 20 klux (by means of sensor)
measured value memory	500 measuring results
interfaces	USB, RS 232
incl. software	BENNING PC-Win IT 120 B
item no.	044102

## Scope of delivery of the installation testers

	BENNING IT 110	BENNING IT 120 B
tester incl. carrying case / carrying strap	x	x
switchable probe tip	x	x
test cable with shock-proof plug	x	x
universal test cable, 3 x L = 1.5 m	x	x
3 x test probe, 3 x crocodile clips	x	x
charger with 6 NiMH storage batteries (AA)	x	x
PC software BENNING PC-Win IT 120 B		x
USB and RS 232 cable		x

## Optional accessories for BENNING IT 120 B

current clamp adapter <b>BENNING CC 2</b>	0.5 A – 20 A AC (200 A AC)	item no. 044110
illumination sensor <b>BENNING luxmeter type B</b>	Accuracy: 5 %	item no. 044111
earthing set consisting of 2 earth rods and 3 test cables (2 x L = 20 m, 1 x L = 4.5 m)		item no. 044113



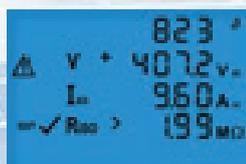
# BENNING PV 1-1 installation tester for photovoltaic systems

## Commissioning tests and periodic inspection of PV systems



### BENNING PV 1-1 PV installation tester for testing grid-connected PV systems

- tests in compliance with VDE 0126-23 (DIN 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



Measured values transmitted via wireless connection



### Application

For commissioning tests and periodic inspection of grid-connected PV systems according to VDE 0126-23. Meets all requirements necessary for system documentation of the DC side. Ideal for troubleshooting, maintenance work and performance evaluation of PV systems.

### Features of the BENNING PV 1-1

- easy and safe operation by means of keys
- automatic test procedure for polarity, open-circuit voltage, short-circuit current and insulating resistance
- RISO measurement with "PASS/FAIL" indication
- memory of measured values for 200 PV strings
- integrated real-time clock with date/time stamp for each measurement
- USB interface and download software for the preparation of test certificates in MS Excel®
- safe contacting even during energy supply of the PV system
- direct connection by means of MC4 and "Sunclix" connectors

### Measuring functions

- continuity test of the protective conductor and of the equipotential bonding conductor with a testing current of 200 mA
- polarity test of the DC current cables
- open-circuit voltage for each PV string of up to 1000 VDC
- short-circuit current for each PV string of up to 15 ADC
- insulating resistance with a testing voltage of 250 V, 500 V and 1000 VDC
- DC string current and AC current by means of *BENNING CC 3* current measuring clamp up to 40 A AC/DC (optional)

### Radio interface "Wireless SUN Link"

- wireless connection to the insolation and temperature measurement instrument *BENNING SUN 2* (optional)
- direct display of the insolation value in W/m<sup>2</sup>
- storage of the electric quantities to be measured considering the insolation and the module/ambient temperature in real time



BENNING CC 3



BENNING TA 5

### BENNING PV 1-1 Installation tester for photovoltaic systems

	BENNING PV 1-1
display	graphic display (illuminated)
protective conductor resistance	0.05 Ω – 199 Ω
insulating resistance	0.2 MΩ – 199 MΩ
open-circuit voltage with polarity	5 V to 1000 V DC
short-circuit current	0.5 A to 15 A DC
DC string current/ AC current	0.2 A to 40 A DC/AC (by means of <i>BENNING CC 3</i> )
insolation	100 to 1250 W/m <sup>2</sup> (by means of <i>BENNING SUN 2</i> )
PV module/ambient temperature	-30 °C to +125 °C (by means of <i>BENNING SUN 2</i> )
voltage via 4 mm sockets	30 to 440 V AC/DC
interface/radio interface	1 x USB/433 MHz signal
dimensions/weight	270 x 115 x 55 mm/2.6 kg
scope of delivery	carrying case, measuring lines, alligator clips, MC4 and "Sunclix" PV measuring lines, batteries, USB cable, download software on CD-ROM
item no.	050421

### Optional accessories for BENNING PV 1-1

Current clamp adapter *BENNING CC 3* for AC/DC current measurement 0.2 to 300 A AC/DC **item no. 044038**

Measuring line *BENNING TA 5* for protective conductor measurement Line length: 40 m **item no. 044039**



BENNING PV 1-1  
scope of delivery

# Insolation and temperature measuring instrument **BENNING SUN 2** with digital compass and inclinometer



## **BENNING SUN 2**

### Insolation and temperature measuring instrument for PV systems and solar thermal systems

Ideal for the planning, commissioning tests and periodic inspection of grid-connected PV systems according to VDE 0126-23 as well as for testing solar thermal systems.

### Features of the **BENNING SUN 2**

- universal 4-in-1 measuring instrument for all testing and maintenance work as well as for economic efficiency analysis
- temperature-compensated PV reference cell for precise insolation measurement
- precise temperature measurement by means of high-precision sensors
- data logger for 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®
- data logger with energy-saving stand-by mode
- shock-absorbing protective rubber holster

### Radio interface – “Wireless SUN Link”

- wireless transmission of insolation, module temperature and ambient temperature including date/time stamp to the **BENNING PV 1-1**

### Measuring functions

- insolation measurement in W/m<sup>2</sup> or BTU/h/ft<sup>2</sup>
- dual-channel temperature sensor for measuring the module temperature and the ambient temperature
- digital compass for determining the cardinal direction
- inclinometer for determining the module/roof pitch



