

2015



Product catalogue **Measurement and testing equipment**



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Table of contents

Electrical test equipment

Voltage detectors/testers	01
Lamp testers	04
Continuity testers	06
Phase sequence indicators	07

Testing equipment for photovoltaic systems

08

Detecting and measuring lines/cables

Cable locators	12
Cable length measurement equipment	14

Digital multimeters

15

Current clamps

23

Test equipment for testing in accordance with DIN VDE (DIN VDE 0100, 0105, 0113, 0701-0702, 0751)

Basic workshop equipment	38
Installation testers (DIN VDE 0100/0105)	40
Appliance testers (DIN VDE 0701-0702 and 0751)	44

Software packages

50

Measurement and testing equipment for temperature/climate/ environment and other non-electrical parameters

52

Power and energy measurement

65

Accessories

Testing accessories	68
Cases	74
Spare parts/fuses	75

Appendix

Measurement categories	77
General terms and conditions of sale	78



















Electrical test equipment



Our range of electrical test equipment includes latest-generation voltage detectors, non-contact voltage testers in compact pen form, continuity testers and phase sequence indicators to ensure safe determination of phase sequence and motor rotational direction.






These devices make up the basic equipment used by every specialist electrician.

Pictograms used in this chapter

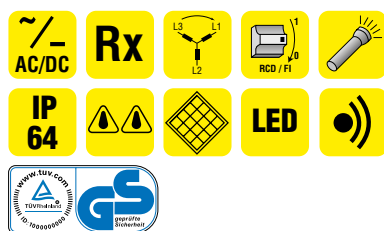
	Continuity testing (visual and/or audible)		DC and AC voltages
	Trip testing or internal load for tripping a residual current circuit breaker (RCD/FI)		Phase sequence
	Display with LED		IP protection category (e.g. IP65)
	Display with LCD		Water-proof (splash, spray water)
	Illuminated measurement point		Dust-proof
	Resistance measurement (e.g. 0–2 kΩ)		Display held for poorly visible or hard-to-read measurement results
	Backlight		Non-contact detection of AC voltage
	No battery required		Detection of magnetic fields
	AC voltage		Audible detection of (AC) voltage

Voltage detectors



					
Model	2100-ALPHA	2100-BETA	VOLTfix plus	VOLTfix Drill	MAGNO-VOLTfix
see page	2.3	2.3	2.5	2.5	2.5
Order no.	2100-ALPHA	2100-BETA	2052-D	2054-D	2050-D
Display	9 LEDs	9 LEDs, 3 1/2-digit, LCD	1 LED	2 LEDs	2 LEDs
Voltage testing					
Range/resolution	12, 24, 50, 120, 230, 400, 690 V	12, 24, 50, 120, 230, 400, 690 V 12–690 V/1 V	50–600 V AC	50–600 V AC	50–600 V AC
AC/DC tolerance	as per DIN VDE 0682-401	as per DIN VDE 0682-401			
Test current (at voltage)	< 3.5 mA (690 V)	< 3.5 mA (690 V)			
Base load (at voltage)	approx. 2.4 W (690 V)	approx. 2.4 W (690 V)			
Automatic switch-on threshold	approx. 12 V	approx. 12 V	approx. 50 V	approx. 50 V	approx. 50 V
Measurement category	CAT IV/600 V, CAT III/690 V	CAT IV/600 V, CAT III/690 V	CAT III/600 V	CAT III/600 V	CAT III/600 V
Frequency range					
Voltage measurement	DC, 16.7–70 Hz	DC, 16.7–70 Hz	50–500 Hz	50–500 Hz	50–500 Hz
Phase sequence indicator	47–63 Hz	47–63 Hz			
Polarity indicator	Entire range	Entire range			
Continuity testing					
Range/signalling	0–500 kΩ visual/audible	0–500 kΩ visual/audible		0–3 MΩ	
Test current	<5 μA	<5 μA		approx. 0.3 μA	
General					
Additional load	approx. 140 W at 690 V, ≤ 200 mA	approx. 140 W at 690 V, ≤ 200 mA			
Duty cycle(ED)/recovery time	max. 30 s/240 s	max. 30 s/240 s	Continuous	Continuous	Continuous
Power supply	2 x 1.5 V, IEC LR03	2 x 1.5 V, IEC LR03	2 x 1.5 V, IEC LR03	2 x 1.5 V, IEC LR03	2 x 1.5 V, IEC LR03
Testing DC and AC voltage	●	●	AC only	AC only	AC only
Automatic measurement range selection	●	●			
Unipolar phase testing	●	●	●	●	●
Automatic internal base load	●	●			
Accessories "case"	CC-VP-7xx	CC-VP-7xx			
	Continuity testing, unipolar phase testing, illuminated measurement point	Continuity testing, unipolar phase testing, illuminated measurement point, digital LCD			

Voltage detectors



2100-ALPHA

Voltage and continuity tester with phase sequence indicator

Functions

- Voltage testing
- Visual and audible continuity and voltage testing
- Patented phase sequence indicator, no need for a "third hand"
- Unipolar phase testing
- Polarity indicator

Device information

- Connectable load (load tester) of 140 W using two push-buttons, tripping an RCD/FI up to 30 mA
- IP 64, splash water-proof and dust-proof
- Non-detachable probe tip protector to reduce risk of injury
- Fully functional voltage indicator without batteries or with flat batteries

Device features

- Audible warning signal above a detected AC voltage of 50 V and DC voltage of 120 V
- 4-mm probe tip extender for simple and ergonomic testing in outlets
- Probe tip protector caps to reduce risk of injury

Specifications

Display	LED bar display ±12, ±24, 50, 120, 230, 400, 690 V LC display, 12–690 V AC/DC
Voltage range	12–690 V AC/DC
AC/DC voltage	automatic detection
Frequency range	DC, 16.7–70 Hz
Internal base load	approx. 2.4 W at 690 V
Test current	≤3.5 mA (without pushing a button)
Connectable load	approx. 140 W (at 690 V)
Test current under load	≤ 200 mA
Phase sequence detection (external conductor)	340–440 V AC
Frequency range	47–63 Hz
Unipolar phase testing	
Voltage range	180–690 V AC
Frequency range	40–70 Hz
Continuity testing	
Switching threshold	approx. 500 kΩ
Test current	<5 μA
Safety certificate:	DIN VDE 0682-401, EN 61243-3
Measurement category	CAT IV/600 V, CAT III/690 V
Degree of contamination	2
Protection category	IP 64, splash-proof and dust-proof
Power supply	
Power supply	2 1.5 V micro batteries, IEC LR03
Current draw	max. 60 mA
Dimensions	approx. 280 x 78 x 35 mm
Weight	approx. 310 g



2100-BETA

Voltage and continuity tester with phase sequence indicator

Same as 2100-ALPHA and also offers:

- Digital LC display 12–690 V AC/DC



Accessories:

Carry case
Order no. CC-VP-7xx



2100 ALPHA/BETA includes:

- 1 2100-ALPHA or 2100-BETA
- 2 test probe covers (GS38)
- 2 1.5 V batteries, IEC LR 03 (AAA), micro
- 1 product manual

Ordering information:

Name	Order no.	Item no.
2100-ALPHA	2100-ALPHA*	4312495
2100-BETA	2100-BETA*	4312508
Carry case	CC-VP-7xx	2732643

Lamp tester



LT-10 EUR

Lamp tester

Functions

- Testing of various types of fluorescent lamps
- Non-contact voltage detection
- Direct testing of lamp contacts

Device information

- Easy one-handed/one-button operation
- Extremely compact — fits into any pocket
- Compatible with the most common fluorescent lamps:
 - T2, T4, T5, T8, T9, T10, T12
 - Energy-saving fluorescent lamps
- Including sodium vapour lamp antenna for testing additional lamps:
 - Low-pressure sodium vapour lamps
 - High-pressure sodium vapour lamps
 - Neon tubes
 - Mercury vapour lamps
 - Metal halide lamps

Device feature

- Integrated high-sensitivity 122-cm antenna (removable and retractable) allows testing of lamps and voltage without conductors

Specifications

Display	1 LED
Test voltage (with new battery)	approx. 3 kV/280 kHz
Non-contact	
Field strength:	approx. 100 μ V/m at 260-300 kHz
Voltage test:	90 V AC to 600 V AC, 50/60
General	
Constructed according to	EN61010/IEC61010
Measurement category	CAT II/300 V, CAT I/600 V
Degree of contamination	2
Protection category	IP 40
Power supply	1 x 9 V battery, 6LR61
Dimensions	170 x 40 x 24 mm
Weight	approx. 100 g (including batteries)

Ordering information:

Name	Order no.	Item no.
LT-10-EUR	LT-10-EUR	4386345
LT-10-ANT	LT-10-ANT	4357839

Includes:

- 1 LT-10-EUR
- 1 antenna 122 cm
- 1 adapter plate for fluorescent tubes
- 1 antenna for sodium vapour lamps
- 1 carry case
- 1 product manual



Voltage testers



Includes:

1 VOLTfix plus
2 1.5 V battery, IEC LR03
1 product manual

VOLTfix plus Non-contact voltage tester

Functions

- Non-contact visual and audible detection of AC voltages
- Fast, precise detection of line breaks in exposed cables, e.g. cable drums or extension cables

Device information

- Reliable automatic self-test with switched-on unit by visual readiness display
- Compact, practical design that fits in any pocket
- Large application field in trades and industry

Device feature

- On/off switch

Specifications

Display	1 LED
Voltage range	50–600 V AC
Frequency range	50–500 Hz
Duty cycle (ED)	continuous
Degree of contamination	2
Measurement category	CAT III/600 V
Safety certificate	DIN VDE 0411, EN 61010
Power supply	2 1.5 V batteries, IEC LR03
Dimensions	140 x 24 x 20 mm
Weight	approx. 50 g

Ordering information:

Name	Order no.	Item no.
VOLTfix plus	2052-D*	3454347



Includes:

1 VOLTfix Drill
2 1.5 V battery, IEC LR03
1 product manual

VOLTfix Drill Non-contact voltage tester with screwdriver insert

Functions

- Non-contact visual and audible detection of AC voltages
- Direct voltage testing via screwdriver blade
- Continuity testing
- Fast, precise detection of line breaks in exposed cables, e.g. cable drums, extension cables

Device information

- Reliable automatic self-test at device start-up by visual readiness display
- Compact, practical design that fits in any pocket

Device feature

- Bright, integrated torch
- Permanently integrated screwdriver insert (chromium-vanadium-molybdenum steel blade)

Specifications

Display	2 LEDs
Voltage range/Frequency range	50–600 V AC
Voltage	50–500 Hz
Continuity testing	0–3 MΩ
Test current	approx. 0.3 μA
Duty cycle (ED)	continuous
Degree of contamination	2
Measurement category	CAT III/600 V
Safety certificate	DIN VDE 0411, EN 61010
Power supply	2 1.5 V batteries, IEC LR03
Dimensions	160 x 25 x 21 mm
Weight	approx. 55 g

Ordering information:

Name	Order no.	Item no.
VOLTfix Drill	2054-D*	3454358



Includes:

1 MAGNO-VOLTfix
2 1.5 V battery, IEC LR03
1 product manual

MAGNO-VOLTfix Non-contact voltage tester with magnetic field detection

Functions

- Non-contact visual and audible detection of AC voltages
- Fast, precise detection of line breaks in exposed cables, e.g. cable drums, extension cables
- Visual signal for detecting magnetic fields, e.g. on magnetic coils or permanent magnets

Device information

- Compact, practical design that fits in any pocket
- Large application field in trades and industry

Specifications

Display	2 LEDs
Voltage range/Frequency range	50–600 V AC
Voltage	50–500 Hz
Duty cycle (ED)	continuous
Degree of contamination	2
Measurement category	CAT III/600 V
Safety certificate	DIN VDE 0411, EN 61010
Power supply	2 1.5 V batteries, IEC LR03
Dimensions	140 x 24 x 20 mm
Weight	approx. 50 g

Ordering information:

Name	Order no.	Item no.
MAGNO-VOLTfix	2050-D*	3454335

Continuity testers



Includes:

- 1 TESTFIX without batteries
- 1 spare lamp
- 1 carry case
- 2 uninsulated crocodile clips
- 1 product manual

TESTFIX

Continuity and cable tester with torch function

Functions

- Audible continuity tester (buzzer)
- Visual continuity display (lamp)

Device information

- Low-impedance continuity tester
- For testing light bulbs, fuses etc.
- For testing wiring and supply networks

Device features

- Torch function with continuous light

Specifications

Continuity testing	0–10 Ω (optical), 0–100 Ω (acoustic)
Test current	approx. 200 mA (optical) approx. 40 mA (acoustic)
Test voltage	< 4.5 V
Power supply	3 1.5 V battery, IEC LR6
Dimensions	130 x 75 x 35 mm
Weight	approx. 180 g

Ordering information:

Name	Order no.	Item no.
TESTFIX	9023*	2147430



Includes:

- 1 Ohmtest
- 1 9 V battery, IEC 6LR61
- 1 alligator clip
- 2 test probes
- 1 product manual

Ohmtest

Continuity tester

Functions

- Audible continuity tester
- Visual continuity display
- Noise voltage indicator >50 V

Device information

- Application fields: resistance, semiconductor and polarity testing, light bulbs, fuses etc.

Device feature

- Voltage-resistant up to 600 V

Specifications

Continuity testing	0–500 k Ω
Test current	approx. 5 μ A
Test voltage	< 9 V
Noise voltage indicator	50–600 V
Protection category	IP 40
Power supply	1 9 V battery, IEC 6LR61
Dimensions	110 x 58 x 24 mm
Weight	approx. 150 g



Accessories:

- Carry case
- Order no. 1150

Ordering information:

Name	Order no.	Item no.
Ohmtest	9072-D*	3454373
Carry case	1150	2145755

Phase sequence indicator



DR 100

Phase sequence indicator

Functions

- Three phases displayed with glow lamps
- Phase sequence displayed with glow lamps

Device information

- Quick determination of the phase sequence in three-phase networks

Specifications

Voltage range	200–440 V
Current draw (at voltage)	< 3.5 mA (440 V)
Frequency range	50–60 Hz
Duty cycle	continuous
Degree of contamination	2
Measurement category	CAT III/400 V
Safety certificate:	DIN VDE 0411/EN 61010-1/ DIN VDE 0413-7, EN 61557-7, IEC 61557-7
Power supply	from measured object
Dimensions	110 x 58 x 24 mm
Weight	approx. 150 g



Includes:

- 1 DR 100
- 3 test probes
- 1 alligator clip
- 1 product manual



Accessories:

- UNIdreh accessories set
Order no. 1324



- Carry case
Order no. 1150



- Test clips for busbars
Order no. 391511 (red)
Order no. 391512 (black)

Ordering information:

Name	Order no.	Item no.
DR 100	9042-D*	3454425
UNIdreh accessories set	1324	2146183
Carry case	1150	2145755
Test clip for busbars		
red	391511	2146861
black	391512	2146877



DR 705

Phase sequence indicator

Functions

- Three phases displayed with glow lamps
- Phase sequence displayed with glow lamps

Device information

- Quick determination of the phase sequence in three-phase networks

Specifications

Voltage ranges	120–440 V
Phase sequence display	120–440 V
Phase indicator	200–440 V
Current draw (at voltage)	< 3.5 mA (440 V)
Frequency range	50–60 Hz
Duty cycle	continuous
Degree of contamination	2
Measurement category	CAT III/300 V
Safety certificate	DIN VDE 0411/EN 61010-1/ DIN VDE 0413-7, EN 61557-7, IEC 61557-7
Power supply	from measured object
Dimensions	124 x 61 x 27 mm
Weight	approx. 200 g



Includes:

- 1 DR 705
- 3 test probes
- 1 alligator clip
- 1 product manual



Accessories:

- UNIdreh accessories set
Order no. 1324



- Carry case
Order no. 1150



- Test clips for busbars
Order no. 391511 (red)
Order no. 391512 (black)

Ordering information:

Name	Order no.	Item no.
DR 705	9043-D*	3454433
UNIdreh accessories set	1324	2146183
Carry case	1150	2145755
Test clip for busbars		
red	391511	2146861
black	391512	2146877

Testing technology designed specifically to maintain PV systems



The SOLAR-4000 enables quick and simple maintenance of PV systems as well as allowing customers to confirm proper functionality of their PV systems.

The portable SOLAR-4000 I-V characteristic curve analyser determines voltage-current characteristic curves according to DIN VDE 0126-6/EN 60891 or measures open circuit voltage and short-circuit current according to DIN VDE 0126-23/ EN 62446 on photovoltaic module strings or individual modules.



Pictograms used in this chapter

	Rapid measurement		Infrared temperature measurement
	Wireless transmission (radio waves)		Touchscreen operation with one finger on a display
	Lightweight		Interface to PC/software
	SD memory card		Instantaneous value memory
	MIN/MAX memory		

Solar analyser



Includes:

- 1 SOLAR-4000 ANALYZER
- 1 SOLAR-4000 SENSOR
- 1 hardshell case with foam insert
- 6 PV test lead set (MC3, MC4, Huber+Suhner, Tyco, SunClix and without PV connector)
- 1 sensor bracket
- 1 SD card (PC software with manual)
- 1 USB SD/SDHC card reader
- 2 chargers
- 2 product manuals

SOLAR-4000

Peak-power and I-V characteristic curve analyser for photovoltaic systems

Functions

- Rapid and precise measurement within approx. 15–30 s
- Easy identification of faults and defects in PV systems and PV modules
- Very light and easy-to-handle test tool
- Wireless data transmission between analyser and sensor via ZigBee radio link, range up to max. 100 m
- Non-contact temperature measurement
- Measurement of monocrystalline and polycrystalline solar cells (measurement of thin-film modules on request, without STC calculation)
- Easy menu navigation via colour touchscreen
- Large measurement range: 1.0–1000 V and 0.1–15.0 A
- Creation of system and maintenance reports
- Comparison of the power of a system over several years
- Built-in rechargeable battery allows measurements over several hours
- Test tool and software have more than 5000 module data units
- Module data updates available on a regular basis free of charge
- Fast and easy installation of the sensor directly on the solar module by using quick spanner provided
- Application software included as standard
- Measurement of current-voltage characteristic curves according to DIN VDE 0126-6/EN 60891
- Measurement of open circuit voltage and short-circuit current according to DIN VDE 0126-23/EN 62446

Specifications

SOLAR-4000 ANALYZER

Display	3.2-inch colour LCD touchscreen display
Measurement	I-V characteristic diagram, short-circuit current, open circuit voltage, power, MPP current, MPP voltage
Calculated values	STC values (short-circuit current, open circuit voltage, MPP current, MPP voltage), fill factor, MPP power,
Voltage measurement range	1.0–1000 V (U _{oc} > 5 V)
Current measurement range	0.1–15.0 A
Measuring connections	standard 4-mm test leads
Measurement duration per characteristic curve	15–30 seconds
Memory slots for measurement curves dependent on SD memory card (> 1000 measurement curves for 1 GB)	
Power supply	lithium polymer battery, 37 V, 2 Ah
Auto power-off	adjustable (1 to 15 minutes)
Interface	radio link to sensor and SD/SDHC memory card for PC
Protection category	IP 20
Protection class	II
Measurement category	CAT II/1000 V, CAT III/600 V
Safety certificate:	EN 61010-1, EN 61010-31
Operating temperature	0 to +50°C
Dimensions	210 x 105 x 41 mm
Weight	approx. 500 g

SOLAR-4000 SENSOR

Display	LCD (2 rows, 16 characters)
Measurement	global incident radiation, module temperature, angle of inclination
Temperature measurement range	0 to +100°C
Incident radiation measurement range	100–1200 W/m²
Measurement connection	infra-red, non-contact
Reference cells	1 monocrystalline cell, 1 polycrystalline cell
Power supply	lithium polymer battery, 37 V, 2 Ah
Interface	radio link to analyser
Ambient temperature	0 to +60°C
Protection category	IP 20
Dimensions	160 x 82 x 41 mm
Weight	approx. 200 g

Ordering information:

Name	Order no.	Item no.
SOLAR-4000	SOLAR-4000	4099097



SOLAR-100

Radiation meter

Functions

- Solar radiation measurement
- Light transmissivity of windows and glass panes (g factor) determination

Device information

- Display can be switched between W/m² and BTU/(ft² x h)
- Manual measurement range selection
- Integrated readings memory (data hold)
- MAX/MIN feature
- Manual zero compensation

Includes:

- 1 SOLAR-100
- 1 9 V battery, IEC 6F22
- 1 carry case
- 1 product manual

Specifications

Display	LCD, 3 1/2-digit, 1999 digits
Measurement ranges	0–200, 2000 W/m², 0–634 BTU/(ft² x h)
Resolution	0.1, 1 W/m²; 0.1, 1 BTU
Accuracy	±10 W/m² (or ±3 BTU) or ±5%
Power supply	1 9 V battery, IEC 6F22
Dimensions	130 x 63 x 38 mm (device) 80 x 55 x 29 mm (sensor)
Weight	approx. 230 g

Ordering information:

Name	Order no.	Item no.
SOLAR-100	SOLAR-100	3474979

Locating and measuring lines and cables



Cable locators are used to find and trace lines and cables, correlating receptacles and fuses with circuits, detecting hidden switching and branching sockets in walls, floors and ceilings and locating cable breaks and short circuits.

Cable meters and echo meters are used to measure the length of lines and cables.

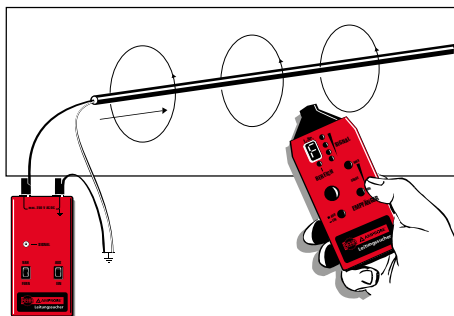
Thereby making it simple and straightforward to determine the length of laid cables or stocks in a cable warehouse without unwinding or unreeling the lines/cables.

Cable locators



Important information about cable locators

A cable locator is a universal tracing device designed to locate cables and cable faults in installations.



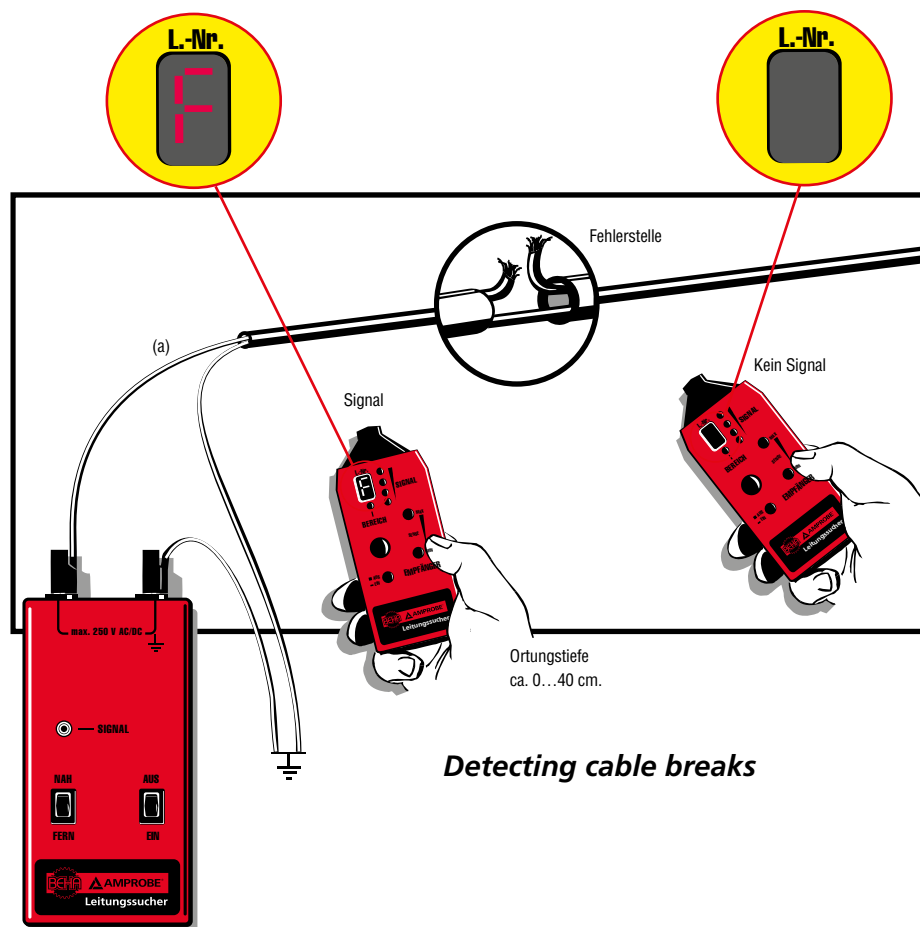
Operating principle

In the same way as radio, cable locators work with a carrier signal and a useful signal. A transmitter sends a coded signal at a carrier frequency into the cable to be located or traced. The receiver identifies the signal and thus allocates the cable.

Possible applications

A variety of location tasks can be performed using cable locators. These include:

- Detecting cable breaks in a wall
- Detecting cables in a wall
- Detecting short circuits in cables
- Detecting fuses and assigning them to circuits
- Detecting inadvertently plastered-over outlets and junction boxes



Detecting cable breaks

Location depth

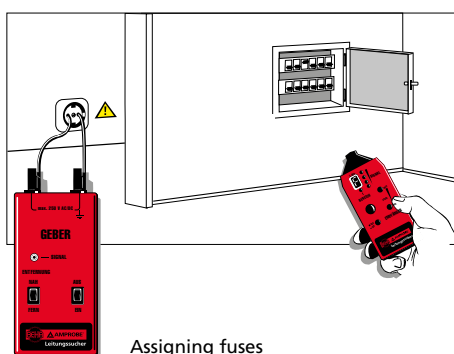
The location depth is up to 40 cm, depending on the wall type (masonry, concrete etc.) and the operating mode (energised or de-energised location).

Sensitivity

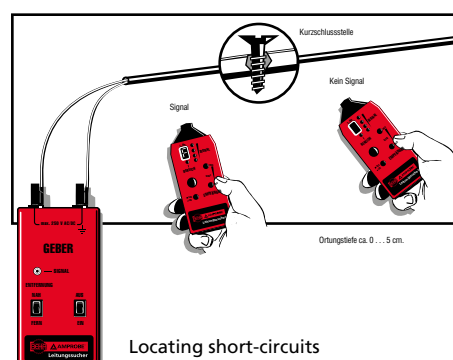
The receiver sensitivity is divided into nine levels and can be adjusted at the touch of a button. A contact electrode, with which sensitivity can be increased by a factor of 1.5, is available for rough localisation. The transmitter has two switchable signal strengths — NEAR and REMOTE.

Display on the receiver

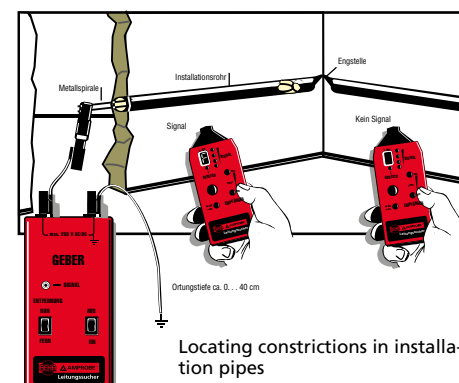
The receiver has a seven-section LED display and an LED row, which indicates the signal strength and coding.



Assigning fuses



Locating short-circuits



Locating constrictions in installation pipes

Cable locators/fuse finders



USA Patent
5418447

D Patent
4103234

Cable locator set in case

For energised and de-energised circuits

Functions

- Targeted detection of cables in walls, cable breaks, short-circuits in cables
- Detecting fuses and assigning them to circuits
- Detecting inadvertently plastered-over outlets and junction boxes
- Detecting interruptions and short circuits in unshielded underfloor heating systems
- Tracing metal water and heating pipes

Device information

- Set comprising transmitter and receiver in impact-resistant, sturdy case
- Visual and audible display of transmitter signal
- Clear and understandable product manual with application examples

Device features

- All fields of application (energised and de-energised) are covered without the need for additional equipment
- Reliable localisation by displaying a defined letter on the receiver

Specifications

Receiver display	LED row for intensity and seven-section display of number or letter to read out the transmitter coding
Location depth	0–40 cm
Voltage resistance	250 V
Measurement category	CAT II/250 V
Degree of contamination	2
Safety of power supply	EN 61010-1/IEC 61010 1 9 V battery, IEC 6LR61 (receiver) 2 9 V battery, IEC 6LR61 (transmitter)
Dimensions	380 x 305 x 90 mm (case)
Weight	approx. 1.8 kg

Includes:

- 1 cable locator receiver
- 1 cable locator transmitter, code "F"
- 4 test leads
- 3 9 V battery, IEC 6LR61
- 2 crocodile clips
- 2 test probes
- 1 case
- 1 product manual

Ordering information:

Name	Order no.	Item no.
Cable locator set in case	2032-D	3454320



SF100

Fuse finder for energised circuits

Functions

- Detecting fuses quickly and accurately and assigning them to circuits
- Detecting and tracing cables under plaster

Device information

- Set comprising transmitter and receiver in sturdy carry case
- Visual and audible display of transmitter signal on receiver
- Transmitter has integrated safety plug for simple contacting with Schuko sockets
- Easy to switch between fuse and cable location functions
- Continuous sensitivity adjustment for receiver
- Coded signal enables easy identification by receiver

* Not available in Switzerland

* For UK: circuit breaker finder ECB50A-E available with UK plug

Specifications

Receiver display	2 LEDs and 7-section alphabetic display to read out the transmitter coding
Location depth	Fuse function 0–10 cm Cable function 0–40 cm
Voltage range	100–250 V AC (50–60 Hz)
Measurement category	CAT III/300 V
Degree of contamination	2
Safety certificate:	EN 61010-1/IEC 61010
Power supply	1 9 V battery, IEC 6LR61 (receiver) Supply from mains (transmitter)
Dimensions	180 x 120 x 45 mm (bag)
Weight	approx. 250 g (set)

Includes:

- 1 fuse finder transmitter
- 1 fuse finder receiver
- 1 9 V battery, IEC 6LR61
- 1 carry case
- 1 product manual

Ordering information:

Name	Order no.	Item no.
SF100	2025-D	3454312
ECB50A-E	ECB50A-E	3027097
ECB50A-FGIS	ECB50A-FGIS	3027106

Cable locators



AT-3500

Cable locator for detecting buried cables and pipework

Functions

- Locating and tracing buried cables and pipework
- Simplified locating function allows localisation of cable and pipework damage
- Determining position, depth and orientation of metal cables
- Visual and audible display

Device information

- Set comprising transmitter, receiver and testing accessories
- Variety of measurement functions enable high degree of accuracy:
 - Passively via mains frequency
 - Passively via radio signals
 - Actively using signal generator
- Transmitter has non-energised output
- Extensive range of accessories available

Device features

- Large backlit display with easy-to-use menus
- Rugged design for use in bad weather and tough environmental conditions

Specifications

Transmitter T-3500	
Transmission power	0.1 W/0.5 W (switchable)
Frequency	32.768 kHz
Power supply	6 batteries, IEC LR20/D/Mono
Operating time	approx. 40 hours (for intermittent operation with alkaline batteries, 20°C)
Protection category	IP 56
Dimensions	260 x 255 x 140 mm
Weight	1.7 kg
Receiver R-3500	
Frequency ranges	Range 1: radio 15 kHz to 23 kHz; range 2: power network 50/60 Hz; range 3: transmitter 32.768 kHz
Sensitivity	Range 1: radio > 20 µA; range 2: power network > 7 mA; range 3: transmitter > 5 µA
Depth range	0.1–5 m
Resolution	0.1 m
Power supply	10 1.5 V batteries, IEC LR6/AA/Mignon
Operating time	approx. 40 hours (for intermittent operation with alkaline batteries, 20°C)
Protection category	IP 67 from lower edge of receiver to lower edge of battery compartment, and IP 56 for all parts not included in this description
Dimensions	approx. 99 x 660 x 252 mm
Weight	approx. 2.5 kg

Includes:

- 1 R-3500 receiver
- 1 T-3500 transmitter
- 1 product manual
- 2 test leads
- 2 crocodile clips
- 1 earth spike
- 10 1.5 V batteries, IEC LR6/AA/Mignon
- 6 1.5 V batteries, IEC LR20/D/Mono
- 1 rugged carry case



Accessories:

MLS55-3, tube transmitter for AT-3500
Order no. MLS55-3



SC-3500, feed current clamp for AT-3500
Order no. SC-3500

Ordering information:

Name	Order no.	Item no.
AT-3500	AT-3500	3435058
MLS55-3	MLS55-3	3435099
SC-3500	SC-3500	3435073



AT-3500

Earth cable and pipeline finder

The AT-3500 cable locator allows you to ensure that productivity remains high and costs remain low. This cable locator is a robust and economical solution for locating energised and non-energised buried lines, cables and pipework. It is ideally suited for tasks relating to car park and airport lighting, and immediately displays the location of cables and pipework on a backlit multi-section digital display and with audible indicators.

The AT-3500 works on the 33-kHz frequency, which has proven itself for the majority of location applications. The device features a high sensitivity current mode and a wireless mode to detect the presence of cables at construction sites. Depth measurements can be performed at the touch of a button.

Cable length measurement



© Patent
3635518

Includes

- 1 cable meter 3000
- 2 test leads
- 1 adjustment ring
- 1 9 V battery, IEC 6LR61
- 2 quick-help cards
- 1 carry case
- 1 protective shell
- 1 product manual
- 1 pkg. copper nails (10x)

Cable meter 3000

Functions

- Cable length measurement using four-pole measuring method (Kelvin method), for which access to the start and end of the cable are required
- Resistance measurement
- Continuity beeper

Device information

- 56 permanently set measurement ranges, which are already programmed with the most common cable cross-sections
- 84 variable measurement ranges, which can be stored individually by the user, to measure user-specific line and cable types
- Cable lengths of up to 20 km can be measured
- Illuminated display
- External, internal or manual temperature compensation for measurement results with even greater accuracy
- Quick-help cards with operating hints and cable types
- Auto power-off

Device features

- Sum memory for measuring and adding multiple cable rings of the same cable type
- Readings memory for 500 measurements
- RS-232 interface
- Software free via online download

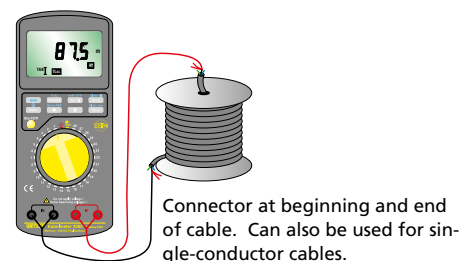
Also suitable for single-conductor cables

Specifications

Display	LCD, 4 1/2-digit, 19999 digits
Measurement ranges/resolution	0–2000 m/0.1 m
	0–20,000 m/1 m
Tolerance	± (2% of reading +5 digits)
Cross-sections	0.05–500 mm ²
Resistance/resolution	0.5–2000 Ω/0.01 Ω
Tolerance	± (2% of reading +5 digits)
Continuity	R < 10 Ω
Power supply	1 9 V battery, IEC 6LR61
Dimensions	193 x 91 x 50 mm
Weight	approx. 510 g

Ordering information:

Name	Order no.	Item no.
Cable meter 3000	2005	2146190
Interface cable	1282	2146107



Echometer 3000

Functions

- Cable length measurement by transit time (pulse) measurement, in which only one end of the cable (2 conductors) is required
- Resistance measurement
- Continuity beeper

Device information

- 58 permanently set measurement ranges, which are already programmed with the most common cable types
- 87 variable measurement ranges, which can be stored individually by the user, to measure user-specific line and cable types
- Cable lengths of up to 2000 m (depending on the cable type) can be measured
- Illuminated display
- Detection of single-conductor or multi-conductor cable breaks or short circuits for fault location
- Quick-help card with operating hints and cable types
- Cannot be used for single-conductor cables
- Auto power-off

Device features

- Sum memory for measuring and adding multiple cable rings of the same cable type
- Readings memory for 500 measurements
- RS-232 interface
- Software free via online download

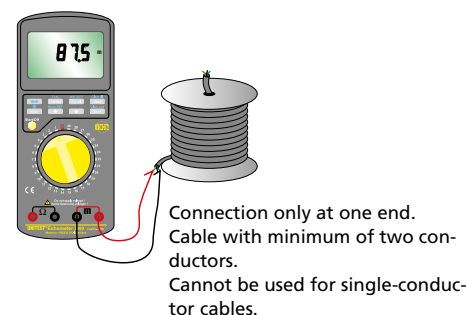
Only suitable for multi-conductor cables

Specifications

Display	LCD, 4 1/2-digit, 19999 digits
Measurement ranges	0–2000 m or
	Attenuation limit
Resolution	0.1 m
Base tolerance	± (2% of reading + 3 m)
Cross-sections	up to max. 35 mm ²
Resistance	0–2000 Ω
Resolution	0.1 Ohm
Tolerance	± (2% of reading + 5 digits)
Continuity	< 10 Ohm
Test current	approx. 1 mA
Power supply	1 9 V battery, IEC 6LR61
Dimensions	193 x 91 x 50 mm
Weight	approx. 510 g

Ordering information:

Name	Order no.	Item no.
Echometer 3000	2006	2146202
Interface cable	1282	2146107















Includes:

- 1 Echometer 3000
- 1 test lead, red/black
- 1 protective shell
- 2 crocodile clips
- 2 test probes
- 3 quick-help cards
- 1 9 V battery, IEC 6LR61
- 1 carry case
- 1 product manual

Digital multimeters



Multimeters are test equipment designed to test several different parameters. Our range of products extends from compact multimeters for simple applications (such as troubleshooting) through to multimeters for more demanding applications, e.g. in development areas or in industry, with a wide array of functions and testing options. Thus we offer the right multimeter to suit every application, with optimum price/performance ratios.

	Battery test		Backlight
	Temperature measurement		Diode test and audible Continuity testing
	frequency measurement		Integrated readings memory
	Capacitance measurement		Indication of measurement category
	PC interface		True RMS measurement
	Digital bar graph display		Min/Max hold

Digital multimeters



AM-500-EUR Compact digital multimeter

Functions

- Voltage, current and resistance measurement
- Diode and audible continuity testing

Device information

- Automatic and manual measurement range selection
- Integrated readings memory (data hold)
- Shock and impact-resistant thanks to protective shell as standard
- μ A measurement range
- Auto power-off

Device features

- Battery test 1.5 V and 9 V

Specifications

Display	LCD, 3 1/2-digit, 1999 digits
Measurement ranges	
AC voltage	1 mV–600 V
Basic accuracy	$\pm(1.0\%$ of reading + 3 digits)
Frequency range	45–400 Hz
DC voltage	1 mV–600 V
Basic accuracy	$\pm(0.8\%$ of reading + 3 digits)
Input resistance	10 M Ω
AC current	0.1 μ A–10 A
Basic accuracy	$\pm(1.5\%$ of reading + 3 digits)
Frequency range	45–400 Hz
DC current	0.1 μ A–10 A
Basic accuracy	$\pm(1.2\%$ of reading + 3 digits)
Resistance	1 Ω –20 M Ω
Basic accuracy	$\pm(1.5\%$ of reading + 5 digits)
Degree of contamination	2
Measurement category	CAT III/600 V
Safety certificate	DIN VDE 0411, EN 61010, IEC 61010
Power supply	2 1.5 V, LR3
Dimensions	150 x 83 x 40 mm
Weight	approx. 290 g (including battery)

Manuell
Range

CAT III
600 V



Includes:

- 1 AM-500-EUR
- 2 test leads
- 2 1.5 V batteries, LR3
- 1 product manual

Accessories:



- Carry case for equipment with protective shell

Order no. 1150



- Safety set

Order no. 370003

Ordering information:

Name	Order no.	Item no.
AM-500-EUR	AM-500-EUR	4102332
Carry case	1150	2145755
Safety set	370003	2146666



LCR55A LCR meter

Functions

- Resistance measurement
- Capacitance measurement
- Inductance measurement
- Transistor and diode measurement

Device information

- Manual measurement range selection
- Integrated readings memory (data hold and MAX hold)
- Shock and impact-resistant thanks to protective shell as standard
- Auto power-off

Device features

- Large, easy-to-read display

Specifications

Display	LCD, 3 1/2-digit, 1999 digits
Measurement ranges	
Resistance	0.01 Ω –20 M Ω
Basic accuracy	$\pm(0.5\%$ of reading + 5 digits)
Continuity	R < 30 Ω
Inductance	1 μ H–200 H
Basic accuracy	$\pm(3.0\%$ of reading + 20 digits)
Capacitance	1 pF–2000 μ F
Basic accuracy	$\pm(1.0\%$ of reading + 3 digits)
Diode test	0–3 V
Accuracy	$\pm(1.5\%$ of reading + 1 digit)
Transistor test (NPN, PNP)	hfe, I _{ceo}
Test current	approx. 1 mA
Test voltage	typically 3.0 V DC
Power supply	1 9 V battery, IEC 6LR61
Dimensions	183 x 79 x 38 mm
Weight	approx. 311 g (including battery)

Manuell
Range

Data
Hold

Includes:

- 1 LCR55A
- 2 test leads
- 2 crocodile clips
- 1 9 V battery, IEC 6LR61
- 1 product manual

Accessories:



- Case CC-ACDC

Order no.

Ordering information:

Name	Order no.	Item no.
LCR55A	LCR55A	3026976
CC-ACDC	CC-ACDC	2732643

Digital multimeters



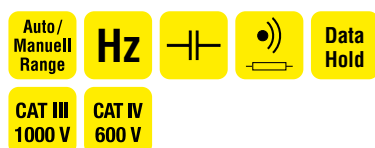
Hexagon 110



Hexagon 120



Hexagon 340



Hexagon® 110

Digital multimeter with audible socket checks (ABK)

Functions

- Voltage, current and resistance measurement
- Capacitance and frequency measurement
- Diode and audible continuity testing

Device information

- Automatic and manual measurement range selection
- Integrated readings memory (data hold) and max hold
- Relative value measurement
- Auto power-off
- Shock and impact-resistant thanks to protective shell as standard

Device features

- Digital multimeter with extra-large display
- Audible warning signal in case of incorrect jack assignment for the measurement range (Hexagon 110 and 120 only)

Hexagon® 120

Same as Hexagon 110 but with:

- Temperature measurement

Hexagon® 340A

Same as Hexagon 120 but with:

- True RMS measurement (TRMS)
- Galvanically isolated IR/RS-232 interface (software with adapter as option)
- 0.08% best basic accuracy
- Additional bar graph display with zoom function to assess trends
- Illuminated display

Specifications*

Display	LCD, 3 ³ / ₄ -digit, 5000 digits
Measurement ranges	
AC/DC voltage	0.01 mV–1000 V
Basic accuracy, AC	± (0.5% of reading + 3 D)
Basic accuracy, DC	± (0.08% of reading + 2 D)
AC/DC current	0.1 µA–10 A (20 A, 30 s)
Basic accuracy, AC	± (0.6% of reading + 3 D)
Basic accuracy, DC	± (0.2% of reading + 4 D)
Frequency range for	
AC voltage	40 Hz–20 kHz
AC current	40 Hz–1 kHz
Resistance	0.01 Ω–50 MΩ
Basic accuracy	± (0.1% of reading + 2 D)
Temperature	–50°–1000°C
Basic accuracy	± (0.3% of reading + 3 digits)
Frequency	5 Hz–125 kHz
Basic accuracy	± (0.01% of reading + 2 digits)
Capacitance	0.01 nF–9999 µF
Basic accuracy	± (0.8% of reading + 3 digits)
Degree of contamination	2
Measurement category	CAT III/600 V, CAT II/1000 V (110, 120) CAT IV/600 V, CAT III/1000 V (340)
Safety certificate:	DIN VDE 0411, EN 61010, IEC 61010
Power supply	1.9 V battery, IEC 6LR61
Dimensions	198 x 97 x 55 mm
Weight	approx. 430 g

* Specifications relate to the top model in the series. Please find specifications for the individual models on our webpage at www.beha-amprobe.de, or go to pages 27 und 28.

Model	Hexagon 110	Hexagon 120	Hexagon 340A
Display	3 ³ / ₄ -digit, 4000 digits	3 ³ / ₄ -digit, 4000 digits	3 ³ / ₄ -digit, 5000 digits
True RMS measurement	–	–	•
Bar graph display	–	–	•
Temperature	–	•	•
Min/max memory	Max hold	Max hold	•
Peak hold	–	–	•
Illuminated display	–	–	•
RS-232 interface	–	–	•
Audible socket checks	•	•	–
IR/RS-232 interface	–	–	•
Measurement category	CAT III/600 V	CAT III/600 V	CAT IV/600 V

Hexagon series includes:

- 1 Hexagon 110, 120 or 340
- 1 protective shell
- 2 test leads
- 1 temperature probe (0°C to +400°C) (120, 340)
- 1 9 V battery, IEC 6LR61 (340)
- 2 1.5 V batteries, IEC LR03 (110, 120)
- 1 product manual



Accessories:

For all Hexagon models

Carry case for equipment with protective shell Order no. 1150



Safety set Order no. 370003



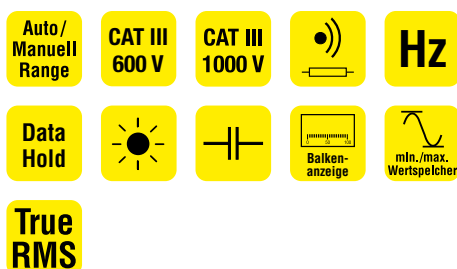
For Hexagon 340:

Software to transfer and display the readings to a PC Order no. 1332

Ordering information:

Name	Order no.	Item no.
Hexagon 110	93523-D	3454478
Hexagon 120	93524-D	3454484
Hexagon 340A	93497-D	3454491
Carry case	1150	2145755
Safety set	370003	2146666
Software	1332	3313506

Digital multimeters



AM series includes:

- 1 AM-510, AM-520, AM-530, AM-540 or AM-550
- 2 test leads
- 1 temperature probe (only AM-520-EUR, AM-530-EUR)
- 2 temperature probes (only AM-540-EUR, AM-550-EUR)
- 1 temperature adapter (only AM-540-EUR, AM-550-EUR)
- 1 carry belt (AM-520-EUR, AM-530-EUR, AM-540-EUR, AM-550-EUR only)
- 1 9 V battery, IEC 6LR61
- 1 carry case (only AM-520-EUR, AM-530-EUR, AM-540-EUR, AM-550-EUR)
- 1 product manual



Accessories:

Safety set
370003

Order no.

AM-510-EUR

Functions

- Voltage, current and resistance measurement
- Capacitance and frequency measurement
- Diode and audible continuity testing
- Battery test 1.5 V and 9 V (AM-510 only)

Device information

- Automatic and manual measurement range selection
- Integrated readings memory (data hold)
- Illuminated display
- Relative value measurement
- Auto power-off

Device features

- True RMS measurement TRMS (only AM-530-EUR and AM-550-EUR)
- Non-contact voltage detection
- Integrated LED flashlight

AM-520-EUR

Same as AM-510-EUR, but with:

- Temperature measurement

Device information

- Additional bar graph display (61 segments)
- MIN/MAX hold
- Carry case included as standard

AM-530-EUR

Same as AM-520-EUR, but with:

- True RMS measurement (TRMS)

AM-540-EUR

Same as AM-520-EUR, but with:

- Low pass filter
- Peak value measurement

Device features

- Dual temperature input
- Duty cycle function
- Measurement category CAT IV/600 V, CAT III/1000 V

AM-550-EUR

Same as AM-540-EUR, but with:

- True RMS measurement (TRMS)

Specifications*

Display	LCD, 3 ³ / ₄ -digit, 5999 digits
Measurement ranges	
AC voltage	1 mV–1000 V
Basic accuracy	±(1.0% of reading + 3 digits)
Frequency range	45 Hz–1 kHz
DC voltage	0.1 mV–1000 V
Basic accuracy	±(0.5% of reading + 3 digits)
Input resistance	10 MΩ
AC current	0.1 μA–10 A
Basic accuracy	±(1.2% of reading + 5 digits)
Frequency range	45 Hz–1 kHz
DC current	0.1 μA–10 A
Basic accuracy	±(1.0% of reading + 2 digits)
Resistance	0.1 Ω–60 MΩ
Basic accuracy	±(1.0% of reading + 2 digits)
Continuity	R < 10 Ω
Frequency	1.00 Hz–60 MHz
Basic accuracy	±(0.1% of reading + 3 digits)
Capacitance	0.01 nF–60 mF
Basic accuracy	±(3.0% of reading + 5 digits)
Temperature	–40°C–1000°C
Basic accuracy	±(1.0% of reading + 8°C)
Degree of contamination	2
Measurement category	CAT III/600 V, CAT II/1000 V (AM-510, AM-520, AM-530) CAT IV/600 V, CAT III/1000 V (AM-540, AM-550)
Safety certificate:	DIN VDE 0411, EN 61010, IEC 61010
Power supply	1 9 V battery, IEC 6LR61
Dimensions	182 x 90 x 45 mm

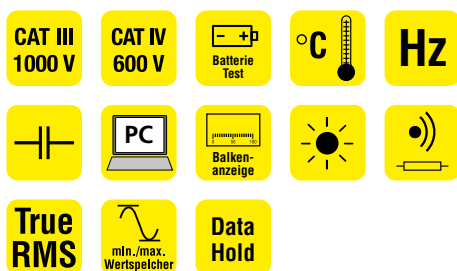
* Specifications relate to the top model in the series. Please find information relating to the individual models on our webpage at www.beha-amprobe.de, go to pages 27 und 28

Ordering information:

Name	Order no.	Item no.
AM-500-EUR	AM-500-EUR	4102332
AM-510-EUR	AM-510-EUR	4102332
AM-520-EUR	AM-520-EUR	4131281
AM-530-EUR	AM-530-EUR	4131296
AM-540-EUR	AM-540-EUR	4131308
AM-550-EUR	AM-550-EUR	4131313
Safety set	370003	2146666

Model	AM-510-EUR	AM-520-EUR	AM-530-EUR	AM-540-EUR	AM-550-EUR
Display	3 ³ / ₄ -digit, 3999 digits	3 ³ / ₄ -digit, 3999 digits	3 ³ / ₄ -digit, 3999 digits	3 ³ / ₄ -digit, 5999 digits	3 ³ / ₄ -digit, 5999 digits
True RMS measurement	–	–	•	–	•
Bar graph display	–	•	•	•	•
Temperature	–	•	•	•	•
Temperature inputs	0	1	1	2	2
Min/max memory	–	•	•	•	•
Peak hold	–	–	–	•	•
Battery test	•	–	–	–	–
Low pass filter	–	–	–	•	•
Duty ratio function	–	–	–	•	•
Measurement category	CAT III/600 V	CAT III/600 V, CAT II/1000 V	CAT III/600 V, CAT II/1000 V	CAT IV/600 V, CAT III/1000 V	CAT IV/600 V, CAT III/1000 V

Digital multimeters



XR-A series includes:

- 1 37XR-A or 38XR-A
- 2 test leads
- 1 magnet clip
- 2 test leads
- 1 temperature adapter (only 38XR-A)
- 1 temperature probe (0°C–200°C) (only 38XR-A)
- 1 9 V battery, IEC 6LR61
- 1 product manual



Accessories:

For all XR-A models

Large carry case Order no.
VC221B



Safety set Order no.
370003



For 38XR-A

Software "38SW-A" to transfer and display the readings to a PC Order no. 38SW-A

37XR-A

Functions

- Voltage, current and resistance measurement
- Diode and audible continuity testing
- Capacitance and frequency measurement
- Attenuation measurement (dBm)

Device information

- Automatic and manual measurement range selection
- Integrated readings memory (data hold, MIN/MAX)
- Relative and peak value measurement
- Additional bar graph display (41 segments)
- Auto power-off
- Illuminated display
- Shock and impact-resistant thanks to protective shell as standard

Device features

- Non-contact voltage detection (NVC)
- Magnet clip (Magne-Grip™)
- Audible warning signal in case of incorrect jack assignment for the measurement range and display message

Only relevant for 37XR-A:

- Inductance measurement
- Logic test function (TTL, CMOS)
- Duty cycle function

38XR-A

Same as 37XR-A, but with:

- Temperature measurement

Device features

- True RMS measurement, AC+DC (TRMS)
- RS-232 interface for connection to PCs (Software "38SW-A" available as an option)
- Current loop measurement 4–20 mA

XR-A series specifications*

Display	LCD, 4-digit, 9999 digits
Measurement ranges	
AC voltage	0.1 mV–750 V
Basic accuracy	±(1.2% of reading + 10 digits)
Frequency range	45 Hz–2 kHz
DC voltage	0.1 mV–1000 V
Basic accuracy	±(0.25% of reading + 5 digits)
Input resistance	10 MΩ
AC current	0.1 μA–10 A
Basic accuracy	±(1.5% of reading + 20 digits)
Frequency range	45 Hz–1 kHz
DC current	0.1 μA–10 A
Basic accuracy	±(0.5% of reading + 10 digits)
Resistance	0.1 Ω–40 MΩ
Basic accuracy	±(0.5% of reading + 8 digits)
Continuity	R < 40 Ω
Frequency	3.00 Hz–10 MHz
Basic accuracy	±(0.1% of reading + 5 digits)
Capacitance	0.01 nF–400.0 μF
Basic accuracy	±(3.0% of reading + 10 digits)
Temperature	–20°C–1300°C
Basic accuracy	±(1.0% of reading + 3°C)
Current loop measurement	(4–20 mA) 0 to 100%
Basic accuracy	± (0.5% + 5 digits)
Attenuation	–13 dBm to + 50 dBm
Basic accuracy	± (0.7 dB + 8 digits)
Degree of contamination	2
Measurement category	CAT III/300 V, CAT II/600 V (30XR-A), CAT III/600 V, CAT II/1000 V (33XR-A, 34XR-A, 37XR-A), CAT IV/600 V, CAT III/1000 V (38XR-A)
Safety certificate:	DIN VDE 0411, EN 61010, IEC 61010
Power supply	1 9 V battery, IEC 6LR61
Dimensions	196 x 92 x 60 mm
Weight	approx. 492 g (including battery)

Ordering information:

Name	Order no.	Item no.
37XR-A	37XR-A-D	3454698
38XR-A	38XR-A-D	3454705
VC221B (case)	VC221B	3068271
Safety set	370003	2146666
38SW-A (software)	38SW-A	2727813

Digital multimeters



PM51A

Pocket multimeter with frequency and capacitance measurement

Functions

- AC/DC voltage measurement
- Resistance measurement
- Diode and audible continuity testing
- Capacitance and frequency measurement

Device information

- Automatic measurement range selection
- Integrated readings memory (data hold)
- With permanently connected test leads
- Auto power-off

Device features

- Compact, card-sized digital multimeter
- Large, easy-to-read display

Specifications

Display	LCD, 3 3/4-digit, 4000 digits
Measurement ranges	
AC voltage	0.001 V–600 V
Basic accuracy	±(2.0% of reading + 5 digits)
Frequency range	50 Hz–500 Hz
DC voltage	0.1 mV–600 V
Basic accuracy	±(1.0% of reading + 2 digits)
Input resistance	10 MΩ
Resistance	0.1 Ω–40 MΩ
Basic accuracy	±(1.5% of reading + 6 digits)
Continuity	R < 65 Ω
Frequency	5 Hz–1 MHz
Basic accuracy	±(0.5% of reading + 4 digits)
Capacitance	0.1 nF–3000 μF
Basic accuracy	±(3.5% of reading + 6 digits)
Degree of contamination	2
Measurement category	CAT III/300 V, CAT II/600 V
Safety certificate:	DIN VDE 0411, EN 61010, IEC 61010
Power supply	1.3 V battery, IEC CR2032
Dimensions	113 x 53 x 10 mm
Weight	approx. 78 g (including battery)

Auto Range

CAT III
300 V

Data Hold



Includes:

- 1 PM51A
- 1 3 V battery, IEC CR2032
- 1 product manual



Accessories:

Case

Order no. VC3A

Ordering information:

Name	Order no.	Item no.
PM51A	PM51A	2727700
VC3A	VC3A	3099130



PM55A

Pocket multimeter with non-contact voltage detection (VolTest™) and automatic function selection (AutoTest™)