Insolation, angle of inclination and compass bearing



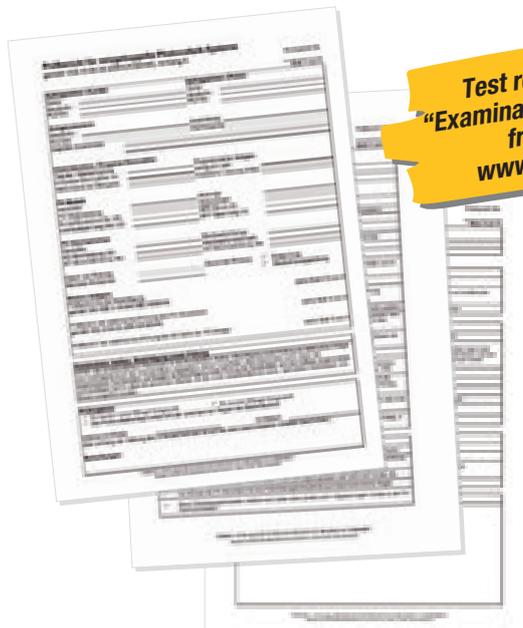
Insolation, PV module/ambient temperature



Wireless transmission of measuring data (alternatively import of measuring data by means of date/time stamp)

## **BENNING SUN 2** Insolation and temperature measuring instrument

	<b>BENNING SUN 2</b>
display	graphic display
insolation	100 to 1250 W/m <sup>2</sup>
PV module/ambient temperature	-30 °C to +125 °C
compass bearing (orientation)	0° to 360°
angle of inclination measurement	0° to 80°
real-time clock	date/time stamp
measured value memory	5000 data records for insolation and temperature
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, battery set, USB cable, download software on CD-ROM
item no.	050420



Test report forms  
“Examination of PV systems”  
free under  
[www.benning.de](http://www.benning.de)



**BENNING SUN 2**  
scope of delivery



## Demonstration case for practice-oriented application of testers, measuring instruments and safety instruments

### BENNING DB 1

Demonstration case for testing and measuring primary quantities of electrical engineering

### BENNING DB 2

Demonstration case for practice-oriented application and training concerning VDE 0100 installation testers

For further information visit our website [www.benning.de](http://www.benning.de)



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



portable case for simulation of electrical systems conforming to standards according to DIN VDE 0100/105

#### Demonstration case

	<b>BENNING DB 1</b>
<b>power supply</b>	230 V, 50/60 Hz mains connection
<b>dimensions/weight</b>	405 x 330 x 160 mm, approx. 6 kg
<b>scope of delivery</b>	case with mains connection cable
<b>item no.</b>	044132

#### Demonstration case

	<b>BENNING DB 2</b>
<b>power supply</b>	230 V, 50/60 Hz mains connection
<b>dimensions/weight</b>	450 x 330 x 110 mm, approx. 4.5 kg
<b>scope of delivery</b>	case with mains connection cable
<b>item no.</b>	044133

### Recommendation for the workshop equipment for enterprises of electrical engineer-craft according ZVEH and VDEW guidelines (Electricity Association)

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
Two-pole voltage tester	DIN VDE 0682-401 IEC/EN 61243-3	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)	DIN VDE 0411-1 IEC/EN 61010-1	MM 2 item no. 044028	MM 1-3 + CC 1 item no. 044084 + 044037	MM 7-1 + CC 1 item no. 044085 + 044037
Clip-on ammeter (min. 300 A)	DIN VDE 0411-1 IEC/EN 61010-1	CM 2 item no. 044035	CM 5-1 item no. 044066	CM 8 item no. 044064
Insulation tester	DIN VDE 0413-2 IEC/EN 61557-2	IT 101 item no. 044033	IT 110 item no. 044100	IT 120 B item no. 044102
Loop ohmmeter	DIN VDE 0413-3 IEC/EN 61557-3	-		
Ohmmeter	DIN VDE 0413-3 IEC/EN 61557-4	IT 101 item no. 044033	IT 110 item no. 044100	IT 120 B item no. 044102
F/RCD-meter	DIN VDE 0413-6 IEC/EN 61557-6	-		
Phase sequence indicator	DIN VDE 0413-7 IEC/EN 61557-7	TRITEST® item no. 020050	ST 720 item no. 050312	ST 750 A item no. 050320
Instrument for testing electrical equipment (DIN VDE 0701-0702, 0751-1)	DIN VDE 0404-1 DIN VDE 0404-2	ST 710 item no. 050308		

#### Additional recommendation ZVEH

Grounding gauge	DIN VDE 0413-6 IEC/EN 61557-6	-	-	Earthing set for IT 120 B item no. 044113
Continuity tester	DIN VDE 0413-7 IEC/EN 61557-7	-	DUTEST® item no. 050155	-
Light meter lux meter	-	-	-	Luxmeter type B for IT 120 B item no. 044111

#### Additional recommendation of BENNING

Differential current clamp for error current determination in electric equipment and systems	DIN VDE 0411-1 IEC/EN 61010-1 DIN VDE 0404-4	CM 9 item no. 044065	CM 9 item no. 044065	CM 9 item no. 044065
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**BENNING**

# DUTEST® pro, TRITEST® pro

Professional continuity tester and phase sequence indicator

**NEW!**



## Testers of the new generation



SCHUTZ  
400 V  
PROTECTED



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

- acoustic and visual continuity test (three-step)
- loud test buzzer (adjustable to four levels)
- phase and external-voltage indication: 6 to 400 V AC/DC
- high-power LED torch (adjustable to four levels)
- non-contact cable break detector
- magnetic holder and belt clip at the rear of the housing



**TRITEST® pro phase sequence indicator  
with high-power LED torch**

- phase sequence testing (clockwise/counter-clockwise) in three-phase systems
- indication of phase voltages L1, L2 and L3
- high-power LED torch
- magnetic holder and belt clip at the rear of the housing



## DUTEST® pro

Continuity and line tester for testing high-impedance and low-impedance resistances