Functions

- Voltage and resistance measurement
- Diode and audible continuity testing
- Current measurement (AC/DC μA measurement range)
- Capacitance and frequency measurement
- Non-contact voltage detection (VolTest™)

Device information

- Automatic measurement range selection
- Rubber protective shell included
- Auto power-off

Device features

- Compact, card-sized digital multimeter
- Large, easy-to-read display
- Automatic function selection of voltage and resistance (AutoTest™)

Specifications

Display	LCD, 3 3/4-digit, 6000 digits
Measurement ranges	
AC voltage	0.001 V–600 V
Basic accuracy	±(1.5% of reading + 5 digits)
Frequency range	50 Hz–60 Hz
DC voltage	0.001 V–450 V
Basic accuracy	±(0.5% of reading + 3 digits)
AC current	0.1 μA–2000 μA
Basic accuracy	±(1.5% of reading + 3 digits)
Frequency range	50 Hz–60 Hz
DC current	0.1 μA–2000 μA
Basic accuracy	±(1.2% of reading + 3 digits)
Resistance	0.1 Ω–6,000 MΩ
Basic accuracy	±(1.2% of reading + 6 digits)
Continuity	R < 175 Ω
Frequency	10 Hz–30.00 kHz
Basic accuracy	±(0.5% of reading + 4 digits)
Capacitance	0.1 nF–100.0 μF
Basic accuracy	±(3.5% of reading + 6 digits)
Degree of contamination	2
Measurement category	CAT III/300 V, CAT II/600 V
Safety certificate:	DIN VDE 0411, EN 61010, IEC 61010
Power supply	1.3 V battery, IEC CR2032
Dimensions	113 x 53 x 10 mm
Weight	approx. 78 g (including battery)

Auto Range

CAT III
300 VV
Berührungs-
los

Includes:

- 1 PM55A
- 1 3 V battery, IEC CR2032
- 1 case
- 1 product manual



Accessories:

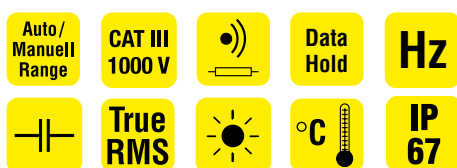
Case

Order no. VC3A

Ordering information:

Name	Order no.	Item no.
PM55A	PM55A	2727721
VC3A	VC3A	3099130

Digital multimeters



Includes:

- 1 HD160C
- 2 test leads
- 1 magnet clip
- 1 temperature probe
- 1 9 V battery, IEC 6LR61
- 1 product manual

**HÖCHSTE
SICHERHEIT**
CAT IV/1000 V

HD160C

Heavy Duty TRMS multimeter for industrial applications

Functions

- Voltage, current and resistance measurement
- Diode and audible continuity testing
- Capacitance and frequency measurement
- Temperature measurement

Device information

- Automatic and manual measurement range selection
- Integrated readings memory (data hold)
- MIN/MAX, relative-mean value measurement
- Illuminated display
- Shock and impact-resistant thanks to protective shell as standard
- Auto power-off

Device features

- True RMS measurement (TRMS)
- Optimum safety: CAT IV/1000 V
- High voltages (1000 V AC and 1500 V DC)
- Protection category IP67

HD110C

Rugged multimeter for industrial applications

Functions

- Voltage, current and resistance measurement
- Diode and audible continuity testing

Device information

- Manual measurement range selection
- Integrated readings memory (data hold)
- Shock and impact-resistant thanks to protective shell as standard
- Auto power-off

Device features

- Optimum safety: CAT IV/1000 V
- High voltages (1000 V AC and 1500 V DC)
- Protection category IP67

Specifications

Display	LCD, 4-digit, 9999 digits
Measurement ranges	
AC voltage	0.1 mV–1000 V
Basic accuracy	±(1.2% of reading + 10 digits)
Frequency range	45 Hz–2 kHz
DC voltage	0.1 mV–1500 V
Basic accuracy	±(0.1% of reading + 5 digits)
Input resistance	10 MΩ
AC current	0.01 μA–2 A
Basic accuracy	±(0.8% of reading + 4 digits)
Frequency range	45 Hz–1 kHz
DC current	0.01 μA–2 A
Basic accuracy	±(1.5% of reading + 10 digits)
Resistance	0.1 Ω–40 MΩ
Basic accuracy	±(1.0% of reading + 10 digits)
Continuity	R < 40 Ω
Frequency measurement	0.01 Hz–10 MHz
Basic accuracy	±(0.1% of reading + 5 digits)
Capacitance measurement	0.01 nF–400.0 μF
Basic accuracy	±(3.0% of reading + 10 digits)
Temperature	–20°C–1300°C
Basic accuracy	±(1.0% of reading + 3°C)
Degree of contamination	2
Measurement category	CAT IV/1000 V
Safety certificate:	DIN VDE 0411, EN 61010, IEC 61010
Power supply	1 9 V battery, IEC 6LR61
Dimensions	200 x 102 x 59 mm
Weight	approx. 642 g (including battery)

* Specifications relate to model HD160C. Please find specifications for the individual models on our webpage at www.beha-amprobe.de

Ordering information:

Name	Order no.	Item no.
HD160C	HD160C	2670787
HD110C	HD110C	2670779
Professional test lead set	1306	3313458

Accessories:

Professional test lead set with silicone insulation
Order no. 1306



Includes:

- 1 DM73C
- 1 test leads
- 1 alligator clip
- 1 test probe
- 2 1.5 V batteries, IEC LR44
- 1 product manual

DM73C

Pen-shaped digital multimeter

Functions

- Voltage and resistance measurement
- Diode and audible continuity testing

Device information

- Automatic measurement range selection
- Integrated readings memory (data hold)
- Additional bar graph display
- Auto power-off

Device features

- Compact, pen-shaped testing tool



Accessories:

Carry case Order no. VC30A

Specifications

Display	LCD, 3 1/4-digit, 3400 digits
Measurement ranges	
AC voltage	0.001 V–600 V
Basic accuracy	±(1.5% of reading + 8 digits)
Frequency range	50 Hz–500 Hz
DC voltage	0.1 mV–600 V
Basic accuracy	±(0.5% of reading + 2 digits)
Input resistance	10 MΩ
Resistance	0.1 Ω–34 MΩ
Basic accuracy	±(1.0% of reading + 4 digits)
Continuity	R < 35 Ω
Degree of contamination	2
Measurement category	CAT III/300 V, CAT II/600 V
Safety certificate:	DIN VDE 0411, EN 61010, IEC 61010
Power supply	2 1.5 V batteries, IEC LR44
Dimensions	198 x 29 x 35 mm
Weight	approx. 150 g (including battery)

Ordering information:

Name	Order no.	Item no.
DM73C	DM73C	2727739
VC30A	VC30A	3068280

Junior set and kits



Our recommendation for trainees!

Junior set A

comprising:

- Hexagon 60 digital multimeter
- 2100-ALPHA
- Testfix 9023
- Test leads (red/black)
- Rugged carry case

Includes:

- 1 Hexagon 60
- 1 2100-ALPHA
- 1 Testfix 9023
- 2 test leads
- 1 rugged carry case

Ordering information:

Name	Order no.	Item no.
Junior set A	AMPRB-EU-03-A	4460579



AMPRB-EU-01-A

Standard kit

Contents

- AM-510-EUR (digital multimeter)
- ACD-10 PLUS (digital current clamp)
- TPP1-C1 (contact thermometer)
- EU-200 (test lead set with 2 test leads, 2 4-mm test probes), 2 alligator clips CAT III/1000 V
- Hardshell case

Includes:

- 1 AM-510
- 1 ACD-10 PLUS
- 1 TPP1-C1
- 1 EU-200
- 1 hardshell case

Ordering information:

Name	Order no.	Item no.
Standard kit A	AMPRB-EU-01-A	4460593



AMPRB-EU-02-A

Professional kit

Contents

- AM-550-EUR (digital multimeter TRMS)
- ACDC-100 TRMS (digital AC/DC current clamp)
- IR608A (infrared thermometer)
- EU-200 (test lead set with two test leads, two 4-mm test probes), two crocodile clips CAT III/1000 V
- Hardshell case

Includes:

- 1 AM-550
- 1 ACDC-100 TRMS
- 1 IR608A
- 1 EU-200
- 1 hardshell case

Ordering information:

Name	Order no.	Item no.
Professional kit A	AMPRB-EU-02-A	4460587











Current clamps



Our clamp meters and clamp adapters are ideal for measuring currents without having to break the current flow, and they facilitate current measurements in devices and systems from 1 mA up to 3000 A.

Our leakage probes, which enable a resolution of 0.01 mA AC, are ideally suited for fault diagnostics of insulation faults in systems and for device testing.

Pictograms used in this chapter

	Minimum or maximum readings memory		PC interface
	Peak value memory		Installation around NON-INSULATED, HAZARDOUS ACTIVE conductors and removal from these is permitted
	Optimal resolution (e.g. 10 µA AC)		Integrated readings recording (data logger)
	Specification for current measurement range (e.g. 1000 A AC)		Backlight
	Analogue output		True RMS measurement

Important information about current clamps

Important information about current clamps and clamp adapters

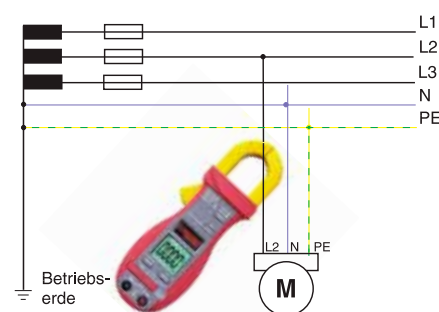
Current clamps and probe adapters are suitable for measuring alternating and direct currents on devices and systems without breaking the current flow.

Safety

Use only current clamps or clamp adapters that are suitable to perform the required measurement based on the specified measurement category. If you intend to perform a current measurement in a distribution box within a building, you must use a test tool of at least measurement category III (CAT III). Refer to page 19.1 for a detailed description of measurement categories.

Interruption-free current measurement

Shutting down systems or individual devices in order to disconnect the circuit is not generally possible in practice and is avoided for the most part. All associated hazards can be effectively circumvented, such as the occurrence of dangerous contact voltage or potential voltage reversal when shutting off the circuit.

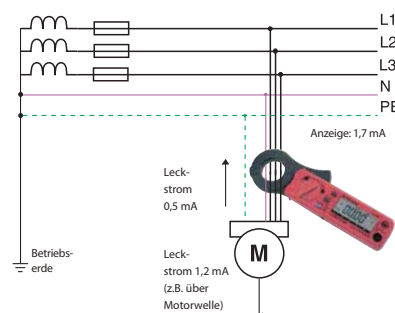


Messung der Stromaufnahme eines Einphasen-Motors

Surface leakage measurement (leakage current measurement)

High-resolution current clamps for leakage currents from 10 μ A are essential in particular for fault diagnostics and testing of devices and systems in accordance with the German Ordinance on Industrial Safety and Health (BGV A3, VBG 4). Currents that do not flow back via a single

electric conductor (e.g. N) can be measured quickly, easily and safely by including all active conductors (e.g. L1, L2, L3, N or L1, N).



Differenzstrommessung mit Leckstromzange

Easy to use

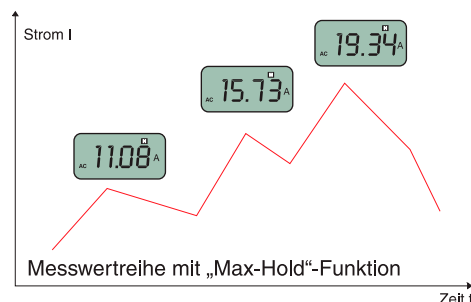
Our current clamps and clamp adapters are simple and convenient to operate. The individual current conductor is entirely enclosed by the current clamp. The reading appears on the digital display and can be read in an instant.

Recording of displayed readings (HOLD) and readings memory

The value on the display is recorded by pressing the HOLD key, providing a very useful function if the display cannot be read during the measurement. On some current clamps, the minimum or maximum value (minimum/maximum readings memory) of a series of measurements can also be saved on the display.

Peak value memory (peak hold)

Some current clamps are equipped with a peak value memory (or start-up current measurement). Owing to the reduced response time, issues such as current surges can be recorded when switching on motors.



Anzeige einer Stromzange bei aktivierter „MAX-HOLD“-Funktion

True RMS measurement

A true RMS value measurement is required for maximum accuracy recording of the alternating current or mixed current. The effective value is particularly significant for non-sinusoidal currents, e.g. phase angle control. The average value indicated by conventional current clamps is less than the actual current present. Refer to the "Important information about multimeters" section for further information on the effective value.

Power clamp meters

BEHA-AMPROBE power clamp meters measure apparent power, active power, reactive power and power factor \cos quickly and easily. Consumers with load currents up to 1000 A can be measured.

Clamp adapters

Clamp adapters are suitable for applications based exclusively around measurement value recording. Depending on the type of analysis circuit, the primary flowing measurement current can be converted into a considerably reduced, non-hazardous secondary current or a voltage. Applications: e.g. switch cabinet construction, laboratory test circuits.

Current clamps — overview

Model	ACD-10 PLUS	ACD-14 PLUS	ACD-205W	ACD-235W	CHB 15	CHB 35	ACDC-100	ACDC-100 TRMS
Page	40	40	41	41	43	43	42	42
								
Max. current	600 A	600 A	400 A	400 A	200 A	400 A	800 A AC/1000 A DC	800 A AC/1000 A DC
Current type	AC	AC	AC	AC	AC/DC	AC/DC	AC/DC	AC/DC
True RMS measurement								
Display	3½-digit, 4000 digits	3½-digit, 4000 digits	3½-digit, 3999 digits	3½-digit, 3999 digits	3½-digit, 3999 digits	3½-digit, 3999 digits	3½-digit, 4000 digits	3½-digit, 4000 digits
AC current	0.01 A–600 V	0.01 A–600 V	0.01 A–400 Hz	0.01 A–400 Hz	0.01 A–200 A	0.001 A–400 A	0.1 A–800 A	0.1 A–800 A
Basic accuracy*	1.5% + 8 digits	1.9% + 8 digits	2% + 6 digits	2% + 6 digits	2% + 4 digits	2% + 3 digits	1.5% + 5 digits	1.5% + 5 digits
Frequency range	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	40 Hz–1 kHz	40 Hz–1 kHz	40–200 Hz	40–200 Hz
DC current					0.01 A–200 A	0.01 A–400 A	0.1 A–1000 mA	0.1 A–1000 mA
Basic accuracy*					2% + 2 digits	2% + 2 digits	1.5% + 4 digits	1.5% + 4 digits
AC voltage	0.001 V–600 V	0.001 V–600 V	1 mV–600 V	1 mV–600 V	0.1 V–400 A	0.1 V–400 V	0.1 mV–600 V	0.1 mV–600 V
Basic accuracy*	1.5% + 5 digits	1.5% + 5 digits	1.2% + 5 digits	1.2% + 5 digits	2% + 2 digits	1% + 4 digits	1% + 4 digits	1% + 4 digits
Frequency range	50–500 Hz	50–400 Hz	50–500 Hz	50–500 Hz	40 Hz–1 kHz	50–500 Hz	50–500 Hz	50–500 Hz
DC voltage	0.1 mV–600 V	0.1 mV–600 V	0.1 mV–600 V	0.1 mV–600 V	0.1 V–400 A	0.1 V–400 V	0.1 mV–600 V	0.1 mV–600 V
Basic accuracy*	0.5% + 3 digits	0.5% + 3 digits	0.5% + 2 digits	0.5% + 2 digits	2% + 2 digits	0.5% + 3 digits	0.5% + 3 digits	0.5% + 3 digits
Resistance	0.1 Ω–40.00 MΩ	0.1 Ω–40.00 MΩ	0.1 Ω–40.00 MΩ	0.1 Ω–40.00 MΩ	0.1 Ω–400 Ω	0.1 Ω–400 Ω	0.1 Ω–40 MΩ	0.1 Ω–40 MΩ
Basic accuracy*	1.0% + 4 digits	0.8% + 6 digits	1.0% + 4 digits	1.0% + 4 digits	2% + 2 digits	0.8% + 6 digits	0.8% + 6 digits	0.8% + 6 digits
Continuity testing	R < 120 Ω	R < 120 Ω	R < 25 Ω	R < 25 Ω	R < 40 Ω	R < 120 Ω	R < 120 Ω	R < 120 Ω
Frequency measurement	0.001 Hz–100 kHz	0.001 Hz–100 kHz			0.01 Hz–50 kHz	0.01 Hz–9.99 kHz		
Power measurement								
Data hold								
MIN/MAX/peak hold								
Capacitance measurement								
Jaw opening	25 mm	26 mm	30 mm	30 mm	23 mm	23 mm	50 mm	50 mm
Power supply	1 x 3 V, IEC/CR2032	2 x 3 V, IEC/CR2032	2 x 1.5 V, IEC LR03	2 x 1.5 V, IEC LR03	2 x 1.5 V, IEC LR6	2 x 1.5 V, IEC LR6	2 x 1.5 V, IEC LR03	2 x 1.5 V, IEC R03
Auto power-off								
Measurement category	CAT III/600 V	CAT III/600 V	CAT III/600 V	CAT III/600 V	CAT III/600 V	CAT III/600 V	CAT III/600 V	CAT III/600 V
Special features	Narrow jaws Measurement of start-up current	2000 µA measurement range for direct measurement of ionisation currents in heating systems	Non-contact voltage detection, rotary probe head (180°)	Non-contact voltage detection, rotary probe head (180°)	Non-contact frequency measurement	Non-contact frequency measurement	Measurement of start-up current True RMS measurement	Measurement of start-up current True RMS measurement

Current clamps — overview

Model	ACD-50NAV	ACDC-52NAV	ACDC-54NAV	ACDC-400	ACDC-3400 IND	AC50A	CHB 5	LH41A
Page	46	44	45	42	45	44	46	47
								
Max. current	600 A	600 A	1000 A AC/DC	400 A	1000 A	60 A	50 A	40 A
Current type	AC	AC/DC	AC/DC	AC/DC	AC/DC	AC	AC	AC/DC
True RMS measurement	•	•	•	•	•	•	•	•
Display	3 1/2 digit, 4000 digits	3 1/2 digit, 4000 digits	3 1/2 digit, 4000 digits	3 1/2 digit, 3999 digits	3 1/2 digit, 6600 digits	3 1/2 digit, 3999 digits	4 digit, 9999 digits	4 digit, 4000 digits
AC current	0.01–600 A	0.01–600 A	0.01–1000 A	0.01 A–400 Hz	0.1 A–1000 A	0.01 mA–60 A	0.5 mA–50 A	0.001–40 A
Basic accuracy*	1.5% + 5 digits	1.5% + 5 digits	1.5% + 5 digits	1.5% + 3 digits	2% + 10 digits	1.5% + 5 digits	1.5% + 5 digits	1.3% + 5 digits
Frequency range	50 Hz–400 Hz	50 Hz–400 Hz	50 Hz–400 Hz	50/60 Hz	50–1 kHz	40 Hz–1 kHz	45 Hz–1 kHz	40–400 Hz
DC current	0.01–600 A	0.01–600 A	0.01–1000 A	0.01 A–400 A	0.1 A–1000 A	•	•	0.001–40 A
Basic accuracy*	1.5% + 5 digits	1.5% + 5 digits	1.5% + 5 digits	1.5% + 3 digits	2% + 5 digits	•	•	1.3% + 5 digits
AC voltage	0.01–1000 V	0.01–1000 V	0.01–1000 V	0.1 mV–600 V	0.1 mV–750 V	0.1 V–400 A	0.1 V–600 V	•
Basic accuracy*	1% + 5 digits	1% + 5 digits	1% + 5 digits	1% + 3 digits	1.5% + 8 digits	2% + 4 digits	0.5% + 5 digits	•
Frequency range	50 Hz–500 Hz	50 Hz–500 Hz	50 Hz–500 Hz	50–500 Hz	50 Hz–1 kHz	40 Hz–1 kHz	50 Hz–1 kHz	•
DC voltage	0.01–1000 V	0.01–1000 V	0.01–1000 V	0.1 mV–600 V	0.1 mV–1000 A	•	•	•
Basic accuracy*	0.7% + 2 digits	0.7% + 2 digits	0.7% + 2 digits	0.8% + 2 digits	0.5% + 2 digits	•	•	•
Resistance	1 Ω–99.99 kΩ	1 Ω–99.99 kΩ	1 Ω–99.99 kΩ	0.1 Ω–40 MΩ	0.1 Ω–66.00 MΩ	0.1 Ω–400 Ω	•	•
Basic accuracy*	1% + 3 digits	1% + 3 digits	1% + 3 digits	1% + 3 digits	1% + 5 digits	1% + 2 digits	•	•
Continuity testing	R < 30 Ω	R < 30 Ω	R < 30 Ω	R < 40 Ω	R < 30 Ω	R < 40 Ω	•	•
Frequency measurement	20.00–9,999 kHz	20.00–9,999 kHz	20.00–9,999 kHz	•	0.01 Hz–1000 A	•	45 Hz–65 Hz	•
Power measurement	0–600 A	0–600 A	0–999 kW	•	•	•	•	•
Data hold	•	•	•	•	•	•	•	•
MIN/MAX peak hold	•	•	•	•	•	•	•	•
Capacitance measurement	0.01–4000 μF	0.01–4000 μF	0.01–4000 μF	•	0.001 nF–6.6 mF	•	•	•
Jaw opening	37 mm	42 mm	42 mm	30 mm	51 mm	30 mm	30 mm	19 mm
Power supply	9 V, IEC 6F22	9 V, IEC 6F22	9 V, IEC 6F22	2 x 1.5 V, IEC R03	1 x 9 V, IEC 6F22	2 x 1.5 V, IEC LR6	2 x 1.5 V, IEC LR6	1 x 9 V, IEC 6LR61
Auto power-off	•	•	•	•	•	•	•	•
Measurement category	CAT IV/600 V, CAT III/1000 V	CAT IV/600 V, CAT III/1000 V	CAT IV/600 V, CAT III/1000 V	CAT III/600 V	CAT III/1000 V, CAT IV/600 V	CAT III/600 V	CAT III/600 V, CAT III/300 V	CAT III/300 V
Special features	Active power, cos φ, total harmonic distortion (THD), bar graph display	Active power, cos φ, total harmonic distortion (THD), bar graph display	Active power, cos φ, total harmonic distortion (THD), temperature, bar graph display	Illuminated display	Relative value measurement, illuminated display, duty cycle	Leakage clamp, minimum resolution 0.01 mA	Leakage clamp, minimum resolution 0.01 mA Harmonic measurement, up to 99th, peak value measurement	Measurement of DC currents with 1 mA resolution

General Specifications AMP-200-EUR and AMP-300-EUR



Model	AMP-210-EUR	AMP-220-EUR	AMP-310-EUR	AMP-320-EUR	AMP-330-EUR
Page	00	00	00	00	00
Display	3-5/6 digits 6000 counts	3-5/6 digits 6000 counts	3-5/6 digits 6000 counts	3-5/6 digits 6000 counts	3-5/6 digits 6000 counts
Polarity	Automatic	Automatic	Automatic	Automatic	Automatic
True RMS measurement	5 per second nominal	5 per second nominal	5 per second nominal	5 per second nominal	5 per second nominal
Operating Temperature	32 to 104°F (0 to 40°C)	32 to 104°F (0 to 40°C)	32 to 104°F (0 to 40°C)	32 to 104°F (0 to 40°C)	14 to 122°F (-10 to 50°C)
Relative Humidity	80% at 30°C, 50% at 40°C	80% at 30°C, 50% at 40°C	80% at 30°C, 50% at 40°C	80% at 30°C, 50% at 40°C	Non condensing at ≤10°C 90% at 10 to 30°C 75% at 30 to 40°C 45% at 40 to 50°C
Operating Altitude	0 to 2000 m	0 to 2000 m	0 to 2000 m	0 to 2000 m	0 to 2000 m
Pollution Degree	2	2	2	2	2
Storage Temperature	-4 to 140°F (-20°C to 60°C), < 80% RH	-4 to 140°F (-20°C to 60°C), < 80% RH	-4 to 140°F (-20°C to 60°C), < 80% RH	-4 to 140°F (-20°C to 60°C), < 80% RH	-4 to 140°F (-20°C to 60°C), < 80% RH
Temperature Coefficient	Nominal 0.15 x (specified accuracy)/ °C @ (0°C to 18°C or 28°C to 40°C)	Nominal 0.15 x (specified accuracy)/ °C @ (0°C to 18°C or 28°C to 40°C)	Nominal 0.15 x (specified accuracy)/ °C @ (0°C to 18°C or 28°C to 40°C)	Nominal 0.15 x (specified accuracy)/ °C @ (0°C to 18°C or 28°C to 40°C)	Nominal 0.10 x (specified accuracy)/ °C @ (0°C to 18°C or 28°C to 50°C)
Battery	Two AAA 1.5 V battery	Two AAA 1.5 V battery	Two AAA 1.5 V battery	Two AAA 1.5 V battery	Two AAA 1.5 V battery
EMC	Meets EN 61326-1:2006	Meets EN 61326-1:2006	Meets EN 61326-1:2006	Meets EN 61326-1:2006	Meets EN 61326-1:2006
Safety Compliance	UL/IEC/EN 61010-1 ed. 3.0, IEC/EN 61010-2-033 ed. 1.0, CAN/CSA C22.2 NO. 61010-1 ed. 3.0, IEC/EN 61010-2-032 ed. 3.0 & IEC/EN 61010-031 ed. 1.1	UL/IEC/EN 61010-1 ed. 3.0, IEC/EN 61010-2-033 ed. 1.0, CAN/CSA C22.2 NO. 61010-1 ed. 3.0, IEC/EN 61010-2-032 ed. 3.0 & IEC/EN 61010-031 ed. 1.1	UL/IEC/EN 61010-1 ed. 3.0, IEC/EN 61010-2-033 ed. 1.0, CAN/CSA C22.2 NO. 61010-1 ed. 3.0, IEC/EN 61010-2-032 ed. 3.0 & IEC/EN 61010-031 ed. 1.1	UL/IEC/EN 61010-1 ed. 3.0, IEC/EN 61010-2-033 ed. 1.0, CAN/CSA C22.2 NO. 61010-1 ed. 3.0, IEC/EN 61010-2-032 ed. 3.0 & IEC/EN 61010-031 ed. 1.1	UL/IEC/EN 61010-1 ed. 3.0, IEC/EN 61010-2-033 ed. 1.0, CAN/CSA C22.2 NO. 61010-1 ed. 3.0, IEC/EN 61010-2-032 ed. 3.0 & IEC/EN 61010-031 ed. 1.1
Certification	UL (c/us) and CE	UL (c/us) and CE	UL (c/us) and CE	UL (c/us) and CE	UL (c/us) and CE
Dimensions (L x W x H)	8.62 x 3.03 x 1.46 in (219 x 77 x 37 mm)	8.82 x 3.03 x 1.46 in (224 x 77 x 37 mm)	8.62 x 3.03 x 1.46 in (219 x 77 x 37 mm)	8.82 x 3.03 x 1.46 in (224 x 77 x 37 mm)	10.16 x 3.70 x 1.73 in (258 x 94 x 44 mm)
Weight	208 g (0.46 lb)	254 g (0.56 lb)	208 g (0.46 lb)	254 g (0.56 lb)	420 g (0.93 lb)
Ordering information	4560581	4560596	4560603	4560615	4560626

AMP-25-EUR Mini-Clamp



AMP-25-EUR AC/DC TRMS Mini-Clamp

- True-RMS for noisy environments provides accuracy and dependability
- AC & DC current to 300 A (10mA resolution)
- Low pass filter for variable frequency drives
- Inrush current for motor start-up monitoring
- Non-contact voltage detection (NCV)
- Jaw opening to 25 mm (1 in)
- Autoranging
- DCA zero and data hold
- Auto power off
- Large LCD backlit display
- Safety Rated CAT III 600 V

Specifications

Display	Digital: 6000 counts, updates 2/sec
Range	Autoranging
Operating Temperature	0°C to 30°C (32°F to 86°F), ≤ 80% RH 30°C to 40°C (86°F to 104°F), ≤ 75% RH 40°C to 50°C (104°F to 122°F), ≤ 45% RH
Operating Altitude	≤ 2000 m
Storage Temperature	-20°C to +60°C (-4°F to 140°F)
Pollution Degree	2
Temperature Coefficient	0.2 x (specified accuracy)/ °C (<18 °C, >28 °C)/ °F(<64.4°F, >82.4°F)
Vibration Requirement	MIL-PRF-28800F for A Class 2
Drop Proof	120 cm (4 feet)
Battery Two	1.5 V LR44 size button batteries
Battery Life	20 hours typical
Low Battery Indication	
Auto Power Off	Idle for 20 minutes
Overvoltage Category	CAT III 600 V
Safety Compliance	IEC/EN 61010-1, IEC/EN 61010-2-030, IEC/EN 61010-2-032
EMC Compliance	IEC/EN 61326-1
Agency Approval	
Dimensions (H x W x L)	147 x 60 x 32 mm (5.8 x 2.4 x 1.3 in)
Weight	Approximately 140 g (0.31 lb) with batteries installed
Jaw Opening & Conductor Diameter	25 mm (1.0 in) max.

Includes:

- 1 carrying case
- 2 1.5 V LR44 batteries installed
- 1 user manual

Ordering information:

Name	Order no.	Item no.
AMP-25-EUR	AMP-25-EUR	4588268



Clamp meters (AC) up to 600 A



ACD-10 PLUS Alternating current clamp (AC)

Functions

- Current, voltage and resistance measurement
- Continuity beeper
- Diode test
- Capacitance and frequency measurement
- Measurement of start-up current (30 ms)

Device information

- Automatic measurement range selection
- Integrated readings memory (data hold and MAX hold)
- Jaw opening 25 mm
- Auto power-off

Device features

- Narrow jaw side

Specifications

Display	LCD, 3 ³ / ₄ digit, 4000 digits
Measurement ranges	
AC current	0.01 A–600 A
Basic accuracy	±(1.5% of reading + 8 digits)
Frequency range	50/60 Hz
AC voltage	0.001 V–600 V
Basic accuracy	±(1.5% of reading + 5 digits)
Frequency range	50–500 Hz
DC voltage	0.1 mV–600 V
Basic accuracy	±(0.5% of reading + 3 digits)
Continuity	R < 120 Ω
Resistance	0.1 Ω–40.00 MΩ
Basic accuracy	±(1.0% of reading + 4 digits)
Frequency measurement	0.001 Hz–100 kHz
Capacitance measurement	0.1 nF–3000 μF
Degree of contamination	2
Measurement category	CAT III/600 V
Safety certificate:	DIN VDE 0411/EN 61010/IEC 61010
Jaw opening	approx. 25 mm
Power supply	1.3 V battery, IEC CR2032
Dimensions	190 x 63 x 32 mm
Weight	approx. 150 g



Includes:

- 1 ACD-10 PLUS
- 2 test leads
- 1 3 V battery, IEC CR2032
- 1 carry case
- 1 product manual



Accessories:

- Safety set Order no. 370003

Ordering information:

Name	Order no.	Item no.
ACD-10 PLUS	ACD-10 PLUS	3037808
ACD-10 PLUS	ACD-10 PLUS-D	3454555
Safety set	370003	2146666



ACD-14 PLUS Alternating current clamp with dual display (AC)

Functions

- Current, voltage and resistance measurement
- Continuity beeper
- Capacitance and frequency measurement
- Temperature measurement
- Measurement of start-up current

Device information

- Automatic measurement range selection
- Integrated readings memory (data hold and MAX hold)
- Jaw opening 26 mm
- Auto power-off

Device features

- Dual display
- μA measurement range for direct current measurements of ionisation currents in heating systems

Specifications

Display	LCD, 3 ³ / ₄ -digit, 4000 digits
Measurement ranges	
AC current	0.01 A–600 A
Basic accuracy	±(1.9% of reading + 8 digits)
Frequency range	50/60 Hz
Ionisation current AC/DC	0.1 μA–2000 μA
AC voltage	0.001 V–600 V
Basic accuracy	±(1.5% of reading + 5 digits)
Frequency range	50–400 Hz
DC voltage	0.1 V–600 V
Basic accuracy	±(0.5% of reading + 3 digits)
Continuity	R < 120 Ω
Resistance	0.1 Ω–40.00 MΩ
Basic accuracy	±(0.8% of reading + 6 digits)
Frequency measurement	0.001 Hz–100 kHz
Capacitance measurement	0.1 nF–3000 μF
Temperature	-20°C–300°C
Basic accuracy	±(2% of reading + 3°C)
Degree of contamination	2
Measurement category	CAT III/600 V
Safety certificate:	DIN VDE 0411/EN 61010/IEC 61010
Jaw opening	approx. 26 mm
Power supply	2.3 V battery, IEC CR2032
Dimensions	190 x 63 x 32 mm
Weight	approx. 200 g



Includes:

- 1 ACD-14 PLUS
- 2 test leads
- 2 3 V batteries, IEC CR 2032
- 1 temperature probe
- 1 carry case
- 1 product manual



Accessories:

- Safety set Order no. 370003

Ordering information:

Name	Order no.	Item no.
ACD-14 PLUS	ACD-14 PLUS-D	3454562
ACD-14 PLUS	ACD-14-PLUS	3086905
Safety set	370003	2146666

Clamp meters (AC) up to 400 A



ACD-20SW Rotary head current clamp (AC)

Functions

- Current, voltage and resistance measurement
- Continuity beeper
- Diode test

Device information

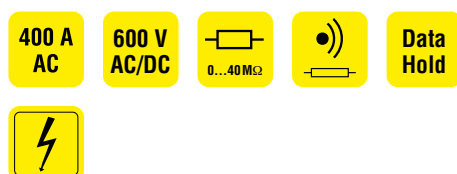
- Automatic and manual measurement range selection
- Integrated readings memory (data hold)
- Jaw opening approx. 30 mm
- Auto power-off

Device features

- Jaw head can be rotated by 180°
- Non-contact voltage detection

Specifications

Display	LCD, 3¾-digit, 3999 digits
Measurement ranges	
AC current	0.01–400 A
Basic accuracy	±(2% of reading + 6 digits)
Frequency range	50 Hz–60 Hz
AC voltage	1.0 mV–600.0 V
Basic accuracy	±(1.2% of reading + 5 digits)
Frequency range	50–500 Hz
DC voltage	0.1 mV–600 V
Basic accuracy	±(0.5% of reading + 2 digits)
Continuity	R < 25 Ω
Resistance	0.1 Ω–40 MΩ
Basic accuracy	±(1.0% of reading + 4 digits)
Degree of contamination	2
Measurement category	CAT III/600 V
Safety certificate:	DIN VDE 0411/EN 61010/IEC 61010
Jaw opening	approx. 30 mm
Power supply	2 1.5 V batteries, AAA, IEC LR03
Dimensions	240 × 70 × 41 mm
Weight	approx. 220 g



Includes:

- 1 ACD-20SW
- 2 test leads
- 2 1.5 V battery, IEC LR03
- 1 carry case
- 1 product manual



Accessories:

Safety set Order no. 370003

Ordering information:

Name	Order no.	Item no.
ACD-20SW	ACD-20SW	3472723
Safety set	370003	2146666



ACD-23SW Rotary head current clamp TRMS (AC)

Functions

- Current, voltage and resistance measurement
- Continuity beeper and diode test
- Capacity and temperature measurement

Device information

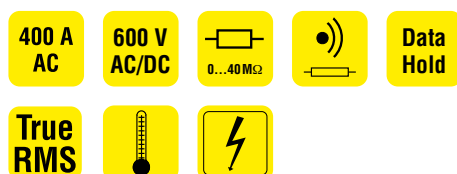
- Automatic and manual measurement range selection
- Integrated readings memory (data hold)
- Jaw opening approx. 30 mm
- Auto power-off

Device features

- Jaw head can be rotated by 180°
- Non-contact voltage detection
- True RMS measurement (TRMS)

Specifications

Display LCD,	3¾ digit, 3999 digits
Measurement ranges	
AC current	0.01–400 A
Basic accuracy	±(2% of reading + 6 digits)
Frequency range	50 Hz–60 Hz
AC voltage	1.0 mV–600.0 V
Basic accuracy	±(1.2% of reading + 5 digits)
Frequency range	50–500 Hz
DC voltage	0.1 mV–600 V
Basic accuracy	±(0.5% of reading + 2 digits)
Continuity	R < 25 Ω
Resistance	0.1 Ω–40 MΩ
Basic accuracy	±(1.0% of reading + 4 digits)
Capacitance measurement	0.01–4000 µF
Temperature measurement	–35–400°C
Degree of contamination	2
Measurement category	CAT III/600 V
Safety certificate:	DIN VDE 0411/EN 61010/IEC 61010
Jaw opening	approx. 30 mm
Power supply	2 1.5 V batteries, AAA, IEC LR03
Dimensions	240 × 70 × 41 mm
Weight	approx. 220 g



Includes:

- 1 ACD-23SW
- 2 test leads
- 2 1.5 V battery, IEC LR03
- 1 temperature probe
- 1 carry case
- 1 product manual



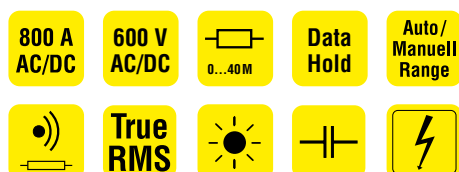
Accessories:

Safety set Order no. 370003

Ordering information:

Name	Order no.	Item no.
ACD-23SW	ACD-23SW	3804941
Safety set	370003	2146666

Clamp meters (AC/DC) up to 400 A/800 A



Includes:

- 1 Amprobe ACDC-100 or ACDC-100 TRMS
- 2 test leads
- 1 1.5 V battery, IEC LR03
- 1 carry case
- 1 product manual

ACDC-100

Digital alternating and direct current clamp (AC/DC)

Functions

- Current, voltage and resistance measurement
- Capacitance measurement
- Continuity beeper
- Measurement of start-up current (30 ms)

Device information

- Automatic and manual measurement range selection
- Integrated readings memory (data hold)
- Jaw opening 50 mm
- Auto power-off

Device features

- Large, easy-to-read display

ACDC-100 TRMS

Digital alternating and direct current clamp (AC/DC)

- Same as ACDC-100 but with:
- True RMS measurement (TRMS)
- Illuminated display



Accessories:

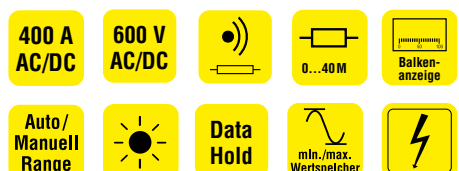
- Safety set Order no. 370003

Specifications

Display	LCD, 3 1/4-digit, 4000 digits
Measurement ranges	
AC current	0.1 A–800 A
Basic accuracy	±(1.5% of reading + 5 digits)
Frequency range	40 Hz–200 Hz
DC current	0.1 A–1000 A
Basic accuracy	±(1.5% of reading + 4 digits)
AC voltage	0.1 mV–600 V
Basic accuracy	±(1% of reading + 4 digits)
Frequency range	50–500 Hz
DC voltage	0.1 mV–600 V
Basic accuracy	±(0.5% of reading + 3 digits)
Continuity	R < 120 Ω
Resistance	0.1 Ω–40.00 MΩ
Basic accuracy	±(0.8% of reading + 6 digits)
Capacitance measurement	0.1 nF–3000 μF
Degree of contamination	2
Measurement category	CAT III/600 V
Safety certificate:	DIN VDE 0411/EN 61010/IEC 61010
Jaw opening	approx. 50 mm
Power supply	2 1.5 V batteries, IEC LR03
Dimensions	227 x 78 x 40 mm
Weight	approx. 290 g

Ordering information:

Name	Order no.	Item no.
ACDC-100	ACDC-100-D	3454603
ACDC-100	ACDC-100	2740452
ACDC-100 TRMS	ACDC-100 TRMS-D	3454615
ACDC-100 TRMS	ACDC-100 TRMS	2740465
Safety set	370003	2146666



Includes:

- 1 ACDC-400
- 2 test leads
- 2 1.5 V battery, IEC LR03
- 1 carry case
- 1 product manual

ACDC-400

Alternating and direct current clamp (AC/DC)

Functions

- Current, voltage and resistance measurement
- Continuity beeper

Device information

- Automatic and manual measurement range selection
- Integrated readings memory (data hold, MIN/MAX)
- Relative value measurement
- Additional bar graph display
- Jaw opening 30 mm
- Auto power-off

Device features

- Alternating and direct current clamp also suitable for automotive sector, back-up power supplies and solar systems
- Illuminated display



Accessories:

- Safety set Order no. 370003

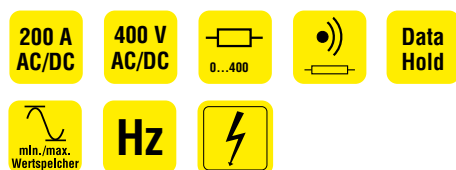
Specifications

Display	LCD, 3 1/4-digit, 3999 digits
Measurement ranges	
AC current	0.01 A–400 A
Basic accuracy	±(1.5% of reading + 3 digits)
Frequency range	50/60 Hz
DC current	0.01 A–400 A
Basic accuracy	±(1.5% of reading + 3 digits)
AC voltage	0.1 mV–600 V
Basic accuracy	±(1% of reading + 3 digits)
Frequency range	50–500 Hz
DC voltage	0.1 mV–600 V
Basic accuracy	±(0.8% of reading + 2 digits)
Continuity	R < 40 Ω
Resistance	0.1 Ω–40 MΩ
Basic accuracy	±(1% of reading + 3 digits)
Degree of contamination	2
Measurement category	CAT III/600 V
Safety certificate:	DIN VDE 0411/EN 61010/IEC 61010
Jaw opening	approx. 30 mm
Power supply	2 1.5 V batteries, IEC LR03
Dimensions	205 x 64 x 39 mm
Weight	approx. 280 g

Ordering information:

Name	Order no.	Item no.
ACDC-400	ACDC-400-D	3454596
ACDC-400	ACD-400	2730810
Safety set	370003	2146666

Clamp probes (AC/DC) up to 200 A/400 A



CHB15

Alternating and direct current clamp (AC/DC)

Functions

- Current, voltage and resistance measurement
- Continuity beeper
- Frequency measurement

Device information

- Manual measurement range selection
- Integrated readings memory (data hold)
- MIN/MAX and relative value measurement
- Additional bar graph display
- Jaw opening 23 mm

Device features

- Alternating and direct current clamp also suitable for automotive sector, back-up power supplies and solar systems

Specifications

Display	LCD, 3 1/4-digit, 3999 digits
Measurement ranges	
AC current	0.01–200 A
Basic accuracy	± (2% of reading + 4 digits)
DC current	0.01–200 A
Basic accuracy	± (2% of reading + 2 digits)
AC voltage	0.1–400 V
Basic accuracy	± (2% of reading + 2 digits)
DC voltage	0.1–400 V
Basic accuracy	± (2% of reading + 2 digits)
Frequency range for alternating current/voltage	
40 Hz–1 kHz	
Input resistance	10 MΩ
Resistance	0.1–400 Ω
Basic accuracy	± (2% of reading + 2 digits)
Continuity	R < 40 Ω
Frequency measurement	0.01 Hz–50 kHz
Basic accuracy	± (1% of reading + 2 digits)
Degree of contamination	2
Measurement category	CAT II/600 V
Safety certificate:	DIN VDE 0411/EN 61010/IEC 61010
Jaw opening	approx. 23 mm
Power supply	2 1.5 V batteries, IEC LR6
Dimensions	183 x 64 x 36 mm
Weight	approx. 190 g

Includes:

- 1 CHB15
- 2 test leads
- 2 1.5 V batteries, IEC LR6
- 1 carry case
- 1 product manual



Accessories:

- Safety set Order no. 370003

Ordering information:

Name	Order no.	Item no.
CHB15	93468-D	3454457
Safety set	370003	2146666



CHB35

Alternating and direct current clamp TRMS (AC/DC)

Functions

- Current measurement
- Frequency measurement (non-contact)

Device information

- Manual measurement range selection
- Integrated readings memory (data hold)
- MIN/MAX and relative value measurement
- Additional bar graph display
- Jaw opening 23 mm

Device features

- Alternating and direct current clamp also suitable for automotive sector, back-up power supplies and solar systems
- True RMS measurement (TRMS)

Specifications

Display	LCD, 3 1/4-digit, 3999 digits
Measurement ranges	
AC current	0.001–400 A
Basic accuracy	± (2% of reading + 3 digits)
DC current	0.01–400 A
Basic accuracy	± (2% of reading + 2 digits)
Frequency range for alternating current	
40 Hz–1 kHz	
Crest factor	<4
Frequency measurement	0.01 Hz–999 kHz
Basic accuracy	± (1% of reading + 2 digits)
Degree of contamination	2
Measurement category	CAT II/600 V
Safety certificate:	DIN VDE 0411/EN 61010/IEC 61010
Jaw opening	approx. 23 mm
Power supply	2 1.5 V batteries, IEC LR6
Dimensions	183 x 64 x 36 mm
Weight	approx. 190 g

Ordering information:

Name	Order no.	Item no.
CHB35	93469-D	3454469

Includes:

- 1 CHB35
- 2 1.5 V batteries, IEC LR6
- 1 carry case
- 1 product manual

Clamp meters (AC/DC) up to 600 A



ACD-50NAV CAT IV Navigator™ power clamp meter 600 A AC TRMS

Functions

- Current, voltage and resistance measurement
- Continuity beeper
- Capacitance and frequency measurement
- Measurement of active power
- Measurement of power factor $\cos \varphi$
- Measurement of harmonics (current, voltage up to 25th)
- Measurement of total harmonic distortion (THD)
- Start-up current measurement for motors

Device information

- Automatic and manual measurement range selection
- Integrated readings memory (MIN/MAX and data hold)
- Peak value memory (peak hold)
- Phase sequence measurement
- Low pass filter for measurements on frequency inverters
- Large display with backlight and analogue bar graph
- Jaw opening 37 mm
- Auto power-off

Device features

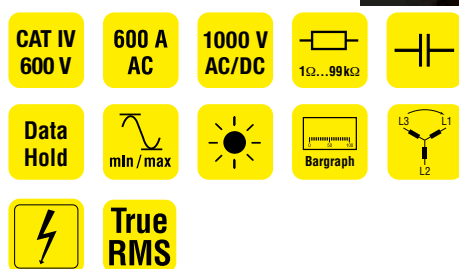
- True RMS value measurement AC+DC (TRMS)
- Automatic torch function when opening jaw
- Non-contact voltage detection
- Functions can be selected via joystick

Specifications

Display	LCD, 3 3/4-digit, 4000 digits
Measurement ranges	
AC current	0.01–600 A
Basic accuracy	± (1.5% of reading + 5 digits)
Frequency range	50 Hz–400 Hz
AC voltage	0.01–1000 V
Basic accuracy	± (1% of reading + 5 digits)
Frequency range	50 Hz–500 Hz
DC voltage	0.01–1000 V
Basic accuracy	± (0.7% of reading + 2 digits)
Active power	0–600.0 kW
$\cos \varphi$	-1.00 to 0.00 to +1.00
Harmonics	Up to 25th
Total harmonic distortion (THD)	0.1 to 100%
Resistance	1 Ω –99.99 k Ω
Basic accuracy	± (1% of reading + 3 digits)
Continuity	R < 30 Ω
Frequency measurement	20.00–9,999 kHz
Capacitance measurement	0.01–4000 μ F
Degree of contamination	2
Measurement category	CAT IV/600 V, CAT III/1000 V
Safety	DIN VDE 0411/EN 61010/IEC 61010
Jaw opening	approx. 37 mm
Power supply	1.9 V battery, IEC 6F22
Dimensions	approx. 260 x 80 x 40 mm
Weight	approx. 480 g

Ordering information:

Name	Order no.	Item no.
ACD-50NAV	ACD-50NAV	3729945
Safety set	370003	2146666



Includes:

- 1 ACD-50NAV
- 2 test leads
- 1.9 V battery, IEC 6F22
- 1 x carry case
- 1 product manual



Accessories:

Safety set Order no. 370003



ACDC-52NAV CAT IV Navigator™ power meter clamp 600 A AC/DC TRMS

Functions

- Current, voltage and resistance measurement
- Continuity beeper
- Capacitance and frequency measurement
- Measurement of active power
- Measurement of power factor $\cos \varphi$
- Measurement of harmonics (current, voltage up to 25th)
- Measurement of total harmonic distortion (THD)
- Start-up current measurement for motors

Device information

- Automatic and manual measurement range selection
- Integrated readings memory (MIN/MAX and data hold)
- Peak value memory (peak hold)
- Phase sequence measurement
- Low pass filter for measurements on frequency inverters
- Large display with backlight and analogue bar graph
- Jaw opening 42 mm
- Auto power-off

Device features

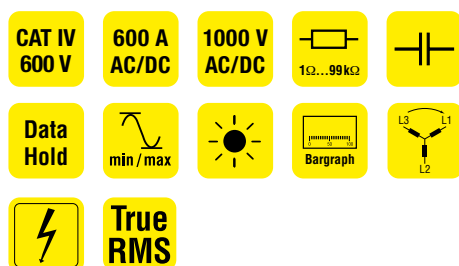
- True RMS value measurement AC+DC (TRMS)
- Automatic torch function when opening jaw
- Non-contact voltage detection
- Functions can be selected via joystick

Specifications

Display	LCD, 3 3/4-digit, 4000 digits
Measurement ranges	
AC current	0.01–600 A
Basic accuracy	± (1.5% of reading + 5 digits)
Frequency range	50 Hz–400 Hz
DC current	0.01–600 A
Basic accuracy	± (1.5% of reading + 5 digits)
AC voltage	0.01–1000 V
Basic accuracy	± (1% of reading + 5 digits)
Frequency range	50 Hz–500 Hz
DC voltage	0.01–1000 V
Basic accuracy	± (0.7% of reading + 2 digits)
Active power	0–600.0 kW
$\cos \varphi$	-1.00 to 0.00 to +1.00
Harmonics	Up to 25th
Total harmonic distortion (THD)	0.1–100%
Resistance	1 Ω –99.99 k Ω
Basic accuracy	± (1% of reading + 3 digits)
Continuity	R < 30 Ω
Frequency measurement	20.00–9,999 kHz
Capacitance measurement	0.01–4000 μ F
Degree of contamination	2
Measurement category	CAT IV/600 V, CAT III/1000 V
Safety certificate	DIN VDE 0411/EN 61010/IEC 61010
Jaw opening	approx. 42 mm
Power supply	1.9 V battery, IEC 6F22
Dimensions	approx. 260 x 80 x 40 mm
Weight	approx. 480 g

Ordering information:

Name	Order no.	Item no.
ACDC-52NAV	ACDC-52NAV	3729961
Safety set	370003	2146666



Includes:

- 1 ACDC-52NAV
- 2 test leads
- 1.9 V battery, IEC 6F22
- 1 x carry case
- 1 product manual



Accessories:

Safety set Order no. 370003

Clamp meters (AC/DC) up to 1000 A



ACDC-54NAV CAT IV Navigator™ power meter clamp 1000 A AC/DC TRMS

Functions

- Current, voltage and resistance measurement
- Continuity beeper
- Capacitance and frequency measurement
- Temperature measurement
- Measurement of active power
- Measurement of power factor $\cos \varphi$
- Measurement of harmonics (current, voltage up to 25th)
- Measurement of total harmonic distortion (THD)
- Start-up current measurement for motors

Device information

- Automatic and manual measurement range selection
- Integrated readings memory (MIN/MAX and data hold)
- Peak value memory (peak hold)
- Phase sequence measurement
- Low pass filter for measurements on frequency inverters
- Large display with backlight and analogue bar graph
- Jaw opening 42 mm
- Auto power-off

Device features

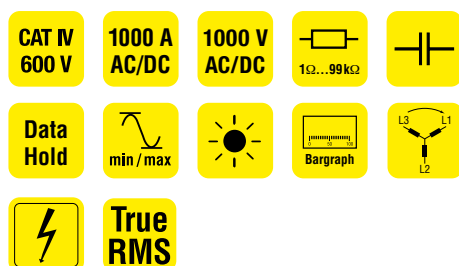
- True RMS value measurement AC+DC (TRMS)
- Automatic torch function when opening jaw
- Non-contact voltage detection
- Functions can be selected via joystick

Specifications

Display	LCD, 3 1/4-digit, 4000 digits
Measurement ranges	
AC current	0.01–1000 A
Basic accuracy	± (1.5% of reading + 5 digits)
Frequency range	50 Hz–400 Hz
DC current	0.01–1000 A
Basic accuracy	± (1.5% of reading + 5 digits)
AC voltage	0.01–1000 V
Basic accuracy	± (1% of reading + 5 digits)
Frequency range	50 Hz–500 Hz
DC voltage	0.01–1000 V
Basic accuracy	± (0.7% of reading + 2 digits)
Active power	0–999.9 kW
$\cos \phi$	-1.00 to 0.00 to +1.00
Harmonics	Up to 25th
Total harmonic distortion (THD)	0.1–100%
Resistance	1 Ω –99.99 k Ω
Basic accuracy	± (1% of reading + 3 digits)
Continuity	R < 30 Ω
Frequency measurement	20.00–9,999 kHz
Capacitance measurement	0.01–4000 μ F
Temperature measurement	-50–1000°C
Degree of contamination	2
Measurement category	CAT IV/600 V, CAT III/1000 V
Safety	DIN VDE 0411/EN 61010/IEC 61010
Jaw opening	approx. 42 mm
Power supply	1.9 V battery, IEC 6F22
Dimensions	approx. 260 x 80 x 40 mm
Weight	approx. 480 g

Ordering information:

Name	Order no.	Item no.
ACD-54NAV	ACD-54NAV	3729989
Safety set	370003	2146666



Includes:

- 1 ACDC-54NAV
- 2 test leads
- 1 temperature probe
- 1 9 V battery, IEC 6F22
- 1 x carry case
- 1 product manual

Accessories:



Safety set

Order no. 370003



ACDC-3400 IND CAT IV true RMS clamp meter for industrial applications up to 1000 A AC/DC

Functions

- Current, voltage and resistance measurement
- Continuity beeper
- Frequency measurement
- Capacitance measurement
- Peak value measurement
- Duty cycle function

Device information

- Automatic and manual measurement range selection
- Integrated readings memory (data hold, peak hold)
- Additional bar graph display
- Illuminated display
- Auto power-off
- Relative value measurement
- Jaw opening: 51 mm

Device features

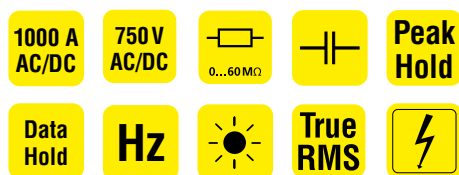
- True RMS measurement (TRMS)

Specifications

Display	LCD, 3 1/4-digit, 6600 digits
Measurement ranges	
AC current	0.1–1000 A
Basic accuracy	± (2% of reading + 10 digits)
Frequency range	50 Hz–1 kHz
DC current	0.1–1000 A
Basic accuracy	± (2% of reading + 5 digits)
AC voltage	0.1 mV–750 V
Basic accuracy	± (1.5% of reading + 8 digits)
Frequency range	50 Hz–1 kHz
Direct voltage	0.1 mV–1000 V
Basic accuracy	± (0.5% of reading + 2 digits)
Continuity	R < 30 Ω
Resistance	0.1 Ω –66.00 M Ω
Basic accuracy	± (1% of reading + 5 digits)
Frequency measurement	0.01 Hz–1000 kHz
Capacity	0.001 nF–6.6 mF
Duty cycle	5.0–95.0%
Degree of contamination	2
Measurement category	CAT III 1000 V, CAT IV 600 V, as per EN 61010/IEC 61010
Safety	approx. 51 mm
Jaw opening	1.9 V battery, IEC 6F22
Power supply	281 x 105 x 53 mm
Dimensions	approx. 560 g
Weight	

Ordering information:

Name	Order no.	Item no.
ACDC-3400 IND	ACDC-3400 IND	3434889
TL36A	TL36A	3034444
Safety set	370003	2146666