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



## 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 set of 4 mm test probes and alligator clip

Technical data	DUTEST® pro	TRITEST® pro
LED-indication	3 x yellow, 2 x red	4 x red, 1 x green
Acoustic continuity test:	loud test buzzer up to 100 Ω	-
Visual continuity test (yellow LED):	0 to 100 Ω/1 kΩ/10 kΩ	-
Phase sequence indication (green/red LED):	-	clockwise/counter-clockwise phase sequence
Voltage range:	6 V to 400 V AC/DC (50 Hz/60 Hz)	400 V to 500 V AC (50 Hz/60 Hz)
Single-pole external conductor test (phase):	yes	-
Polarity test (+/-):	yes	-
Non-contact cable break detection:	yes	-
Luminous LED torch:	yes, adjustable to four levels	yes, single-level
Magnetic suspension and belt clip	yes	yes
Safety:	DIN EN 61010-1	DIN EN 61010-1, DIN EN 61557-7
Measuring category:	CAT III 300 V	CAT III 300 V
Batteries:	3 x 1.5 V batteries of type AA (LR6)	3 x 1.5 V batteries of type AA (LR6)
Scope of delivery:	incl. set of measuring lines (red/black)	incl. set of measuring lines / test probes (brown/black/green), alligator clip (black)
Item no.:	050156	020052

**BENNING**

# TRITEST® easy

Phase / phase sequence tester

**NEW!**



clockwise  
phase sequence



counter-clockwise  
phase sequence



Recommended retail price:

**39,90 €**

All prices are exclusive of VAT.  
item no.: 020051

## quick & easy testing

*quick & easy testing*



**CAT IV  
600 V**

### **TRITEST® easy - non-contact phase / phase sequence tester**

- quick phase testing in AC mains
- easy phase sequence testing (clockwise/counter-clockwise) in three-phase systems (three-phase current)
- localization of cable breaks in insulated and live lines
- visual indication by means of green/red LED probe tip and acoustic indication via buzzer
- voltage range: 200 to 1,000 VAC
- overvoltage category: CAT IV 600 V, DIN EN 61010-1
- break-proof ABS housing with pen clip
- easy operation by means of stand-by LED

Recommended retail price:

**39,90 €**

All prices are exclusive of VAT.  
item no.: 020051



Phase tester to properly wired outlets and junction boxes.



Finding cable breaks in isolated and under-voltage lines.

## **BENNING TRITEST® easy**

Non-contact phase / phase sequence tester

### **Application:**

Easy and quick testing of phase (external conductor) and phase sequence in electrical installations and appliances. Compact and simple tester for domestic, commercial and industrial use. Ideal for quick troubleshooting.

### **Test functions:**

- phase (external conductor) testing on shock-proof sockets, distribution boxes and automatic circuit breakers etc.
- phase sequence testing (L1-L2-L3) in three-phase mains by means of  
green LED probe tip (lights up) = clockwise phase sequence  
red LED probe tip (lights up) = counter-clockwise phase sequence
- testing with regard to phase balance  
green LED probe tip (flashing) = same phase
- localization of cable breaks and interruptions in insulated and live lines, e.g. in cable reels or in chains of lights

### **Special features:**

- 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
- ON/OFF push-button with stand-by LED for phase test  and phase sequence test 
- automatic switch-off (AUTO Power-OFF) after 5 minutes
- highest measuring category CAT IV 600 V
- break-proof ABS housing with protection against dust and water spray

<b>Technical data</b>	<b>TRITEST® easy</b>
<b>Indication:</b>	visual via LED probe tip, acoustic via buzzer
<b>Phase test:</b>	red LED probe tip and buzzer, flashing and acoustic signal frequency increase with voltage increasing
<b>Phase sequence test:</b>	green/red LED probe tip for clockwise/counter-clockwise phase sequence
<b>Voltage range:</b>	200 to 1000 V AC
<b>Frequency range:</b>	45 to 65 Hz
<b>ON/OFF switch:</b>	with stand-by LED for phase test  and phase sequence test 
<b>Automatic switch-off:</b>	after 5 minutes
<b>Measuring category:</b>	CAT IV 600 V, CAT III 1,000 V
<b>Safety:</b>	DIN EN 61010-1
<b>Dimensions (L x W x H):</b>	approx. 153 x 20 x 25 mm
<b>Weight:</b>	approx. 40 g
<b>Batteries:</b>	2 x 1.5 V micro batteries of type AAA
<b>Scope of delivery:</b>	incl. batteries, operating manual, CD-ROM
<b>Item no.:</b>	020051

**BENNING**

# CFlex 1, CFlex 2

Flexible AC current  
transformers with analog  
output or digital display

**NEW!**

## flexible & safe measurements

### ***BENNING CFlex 1, BENNING CFlex 2*** ***Flexible AC current transformers for*** ***AC current measurement***

- safe AC current measurement up to 3000 A
- measuring loop with high flexibility for narrow measuring points and large cable cross-sections
- length / diameter of measuring loop: 46 cm / 16 cm
- length of connecting cable: 1.8 m
- universally applicable for all measuring instruments with voltage input via 4 mm safety plugs (only BENNING CFlex 1)

#### ***Additionally for BENNING CFlex 2:***

- large 4-digit LC display with illumination
- TRUE RMS measuring method



BENNING CFlex 1



BENNING CFlex 2

Recommended retail price:  
**149.80 €**  
 All prices are exclusive of VAT.  
 Item no.: 044068



Recommended retail price:  
**199.80 €**  
 All prices are exclusive of VAT.  
 Item no.: 044069



## BENNING CFlex 1

Flexible AC current transformer  
 with analog output

- universally applicable for all customary digital multimeters, digital clamp meters and scopemeters via 4 mm safety plugs
- high flexibility for narrow measuring points, large cable cross-sections and for clamping several conductors
- simple closing mechanism which can be operated with gloves
- green LED for stand-by mode, red LED for battery undervoltage
- measuring category CAT III 600 V
- including protective pouch and batteries