Includes:

- 1 ACDC-3400 IND
- 2 test leads
- 1 9 V battery, IEC 6F22
- 1 Carry case
- 1 product manual

Accessories:



Safety set

Order no. 370003

Test lead set with crocodile clips
no. TL36A

Leakage clamp meters (AC)



AC50A

Digital leakage probe for alternating currents (AC)

Functions

- Leakage test as per German Ordinance on Industrial Safety and Health [BetrSichV]
- Surface leakage measurement (leakage current)
- Voltage and resistance measurement
- Continuity beeper

Device information

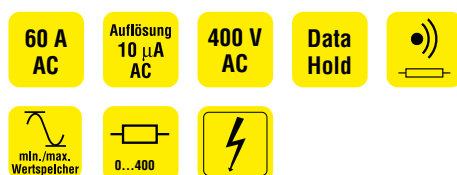
- Manual measurement range selection
- Integrated readings memory (data hold)
- MIN/MAX and relative value measurement
- Additional bar graph display
- Jaw opening 30 mm
- Auto power-off

Device features

- Minimum resolution 0.01 mA
- Areas of application: measurement of leakage currents, e.g. surface leakage or fault currents, current draw of devices in service and customer service sectors without breaking the circuit

Specifications

Display	LCD, 3 1/4-digit, 3999 digits
Measurement ranges	
AC current	0.01 mA–60 A
Tolerance	± (1.5% of reading + 5 digits)
AC voltage	0.1–400 V
Tolerance	± (2% of reading + 4 digits)
Frequency range for alternating current/voltage	40 Hz–1 kHz
Input resistance	10 MΩ
Tolerance	
Resistance	0.1–400 Ω
Tolerance	± (1% of reading + 2 digits)
Continuity	R<40 Ω
Degree of contamination	2
Measurement category	CAT II/600 V
Safety certificate:	DIN VDE 0411/EN 61010/IEC 61010
Jaw opening	approx. 30 mm
Power supply	2 1.5 V batteries, IEC LR6
Dimensions	210 x 62 x 36 mm
Weight	approx. 230 g



Includes:

- 1 AC50A
- 2 test leads
- 2 1.5 V batteries, IEC LR6
- 1 carry case
- 1 product manual



Accessories:

- Measurement adapters for surface leakage measurements:
- | | |
|----------------|----------------|
| Schuko/Schuko | Order no. 1233 |
| CEE 5-pin 16 A | Order no. 1235 |
| CEE 5-pin 32 A | Order no. 1236 |



Ordering information:

Name	Order no.	Item no.
AC50A	AC50A	3033017
AC50A	AC50A-D	3454543
Test adapter:		
Schuko/Schuko	1233	2145900
CEE 5-pin 16 A	1235	2145921
CEE 5-pin 32 A	1236	2145939



CHB5

Digital leakage probe with harmonic measurement TRMS (AC)

Functions

- Leakage test as per German Ordinance on Industrial Safety and Health [BetrSichV]
- Surface leakage measurement (leakage current measurement) TRMS
- Voltage measurement (TRMS)
- Frequency measurement
- Harmonic measurement for current and voltage readings (up to 99th harmonic)

Device information

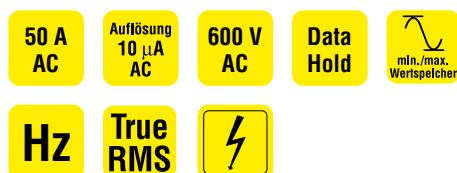
- Integrated readings memory (data hold)
- MIN/MAX value measurement
- Jaw opening 30 mm
- Auto power-off

Device features

- Minimum resolution 0.01 mA
- Harmonic measurement
- Areas of application: measurement of leakage currents, e.g. surface leakage or fault currents, current draw of devices in service and customer service sectors without breaking the circuit

Specifications

Display	LCD, 4-digit, 9999 digits
Measurement ranges	
AC current	0.5 mA–50 A
Basic accuracy	± (1.5% of reading + 5 digits)
AC voltage	0.1–600 V
Basic accuracy	± (0.5% of reading + 5 digits)
Frequency range for alternating current/voltage	45 Hz–1 kHz
Input resistance	10 MΩ
Frequency measurement	45–65 Hz
Basic accuracy	± (0.2 Hz)
Harmonics	Display up to 99th
Crest factor measurement	1.00–99.99
Basic accuracy	± (5% of reading + 30 digits)
Degree of contamination	2
Measurement category	CAT II/600 V, CAT III/300 V
Safety certificate:	DIN VDE 0411/EN 61010/IEC 61010
Jaw opening	approx. 30 mm
Power supply	2 1.5 V batteries, IEC L 6
Dimensions	210 x 62 x 36 mm
Weight	approx. 200 g



Includes:

- 1 CHB5
- 2 test leads
- 2 1.5 V batteries, IEC LR6
- 1 carry case
- 1 product manual



Accessories:

- Measurement adapters for surface leakage measurements:
- | | |
|----------------|----------------|
| Schuko/Schuko | Order no. 1233 |
| CEE 5-pin 16 A | Order no. 1235 |
| CEE 5-pin 32 A | Order no. 1236 |



Ordering information:

Name	Order no.	Item no.
CHB5	93570	3313218
Test adapter:		
Schuko/Schuko	1233	2145900
CEE 5-pin 16 A	1235	2145921
CEE 5-pin 32 A	1236	2145939

Clamp meters (AC/DC) and clamp adapters



LH41A

Digital alternating and direct current clamp (AC/DC)

Functions

- Current measurement starting from 1 mA AC and DC

Device information

- Manual measurement range selection
- Jaw opening 19 mm
- Automatic zero (DC measurement range)
- Integrated readings memory (data hold) 5s
- Auto power-off

Device features

- Minimum resolution 1 mA
- Shielded against external interfering signals

Specifications

Display	LCD 4 digit, 4000 digits
Measurement ranges	
Ac/DC current	0.001–40 A
Basic accuracy	±(1.3% of reading + 5 digits)
Frequency range	40–400 Hz
Degree of contamination	2
Measurement category	CAT III/300 V
Safety certificate:	DIN VDE 0411/EN 61010/IEC 61010
Jaw opening	approx. 19 mm
Power supply	1 9 V battery, IEC 6LR61
Dimensions	184 x 71 x 31 mm
Weight	approx. 235 g

40 A
AC/DC

Auflösung
1 mA
AC/DC

Data
Hold



Includes:

- 1 LH41A
- 1 9 V battery, IEC 6LR61
- 1 product manual

Ordering information:

Name	Order no.	Item no.
LH41A	LH41A	3030898



CT235A

Clamp adapters (AC/DC)

Functions

- Clamp adapters for extending alternating and direct current ranges of multimeters up to 1000 A AC/DC

Device information

- Can be combined with all standards multimeters as well as with TRUE RMS multimeters or analogue writers
- Output signal: 1 mV corresponds to 1-A measurement current
- Jaw opening 32 mm
- Permanently connected test leads
- Zero point adjustment

Specifications

Measurement ranges	
AC/DC current	200 A, 1000 A
Basic accuracy	±(1% + 0.5 A)
Output voltage	1 mV/A
Frequency range	
for alternating current	50 Hz–10 kHz
Degree of contamination	2
Measurement category	CAT III/300 V
Safety certificate:	DIN VDE 0411/EN 61010/IEC 61010
Jaw opening	approx. 32 mm
Connection cable length	approx. 1.5 m
Power supply	1 9 V battery, IEC 6F22
Dimensions	approx. 195 x 70 x 30 mm
Weight	approx. 300 g

Includes:

- 1 CT235A
- 1 9 V battery, IEC 6F22
- 1 product manual

Ordering information:

Name	Order no.	Item no.
CT235A	CT235A	3026809



CT237B

Clamp adapters (AC/DC)

Functions

- Clamp adapters for extending alternating and direct current ranges of multimeters up to 200 A AC/DC

Device information

- Can be combined with all standards multimeters as well as with TRUE RMS multimeters or analogue writers
- Output signal: 10 mV corresponds to 1-A measurement current
- Jaw opening 20 mm
- Permanently connected test leads
- Zero point adjustment

Specifications

Measurement ranges	
AC/DC current	20 A, 200 A
Basic accuracy	±(1.2% + 0.03 A)
Output voltage	10 mV/A (20 A measurement range)
	1 mV/A (200 A measurement range)
Frequency range for AC current	50 Hz–1 kHz
Degree of contamination	2
Measurement category	CAT III/300 V
Safety certificate:	DIN VDE 0411/EN 61010/IEC 61010
Jaw opening	approx. 20 mm
Power supply	1 9 V battery, IEC 6F22
Connection cable length	approx. 1.5 m
Dimensions	approx. 185 x 70 x 30 mm
Weight	approx. 280 g

Includes:

- 1 CT237B
- 1 9 V battery, IEC 6F22
- 1 product manual

Ordering information:

Name	Order no.	Item no.
CT237B	CT237B	3511514

Measurement and testing equipment as per DIN VDE



























Measurement and testing equipment according to DIN VDE is used to test electrical safety to determine they are safe for people and property.

Our measurement and testing equipment is divided into three groups corresponding to the tests to be carried out:

- Testing electrical systems (stationary) in accordance with DIN VDE 0100
- Testing electrical equipment (portable) in accordance with DIN VDE 0701-0702
- Testing electrical machines in accordance with DIN VDE 0113








This equipment was developed to meet the requirements of users and standards and to perform tests quickly, simply and safely. Our measurement and testing equipment features an integrated readings memory to create a test log, thereby making the logging process even more effective with our software packages.

Pictograms used in this chapter









	Low-impedance measurement according to DIN VDE 0413		Leakage test
	Loop resistance measurement		Contact current measurement
	Internal resistance measurement		Software available as an option
	Trip testing or internal load for tripping a residual current circuit breaker (RCD/FI)		Internal readings memory
	Earthing measurement		High-voltage testing (AC)
	RCD/FI testing with increasing test current		No battery required
	Curve shape of test current (RCD/FI) is adjustable		Display with LCD
	Test time is adjustable		Integrated outlet test with contact electrode
	PC interface		Touchscreen
	SD memory card		Automatic testing sequence
	Testing of all-current sensitive RCD/FI		Terminal for barcode scanners
	Testing of portable fault current protective switches (PRCD)		An external current clamp can be connected

Complete equipment systems

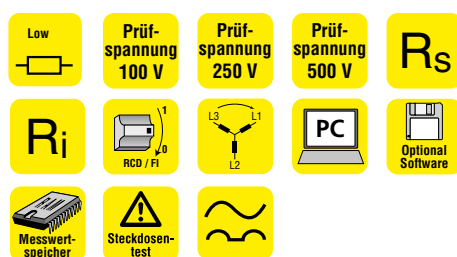
Basic workshop equipment/professional

Row no.	VDE regulation	Measurement and testing equipment	Figure	Order no.	Item no.
1	Two-pin voltage detector and single-pin voltage detector as per DIN VDE 0682, Part 401, DIN EN 61243-3 (previously DIN VDE 0680, Pt. 5) phase sequence indicator as per DIN VDE 0413, EN 61557	2100-ALPHA Voltage detector		2100-ALPHA	4312495
2	Voltmeter/ammeter as per DIN VDE 0411/EN 61010	AM-500-EUR Digital multimeter		AM-500-EUR	4102332
3	Clamp ammeter as per DIN VDE 0411/EN 61010	ACD-10 PLUS Digital current clamp		ACD-10 PLUS D ACD-10 PLUS	3454555 3037808
4	Insulation tester, loop resistance measurement unit, ohmmeter, RCD/Fi test tool as per DIN VDE 0413, EN 61557, combination meter for measurements according to DIN VDE 0100	Telaris ProInstall-200		PROINSTALL-200-EUR	4374519
5	Earth tester as per DIN VDE 0413, EN 61557			PROINSTALL-200-CH PROINSTALL-200-D	4374491 4373980
6		TL-USB USB download cable for ProInstall series including driver CD		TL-USB	4372676
7		es control 0100 professional Software for logging according to DIN VDE 0100, 0105		1312	2390062
8		Beha-Amprobe downloader software with interface cable		DL-SW-KIT	4597359

Basic workshop equipment/master

Row no.	VDE regulation	Measurement and testing equipment	Figure	Order no.	Item no.
1	Two-pin voltage detector as per DIN VDE 0682, Part 401, DIN EN 61243-3 (previously DIN VDE 0680, Pt. 5) phase sequence indicator as per DIN VDE 0413, EN 61557	2100-BETA Voltage detector		2100-BETA	4312508
2	Voltmeter/ammeter as per DIN VDE 0411/EN 61010	Hexagon 340 Digital multimeter		HEX340-D	3454491
3	Clamp ammeter as per DIN VDE 0411/EN 61010	ACDC-100 TRMS Digital current clamp		ACDC-100-D ACDC-100	3454603 2740452
4	Handy device in a case for safety and repetition testing of portable electrical operating equipment according to DIN VDE 0701-0702 and BGV A3	GT-800 Appliance tester		GT-800 GT-800-CH	4151644 4460614
5	Insulation tester, loop resistance meter, ohmmeter, RCD/FI measuring tool, phase sequence indicator, earth tester according to DIN VDE 0413, EN 61557, IEC 61557 for all measurements according to DIN VDE 0100 and more	ProInstall-200 Installation tester		PROINSTALL-200-EUR PROINSTALL-200-CH PROINSTALL-200-D	4374519 4374491 4373980
6		TL-USB USB download cable for ProInstall series including driver CD		TL-USB	4372676
7		es control professional Komplett Software for logging according to DIN VDE 0100, 0701-0702		1316	2390735
8		Beha-Amprobe downloader software with interface cable		DL-SW-KIT	4597359

Measurement and testing equipment as per DIN VDE 0100



TELARIS® ProInstall-100 Combined installation measuring tool

Functions

- Loop resistance measurement
- Internal net resistance measurement
- Short-circuit current measurement
- Low-impedance measurement and continuity testing
- Insulation testing
- RCD/FI measurement (contact voltage, trip time, trip current — increasing current)
- Voltage and frequency measurement

Device information

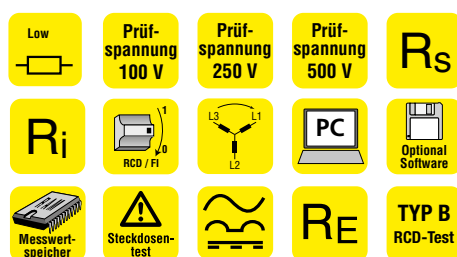
- Memory for approx. 400 readings with three levels for assigning distributor and circuit numbers
- IR/USB interface to transfer stored readings to a PC
- Software for logging available to print out a test log
- Integrated outlet test with contact electrode to detect incorrectly connected outlets or missing protective conductors
- Easy-to-read, large, backlit LCD and particularly large viewing angle
- Auto power-off

Device features

- Compact and robust design allows you to work even under the most difficult conditions (weighs only 1500 g)
- Easy-to-operate and intuitive user interface enables instant and efficient working
- Test probe with test button included as standard
- Loop resistance measurement and short-circuit current measurement without tripping the RCD/FI

Specifications

Display	LCD, 4-digit, 9999 digits
Measurement ranges/resolution	
Voltage	50–500 V/1 V AC
Frequency	45.0–65.0 Hz/0.1 Hz
Loop resistance	0.15–20/200/200 Ω 0.01/0.1/1 Ω
Short-circuit current	0–10 kA
Input voltage range	100–500 V 50/60 Hz
Test current	approx. 7 A (at 230 V)
Internal net resistance	0.15–20/200/200 Ω 0.01/0.1/1 Ω
Short-circuit current	0–10 kA
Input voltage range	100–500 V 50/60 Hz
Test current	approx. 7 A (at 230 V) approx. 5 mA (at 230 V)
Insulation resistance	0–1000 MΩ 0.01/0.1/1 MΩ
Test voltage	100, 250, 500, 1000 V DC
Low-impedance measurement	0.05–20/200/2000 Ω 0.01/0.1/1 Ω
Test current	> 200 mA DC
RCD/FI rated fault currents	10, 30, 100, 300, 500, 1000 mA
Factors:	x1/2, x1, x5 and AUTO
RCD/FI types:	standard AC, selective, pulsing, type B (ProInstall-200 only)
Measurement functions	contact voltage, trip time, trip current testing with increasing test current
Contact voltage	0–50 V
Trip time	1–510 ms/1 ms
Trip current	30–110% of I _{Δn} (in 10% intervals)
Phase sequence testing	
Input voltage range	100–500 V 50/60 Hz
Earth resistance	0.05–200 Ω/2000 Ω
Probe resistance	0.1–52 kΩ
Max. measuring current	approx. 3.5 mA
Measuring voltage	approx. 25 V
Frequency	128 Hz/140 Hz
General	
Readings memory	approx. 400 or 1000 readings
Interface	IR/USB
Constructed according to	DIN VDE 0411/EN61010/ IEC61010 DIN VDE 0413/ EN61557/IEC61557
Measurement category	CAT III/500 V, CAT IV/300 V
Degree of contamination	2
Protection category	IP 40
Power supply	6 1.5 V batteries, IEC LR6
Dimensions	110 × 260 × 130 mm
Weight	approx. 1500 g (including batteries)



TELARIS® ProInstall-200 Combined installation measuring tool

Same as ProInstall-100 and also offers:

- Testing of all-current sensitive RCD/FI (type B)
- Memory for approx. 1000 readings
- Earthing measurement (optionally with probes)
- RCD/FI analysis for checking all parameters of an RCD/FI

Includes:

- 1 ProInstall-100 or 200
- 3 test leads
- 3 crocodile clips
- 3 test probes
- 1 test probe with test button
- 1 protective shell (integrated)
- 1 carry belt
- 1 carry case
- 6 1.5 V batteries, IEC LR6
- 1 quick reference guide
- 1 product manual on CD-ROM
- 1 Schuko mains test lead

Ordering information:

Name	Order no.	Item no.
ProInstall-100-D	ProInstall-100-D	4373971
ProInstall-100-DK	ProInstall-100-DK	4399247
ProInstall-200-D	ProInstall-200-D	4373980
ProInstall-100-CH	ProInstall-100-CH	4374484
ProInstall-200-CH	ProInstall-200-CH	4374491
ProInstall-100-EUR	ProInstall-100-EUR	4374504
ProInstall-200-EUR	ProInstall-200-EUR	4374519

Recommended accessories

Software		
Earth testing set	TL-EARTH	4388671
USB download cable	TL-USB	4372676
es control 0100	1312	2390062
Beha-Amprobe	DL-SW-KIT	4597359
downloader software with cable		

Additional accessories can be found at the end of the chapter

Application of TELARIS ProInstall 100 and 200



Practical rotary knob

Easy-to-operate and intuitive user interface enables instant and efficient working. The selected function can be clearly read on the rotary knob.

RCD/FI trip time	RLO Continuity
IΔN RCD/FI trip current	RISO Insulation resistance
V Voltage	ZI TRIP Loop impedance for circuits without RCD/FI
L1, L2, L3 Phase sequence/rotary field	ZI NO TRIP Loop impedance for circuits with RCD/FI
RE Earth resistance	ΔT



Large LCD

Easy-to-read, large, backlit LCD and particularly large viewing angle.



Test probe with test button

It is possible to initiate a measurement even in difficult-to-reach areas. This test probe with test button is supplied with power by the meter itself, ensuring it is always ready for use (no additional batteries required).



Easy to use

Select all tests according to the same pattern.

First set the required test using the switch position and then enter the other settings using the quick access buttons (F1-F4).

Press the test button. **That's everything done**

Testing of type B and B+ RCD

The increasing proliferation of electronic loads, particularly operating equipment with integrated frequency inverters or switching power supplies, is associated with the possibility of "pure direct fault currents" occurring in the case of faults.

In the instance of frequency inverters or computer switching power supplies, they can cause pure "DC" surface leakage in the event of insulation faults in the DC link.

These types of fault currents are not recognized by type A fault current protective switches (pulse current sensitive), which are most commonly used, because they only switch off for pulse-like currents and alternating currents.

DIN VDE 0100-530 (Electrical equipment

— switchgear and control gear) requires the following: "If parts of electrical equipment permanently installed on the load side of the fault current protection device (RCD) can produce pure direct fault currents, the fault current protection device must be type B".

Additional fields of use for all-current sensitive fault current protective switches are mentioned in the following standards and directives:

- DIN VDE 0100-712, photovoltaic (PV) power environments
- DIN VDE 0100-723, Educational rooms with experimental equipment
- VDE 0100-482, Fire protection under special risks and dangers

- BGI 608, Systems and equipment on construction sites
- VdS 2033, Electrical systems in fire-endangered plants
- VdS 3501, Insulation protection in electrical systems with electronic equipment

The TELARIS ProInstall 200 can be used not just to test the typical type A fault current protective switches, it can also generate pulse-shaped currents and "pure DC fault currents".

It is therefore possible to test trip times and trip currents (ramp method) of type A, AC, B and B+ RCDs with measuring fault currents from 10 to 500 mA (or 1000 mA for type AC).

Earthing measurement



RE A mA

Includes:

- 1 DGC-1000A
- 1 9 V batteries, IEC LR6
- 1 product manual
- 1 calibration loop
- 1 case

DGC-1000 A

Clamp meter for earth loop measurement

Functions

- Earth loop measurement from 0.025–1500 Ω
- Surface leakage measurement (leakage current) 0.2 mA–1000 mA
- Current measurement 0.2 A–30 A

Device information

- Readings memory for 116 readings
- Recording interval 1–255 s
- Threshold value adjustment with alarm function
- Data hold function
- Jaw opening 23 mm
- Calibration loop supplied

Device features

- Earthing measurement in closed earthing systems without setting earth spikes
- TRMS current measurement

Specifications

Display	LCD, 4-digit, 9999 digits
Display ranges/resolution	0.2–1.000/10.00/100.0/1000 mA
Earth resistance	0.025–1500 Ω
Surface leakage	0.001/0.01/0.1/1 mA
Current	0.2 A–4000 A/30 A
Readings memory	for 116 readings
Recording interval	1–255 s
General	
Crest factor	< 3
Degree of contamination	2
Measurement category	CAT III/300 V, CAT II/600 V
Safety certificate:	DIN VDE 0411/IEC 61010
Jaw opening	approx. 23 mm
Power supply	1 9 V battery, IEC 6LR61
Dimensions	257 x 100 x 47 mm
Weight	approx. 640 g

Ordering information:

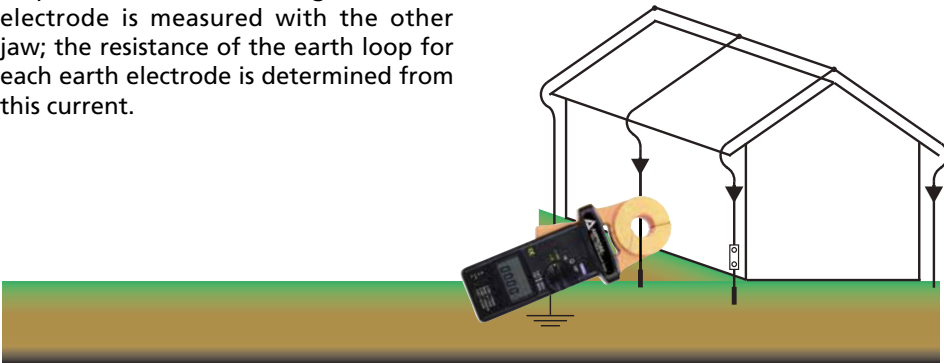
Name	Order no.	Item no.
DGC-1000 A	DGC-1000 A	2731217

Earth loop measurement with a clamp meter

For earthing systems that form a closed loop (e.g. the lightning protection system of a house), the earthing resistance of each earth loop can be quickly and safely determined using a clamp meter (DGC-1000A) designed to measure the earth loop.

The DGC-1000A is a clamp meter that features two current clamps cleverly installed in a single housing. This probe combines the functions of two clamp meters, which are required to measure earth loop resistance without earth spikes, in one compact and user-friendly meter.

To accomplish this, one current clamp induces a measuring current in the earth loop, and the current through the earth electrode is measured with the other jaw; the resistance of the earth loop for each earth electrode is determined from this current.



Outlet tester



Schuko test FI/RCD Outlet tester with RCD/FI tripping

Functions

- Fast and effective testing of 30-mA RCD/FIs
- Testing for proper/improper wiring
- Connection testing of the individual conductors (L-N-PE)
- PE fault detection

Device information

- Real PE fault detection using an LCD and a contact electrode
- Wiring fault detection when protective multiple earthing is used

Device features

- Unambiguous and secure display of PE faults on an LCD

Specifications

Rated voltage	230 V AC $\pm 10\%$
Frequency range	50–60 Hz
RCD/FI test current	30 mA
RCD/FI test time	< 300 ms
Contact voltage monitoring	with interrupt when 20–25 V AC/DC
PE fault detection	
Response threshold	25 V AC
Constructed according to	DIN VDE 0411/EN 61010/IEC 61010
Measurement category	CAT II/300 V
Degree of contamination	2
Power supply	from mains voltage
Dimensions	70 x 55 x 86 mm
Weight	approx. 75 g



© Design patent
29822508.5

Ordering information:

Name	Order no.	Item no.
Schuko test FI/RCD	9080*	3530534

Includes:

- 1 Schuko test FI/RCD
- 1 product manual

Outlet test

The FI/RCD testers feature a display to test the contact assignment, specifically for testing an earthed contact socket.

Correspondingly, the contact voltage is monitored on all RCD/FI testers and any PE faults are clearly displayed.



* In packs of 10 (also available individually)

Appliance testers as per DIN VDE 0701-0702



GT-400 Portable appliance tester as per DIN VDE 0701-0702

- Functions**
- Protective conductor resistance measurement
 - Insulation resistance measurement
 - Protective conductor and contact current measurement (substitute leakage current method)
- Device information**
- Automatic testing sequence for protection category I and protection category II/III devices
 - Automatic testing of extension cables, multiple socket outlets and refrigeration equipment cables
 - Clear indication using symbols to indicate non-compliance with limit values
 - Default limit values in accordance with DIN VDE 0701-0702
- Device features**
- Battery-operated — perfect for mobile use
 - Suitable for technically trained persons thanks to good/bad indication function
 - Easy to operate using a rotary switch and start button

Specifications	
Display	Graphics LCD
Measurement range resolution	
Protective conductor resistance	0.20–2.00 Ω
Test current/voltage	> ± 200 mA DC/> 4 V
Test current/voltage	> 5 A/approx. 6 V AC
Insulation resistance	0.1–20 MΩ
Test current/voltage	> 500 V DC/> 1 mA
Substitute leakage current	0.1–20 mA
Test voltage	approx. 32 V AC
General	
Limit value display	via symbols in the LCD
	Constructed according to DIN VDE
0404	
	DIN VDE 0411/EN 61010/IEC 61010
	DIN VDE 0413/EN 61557/IEC 61557
Measurement category	CAT II/300 V
Degree of contamination	2
Protection class	II
Protection category	IP 40
Power supply	6 1.5 V batteries, IEC LR6 (AA)
Dimensions	approx. 265 x 110 x 50 mm
Weight	approx. 700 g

- Includes:**
- 1 appliance tester GT-400
 - 1 testing accessories set with safety test cable, Safety test clip and safety test probe
 - 6 AA batteries
 - 1 refrigeration equipment connection cable, 0.5 m
 - 1 carry case
 - 1 product manual



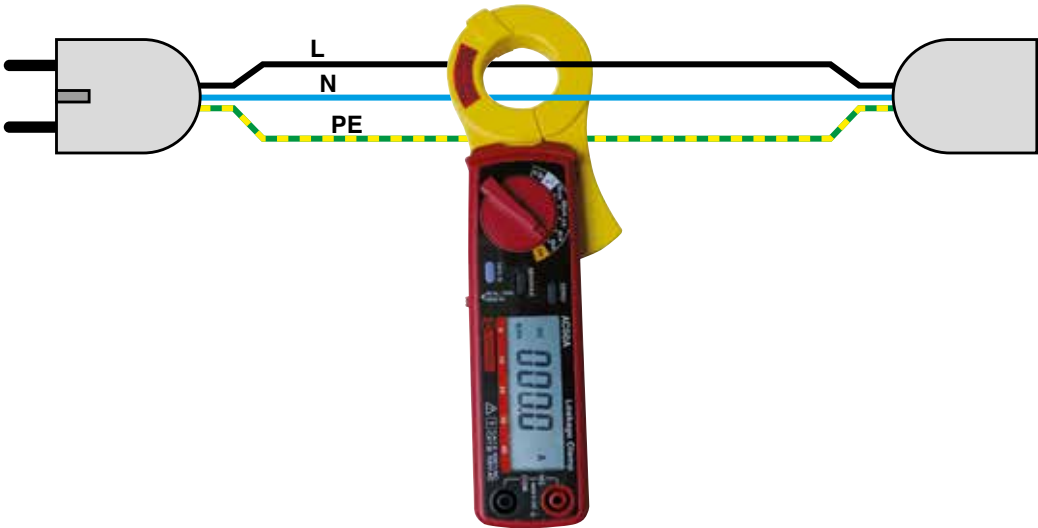
- Accessories:**
- Leakage probe AC50A
 - Schuko/Schuko test adapter 1233*
 - Test log 0701-0702 1279

ALSO AVAILABLE AS SWISS AND UK VERSION

Ordering information:		
Name	Order no.	Item no.
GT-400-D	GT-400-D	4380998
GT-400-CH	GT-400-CH	4381001
GT-400-UK	GT-400-UK	4381012
Recommended accessories		
AC50A	AC50A-D	3454543
Schuko/Schuko test adapter		1233
2145900		
Test log 0701-0702	1279	3313435
Additional accessories can be found at the end of the chapter		

Application example for a leakage test under mains voltage:

Leakage probe AC50A
and test adapter
Schuko/Schuko 1233



Appliance testers as per DIN VDE 0701-0702



GT-600 Appliance tester as per DIN VDE 0701-0702

Functions

- Protective conductor resistance measurement
- Insulation resistance measurement
- Substitute leakage current measurement
- Protective conductor measurement
- Contact current measurement
- Power measurement, load voltage, load current, power factor
- Direct testing of refrigeration equipment cables without an adapter

Device information

- Memory for approx. 3800 readings, real-time clock
- 3 memory levels (customer, location, department)
- Integrated interface (USB 2.0) to transfer readings to a PC
- Separate interface (USB 2.0) to connect a barcode scanner and a keyboard
- Graphical LCD for readings, limit values and parameters
- Connection diagrams and limit values in device cover
- Easy to operate using with rotary switch
- Manual testing sequence
- Clear "Test OK/not OK" display
- Compensation for test lead
- Compact and rugged case
- Convenient software available, with "es control professional" database for logging (optional)

Device features

- 5-A and 0.2-A test current for protective conductor resistance
- Leakage test method for protective conductor current
- Direct measuring method for contact current
- Fast safety and operational testing of refrigeration equipment cables
- Connection for barcode scanner to scan test specimen numbers and test sequences
- Suitable for technically trained persons, good/bad indication function

Specifications

Display	graphics LCD, 128 x 64 dots
Indication ranges	
Protective conductor resistance	0.01–10.0 Ω
Test current/voltage	> 200 mA/approx. 6 V AC
Test current/voltage	> 5 A/approx. 6 V AC
Insulation resistance	0.01–50 MΩ
Test current/voltage	500 V DC/> 1 mA (250/500 V only GT-800)
Substitute leakage current	0.25–20 mA
Test voltage/current	approx. 45 V AC/approx. 260 mA
Protective conductor current	0.25–20 mA (leakage method)
Contact current	0.02–2 mA (direct measurement method)
Apparent power	30 W...4.04 kVA
Effective power	30 W...4.04 kW
Load voltage	195–253 V
Load current	0–16 A
Power factor	0–1
Voltage measurement	
SELV/PELV	10.0–150 V AC/DC
External clamp input	
	0.0–20.0 mA
	0.2–60.0 A, for clamp adapter 1000:1 (GT-800 only)
Functions for testing PRCDs (GT-800 only)	
Protective conductor, insulation, operation, protective conductor current, RCD testing:	1/2x IΔN, 1x IΔN, 5x IΔN, and Trip current (ramp)
PRCD types	2-pin, 3-pin and type S
Mains fuse	2 x T16 A
General	
Readings memory	3800 readings, corresponding to approx. 260 appliance measurements
Interface (USB 2.0)	for PC
Interface (USB 2.0)	for barcode scanner and keyboard
Limit value indication	visual and audible
Constructed according to	DIN VDE 0404 Parts 1, 2, DIN VDE 0411-1/EN 61010-1 DIN VDE 0413/EN 61557 Parts 2, 4
Measurement category	CAT II/300 V
Protection category	IP 40
Power supply	230 V +10%/-15% 50/60 Hz
Internal consumption	approx. 45 VA
Dimensions	300 x 250 x 130 mm
Weight	approx. 4.5 kg

GT-800 Automatic appliance tester as per DIN VDE 0701-0702

Same as GT-600 and also offers:

- Automatic testing sequence, also with entry for customer-specific testing sequences
- Connection for external clamp adapter to measure protective conductor currents, even for 3-phase test specimens
- Testing of portable fault current protective switches (PRCD)
- Switchable 250/500 V test voltage for insulation testing
- Automatic pole reversal of the mains outlet

Includes:

- 1 GT-600 or GT-800 with accessories case (attached to device cover, removable)
- 1 test lead
- 1 test probe
- 1 alligator clip
- 1 interface cable (USB)
- 1 product manual



Adapter cable ACF-6A



Ordering information:

Name	Order no.	Item no.
GT-600	GT-600	4151632
GT-800	GT-800	4151644
GT-800-CH	GT-800-CH	4460614

Recommended accessories

Leakage probe adapter CHB1		1311
2390055		
Adapter cable	ACF-6A	2743889
Barcode scanner BC-1250G		BC-1250G
4377939		
Keyboard KBGE-MT204S	KBGE-MT204S	3504388
es control 0701-0702/0113 software (not including interface adapter)		1314
2390081		

Additional accessories can be found at the end of the chapter

GT-600/GT-800 only available for Germany, Austria (Schuko plug)
GT-800-CH only available for Switzerland

Accessories



Earth testing set

Suitable for:

- e.g. Telaris ProInstall-200

Includes:

- 1 carry case
- 2 earth spikes (235 x Ø 10 mm)
- 1 test lead, red 25 m
- 1 test lead, blue 25 m
- 1 test lead, green 5 m
- 3 test lead winders
- 3 crocodile clips

Ordering information:

Name	Order no.	Item no.
Earth testing set	TL-EARTH	4388671



Barcode scanner
BC-1250G



Barcode scanner

- To scan barcoded test specimen numbers*
- Order no. 1325 for:
- For MACHINEmaster (order no. 9050)

Order no. BC-GT07XX for:

- For appliance tester (order no. 9096, 9098)

Order no. BC-1250G for:

- For machine tester MT 204-S (order no. 9085)
- For appliance testers GT600 und GT800

Ordering information:

Name	Order no.	Item no.
Barcode scanner	1325	3223132
Barcode scanner	BC-GT07XX	3504434
Barcode scanner B	C-1250G	4377939
Barcode stickers (250)	1063	2389952

Barcode stickers

- Abrasion-resistant barcode stickers to identify test specimens
- Sequential numbering
- Barcoded (code 39) and plain text
- Size 54 x 15 mm
- For 0701/0702 test equipment
- For MACHINEmaster (order no. 9050)

* For scanning the following barcode types: code 39, code 128, code 2/5, EAN, UPC



1000 A
AC

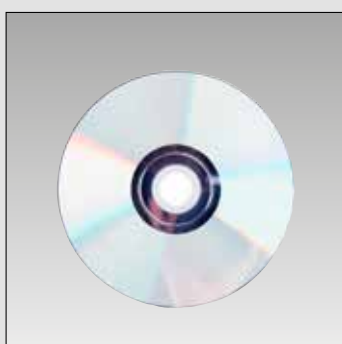
Output
Analog

Clamp adapter AC (only for 0100 EUROtest)

- Clamp adapter for earthing/earth loop measurement (two clamps are required for earth loop measurement)
- Current measurement from approx. 1 mA to 1000 A (together with 0100-EUROtest, from approx. 1 mA to 200 A)
- Jaw opening 48 mm
- Permanently connected test lead
- No batteries required

Ordering information:

Name	Order no.	Item no.
Clamp adapter AC	1226	3313401



Beha-Amprobe Downloader Downloader Documenting Software for easy data transfer

Ordering information:

Name	Order no.	Item no.
Downloader software	DL-SW-KIT	4597359

Downloads data from supported meters: - ProInstall-100, - ProInstall-200

- Displays downloaded data using form and table view for easy analysis
 - Allows saving, retrieving and printing of the downloaded data
 - Provides standard form templates to quickly display results with professional quality
 - Exports data to other programs such as Microsoft Excel using the CVS format
 - Provides utility to clear memory and to change meter setup
 - Opto-isolated USB port for user and computer safety
 - Preview of the live data on the PC using Virtual Meter function
- Built-in forms and tables, Beha-Amprobe ProInstall-200 enthalten (optional)

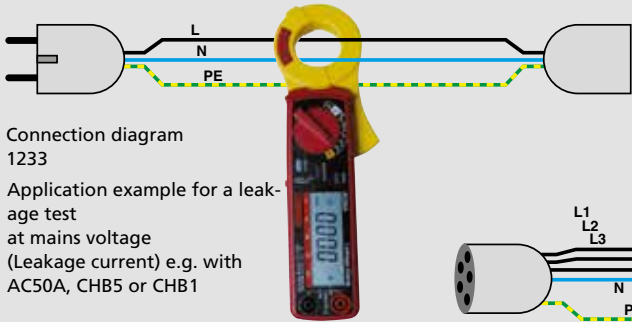
Accessories



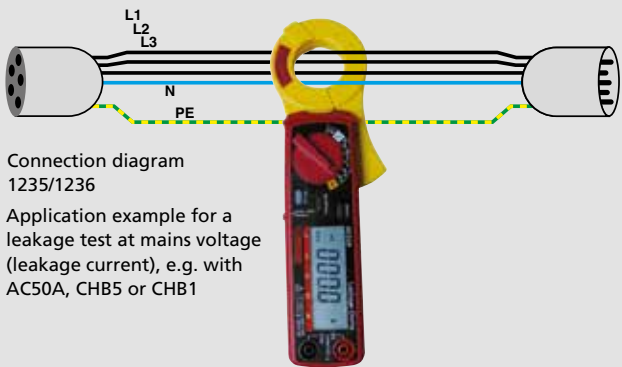
Test adapter
For measuring surface leakage
and leakage current

- Test adapter to measure leakage current, protective conductor current, load current and zero sequence current on portable loads by using a leakage probe
- All conductors lead through individually

Ordering information:		
Name	Order no.	Item no.
Test adapter:		
Schuko/Schuko	1233	2145900
CEE 5-pin 16 A	1235	2145921
CEE 5-pin 32 A	1236	2145939



Connection diagram
1233
Application example for a leakage test
at mains voltage
(Leakage current) e.g. with
AC50A, CHB5 or CHB1

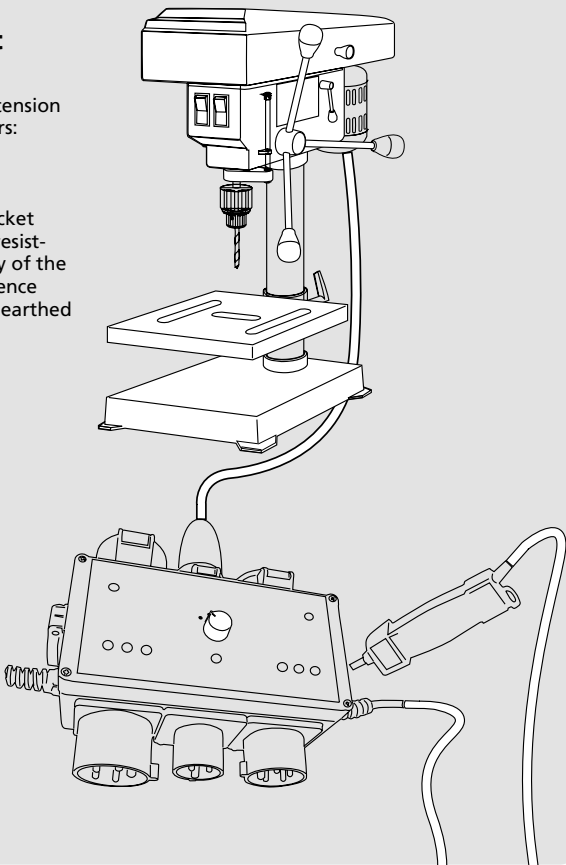


Connection diagram
1235/1236
Application example for a
leakage test at mains voltage
(leakage current), e.g. with
AC50A, CHB5 or CHB1



VLP 5
Three-phase extension test
adapter

- For testing portable equipment and extension cables along with the plugs and couplers:
 - 16 A CEE 3-pin
 - 16 A CEE 5-pin
 - 32 A CEE 5-pin
 - Refrigerator connector and Schuko socket
- Measurement of protective conductor resistance, insulation resistance, functionality of the active conductors and (L-N) phase sequence
- Suitable for all testing equipment with earthed contact socket and test probe



Ordering information:		
Name	Order no.	Item no.
VLP5	1343	3313514

Accessories



DAA-16, DAA-32

DAA-16, DAA-32
Three-phase adapter 16 A or 32 A

- Three-phase CEE 16 A or CEE 32 A plug
- Connection option via five separate 4-mm sockets for L1, L2, L3, N and PE
- For fast connection of testing equipment to three-phase sockets for tests according to DIN VDE 0100

Ordering information:

Name	Order no.	Item no.
DAA-16	DAA-16	2743806
DAA-32	DAA-32	2743850



Three-phase adapter 1142

- For testing portable devices with plugs: 16 A CEE 3-pin, 16 A CEE 5-pin and 32 A CEE 5-pin
- Measurement of protective conductor resistance and insulation resistance
- Suitable for all testing equipment with earthed contact socket and test probe

Ordering information:

Name	Order no.	Item no.
Three-phase adapter	1142	3313394



1240/1241

Three-phase adapter 1240/1241

- For testing portable equipment with three-phase plugs 16 A CEE 5-pin (1240) or 32 A CEE 5-pin (1241)
- Measurement of protective conductor resistance and insulation resistance
- Suitable for all testing equipment with earthed contact socket

Ordering information:

Name	Order no.	Item no.
Three-phase adapter 16A 1240		3313412
Three-phase adapter 32A 1241		3313420

Accessories



50 A
AC

Output
Analog

CHB1
Leakage probe adapter (AC)

Functions

- Clamp adapter to measure leakage currents in conjunction with a multimeter
- Surface leakage measurement in conjunction with GT-800

Device information

- Current output, output signal: 1 mA corresponds to 1 A measuring current
- Jaw opening 30 mm
- Permanently connected test leads
- No batteries required
- Not suitable for earthing measurements

Specifications

Measurement ranges	
AC current	1 mA–50 A
Basic accuracy	±(6% + 0.5 mA)
Output current	1 mA/A
Frequency range	40 Hz–10 kHz
Protection category	IP 30
Degree of contamination	2
Measurement category	CAT II/600 V
Safety certificate:	DIN VDE 0411/EN 61010/IEC 61010
Jaw opening	approx. 30 mm
Connection cable length	approx. 1.5 m
Dimensions	approx. 140 x 45 x 20 mm
Weight	approx. 75 g

Ordering information:

Name	Order no.	Item no.
CHB1	1311	2390055



PAT-BRUSH
Brush probe

- Protective conductor resistance measurement
- Measurement of surface leakage on rotating parts
- 4-mm plug technology

Ordering information:

Name	Order no.	Item no.
Brush probe	PAT-BRUSH	4151667



ADAPTER-PE
Adapter for protective conductors

- Protective conductor resistance measurement
- 4-mm plug technology

Ordering information:

Name	Order no.	Item no.
Adapter for protective conductors	ADAPTER-PE	4151659



PA-1
Adapter for 3-pin plug

- Measurement of protective conductor resistance and insulation

Ordering information:

Name	Order no.	Item no.
Adapter for 3-pin plug	PA-1	4362289

Software packages for logging



Test logs are used to verify the work has been performed correctly and provide the customer and the authorised company with traceable documentation relating to safety.

Beha-Amprobe software packages offer a convenient and practical solution for transferring data from the measurement and testing equipment, quickly and easily creating a test log and archiving the measurement data. Having this test log and data saves time compared to manual preparation, particularly in case of repeat testing or follow-on testing.

es
control

The right software for your device

<div>Software</div> <div> <div>Prüfgeräte</div> <div>Best.-Nr.</div> </div>	<div>es control professional 0100</div> <div>Best.-Nr. 1312</div>	<div>es control professional 0701-0702/0113</div> <div>Best.-Nr. 1314</div>	<div>es control professional Komplett</div> <div>Best.-Nr. 1316</div>	<div>Beha-Amprobe Downloader Software</div> <div>Best.-Nr. DL-SW-KIT</div>
PROINSTALL-100	✓		✓	✓
PROINSTALL-200	✓		✓	✓
GT-600		✓	✓	
GT-800		✓	✓	











Temperature, light, sound, humidity, rotational speed



We offer a comprehensive range of thermometers and suitable thermo sensors for all areas of application in the field of environmental measurement engineering.

What's more, our environmental measurement engineering product range comprises a selection of different test tools such as humidity meters, sound meters and lux meters for measuring light intensity at areas such as workstations.

Pictograms used in this chapter

	NTC as thermocouple		Infrared measurement
	Thermocouple NiCr/Ni (type "K")		Data logger
	DATA HOLD memory		Alarm function
	Min/max memory		PC interface
	Backlight		Measurement of dew point

Temperature meters



IR608A Infrared thermometer

- Functions**
- Non-contact temperature measurement
- Device information**
- Measurements can be taken in °C or °F
 - Integrated readings memory (data hold)
 - Illuminated display
 - Measurement optical resolution 8:1
 - Auto power-off
- Device features**
- Measurement spot marking using laser
 - Handy and compact pistol-shaped housing

Specifications	
Display	LCD, 4-digit
Measurement ranges	-18 to +400°C 0–750°F
Resolution	0.2°C/0.5°F
Basic accuracy	±2% or ±2°C (±3.5°F)
Emissivity	0.95 (default)
Response time	500 ms
Power supply	1.9 V battery, IEC 6LR61
Dimensions	152 x 101 x 38 mm
Weight	approx. 227 g



Includes:

- 1 IR608A
- 1 9 V battery, IEC 6LR61
- 1 product manual

Ordering information:		
Name	Order no.	Item no.
IR608 A	IR608A	3015690



IR-450-EUR Mini infrared thermometer with torch

- Functions**
- IR temperature measurement
 - LED torch
- Device information**
- Measurement spot size to measurement distance ratio 8:1
 - °F/°C can be selected
 - Temperature is displayed for ten seconds
 - With pocket clip
- Device features**
- With laser pointer
 - Small and compact

Specifications	
Display	LCD, 3-digit
Measurement ranges	-30 to +500°C; 20 to 932°F
Resolution	0.2°C/0.5°F
Basic accuracy	±1.5% or ±2°C (±3°F)
Emissivity	0.95 (default)
Response time	500 ms
Power supply	1.5 V battery, IEC LR03, AAA
Dimensions	100 x 20 x 29 mm
Weight	approx. 50 g



Includes:

- 1 IR-450-EUR
- 1 1.5 V battery, IEC LR03, AAA
- 1 product manual

Ordering information:		
Name	Order no.	Item no.
IR-450-EUR	IR-450-EUR	4308539

Temperature meters



IR-710-EUR



IR-710-EUR Infrared thermometer 10:1

Functions

- Non-contact temperature measurement
- Temperature measurement from -18° up to 380°C
- Integrated readings memory (data hold)
- MIN/MAX readings memory
- Illuminated display
- Measurement optical resolution 10:1
- Extremely fast response time
- Auto power-off

Device features

- Measurement spot marking using laser
- Handy and compact pistol-shaped housing

Specifications

Display	LCD, 4-digit
Measurement ranges	-32 to +1550°C
Resolution	0.1°C < 999.9°C/1°C > 999.9°C
Basic accuracy	±1.8% or ±1.8°C
Emissivity	adjustable 0.10–1.00
Response time	250 ms
Measurement spot size to measurement distance ratio 50:1	
Laser	1-point laser >1 mW class 2
Power supply	1 9 V battery, IEC 6LR61
Dimensions	183 x 147 x 57 mm
Weight	approx. 345
Power supply	1 9 V battery, IEC 6LR61
Dimensions	183 x 147 x 57 mm
Weight	approx. 345

* Specifications relate to the top model in the series (IR-750). Please find specifications for the individual models on our webpage at www.beha-amprobe.com



IR-712-EUR
IR-720-EUR
IR-730-EUR



IR-712-EUR Infrared thermometer 12:1

Same as IR-710-EUR and also offers:

- Temperature measurement from -18° up to 550°C
- Measurement optical resolution 12:1
- Infinitely adjustable emissivity factor
- Integrated thread for stand
- Measurement of average temperature

IR-720-EUR Infrared thermometer 20:1

Same as IR-712-EUR and also offers:

- Temperature measurement from -32° up to 1050°C
- Measurement optical resolution 20:1

IR-730-EUR Infrared thermometer 30:1

Same as IR-720-EUR and also offers:

- Temperature measurement from -32° up to 1250°C
- Measurement optical resolution 30:1

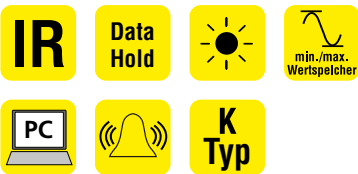
IR-750-EUR Infrared thermometer 50:1

Same as IR-730-EUR yet also offers:

- Temperature measurement from -50° up to 1550°C
- Measurement optical resolution 50:1
- Adjustable alarm function
- Data memory for up to 99 readings
- USB interface to transfer stored readings to a PC
- Input for type K probe



IR-750-EUR



Ordering information:

Name	Order no.	Item no.
IR-710-EUR	IR-710-EUR	4308480
IR-712-EUR	IR-712-EUR	4308498
IR-720-EUR	IR-720-EUR	4308500
IR-730-EUR	IR-730-EUR	4308517
IR-750-EUR	IR-750-EUR	4308521

Includes:

- 1 IR-710-EUR, IR-712-EUR, IR-720-EUR, IR-730-EUR, IR-750-EUR
- 1 9 V battery, IEC 6LR61
- 1 carry case (only for IR-712-EUR, IR-720-EUR, IR-730-EUR, IR-750-EUR)
- 1 product manual
- 1 USB cable (IR-750-EUR only)
- 1 software on CD (IR-750-EUR only)
- 1 x hardshell carry case (IR-750-EUR only)
- 1 x type K wire probe (IR-750-EUR only)

Temperature meters



TMD-50



TMD-50

Digital dual-input thermometer, type K

Functions

- Temperature measurement with connection for two probes
- Measurement of temperature difference

Device information

- Connection for two temperature probes, type K
- Measurements can be taken in °C or °F
- Integrated readings memory (data hold)
- MIN/MAX and relative value measurement
- Measurement of average temperature
- Illuminated display
- Auto power-off

Device features

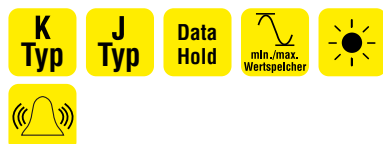
- T1-T2 (temperature difference)
- Shock and impact-resistant thanks to protective shell as standard

TMD-50 specifications

Display	LCD, 3 1/2-digit, 1999 digits
Measurement range	Type K -180 to +1350°C (-292 to +1999°F)
Basic accuracy	±(0.1% of reading +1°C) at -60°C–1350°C
	±(0.1% of reading +2°C) at -60°C–200°C
	±(0.1% of reading +2°F) at -76°F–1999°F
	±(0.1% of reading +4°F) at -76°F to -328°F
Resolution	0.1°C/°F
Power supply	4 1.5 V batteries, IEC R03, AAA
Dimensions	approx. 160 x 85 x 30 mm
Weight	approx. 280 g



TMD-53



TMD-53

Digital dual input thermometer, type K/J

Same as TMD-50 and also offers:

- Connection for two temperature probes (for types K and J)
- Alarm function (visual and audible)
- Clear and concise multifunction display for T1, T2 and T1-T2 (temperature difference)

TMD-53 specifications

Display	LCD, 5-digit, 99999 digits
Measurement range	Type K -180 to +1350°C (-292 to +2462°F)
Basic accuracy	±(0.05% of reading + 0.3°C) at -50°C–1350°C
	±(0.05% of reading + 0.7°C) at -50°C to -200°C
	±(0.05% of reading + 0.6°F) at -58°F–2498°F
	±(0.05% of reading + 1.4°F) at -58°F to -328°F
Resolution	0.1°C/°F
Power supply	4 1.5 V batteries, IEC R03, AAA
Dimensions	approx. 160 x 85 x 30 mm
Weight	approx. 280 g

TMD-56 specifications

Display	LCD, 4 1/2-digit, 19999 digits
Measurement range	Type K: -180°C–1350°C (-292°F–2462°F)
Basic accuracy	Type K
	±(0.05% of reading + 0.3°C) at -50°C–1350°C
	±(0.05% of reading + 0.7°C) at -50°C to -210°C
	±(0.05% of reading + 0.6°F) at -58°F–2501°F
	±(0.05% of reading + 1.4°F) at -58°F to -346°F
Resolution	0.1°C/°F
Power supply	4 1.5 V batteries, IEC R03, AAA
Dimensions	approx. 160 x 85 x 30 mm
Weight	approx. 360 g



TMD-56



TMD-56

Digital thermometer with data logger and USB connection

Same as TMD-53 and also offers:

- Connection for two temperature probes (for types K, J, T, R/S, N and E)
- Integrated real-time clock and date
- Clear and concise multifunction display for date, time, T1, T2 and T1-T2 (temperature difference)
- USB interface
- Analysis software included
- Data logger for 16,000 readings (various intervals can be selected)

TMD-50/TMD-53 includes:

- 1 TMD-50 or TMD-53
- 2 x type K wire probes
- 4 1.5 V batteries, IEC R03, AAA
- 1 product manual

TMD-56 includes:

- 1 TMD-56
- 2 x type K wire probes
- 1 USB cable
- 1 software CD
- 4 1.5 V batteries, IEC R03, AAA
- 1 product manual



Accessories:

Carry case Order no. 1150



Thermal compound up to 250°C (30 g)
Order no. 1032

Ordering information:

Name	Order no.	Item no.
TMD-50	TMD-50	3730150
TMD-53	TMD-53	3730085
TMD-56	TMD-56	3730138
Carry case	1150	2145755
Thermal compound	1032	2145689

Temperature and humidity meters



TPP1-C1 Mini pocket thermometer with immersion probe

- Functions**
- Temperature measurement with integrated NTC sensor
- Device information**
- Immersion probe
 - Readings memory (data hold)
 - Compact design
 - With protective shell as holder (TPP1-C1 only)



TPP2-C1 Mini pocket thermometer with surface probe

- Same as TPP1-C1, but:
- Surface probe does not have protective shell

Specifications

Display	LCD, 3 1/2-digit	
Measurement range	-50 to +250°C	
Range	Resolution	Accuracy
-50 to -20°C	1°C	±3°C
-19.9 to +49.9°C	0.1°C	±2°C
+50.0 to +199.9°C	0.1°C	±(3 % of reading + 1°C)
+200 to +250°C	0.1°C	±(3 % of reading + 1°C)
Temperature change/response time	>5 K/s	
Probe dimensions		
TPP1-C1	128 mm x Ø 3.8 mm	
TPP2-C1	125 mm x Ø 13.7 mm (Tube Ø 3.8 mm)	
Power supply	1 3 V battery, IEC 2032	
Dimensions (with protective shell)	approx. 40 x 30 x 160 mm	
Weight	approx. 16 g	

NTC Typ

Data Hold

Includes:

- 1 TPP1-C1 or TPP2-C1
- 1 3 V battery, IEC 2032
- 1 product manual



Accessories:

- Thermal compound up to 250°C (30 g)
- Order no. 1032

Ordering information:

Name	Order no.	Item no.
TPP1-C1	TPP1-C1	2826634
TPP2-C1	TPP2-C1	2826652
Thermal compound	1032	2145689