Protective pouch included in delivery

## BENNING CFlex 2

Flexible TRUE RMS AC current transformer  
 with digital display

- large 4-digit LC display with illumination
- TRUE RMS measuring method for industrial applications
- direct display of the current intensity in amperes
- safe operation with a distance of 1.8 m to the measuring point
- memory of measured values (HOLD/ MIN/MAX)
- automatic switch-off („APO“), can be disabled
- battery low-voltage indication
- measuring category CAT IV 600 V
- including protective pouch and batteries

Technical data	BENNING CFlex 1	BENNING CFlex 2
Display:	-	4-digit LCD, illuminated
Current (AC):	0.3 A to 3000 A	0.1 A to 3000 A TRUE RMS
Measuring ranges:	30 A/300 A/3000 A	30 A/300 A/3000 A
Transformer ratio (mV/A) / resolution:	100 mV/10 mV/1 mV per A	0.01 A/0.1A/1 A
Measured value memory:	-	HOLD, MIN/MAX
Length / diameter of measuring loop:	46 cm/16 cm	46 cm/16 cm
Cable diameter of the measuring loop:	8.5 mm	8.5 mm
Connecting cable to measuring loop:	1.8 m	1.8 m
Battery low-voltage indication::	yes	yes
Output:	4 mm safety plug	-
Measuring category:	CAT III 600 V	CAT IV 600 V
Scope of delivery:	incl. 2 x 1.5 V batteries of size AAA (LR03), protective pouch	
Item no.:	044068	044069

# BENNING CM 11

TRUE RMS AC/DC milliampere  
current clamp multimeter

NEW!

Recommended retail price:

**299,80 €**

All prices are exclusive of VAT.  
Item no.: 044067

# Measuring AC/DC currents with a resolution of 0.1 mA!

## ***BENNING CM 11 TRUE RMS AC/DC milliampere current clamp multimeter***

- ideal for troubleshooting in electrical installations, control systems, appliances and automotive electrical systems
- precise measurements of low AC/DC currents with highest resolution of 0.1 mA
- multifunctional use for voltage measurements (300 V AC/DC), resistance measurements (500 k $\Omega$ ) and continuity tests
- TRUE RMS measuring method
- compact dimensions with a clamp opening of 23 mm
- memory of measured values (MAX/MIN/HOLD)
- high-quality protective pouch and set of 4 mm measuring lines included in delivery

TRUE  
RMS

20 A AC  
10 A DC

Auflösung  
**0,1 mA**  
Resolution

CAT IV  
300 V

LCD



Protective pouch included in delivery





## BENNING CM 11

TRUE RMS AC/DC milliampere current clamp multimeter

The BENNING CM 11 is the ideal diagnostic tool for all qualified electricians, service technicians and maintenance technicians in electrical trade and industry.

### Application:

Due to its high accuracy in the AC/DC range, the BENNING CM 11 is designed particularly for troubleshooting in electrical installations, control systems, appliances and automotive electrical systems.

- measurements of leakage currents and differential currents
- measurements of process signals from 4 mA to 20 mA without interruption of the current loop
- measurement of stand-by current on automotive batteries for testing with regard to battery discharge due to leakage
- precise measurements of load currents of up to 20 A AC / 10 A DC
- universally applicable for measurements of AC/DC voltages (300 V AC / DC), resistance measurements (500 k $\Omega$ ) and acoustic continuity tests



Technical data	BENNING CM 11
<b>Display:</b>	4-digit LCD, illuminated
<b>Current (AC):</b>	300.0 mA / 3.000 A / 20.00 A TRUE RMS
<b>Max. resolution / accuracy:</b>	0.1 mA / $\pm 1\%$ of the measured value + 5 digits
<b>Current (DC):</b>	300.0 mA / 3.000 A / 10.00 A
<b>Max. resolution / accuracy:</b>	0.1 mA / $\pm 1\%$ of the measured value + 10 digits
<b>Voltage (AC/DC):</b>	50.00 V / 300.0 V TRUE RMS (AC)
<b>Max. resolution / accuracy:</b>	0.01 V / $\pm 1\%$ of the measured value + 2 digits
<b>Resistance:</b>	500.0 $\Omega$ / 5.000 k $\Omega$ / 50.00 k $\Omega$ / 500.0 k $\Omega$
<b>Max. resolution / accuracy:</b>	0.1 $\Omega$ / $\pm 1\%$ of the measured value + 2 digits
<b>Continuity test:</b>	up to 100 $\Omega$ (acoustic/visual)
<b>Measured value memory / null balance:</b>	HOLD, MIN/MAX memory / ZERO
<b>Max. clamp opening:</b>	23 mm
<b>Automatic switch-off:</b>	15 minutes, can be disabled
<b>Battery low-voltage indication:</b>	yes
<b>Dimensions (L x W x H):</b>	206 x 76 x 33 mm
<b>Measuring category:</b>	CAT IV 300 V
<b>Scope of delivery:</b>	incl. 2 x 1.5 V batteries of size AAA (LR03), set of measuring lines and protective pouch
<b>Item no.:</b>	044067

# BENNING ST 725

Appliance Tester

**NEW!**

**NEW!**

Storage locations for 999 test samples  
Mini-USB interface and download  
software on CD-ROM  
Test certificate in MS Excel®  
Direct printing on log printer  
BENNING PT 1