TH-1 Digital humidity and temperature meter

- Functions**
- Humidity measurement
 - Temperature measurement
- Device information**
- Probe integrated in device
 - Measurements can be taken in °C or °F
 - Integrated readings memory (data hold)
 - Minimum and maximum readings memory
 - Auto power-off
- Device features**
- Compact and practical housing shape
 - Measurement of dew point
 - Measurement of wet bulb temperature

Specifications

Display	Dual LCD
Humidity measurement	
Measurement range	0–100% relative air humidity
Resolution	0.1%
Accuracy	± 3% relative air humidity
Temperature measurement	
Measurement range	-20 to +50°C/-4 to +122°F
Resolution	0.1°C/0.1°F
Accuracy	± 0.6°C/± 1°F
Power supply	1 3 V battery, CR2032
Dimensions	175 x 42 x 16 mm
Weight	approx. 120 g

NTC Typ

Data Hold

min./max.
Wertspeicher



Includes:

- 1 TH-1
- 1 3 V battery, CR2032
- 1 product manual

Ordering information:

Name	Order no.	Item no.
TH-1	TH-1	3311871

Temperature and humidity meters



TH-3 Digital humidity and temperature meter

Functions

- Humidity measurement
- Temperature measurement

Device information

- Probe integrated in device
- Measurements can be taken in °C or °F
- Integrated readings memory (data hold)
- Minimum and maximum readings memory
- Auto power-off

THWD-3 Digital humidity and temperature meter

Same as TH-3, but also offers:

- Measurement of dew point
- Measurement of wet bulb temperature

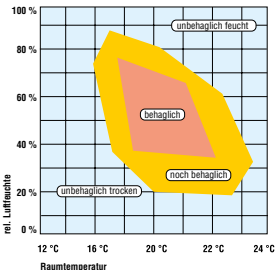
Specifications

Display	LCD, 3 1/2-digit
Humidity measurement	
Measurement range	5–95% relative air humidity
Resolution	0.1%
Accuracy	± 3% relative air humidity
Response time	< 3 min.
Temperature measurement	
Measurement range	-20 to +60°C/-4 to +140°F
Resolution	0.1°C/0.1°F
Accuracy	± 0.8°C/± 1.6°F
Response time	< 10 sec.
Power supply	1.9 V battery, IEC 6LR61 or 6F22
Dimensions	240 x 54 x 34 mm
Weight	approx. 180 g



Includes:

- 1 TH-3 or THWD-3
- 1 carry case
- 1 9 V battery, IEC 6LR61
- 1 product manual



Ordering information:

Name	Order no.	Item no.
TH-3	TH-3	3027060
THWD-3	THWD-3	3033042



MT-10 Construction and wood moisture meter

Functions

- Wood and construction moisture measurement
- Temperature measurement

Device information

- Probe integrated in device
- Moisture measurement can be switched for wood and construction materials
- Temperature measurement can be taken in °C or °F
- Backlight
- Auto power-off

Device information

- Compact and practical housing shape
- Rapid and simple read-out of humidity status via 3 LEDs:
 - Green: Air-dry environment
 - Yellow: Increased humidity
 - Red: Excessive humidity

Specifications

Display	LCD, 3 1/2-digit and 3 LEDs
Humidity measurement	
Measurement principle for electrical resistance	
Measurement range	
Wood	8–60%
Construction material	0.3–2.0%
Temperature	0 to +40°C or +32 to +99°F
Resolution	
Wood	0.1%
Construction material	0.01%
Temperature	0.1°C/0.2°F
Accuracy	
Wood	±2%
Construction material	±0.1%
Temperature	±1°C/±2°F
Power supply	1.9 V battery, 6F22
Dimensions	145 x 60 x 31 mm
Weight	approx. 100 g



Includes:

- 1 MT-10
- 1 9 V battery, 6F22
- 1 product manual

Ordering information:

Name	Order no.	Item no.
MT-10	MT-10	3503178

Temperature and humidity data loggers



TR200-A
Temperature/humidity data logger
with digital display

Functions

- Temperature measurement
- Relative humidity measurement
- Data logger

Device information

- Wall mounting possible
- Easily visible LED warning lights to monitor indoor air quality
- Device to monitor indoor temperature and air humidity
- Selection of storage points: 1000, 2000, 4000, 8000, 12,000, 16,000 max. per function
- Automatic shut-off
- Operation possible only via PC

Device features

- USB interface
- Dust and humidity protection in accordance with protection category IP65
- Optical threshold value indicator

Specifications

Display	LCD, 3¼-digit, 1999 digits
LED display	Red: alarm for high/low values; yellow: recording
Temperature measurement ranges	
Internal sensor	-40°C to +85°C
External sensor	-40°C to +100°C
Relative humidity	0.0–99.9%
Tolerance	
Temperature	±0.6°C (-20°C to +50°C); otherwise ±1.2°C
Relative humidity	±3% at 25°C; otherwise 5%
Temperature resolution	0.1°C
Relative humidity resolution	0.1%
Storage points	1000, 2000, 4000, 8000, 12,000, 16,000
Power supply	1 3.0 V battery, IEC CR2
Protection category	IP54
Dimensions	75 x 55 x 23 mm
Weight	approx. 200 g

Includes:

- 1 TR200-A
- 1 product manual
- 1 3.0 V battery, IEC CR2
- 1 USB cable
- 1 x CD containing software (download suite)

Accessories:

- TPK-60, external temperature probe
- Order no. TPK-60

Ordering information:

Name	Order no.	Item no.
TR200-A	TR-200-A	3477302
TPK-60	TPK-60	3503184



TR300
Temperature/humidity data logger
with digital display

Functions

- Temperature measurement
- Relative humidity measurement
- Data logger
- Dew point indicator

Device information

- Device to monitor indoor air quality
- Wall attachment, stand attachment or self-supporting
- Temperature, relative humidity display
- Optional display of air temperature or dew point
- Easily visible LED warning lights to monitor indoor air quality
- Compact shape
- Selection of storage points: 1000, 2000, 4000, 8000, 12,000, 16,000

Device features

- Real-time marking (date/time)
- USB interface
- Extra-large display
- Alarm function

Specifications

Display	LCD
Measurement ranges	
Temperature range	-20°C to +70°C
Relative humidity	0–100%
Tolerance	
Temperature	±0.6°C at 0–50°C; otherwise ±1.2°C
Relative humidity	±3% at 10–90%; otherwise +5%
Resolution	
Temperature	0.1°C
Relative humidity	0.1%
Power supply	4 1.5 V batteries, IEC LR6
Dimensions	175 x 42 x 16 mm
Weight	approx. 200 g

Includes:

- 1 TR300
- 1 product manual
- 4 1.5 V batteries, IEC LR6
- 1 USB cable
- 1 x CD containing software (download suite)

Ordering information:

Name	Order no.	Item no.
TR300	TR300	3311844

Temperature probes/accessories



K
Typ

TPK-59 Flex. wire probe, 4-mm plug

- With 4-mm plug (19 mm spacing)
- Probe length approx. 0.9 m

Temperature probe, type K
Temperature range -46°C to +316°C
Accuracy ±1.5°C

Ordering information
Order no.: TPK-59 · Item no.: 2733660



K
Typ

Type 104 Fluid probe type K

Temperature range -50°C to +1100°C
Response time approx. 12.0 s (63.2% of end temperature value)
Accuracy ±1.5°C (from 400°C, 0.48% of reading)
Connection cable approx. 500-mm spiral cable
Dimensions 130 x 3 mm
Weight approx. 105 g

Ordering information
Order no.: 5794 · Item no.: 2147186



TPK-60 Temperature probe

- 2.5-mm jack plug
- Suitable for TR100-A and TR200-A
- Cable length: 115 mm
- Temperature range (see TR100-A/TR200-A on page 15.6)

Ordering information
Order no.: TPK-60 · Item no.: 3503184



K
Typ

Type 106 Immersion probe, type K

Temperature range -50°C to +600°C
Response time approx. 12.0 s (63.2% of end temperature value)
Accuracy ±1.5°C (from 400°C, 0.48% of reading)
Connection cable approx. 500-mm spiral cable
Dimensions 130 x 3 mm
Weight approx. 105 g

Ordering information
Order no.: 5793 · Item no.: 3313234



1032 Thermal compound

- Thermal compound up to 250°C (30 g)
- Contains silicone

Ordering information
Order no.: 1032 · Item no.: 2145689



K
Typ

Type 110 Rapid surface probe, type K

Temperature range -50°C to +900°C
Response time approx. 2.3 s (63.2% of end temperature value)
Accuracy ±1.5°C (from 400°C, 0.48% of reading)
Connection cable approx. 500-mm spiral cable
Dimensions 130 x 8 mm
Weight approx. 112 g

Ordering information
Order no.: 5797 · Item no.: 3313241



TM-SWA Data logging software and RS-232 cable for TMA10A

- Real-time software logs the data of all measurement functions and displays it
- Simultaneous recording of two channels
- Air flow and temperature with device TMA10
- Results saved for subsequent analysis
- Automatic calculation of maximum, minimum, average and standard deviation results

Ordering information
Order no.: TM-SWA · Item no.: 3027085



K
Typ

Type 101 Surface probe, type K

Temperature range -50°C to +450°C
Response time approx. 5.5 s (63.2% of end temperature value)
Accuracy ±1.5°C
Connection cable approx. 500-mm spiral cable
Dimensions 130 x 4 mm
Weight approx. 115 g

Ordering information
Order no.: 5795 · Item no.: 2147199



K
Typ

Type 111 Flexible wire probe, type K

Temperature range -50°C to +400°C
Response time approx. 5.0 s (63.2% of end temperature value)
Accuracy ±1.5°C
Dimensions 1000 x 2 mm
Weight approx. 22 g

Ordering information
Order no.: 5790 · Item no.: 3313229

Lux meters



93560
Digital lux meter with memory function

- Functions
- Light intensity measurement
- Device information
- Automatic measurement range selection
 - Silicone sensor
 - Integrated readings memory (data hold)
- Device features
- Readings memory for 99 individual readings

Specifications		
Display	LCD, 4-digit	
Measurement ranges (autorange)	0–50 lx, 0–500 lx, 0–5000 lx, 0–50 klx, 0–200 klx	
Display resolution	0.01 lx, 0.1 lx, 1 lx, 10 lx, 100 lx	
Measurement ranges	0–5, 0–50, 0–500, 0–5000 fc (= Footcandle), 0–20 kfc	
Accuracy	< 10%	
Temperature drift	< 1%/K	
Power supply	6 1.5 V batteries, IEC LR03	
Dimensions	150 x 72 x 35 mm (device) 92 x 60 x 29 mm (sensor)	
Weight	approx. 250 g	

Messbereich
0,1...
200 000 Lux

Data Hold

Messwert-speicher

- Includes:**
- 1 93560
 - 6 1.5 V battery, IEC LR03
 - 1 carry case
 - 1 product manual

Ordering information:		
Name	Order no.	Item no.
93560	93560	3222543



LM-100
Digital lux meter

- Functions
- Light intensity measurement
- Device information:
- Manual measurement range selection
 - Silicone sensor
 - Integrated readings memory (data hold)
 - Maximum readings memory (max)
- LM-120
Digital lux meter
- Same as LM-100 and also offers:
- Automatic and manual measurement range selection
 - Minimum and maximum readings memory (min/max)
 - Auto power-off
 - Zero adjustment button

Specifications	
Display	LCD 3 1/2-digit
Measurement ranges	0–20 (LM-120 only) 0–200, 2000, 20,000, 200,000 Lux 0–20, 200, 2000, 20,000 Footcandle (Fc)
Resolution	0.1, 1, 10, 100 Lux 0.01, 0.1, 1, 10 Fc
Accuracy	< 10%
Power supply	1 9 V battery, IEC 6F22
Dimensions	130 x 63 x 38 mm (device) 80 x 55 x 29 mm (sensor)
Weight	approx. 220 g

Messbereich
0,1...
200 000 Lux

Data Hold

Max Hold

- Includes:**
- 1 LM-100 or LM-120
 - 1 9 V battery, IEC 6F22
 - 1 carry case
 - 1 product manual

Ordering information:		
Name	Order no.	Item no.
LM-100	LM-100	3052348
LM-120	LM-120	3052353

Environment



TMULD-300
Ultrasonic leakage detector kit

- Functions**
- Compressed air leakage (truck compressed air, brake, suspension systems), leakage in cooling and air-conditioning systems, heating systems, vapour lines etc.
 - Leakage from door and window seals, roofs
 - Leakage in automobile sector: Windscreens, door seals
- Device information**
- Kit comprising ultrasonic leakage detector (ULD-300) and ultrasonic transmitter (UT-300) in robust carry case
 - Visual and audible indication of ultrasonic leakage detector

Specifications	
ULD-300	35 kHz–45 kHz ±6 dB
Power supply	1 9 V battery, IEC 6LR61 (each)
Display	LED
Frequency range	
UT-300	40 kHz
Dimensions	
ULD-300	65 x 185 x 25 mm
UT-300	65 x 165 x 25 mm
Weight	
ULD-300	approx. 150 g (including battery)
UT-300	approx. 160 g (including battery)

Includes:

- 1 ULD-300 ultrasonic leakage detector
- 1 UT-300 ultrasonic transmitter
- 1 set of headphones
- 1 extension and parabolic attachment
- 2 9 V batteries, IEC 6LR61
- 1 carry case
- 1 product manual

INFO:
Noises above 20 kHz cannot be perceived by the human ear. Even minor leakages in compressed air or gas systems can result in turbulence that produces ultrasonic sound.
The ULD-300 detects these ultrasonic sounds and provides reliable and accurate direction to the site of leakage. The ULD-300 features a visual (10-stage LED scale) and audible indicator (headphones) as well as a thumbwheel to adjust the sensitivity.

Ordering information:		
Name	Order no.	Item no.
TMULD-300	TMULD-300	2731543



93517
Digital sound meter with memo-function

- Functions**
- Measurement of sound level to compare with reference points published in Berufsgenossenschaftliche Vorschriften B3 (health and safety regulations) (VBG 121) and Berufsgenossenschaftliche Vorschriften A4 (VBG 100)
- Device information**
- Measurement by frequency assessment filters A and C, with direct display in dB
 - Maximum value memory (max hold)
 - Switching option for time assessment "fast-slow"
 - Stand connection
- Device features**
- Alternating and direct voltage output for connection to spectrum analysers, level recorders or FFT analysers
 - Readings memory for 99 individual readings

Specifications	
Display	LCD, 4-digit, bar graph
Measurement ranges/ resolution	30–130 dB/0.1 dB
Frequency range	31.5 Hz–8 kHz
Measurement accuracy	Class 2 as per IEC 61672
Time assessment	FAST (125 ms), SLOW (1 s)
Writer output	AC: 1 Veff to 5 kΩ, DC: 10 mV/dB to 5 kΩ
Power supply	1 9 V battery, IEC 6LR61
Dimensions	264 x 68 x 27 mm
Weight	approx. 260 g

Output
Analog

Messwert-
speicher

Max
Hold

Includes:

- 1 93517
- 1 adjustment screwdriver
- 1 3.5-mm jack plug
- 1 9 V battery, IEC 6LR61
- 1 carry case
- 1 wind guard
- 1 product manual

Ordering information:		
Name	Order no.	Item no.
93517	93517	3313290

Sound meters/calibrators



SM-10 Digital sound meter

Functions

- Sound level measurement

Device information

- Measurement by frequency assessment filters A and C, with direct display in dB
- Integrated readings memory (data hold, max)
- Switching option for time assessment "fast-slow"
- Backlight

Specifications

Display	LCD, 4-digit
Measurement ranges/resolution	
A:	30–130 dB /0.1 dB
C:	35–130 dB /0.1 dB
Frequency range	31.5 Hz–8 kHz
Tolerance	±1.5 dB
Time assessment	fast (125 ms); slow (15 ms)
Power supply	1.9 V battery, IEC 6LR61
Dimensions	200 x 55 x 38 mm
Weight	approx. 230 g



Includes:

- 1 SM-10
- 1 9 V battery, IEC 6LR61
- 1 carry case
- 1 wind guard
- 1 product manual

Ordering information:

Name	Order no.	Item no.
SM-10	SM-10	3052366



SM-20A Digital sound meter

Functions

- Sound level measurement

Device information

- Measurement by frequency assessment filters A and C, with direct display in dB
- Integrated readings memory (data hold, max)
- Switching option for time assessment "fast-slow"
- Backlight

Device features

- USB interface for connection to a PC
- Internal data logger for 14,000 readings

Specifications

Display	LCD, 4-digit
Measurement ranges/	
A:	30–30 dB. (resolution 0.1 dB)
C:	35–130 dB (resolution 0.1 dB)
Tolerance	±1.5 dB
Frequency range	31.5 Hz–8 kHz
Power supply	1.9 V battery, IEC 6LR61
Dimensions	200 x 55 x 38 mm
Weight	approx. 230 g



Includes:

- 1 SM-20A
- 1 9 V battery, IEC 6LR61
- 1 interface cable
- 1 software
- 1 carry case
- 1 product manual

Ordering information:

Name	Order no.	Item no.
SM-20A	SM-20A	3477333



SM-CAL1 Sound calibrator

Functions

- Calibrator for sound meters

Device information

- Two ranges can be selected: 94 dB and 114 dB
- Suitable for 1/2" microphones

Specifications

Output signal	94 dB, 114 dB
Accuracy	± 0.5 dB
Frequency	1 kHz (±4%)
Power supply	1.9 V battery, IEC 6F22
Dimensions	Ø 48 x 125 mm
Weight	approx. 285 g

Includes:

- 1 SM-CAL1
- 1 1/2" adapter
- 1 9 V battery, IEC 6F22
- 1 product manual

Ordering information:

Name	Order no.	Item no.
SM-CAL1	SM-CAL1	3052382

Anemometers



Includes:

1 TMA5
1 TPK60 temperature probe
1 3.0 V battery, IEC CR 2032
1 carry case
1 strap
1 product manual

TMA5 Mini anemometer

Functions

- Air speed measurement (m/s)
- Temperature measurement
- Humidity measurement

Device information

- Automatic measurement range selection
- Integrated readings memory (data hold)
- Auto power-off (can be disabled)

Device features

- External temperature probe can be connected
- Measurement of dew point
- Measurement of wet bulb temperature

Ordering information:

Name	Order no.	Item no.
TMA5	TMA5	3503169

Specifications

Display	LCD, 3¾-digit, 3999 digits
Measurement ranges	
Air speed	1.1–20.0 m/s 0.7–72.0 km/h 0.5–44.7 mph 60–3937 ft/m 0.4–38.8 KNT 1–8 BF
Basic accuracy	± 5% of reading or ± 5 digits (higher value applies)
Temperature (int.)	0°C–50°C 32°F–122°F
Resolution	0.1°C/°F
Basic accuracy	± 1°C
Temperature (ext.)	-20°C–70°C -4°F–158°F
Resolution	0.1°C/°F
Basic accuracy	± 0.6°C
Humidity	5%–95% rel. h.
Resolution	0.1% rel. h.
Basic accuracy	± 3.5% rel. h.
Power supply	1 3 V battery, IEC CR 2032
Dimensions	136 × 46 × 17 mm
Weight	approx. 135 g



Includes:

1 TMA10A
1 carry case
1 9 V battery, IEC 6LR61
1 product manual

TMA10A Anemometers

Functions

- Air speed measurement (m/s)
- Volume flow measurement (m³/s)
- Temperature measurement

Device information

- Integrated readings memory (data hold)
- MIN/MAX and average value measurement
- Auto power-off (can be disabled)
- Ideal for measurements in ventilation, air-conditioning and heating systems
- Flexible precision impeller wheel

Device features

- RS-232 interface for connection to a PC
- TM-SWA software (optional)



Accessories:

TM-SWA data logging software and
RS-232 cable
Order no. TM-SWA

Specifications

Display	LCD, 4-digit, 9999 digits
Measurement ranges (m/s)	0.40–25.00 m/s (resolution 0.01 m/s)
Basic accuracy	± (3% of reading)
Volume flow	0.01–99.99 m³/s (resolution 0.01 m³/s)
Temperature	0–50°C or 32–122°F (resolution 0.1°F/°C)
Basic accuracy	± 1.5°F/0.8°C
Power supply	1 9 V battery, IEC 6LR61
Dimensions	181 × 71 × 38 mm
Weight	approx. 360 g (including battery)

Ordering information:

Name	Order no.	Item no.
TMA10A	TMA10A	2817785
TM-SWA	TM-SWA	3027085



Includes:

1 TMA-21HW
1 telescopic probe
1 carry case
6 1.5 V battery, IEC LR03
1 USB cable
1 software on CD
1 product manual

TMA-21HW Hot-wire anemometer

Functions

- Air speed measurement (m/s)
- Volume flow measurement (m³/s)
- Temperature and humidity measurement

Device information

- Integrated readings memory (data hold)
- MIN/MAX and average value measurement
- Auto power-off (can be disabled)
- Ideal for measurements in ventilation, air-conditioning and heating systems
- Large, illuminated display

Device features

- USB interface to transfer stored readings to a PC
- 1.2-m telescopic probe simplifies measurement
- Integrated data logger for recordings over an extended period

Specifications

Display	LCD, 4-digit, 9999 digits
Measurement ranges (m/s)	0.1–30.0 m/s (resolution 0.1 m/s)
Basic accuracy	± (3% of reading)
Volume flow	0.01–99.99 m³/s (resolution 1 m³/s)
Temperature	-20–60°C (resolution 0.1°C)
Basic accuracy	± 0.5°C
Memory	512 KB for 99 data records
Power supply	6 1.5 V batteries, IEC LR03
Dimensions	150 × 72 × 35 mm (device)
Weight	approx. 300 g (including battery)

Ordering information:

Name	Order no.	Item no.
TMA-21HW	TMA-21HW	3730239

Tachometers



TACH20 Tachometer

Functions

- Revolution measurement
- Speed measurement
- Length measurement

Device information

- Rotational speed display
- Speed at surface displayed in m/min, ft/min and in/min
- Length measurement displayed in m, ft and inches
- Integrated readings memory
- The last value, maximum value or minimum value are indicated on the display
- Visual (non-contact) or mechanically coupled measurement
- Visual measurement is indicated by a red modulated light beam
- Auto power-off approx. 30 sec. (data remains saved)

Specifications

Display	LCD, 5-digit
Measurement ranges	
Rotational speed	1–99,999 rpm
Speed	0.1–1999 m/min
Length	0.02–99,999 m
Tolerance	± 0.2%
	± 0.02% (rotational speed)
Measured time	0.5 s/1 period at low speed
Measurement distance	max. 350 mm
Power supply	2 1.5 V batteries, IEC LR6
Dimensions	180 x 60 x 25 mm
Weight	approx. 195 g

Includes:

- 1 TACH20
- 1 mechanical test adapter
- 1 extension
- 2 test probes
- 2 measurement wheels
- 10 reflective stickers
- 2 1.5 V batteries, IEC LR6
- 1 case
- 1 product manual



Accessories:

- Reflective stickers 75 mm in length (10x)
- Order no. 1154

Ordering information:

Name	Order no.	Item no.
TACH20	TACH20	3311961
Reflective stickers	1154	2145762



TACH-10 Tachometer

Functions

- Revolution measurement
- Speed measurement

Device information

- Rotational speed display
- Speed at surface displayed in m/min, ft/min and in/min
- The last value is indicated on the display
- Visual (non-contact) or mechanically coupled measurement
- Visual measurement is indicated by a red modulated light beam
- Auto power-off

Specifications

Display	LCD, 5-digit
Measurement ranges	
Rotational speed	10–99,999 rpm
Speed	1000–9,999 m/min
Tolerance	± (0.1% of reading + 2 digits)
Measurement distance	50–300 mm
Power supply	1 9 V battery, IEC 6LR61
Dimensions	270 x 180 x 30 mm
Weight	approx. 550 g

Includes:

- 1 x TACH-10
- 1 measurement wheel
- 1 roll of reflective sticker
- 1 9 V battery, IEC 6LR61
- 1 product manual



Accessories:

- Reflective stickers 75 mm in length (10x)
- Order no. 1154

Ordering information:

Name	Order no.	Item no.
TACH-10	TACH-10	3730008
Reflective sticker	1154	2145762

Power and energy measurement



Energy costs have been rising at a rapid rate for many years now, which makes the issue of energy efficiency more relevant than ever.

Using the appropriate test equipment, you can not only measure and document your energy usage, but can also determine how and where your system can save energy.

Power and energy measurement



Includes:

- 1 PQ55A
- 4 current clamps
- 4 crocodile clips
- 4 test leads
- 8 1.5 V batteries, IEC LR6
- 1 mains adapter
- 1 RS-232 cable
- 1 carry case
- 1 PC software (English) for Windows 2000/XP/Vista with comprehensive manual (German)
- 1 product manual

Power Analyser PQ55A

Three-phase power and energy measurement

Functions

- Extensive real-time monitoring, recording and analysis of three-phase systems
- Voltage measurement (true RMS value)
- Current measurement (true RMS value)
- Power factor measurement
- Phase angle measurement
- Power analysis (effective, apparent and reactive power)
- Fourth current clamp to measure zero sequence current
- For use in housing construction, offices and small plants

Device information

- Internal 512-kB data logger for long-term monitoring
- Internal readings memory for max. 99 single individual readings
- Multifunctional reading display for all input signals
- Power supply either with batteries or via external mains adapter
- Current clamps 3–1000 A, jaw opening 40 mm
- Data transfer via optically isolated RS-232 interface
- Software for data analysis included

Specifications

Voltage measurement:

3 input channels with common reference point "N"

Measurement range 0–600 Veff

Resolution 0.1 V

Accuracy $\pm (1\% \text{ of reading} + 10 \text{ D})$ for voltages $> 80 \text{ V}$

Mains frequency 50 Hz (not for FU operation)

Current measurement:

Measurement range

Phases 1-3 3–1000 A

Measurement range "N" 3–250 A

Resolution 0.1 A

Basic accuracy $\pm (2.5\% \text{ of reading} + 15 \text{ D}) \pm 1\%$ for currents $> 3 \text{ A}$

Permissible overload 10% (for sinusoidal current)

Effective power P display range 0–999.9 kW

Apparent power S display range 0 to -999.9 kVA

Reactive power Q display range 0–999.9 kvar

Power factor PF display range 0 to +1

Phase angle display range 0° – 90°

Frequency measurement (for voltage range $> 80 \text{ V}$)

Measurement range 45–85 Hz

Phase sequence detection (for conductor voltages $> 80 \text{ V}$)

Energy measurement (effective, apparent and reactive power)

Accuracy $\pm (3.5\% \text{ of reading} + 20 \text{ D})$

Data logger 512 kB, Nonvolatile memory Max. 20,000 readings, max. 10 measuring series Max. 12,000 readings for one measuring series

Sampling rate adjustable: 5 s, 30 s, 1 min, 2 min

Manual readings memory max. 99 readings

General

Display LCD multifunction display

Data transfer via optically isolated RS-232 interface

Frequency range 42–63 Hz

Power consumption approx. 10 VA

Degree of contamination 2

Protection class II

Protection category IP 30

Measurement category CAT III/600 V

Safety certificate: DIN VDE 0411/EN 61010/IEC 61010

Power supply 8 1.5 V batteries, IEC LR6

Battery life typ. 50 h

Mains adapter Schuko 230 V/12...15 V, 300 mA

Ambient conditions

Operating temperature 0°C to $+50^\circ\text{C}$

Storage temperature -10°C to $+60^\circ\text{C}$

Dimensions of test tool (W x H x D) 235 x 117 x 54 mm

Weight (including battery) approx. 730 g



Ordering information:

Name	Order no.	Item no.
Power Analyser PQ55A	PQ55A	3037739









Testing accessories — creating a "secure" connection



Taking safe and reliable measurements does not just require the correct measurement and testing equipment; you also need suitable testing accessories and other key components.

The testing accessories listed below include a variety of test leads, test probes and crocodile clips. These accessories ensure that every user has the required tools to suit each special measuring task.