## Appliance testing now even **more efficient** and easy

AUTO  
TEST

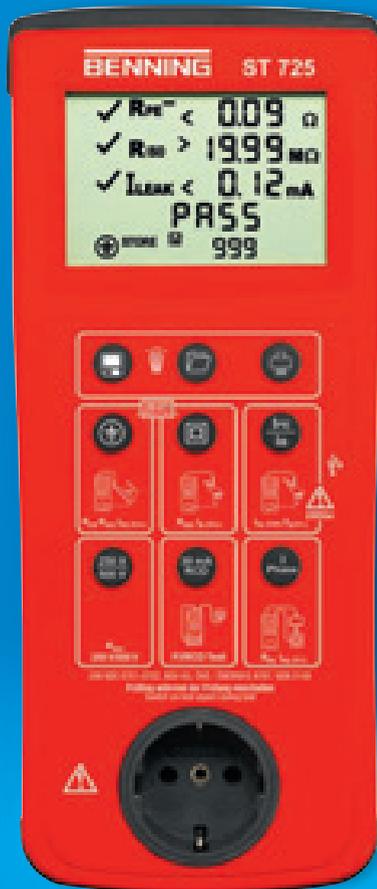
FI/RCD  
TEST

SAFE

USB

SOFTWARE

PRINT



### *BENNING ST 725 - appliance tester for mobile testing of electrical appliances*

- mobile - network-independent testing due to battery operation
- easy - operation by means of push-buttons and hot keys
- quick - testing within a few seconds
- all-in-one - protective conductor current measurement by means of differential current or alternative leakage current measurement method
- automatic testing procedure for devices of classes I, II, (III), extension cables and device connecting cables with IEC connector
- measuring result with „PASS / FAIL“ indication
- preset limiting values



Item no.: 044150 (optional)

**DUAL  
POWER**  
Mains & battery  
operating  
mode

# BENNING ST 725

## Appliance Tester

### Application:

Safety-related testing of electrical appliances and equipment.

The mains operating mode allows the testing of appliances with mains supply units such as electronically controlled devices / tools, PCs, photocopiers and washing machines under operating conditions.

### Measuring functions:

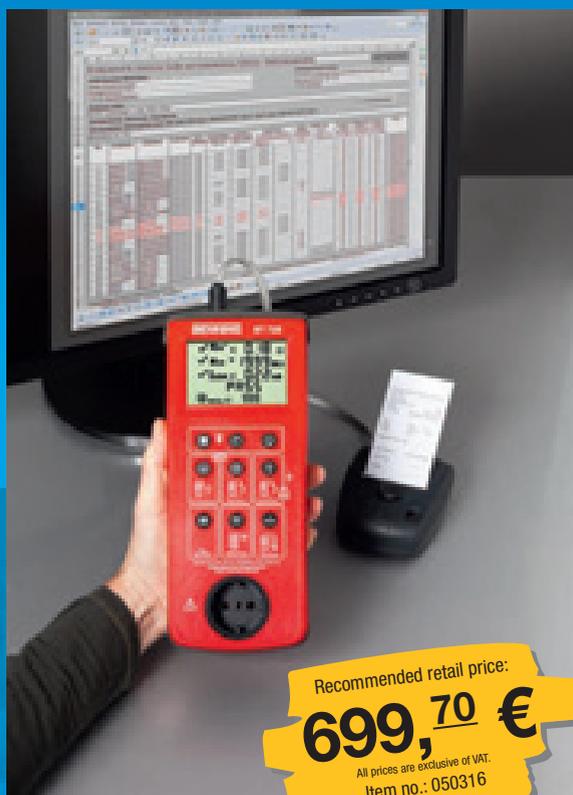
- protective conductor resistance with a pulsed testing current of  $\geq 200$  mA (required in case of oxidized contacts)
- insulating resistance with a testing voltage of 250 V and 500 V
- protective conductor current / contact current by means of the differential current measurement method / direct measurement in mains operating mode and by means of the alternative leakage current measurement method in battery operating mode
- active measurement of the protective conductor current for three-phase appliances under operating conditions by means of optional measuring adapter
- testing of permanently installed and portable 30 mA RCDs/PRCDs with tripping time measurement
- voltage measurement on external shock-proof socket

### Features:

- automatic testing procedure for devices of class I (key 1), class II / III (key 2) and line test (key 3)
- testing of cable reels, multiple distributors and device connecting cables with IEC connector
- reduced testing voltage for devices with overvoltage arrester
- note in case of incorrect selection of the testing procedure and if the test sample is not switched on
- sufficient battery capacity for more than 2,500 test samples
- measuring result with „PASS / FAIL“ indication, preset limiting values

### New product features:

- storage locations for 999 test samples
- 3 hot keys for storing, calling and printing the measured values
- mini-USB interface and download software for the preparation of test certificates in MS Excel®
- direct printing function for printing test certificates on site by means of optional printer BENNING PT 1
- prolonged functional test and differential current measurement (max. 2 x 5 minutes)
- integrated real-time clock for storing the measured values including the test date



Recommended retail price:  
**699,70 €**  
All prices are exclusive of VAT.  
Item no.: 050316

Technical data	BENNING ST 725
Display:	graphic display
Protective conductor resistance: Testing current:	0,05 $\Omega$ - 20 $\Omega$ $\pm 200$ mA DC
Insulating resistance: Testing voltage:	0,1 M $\Omega$ - 20 M $\Omega$ 250 V / 500 V DC
Protective conductor current / contact current by means of differential current measurement method, alternative leakage current measurement method or direct measurement	0,1 mA - 20 mA
RCD testing current: Tripping time:	30 mA / 150 mA (5-fold) 0 ms - 500 ms
Line test:	$R_{PE}$ , $R_{ISO}$ , continuity and short circuit of L and N
Voltage on external shock-proof socket:	50 V - 270 V (L-N, L-PE, N-PE)
Measuring category:	CAT II 300 V
Dimensions (L x W x H) / weight:	270 x 115 x 55 mm / 1,100 g
Batteries:	6 x 1.5 V batteries of type AA, IEC LR6
Scope of delivery:	incl. carrying case, test cable with alligator clip, IEC power cord, CD-ROM with download software, USB cable, battery set
Item no.:	050316

### Optional accessories:

Test badges „Next test“, 300 pieces, item no. 756212	49.80 €
Passive measuring adapter for three-phase loads for $R_{PE}$ , $R_{ISO}$ and $I_{EA}$ measurements:	
16 A CEE coupling - shock-proof plug, item no. 044122	54.90 €
32 A CEE coupling - shock-proof plug, item no. 044123	68.60 €
Active measuring adapter for three-phase loads for $R_{PE}$ , $R_{ISO}$ (direct) measurements under operating conditions:	
16 A CEE adapter, 5-pin, active, item no. 044140	303.70 €
32 A CEE adapter, 5-pin, active, item no. 044141	317.30 €
Portable log printer BENNING PT 1, item no. 044150	527.40 €



Item no. 044122/044123



Item no. 044140/044141



Item no. 044150

**BENNING**

**IT 130**

TRUE RMS Installation Tester

**NEW!**



# Tests according to IEC 60364 even more **efficient** and safer

***BENNING IT 130 testing of electrical installations according to IEC 60364***

- all measuring functions can be selected directly by means of a rotary switch
- memory of measured values for 1800 measurements
- bidirectional interface (upload / download)
- software BENNING PC-Win IT 130 for creation and transmission of installation structures to the tester
- documentation in compliance with ZVEH



Recommended retail price:

**1,299.<sup>80</sup> €**

All prices are exclusive of VAT.  
Item no.: 044103



## BENNING IT 130

### Multifunction Installation Tester

#### Application:

Safety-related tests of electrical installations after construction, modification or as periodic inspection can be carried out easily and efficiently by means of the BENNING IT 130 installation tester.

#### Measuring functions:

- low-impedance resistance of protective conductor and equipotential bonding conductor connections (testing current: 200 mA with polarity reversal)
- insulating resistance with testing voltages of 50/ 100/ 250/ 500/ 1000 V
- line impedance (L-N/L) with voltage drop and short-circuit current
- loop impedance (L-PE) without RCD tripping and short-circuit current
- testing of RCDs, standard and delayed (S), types AC, A, F, B, B+ with AUTO test, contact voltage, tripping time and tripping current (ramp test)
- TRUE RMS voltage, frequency and phase sequence test
- single-fault leakage current in IT networks
- earthing measurement by means of three-wire measuring method (optionally by means of earthing kit)
- TRUE RMS current by means of current clamps BENNING CC 1/ CC 2/ CC 3 (optional)
- luminous intensity by means of BENNING luxmeter type B (optional)

#### Features:

- **NEW:** measured value memory covering four levels: object/ block/ fuse/ measuring point
- **NEW:** bidirectional interfaces (USB / RS 232)
- **NEW:** upload of installation structures and download of measured values
- **NEW:** integrated real-time clock (measured value with date/ time)
- **NEW:** unambiguous „PASS“ / „FAIL“ indication by means of green/ red LED on the tester and on the switchable „Commander“ probe tip
- **NEW:** „Commander“ probe tip with „TEST“ and „MEM“ key as well as bright LED measuring point illumination
- **NEW:** connection for barcode scanner for identifying the measuring point and renaming the storage location
- help function with connecting diagram
- graphic display with background lighting
- power supply by means of six NiMH storage batteries (AA)
- device with integrated storage battery charging function
- delivery including case, storage batteries, measuring leads, charging cable, switchable „Commander“ probe tip, PC software and calibration record

#### Optional accessories:

„Commander“ test plug for shock-proof sockets  
Item no. 044149 198.80 €

16 A CEE measuring adapter, 5-pin, for voltage / rotary field measurement  
Item no. 044148 49.70 €

Barcode scanner with PS/2 connector  
Art. Nr. 009371 265.30 €

40 m measuring line with rewriter and wrist strap  
Art. Nr. 044039 145.00 €

Earthing kit, 2 earth rods and 3 test cables  
Item no. 044113 92.00 €

Current clamp adapter BENNING CC 3, 0.2 A to 300 A AC/DC  
Item no. 044038 138.50 €

Luminous intensity sensor BENNING luxmeter type B  
Item no. 044111 254.40 €



Technical data	BENNING IT 130
Display:	graphic display (illuminated)
Low-impedance measurement:	0.01 Ω - 2 kΩ
Insulating resistance:	10 kΩ - 1000 MΩ
Line impedance (L-N/L):	0.01 Ω - 10 kΩ
Loop impedance (L-PE):	0.01 Ω - 10 kΩ
Short-circuit current:	0.01 A - 200 kA
RCD testing of types AC / A / F and B / B+:	tripping time, tripping current (ramp), contact voltage, automatic testing (AUTO)
Rotary field:	yes
Voltage (TRUE RMS), frequency:	1 V - 550 V, 0 Hz - 500 Hz
Earthing resistance:	0.01 Ω - 2.000 Ω (by means of earthing kit)
Current (TRUE RMS):	0.1 mA - 400 A (by means of clamp)
Luminous intensity:	0.01 lux - 20 klux (by means of sensor)
Measured value memory:	up to 1800 measuring results
Interfaces:	USB, RS 232
Software included:	BENNING PC-Win IT 130
Item no.:	044103

#### Protokoll-Software BENNING PC-Win IT 130:

- **NEW:** creation and transmission (upload) of installation structures to the BENNING IT 130 for efficient periodic testing
- download of measured values and logging by means of test reports and ZVEH test certificates

#### Scope of delivery:



**Stand-by case**

**item no. 010912**

**Size S**

- practical stand-by case with belt loop on the back of the case
- made of hard-wearing nylon fabric
- dimensions: approx. 220 x 110 x 50 mm
- suitable for the following testers and measuring instruments: DUTEST pro, TRITEST pro, BENNING MM 1, MM 1-1, MM 1-2, MM 1-3, MM 9, MM 10, CM 1-1, CM 1-2, CM 1-3, CM 2, CM 3, CM 5-1, CM 9, CM 11, CC 1, CC 2, CC 3 and SUN 2



**Stand-by case**

**item no. 010913**

**Size M**

- practical stand-by case with belt loop on the back of the case
- made of hard-wearing nylon fabric
- dimensions: approx. 240 x 180 x 70 mm
- suitable for the following measuring instruments: BENNING MM 2, MM 3, MM 4, MM 7-1, MM 11, CM 8, IT 101, CFlex 1, CFlex 2



**Stand-by case**

**item no. 010911**

**DUSPOL®**

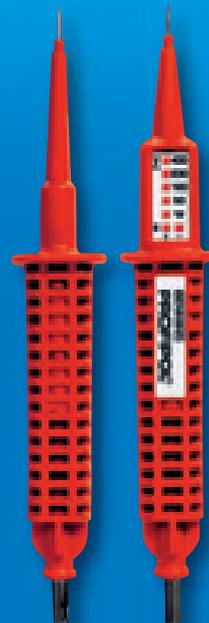
- practical stand-by case with Velcro fastener and belt loop
- made of hard-wearing nylon fabric
- dimensions: 330 x 100 x 60 mm
- suitable for voltage testers *DUSPOL® digital*, *DUSPOL® expert* and *DUSPOL® analog*



**PROFIPOL®**

**Voltage Tester for universal applications**

- indicating DC and AC voltage within the range of 6 - 400 V
- indicating steps 6, 12, 50, 120, 230, 400 V
- polarity test for DC voltage
- shock-proof housing made of rugged high-pressure PE material
- compact dimensions and increased grip
- dustproof and waterproof, protection category IP 65



**PROFIPOL®**  
**item no. 020022**



## Accessories for *BENNING* testers and measuring instruments safe – functional – indispensable



### Hard-top case for testers and measuring instruments item no. 711020

High-quality hard-top case with foam insert and three compartments for professional storage of testers and measuring instruments.

Compartment dimensions: approx. 110 x 300 x 50 mm,  
Case dimensions: approx. 450 x 380 x 110 mm

### *DUSPOL*® stand-by case

item no. 010911

Practical stand-by case with Velcro fastener and belt loop made of hard-wearing nylon fabric suitable for *DUSPOL*® digital, *DUSPOL*® expert and *DUSPOL*® analog.

Dimensions: 330 x 100 x 60 mm



### *BENNING TA 1*

item no. 044124

Ø 4 mm safety crocodile clips, two pieces, red/black, professional equipment, CAT III 1000 V



### *BENNING TA 2*

item no. 044125

set of Ø 4 mm safety measuring leads, six pieces, red/black, professional equipment, consisting of:

- safety measuring leads (silicone), CAT III 1000 V
- safety test probes (4 mm measuring tip), CAT II 1000 V
- safety crocodile clips, CAT III 1000 V



### *BENNING TA 3*

item no. 044126

set of Ø 4 mm safety measuring leads, eight pieces, red/black, professional equipment, CAT III 1000 V, consisting of:

- safety measuring leads (silicone)
- safety test probes (slender measuring tip)
- safety claw clamps
- safety crocodile clips



### *BENNING TA 4*

item no. 044120

magnetic holder for Multimeter and *BENNING IT 101*, 3 pieces, consisting of:

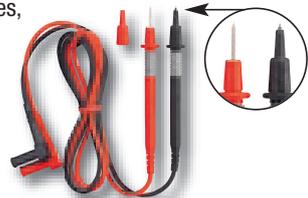
- magnetic holder
- adapter and belt, for attachment of *BENNING* Multimeters to switching cabinets, machine and system parts



### Ø 4 mm safety measuring leads with 2 mm measuring tip

item no. 044146

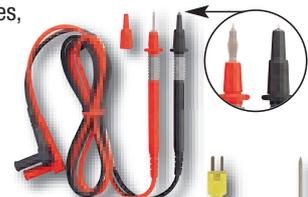
Ø 4 mm safety measuring leads 2 pieces, red/black, L = 1.40 m, with 2 mm measuring tip CAT IV 600 V/  
CAT III 1000 V (with protective caps),  
CAT II 1000 V (without protective caps)



### Ø 4 mm safety measuring leads with 4 mm measuring tip

item no. 044145

Ø 4 mm safety measuring leads 2 pieces, red/black, L = 1.40 m, with 4 mm measuring tip CAT IV 600 V/  
CAT III 1000 V (with protective caps),  
CAT II 1000 V (without protective caps)



### *BENNING TA 5*

item no. 044039

40 m measurement cable with practical winder, strap, for the measurement of protective and bonding conductors, Connection: Ø 4 mm safety test



### Set of safety measuring leads for *BENNING MM 4*

item no. 044119

set of Ø 4 mm safety measuring leads, 3 pieces, consisting of:

- safety measuring leads with 2 mm measuring tip
- 2 measuring probes with 2 mm measuring tip

### Temperature probe (type K)

item no. 044121

insertion probe (V4A steel tube) for flexible substances, liquids, gases and air, measuring range:

-196 °C to +800 °C, suitable for *BENNING MM 1-3*, *MM 7-1*, *MM 11* and *CM 8* digital measuring instruments



# Measuring adapters for BENNING ST 710/ST 720/ST 750 A appliance testers and BENNING CM 9 leakage current clamp

## Measuring adapters for BENNING ST 710/ST 720/ST 750 A

### Measuring adapters for single-phase loads (passive)

for measuring  $R_{PE}$ ,  $R_{ISO}$  and  $I_{EA}$ , CEE coupling (3-pin) with shock-proof plug

- 16 A CEE (3-pin) item no. 044143
- 32 A CEE (3-pin) item no. 044144



### Measuring adapters for three-phase loads (passive)

for measuring  $R_{PE}$ ,  $R_{ISO}$  and  $I_{EA}$ , CEE coupling (5-pin) with shock-proof plug

- 16 A CEE (5-pin) item no. 044122
- 32 A CEE (5-pin) item no. 044123



### Measuring adapter for single-phase and three-phase loads (passive)

for measuring  $R_{PE}$ ,  $R_{ISO}$  and  $I_{EA}$ , triple CEE coupling with shock-proof plug

- Triple CEE coupling: 16 A CEE (5-pin), 32 A CEE (5-pin),  
16 A CEE (3-pin) item no. 044147



### Measuring adapter for BENNING ST 710/ST 720

Shock-proof plug with 4 mm plug for appliances without shock-proof plug

item no. 044142



### Measuring adapters for BENNING ST 720 (active)

Measuring adapters for three-phase loads for measuring  $R_{PE}$  and  $I_{PE}$  (direct measurement method) by means of current transformer, CEE (5-pin) with shock-proof plug

- 16 A CEE (5-pin) item no. 044140
- 32 A CEE (5-pin) item no. 044141



### Measuring adapters for BENNING CM 9 leakage current clamp (active)

for measuring the differential/protective conductor/load current, conductors led through individually, with double insulation

- Single-phase,**  
shock-proof plug/coupling item no. 044131

- Three-phase,**  
16 A CEE (5-pin) item no. 044127
- 32 A CEE (5-pin) item no. 044128

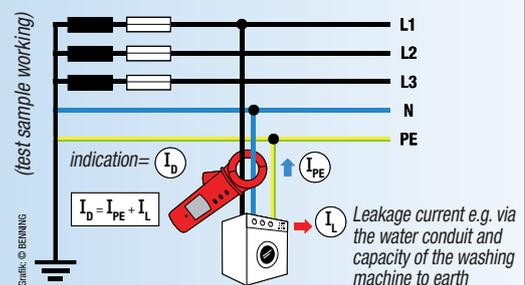


### BENNING CM 9 leakage current clamp

for measuring the differential/protective conductor/load current of single-phase and three-phase loads (1  $\mu$ A to 100 A AC) (see page 7)

item no. 044065

TRUE RMS





## Professional VDE seminars

### Service hotline with 24h service

#### VDE 0701-0702 seminar

##### Testing of electrical appliances/equipment

###### Features:

The seminar addresses qualified electricians, competent persons as well as electrotechnically trained persons who have to do the testing and its documentation according to the DIN VDE 0701-0702 standard for repaired or modified electrical devices or the repetitive testing of electrical devices.

The participants of the seminar will be given an intensive training in order to be able to do this inspection according to regulations considering the optimum use of the *BENNING ST 710/ST 720/ST 750 A* testers as well as of the *BENNING PC-Win ST 750* logging software. At the end of the seminar, the participants will get a certificate of attendance.

###### Content:

Regulations, definitions, measurements (continuity of the protective conductor, insulation, protective conductor current/contact current), test sample management and documentation according to ZVEH.

#### VDE 0126-23 seminar

##### Testing of grid-connected photovoltaic systems

###### Features:

The seminar is intended for qualified electricians who have to carry out commissioning tests and periodic inspection of grid-connected photovoltaic systems in compliance with the VDE 0126-23 standard. The participants of the seminar will be given an intensive training in order to be able to do this inspection according to regulations considering the optimum use of the photovoltaic tester *BENNING PV 1-1* as well as of the insulation and temperature measuring instrument *BENNING SUN 2*.

###### Content:

Regulations, testing of the AC side, testing of the DC side (polarity test, open-circuit voltage, short-circuit current, insulating resistance and operating current measurement for each PV string of the PV generator) as well as minimum requirements for system documentation in compliance with VDE 0126-23.



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Your distributor:

#### VDE 0100 seminar

##### Testing of electrical installations of up to 1000 V

###### Features:

The seminar addresses qualified electricians who have to do the testing and its documentation of electrical installations of up to 1000 V according to the DIN VDE 0100 standard.

The participants of the seminar will be given an intensive training in order to be able to do this inspection independently and according to regulations considering the optimum use of the *BENNING IT 101/IT 110/IT 120 B* testers as well as of the *BENNING PC-Win IT 120 B* logging software. At the end of the seminar, the participants will get a certificate of attendance.

###### Content:

Regulations, definitions, measurements (insulation, continuity of the protective conductor, loop impedance/line impedance, short-circuit current, FI/RCD testing, earthing, rotary field, voltage, frequency), management of measuring data and documentation according to ZVEH.

###### Seminar venue:

BENNING GmbH & Co. KG,  
Robert-Bosch-Straße 20, 46397 Bocholt  
to be agreed upon

###### Seminar dates:

###### Seminar fee:

We are happy to make you an offer:  
phone +49 (0) 28 71/93 - 470

###### Duration:

4 or 6.5 hours

###### Scope of services:

Intensive training in small groups of up to 6 persons, training material, certificate of attendance and refreshments during the seminar

We are pleased to send you our directions and to recommend to you hotels in direct vicinity of the seminar venue.

**free**  
**24h service**

**Service Hotline:**  
**+49 (0) 28 71/93 - 555**

#### Testing, measuring and safety instruments

##### The whole range of testers from one supplier

Developing safe and practical testing and measuring instruments which comply with the relevant standards is an integral part of BENNING's product philosophy for more than 65 years now. Today, BENNING offers a comprehensive product range of high-quality testing, measuring and safety devices the quality requirements of which are orientated according to the demands of professional users. With the generation of *DUSPOL*® voltage testers and with the measuring and safety devices, BENNING sets pioneer standards worldwide concerning safety, functionality and design.

# BENNING

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