Pictograms used in this chapter

	Length of the connector equipment (e.g. 4 mm)		Silicone test lead
	Contact protection		PVC test lead
	Measurement category (e.g. CAT III/1000 V)		Heat-resistant
	Current load rating (e.g. 16 A)		Cold-resistant

Testing accessories



SML 4W test leads
4-mm safety connector technology

- Accessories information
- High-flexibility safety test lead, 0.8 mm²
 - Current load rating: 16 A
 - Measurement category CAT III/600 V



- Version
- Double-sided safety plug with onward connection capability as per DIN VDE 0411/EN 61010/IEC 61010

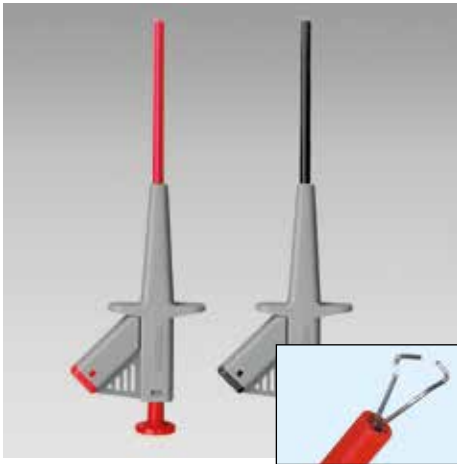
4 mm

CAT III 600 V

16 A

Length/mm insulation	Colour	Line
1000	red	PVC
1000	black	PVC
2000	red	PVC
2000	black	PVC

Order no.	Item no.
307111	2146495
307121	2146508
307112	3313550
307122	3313561



Safety clamp test probe SKP 41 set
4-mm plug technology

- Accessories information
- Approx. 155 x 49 mm
 - Current load rating: 4 A
 - Measurement category CAT III/1000 V



- Version
- Spring wire clamp with flexible, insulated shank
 - Safety clamp test probe with 4-mm safety socket as per DIN VDE 0411/EN 61010/IEC 61010

- Set comprising:
- 1 SKP 41 grey/red
 - 1 SKP 41 grey/black

4 mm

CAT III 1000 V

4 A

Order no.	Item no.
370010	2146701



High-current safety clamp test probe HCP 41 set
4-mm plug technology

- Accessories information
- Approx. 160 x 60 mm
 - Current load rating: 10 A
 - Measurement category CAT III/1000 V



- Version
- Safety clamp test probe with 4-mm safety socket as per DIN VDE 0411/EN 61010/IEC 61010

- Set comprising:
- 1 HCP 41 grey/red
 - 1 HCP 41 grey/black

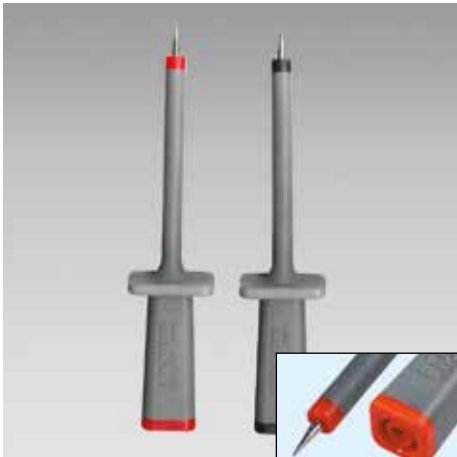
4 mm

CAT III 1000 V

10 A

Order no.	Item no.
370024	2146758

Testing accessories



Test probes PSS 2 set

- Accessories information
- Approx. 100 x 21 mm
 - Current load rating: 6 A
 - Measurement category CAT III/1000 V

- Set comprising:
- 1 test probe PSS 2, grey/red
 - 1 test probe PSS 2, grey/black



- Version
- Safety test probe with 4-mm safety socket as per DIN VDE 0411/EN 61010/IEC 61010

4 mm

CAT III
1000 V

6 A

Order no.	Item no.
370008	2146694



Test probes PSK 2 set 2-mm tip, short version

- Accessories information
- Approx. 102 x 10 mm
 - Current load rating: 16 A
 - Measurement category CAT III/1000 V, CAT IV/600 V (with cover cap)
 - Measurement category CAT II/1000 V (without cover cap)

- Set comprising:
- 1 PSK 2, grey/red (with cover cap)
 - 1 test probe PSK 2, grey/black (with cover cap)



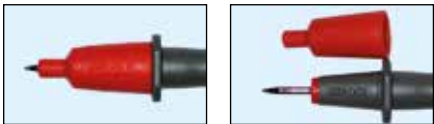
- Version
- Safety test probe with 4-mm safety socket and 2-mm stainless steel probe as per DIN VDE 0411/EN 61010/IEC 61010

4 mm

CAT III
1000 V

CAT IV
600 V

16 A



Order no.	Item no.
370004	2146675

Testing accessories



Safety crocodile clip
KS 4L set
4-mm plug technology

Accessories information

- 94 x 42 mm
- Current load rating: 16 A
- Measurement category CAT III/1000 V, CAT IV/600 V
- Opening: approx. 24 mm

Set comprising:

- 1 KS4L, grey/red
- 1 KS4L, grey/black



Version

- Safety crocodile clip with 4-mm safety socket as per DIN VDE 0411/EN 61010/IEC 61010



Order no.	Item no.
370012	2146712



Test clips for busbars
4-mm safety connector technology

Accessories information

- 155 x 40.5 mm
- Current load rating: 5 A
- For busbars up to 30 mm
- Measurement category CAT III/600 V
- Opening: 0–20 mm/10–30 mm



Version

- Test clip for safe measurement of busbars
- 4-mm safety plug technology



Order no.		Item no.
391511	red	2146861
391512	black	2146877



UNIdreh accessories
set
4-mm plug technology

Accessories information

- Self-retaining test probes with clamping range \varnothing 4–8 mm
- Secure contacting, e.g. in CEE 16 A and CEE 32 A sockets
- Crocodile clamp as standard

Includes:

- 3 probes, black
- 1 crocodile clip, black
- 1 carry case

Specifications

Current load rating	8 A
Measurement category	
Test probes (Astaco)	CAT II/1000 V
Crocodile clip (KS4L)	CAT III/1000 V, CAT IV/600 V
Degree of contamination	2
Safety certificate:	DIN VDE 0411/EN 61010/IEC 61010

Order no.	Item no.
UNIdreh accessories set 1324	2146183



The solution for secure contact in CEE sockets.

Testing accessories



Professional test lead set for multimeters 2-mm safety test probes

Accessories information

- Test lead set with 4-mm safety plug technology
- Ergonomically designed handle
- Silicone safety test lead
- Measurement category CAT IV/1000 V (with cover cap)
- Measurement category CAT II/1000 V (without cover cap)
- 2-mm test probes



Includes:

2 test leads, approx. 1 m in length,
2 cover caps

Specifications

Current load rating	max. 20 A
Measurement category	CAT IV/1000 V, CAT II/1000 V
Degree of contamination	2
Safety certificate:	DIN VDE 0411/EN 61010/ IEC 61010

Order no.

Item no.

Professional test lead set 1306
with silicone insulation

3313458



Professional test lead set for multimeters 4-mm safety test probes

Accessories information

- Test lead set with 4-mm safety plug technology
- Ergonomically designed handle
- Silicone safety test lead
- Measurement category CAT IV/1000 V (with cover cap)
- Measurement category CAT II/1000 V (without cover cap)
- 4-mm test probes



Includes:

2 test leads, approx. 1 m in length,
2 cover caps

Specifications

Current load rating	max. 20 A
Measurement category	CAT IV/1000 V, CAT II/1000 V
Degree of contamination	2
Safety certificate:	DIN VDE 0411/EN 61010/IEC 61010

Order no.

Item no.

Professional test lead set 1307
with silicone insulation

2146176



Mini crocodile clips 2-mm plug technology (fits all 2-mm multimeter test probes)

Accessories information

- 41.5 x 13 mm
- Max. voltage 33 V AC/70 V DC
- Opening: approx. 7 mm



Version

- Miniature crocodile clip

Order no.

Item no.

390450	red	2406492
390451	black	2406509

Testing accessories



4 mm

CAT III
1000 V

CAT IV
600 V

PVC

TL36A
Test lead set
with crocodile clips
2-mm safety test probes

- Accessories information**
- Test lead set with 4-mm safety plug technology
 - PVC-insulated leads
 - Threaded test probe
 - Crocodile clips with threaded connection, opening approx. 10 mm



- Includes:**
- 2 test leads, approx. 1 m in length, with cover caps
 - 2 crocodile clips

Specifications	
Measurement categories	
Test leads	CAT III/1000 V, CAT IV/600 V (with cover cap) CAT II/1000 V (without cover cap)
Crocodile clips	CAT III/1000 V, CAT IV/600 V
Degree of contamination	2
Safety certificate:	DIN VDE 0411/EN 61010/IEC 61010



Order no.	Item no.
TL36A	3034444



4 mm

CAT III
1000 V

CAT IV
600 V

PVC

TL35B
Test lead set
with safety crocodile clips
2-mm safety test probes

- Accessories information**
- Test lead set with 4-mm safety plug technology
 - PVC-insulated leads
 - Threaded test probe
 - Safety crocodile clip with threaded connection, opening approx. 16 mm



- Includes:**
- 2 test leads, approx. 1 m in length, with cover caps
 - 2 crocodile clips

Specifications	
Measurement categories	
Test leads	CAT III/1000 V, CAT IV/600 V (with cover cap) CAT II/1000 V (without cover cap)
Crocodile clips	CAT III/1000 V, CAT IV/600 V
Degree of contamination	2
Safety certificate:	DIN VDE 0411/EN 61010/IEC 61010



Order no.	Item no.
TL35B	3068232



4 mm

CAT III
1000 V

CAT IV
600 V

PVC

- EU-200**
Test lead set
- Accessories information**
- Test lead set with 4-mm safety plug technology
 - 4-mm test probes



- Includes:**
- 2 test leads
 - 2 test probes (with cover caps)
 - 2 crocodile clips

Specifications	
Measurement categories	
Test leads	CAT III/1000 V
Test probes	CAT IV/600 V, CAT III/1000 V (with cover cap) CAT II/1000 V (without cover cap)
Crocodile clips	CAT III/1000 V, CAT IV/600 V
Degree of contamination	2
Safety certificate:	DIN VDE 0411/EN 61010/IEC 61010

Order no.	Item no.
EU-200	2745046

Testing accessories



Safety set

Accessories information
• Test lead set with 4-mm safety plug technology

- Includes:**
- 1 safety test lead, red
 - 1 safety test lead, black
 - 1 test probe, red, with cover cap
 - 1 test probe, black, with cover cap
 - 1 crocodile clip, red
 - 1 crocodile clip, black

Specifications

Current load rating	10 A
Measurement category	
Safety test leads	CAT III/1000 V
Test probes	CAT III/1000 V, CAT IV/600 V (with cover cap) CAT II/1000 V (without cover cap)
Test clips	CAT III/1000 V, CAT IV/600 V
Degree of contamination	2
Safety certificate:	DIN VDE 0411/EN 61010/IEC 61010

Order no.	Item no.
Safety set	370003 2146666



Electronic technician's set

Accessories information
• Test lead set with 4-mm safety plug technology

- Includes:**
- 1 safety test lead, red
 - 1 safety test lead, black
 - 1 crocodile clip, red
 - 1 crocodile clip, black
 - 1 safety clamp test probe, red
 - 1 safety clamp test probe, black
 - 1 safety test probe, red
 - 1 safety test probe, black

Specifications

Current load rating	4 A/10 A
Measurement category	
Safety test leads	CAT III/1000 V
Test probes	CAT III/1000 V
Test clips	CAT III/1000 V, CAT IV/600 V
Clamp test probe	CAT III/1000 V
Degree of contamination	2
Safety certificate:	DIN VDE 0411/EN 61010/IEC 61010

Order no.	Item no.
Electronic technician's set	370001 3313577



Electrician's set

Accessories information
• Test lead set with 4-mm safety plug technology

- Includes:**
- 1 safety test lead, red
 - 1 safety test lead, black
 - 1 safety test probe, red
 - 1 safety test probe, black
 - 1 safety clamp test probe, red
 - 1 safety clamp test probe, black
 - 1 crocodile clip, red
 - 1 crocodile clip, black

Specifications

Current load rating	10 A/16 A
Measurement category	
Safety test leads	CAT III/1000 V
Test probes	CAT III/1000 V
Test clips	CAT III/1000 V, CAT IV/600 V
Clamp test probe	CAT III/1000 V
Degree of contamination	2
Safety certificate:	DIN VDE 0411/EN 61010/IEC 61010

Order no.	Item no.
Electrician's set	370000 2146653

Cases for BEHA-AMPROBE products



1150 **Carry case**

Material: nylon, padded, fasteners, strap
Internal dimensions 200 x 150 x 40 mm

Order no. 1150
Item no: 2145755



1175 **Carry case**

Material: nylon, padded, belt loop
Internal dimensions 295 x 80 x 50 mm

Order no. 1175
Item no: 2145796



CC-VP-7xx **Carry case**

Material: nylon, padded, fasteners, strap
Suitable for 2100 ALPHA/BETA and VP-700 series
Internal dimensions 280 x 80 x 45 mm

Order no.: CC-VP-7xx
Item no: 3889931



1193 **Professional carry case**

Material: nylon, padded, fasteners, strap
Internal dimensions 300 x 400 x 65 mm

Order no. 1193
Item no: 2145812



VC30A **Carry case**

Material: artificial leather, belt loop
External dimensions 200 x 80 x 45 mm

Order no.: VC30A
Item no: 3068280



VC221B **Carry case**

Material: artificial leather, belt loop
External dimensions 220 x 115 x 60 mm

Order no.: VC221B
Item no: 3068271



CC-ACDC **Carry case**

Material: nylon, strap, belt loop
External dimensions 300 x 120 x 60 mm

Order no.: CC-ACDC
Item no: 2732643



SV-U **Carry case**

Material: nylon, strap, belt loop
External dimensions 300 x 120 x 60 mm

Order no.: SV-U
Item no: 2733511

Find more information at: www.beha-amprobe.com

Spare parts and fuses

Note:

The spare parts are available from the Glottertal service centre. You can find additional spare parts and prices online (www.beha-amprobe.de) under the menu item "Service – Spare parts"

To order parts, please use the order form on the next page. Fill it out and send it to the fax number listed. You can check the prices on our homepage www.beha-amprobe.com

Spare parts

for product	Part name	Item no.
0100Expert	Expert test lead with Schuko plug 2 m	2406340
0100Expert	Expert 3-pin test lead 2 m (bla/blu/gr)	2406369
0100Expert	4-pin test lead 1 m	2156598
0100Expert	Replacement colour tape for 8991/9020	2145692
0100Expert/Telaris	Testing accessories 0100-SET bla/blu/gr	2406445
Telaris	Test lead set 1.5 m bla/blue/green Telaris 0100plus	3397588
Telaris	Telaris 3-pin test lead, Schuko plug	3397625
Telaris	Telaris case with no logo	4273623
0701/0702 Multitester	PE test lead 1.5 m crocodile clip 8992	4230479
0701/0702 PC Multitester	PE test lead 1.5 m with crocodile clip 8993	4230454
MACHINEmaster	Commander 1, MACHINEmaster	2390861
MACHINEmaster	Commander 2, MACHINEmaster 5+5m	2390877
Machine tester MT204-S	Test lead extension EXT-MT204S SET 2x10 m	3504374
Machine tester MT204-S	Test lead set TL-MT204S, 2x 2-m Test pr.	3504363
TACH20	Measuring wheel 3.0 (6 inch)	4223163
TACH20	Probe tip extension	4223188
TACH20	Hollow tip d=7	4223174

Fuses

Rated value	Characteristics	Rated voltage	Dimensions	Packaging units	Item no.
500 mA	fast-acting	1000 V	6.3x32 mm	Pack of 4 FP500	1990695
500 mA	fast-acting	500 V	6.3x32 mm	FP520	2156748
500 mA	fast-acting	500 V	6.3x32 mm		3504681
500 mA	fast-acting	1000 V	6.3x32 mm		2156753
630 mA	fast-acting	500 V	6.3x32 mm		4223534
1 A	fast-acting	600 V	10x38 mm		4223398
10 A	fast-acting	600 V	6.3x32 mm		3814230
10 A	fast-acting	500 V	6.3x32 mm		3504670
10 A	fast-acting	1000 V	10x38 mm	Pack of 2 FP100	1990707
11 A	fast-acting	1000 V	10x38 mm		803293
12.5 A	fast-acting	500 V	6.3x32 mm		2156681
15 A	fast-acting	500 V	6.3x32 mm		2156727

Appendix



Measurement categories

Useful information regarding measurement categories, pollution degree, labelling and symbols

Measurement categories

For measurement category, the term "overvoltage rating" was used in the earlier version of DIN VDE 0411-1:1994.

Measurement category I:

Measurement category I applies to electrical equipment used in devices in which only minor overvoltage can occur, such as in devices downstream of the input transformer.

Measurement category II:

Measurement category II applies to electrical equipment in which the hazards of lightning-induced power surge can be disregarded, though in which overvoltage can occur as a consequence of switching operations. Equipment in this category includes items such as electrical equipment between the device and outlet, within electrical devices without input transformer (e.g. household appliances).

Measurement category III:

Measurement category III comprises, in addition to category II devices, electrical equipment subject to particular requirements regarding safety and availability.

Examples: domestic installations, protective devices, outlets, switches etc.

Measurement category IV:

Measurement category IV comprises electrical equipment for which the consequences of lightning strike must be considered. This includes e.g. connection to outdoor conductors, underground cabling to water pumps etc.

Pollution degree

The insulation properties of measurement and testing equipment can be significantly diminished as a consequence of surface contamination. Dust and soot particles or water can form conductive connections and considerably reduce the surface resistance of the insulation.

Pollution degree 1

No occurrence of contamination or occurrence of contamination that is dry and non-conductive only.

There are no consequences associated with this kind of contamination.

Pollution degree 2

Occurrence ordinarily only of non-conductive contamination. Temporary conductivity is to be expected occasionally, however, with dew.


Location of operation e.g. industry, laboratory.


Pollution degree 3


Occurrence of conductive contamination, or occurrence of dry, non-conductive contamination that will become conductive as a consequence of expected condensation.


Location of operation e.g. heavy industry, construction sites, brief use outdoors.

Labelling and symbols

 Warning of hazard area; observe product manual

 Caution! Dangerous voltage, risk of electrocution

 Dual or strengthened insulation in accordance with Class II IEC 61140 (protection category II)

 CE Conformity mark, certifies adherence to applicable guidelines and regulations for the respective device


Protection types

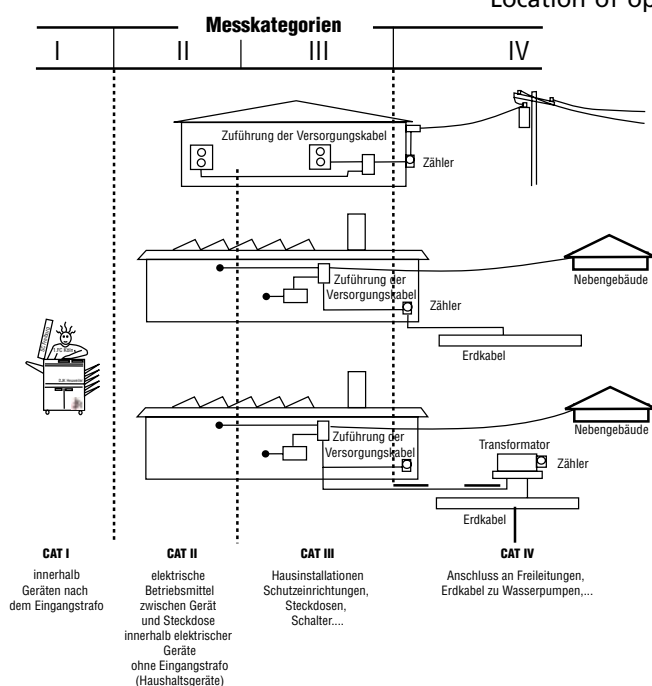
On electronic measurement and test equipment and other equipment, protection against foreign objects (dirt) and water is specified by two digits following the short code IPxx. The first digit can range from 0 to 6. This indicates protection against the intrusion of foreign objects. 0 signals no protection, 6 indicates protection against dust infiltration. The second digit can range from 0 to 8. This indicates protection against the ingress of water. 0 signals no protection, 8 indicates protection against water ingress on submerging.

Protection categories

 Protection category I: Protection via protective conductor

 Protection category II: Protection via protective insulation

 Protection category III: Protection via protective extra-low voltage



General terms and conditions of sale

I. General terms and conditions

- These general terms and conditions of sale apply to all business relationships that BEHA-AMPROBE Glotttertal (hereinafter referred to as Supplier) enters into with its customers (hereinafter referred to as Purchasers). These general terms and conditions of sale apply only if the Purchaser is considered an industrialist (Art. 14 of the German Civil Code [BGB]), corporate body under public law or a special fund under public law.
- These general terms and conditions of sale apply in particular to contracts governing the sale and/or supply of goods subject to transport (hereinafter referred to as Goods), irrespective of whether the Supplier manufactures the Goods itself or purchases the Goods from sub-suppliers (Art. 433, Art. 651 of the German Civil Code). These general terms and conditions of sale also apply as a general agreement in their respectively valid version to future contracts governing the sale and/or supply of goods subject to transport concluded with the same Purchaser without the Supplier having to refer back to these in each individual case.
- These general terms and conditions of sale apply exclusively. Alternative, conflicting or supplementary general terms of business of the Purchaser form part of this agreement only if and to the extent that the Supplier expressly approves of their validity. This provision on consent applies in all cases, including, for instance, where the Supplier executes delivery to the Purchaser unreservedly in full knowledge of the general terms of business of the Purchaser.

II. Contract conclusion

- Quotations provided by the Supplier are non-binding and without obligation.
- Ordering of the Goods by the Purchaser shall be considered a binding offer of contract. Unless otherwise stated in the order, the Supplier has four weeks from receipt to accept this offer of contract.
- Acceptance can be expressed either in writing (e.g. by order confirmation) or by delivery of the Goods to the Purchaser.
- The Supplier reserves the right, including in respect of multiple delivery contracts and general agreements, to make design modifications at any time. In such cases, the Supplier shall not be obliged to make similar modifications to products that have already been delivered. This shall apply accordingly to software updates and upgrades.

III. Pricing and terms of payment

- The prices indicated are factory prices and exclude packaging and value-added tax at the legally applicable rate.
- If the Supplier is obligated in accordance with Art. 4 of the German Packaging Regulations [VerpackV] to take back packaging used for transport of the goods, the Purchaser shall bear the cost of the return transport of the used packaging.
- If the Supplier has assumed responsibility under this agreement for the setup or installation of the Goods and no alternative arrangement has otherwise been concluded, the Purchaser shall, in addition to the full remuneration due under this agreement, bear the cost of all necessary additional expenses, in particular travel expenses, costs for the transport of tools and the personal belongings of personnel deployed by the Supplier and accommodation allowances.
- The Purchaser shall bear the cost of any customs duties payable, fees, taxes or other public charges. All other packaging that is not covered by Art. II No. 2 shall not be taken back by the Supplier and shall become the property of the Purchaser.
- Payments are to be made to the payment office of the Supplier.
- Invoices are to be paid strictly net by the 15th of the subsequent month. The Purchaser shall be deemed to be in default of payment beyond the payment term specified above. An interest rate of 8 percent above the base rate, though not less than 12 percent p.a., will be applied to the purchase price during the period in default. The Supplier reserves the right to assert a further claim for damages as a result of non-payment. With respect to traders, the Supplier's right to commercial due date interest (Art. 353 of the German Commercial Code [HGB]) remains unaffected.
- The Purchaser shall be entitled to rights of offset only insofar as such claim is established without further legal recourse or is unchallenged. The same applies accordingly to the right of retention, exercise of which effective under law is contingent on the counterclaim of the Purchaser being based on the same contractual relationship.

IV. Terms for delivery; delivery and acceptance delays

- To ensure adherence to delivery terms, the Supplier must be in receipt of all documentation, approvals and releases, in particular of plans, to be supplied by the Purchaser in due time and the agreed terms and conditions of payment and other obligations to which the Purchaser is bound must be satisfied. If these requirements are not satisfied in due time, the Supplier is entitled to reasonably extend the delivery terms; this not applies if the Supplier is at fault with respect to the delay.
- If non-adherence to indicated time frames is the result of force majeure, e.g. mobilisation, war, civil disturbance or similar events, e.g. industrial action, lockout, the Supplier is entitled to reasonably extend the delivery terms.
- If the Supplier fails to deliver the Goods to schedule, the Purchaser is entitled to demand compensation for each full week of delay of 0.5%, though not exceeding a total of 5%, of the price for the part of the deliveries that has not been delivered, provided the Purchaser substantiates any consequential financial loss. Both claims for damages on the part of the Purchaser due to delays in delivery and claims for damages in lieu of performance exceeding the thresholds stipulated in the preceding clause are excluded in all instances

of delayed delivery, including after expiry of a term imposed on the Supplier to deliver. This does not apply to cases set forth in Art. XI No. 2.

- The Purchaser shall be obligated to declare within a period of two weeks whether he intends to withdraw from the agreement due to the delay of a delivery upon request of the Supplier. If the Purchaser fails to do so within the prescribed term, his right to withdraw from the agreement will expire.
- If shipment or transfer is delayed at the behest of the Purchaser by more than one month after notice of readiness for dispatch, a storage charge may be billed to the Purchaser after expiry of the one-month term at a rate of 1% of the price of the articles of delivery for each commenced week, with a maximum charge of 100%. The parties to the agreement shall be at liberty to demonstrate that higher or lower storage costs have been incurred; the fixed-rate storage charge will be counted against any more extensive monetary claims.
- If a contractual right to return the Goods has been agreed, the Purchaser shall bear the cost of packaging and shipment. The Purchaser shall bear the full risk of deterioration or potential total loss of the Goods until receipt of the return delivery.

V. Delivery, transfer of risk

- Delivery is ex works; this is also deemed the place of performance. The Goods will be shipped to an alternative destination (sale by dispatch) at the request and expense of the Purchaser. Unless otherwise agreed, the Supplier is entitled to determine the nature of shipment (in particular the shipment company, shipment route, packaging).
- The Purchaser shall assume the risk of accidental total loss, accidental deterioration of the Goods and delay, including in the case of freight-paid delivery, as follows:
 - In the case of sale by dispatch, the full risk passes to the haulage contractor, the freight carrier or other individual or establishment appointed to execute the shipment from the point of dispatch of the Goods. At the request and expense of the Purchaser, the deliveries will be insured by the Supplier against common transport risks
 - In the case of deliveries with setup or assembly, on the day of transfer to the Purchaser's premises or, if agreed, following flawless test operation
 - If acceptance has been agreed, this will be decisive with respect to the transfer of risk. Statutory provisions governing work contracts will also otherwise apply with respect to agreed acceptance; Art. VI No. 6 remains unaffected.
- The Purchaser shall bear the full risk if dispatch, transfer, initiation, performance of setup or assembly, transfer to the Purchaser's premises or test operation are delayed for reasons attributable to the Purchaser or acceptance is delayed by the Purchaser for other reasons.
- The Purchaser may not refuse to accept deliveries due to minor defects. Partial deliveries will be permissible, provided this is not unreasonable to the Purchaser.

VI. Acceptance

If the Supplier requests an acceptance sign-off of the delivery, this must be performed by the Purchaser within two weeks of delivery. If this does not occur, acceptance will be considered signed off if the Purchaser does not complain of precisely identified faults or malfunctions in writing within this period; receipt of complaints by the Supplier is decisive with respect to adherence to the term. Acceptance will likewise be considered signed off if the delivered Goods have been used, if applicable following completion of an agreed test phase.

VII. Retention of ownership

- The Supplier shall retain full ownership of the Goods sold until full payment of all current and future receivables owed to the Supplier resulting from the purchase agreement and current business relationship (secured receivables).
- The Goods subject to retention of ownership may not be pledged to third parties nor assigned as security until full payment of secured receivables. The Purchaser must immediately inform the Supplier in writing if and when access to the Goods belonging to the Supplier are accessed by third parties.
- The Purchaser is entitled to sell on and/or process the Goods subject to retention of ownership in the regular course of business. In such cases, the following additional conditions apply.
 - Retention of ownership extends to products produced through the processing, mixing or combining of the Goods of the Supplier to their full value, whereby the Supplier is deemed the manufacturer.
 - If third party proprietary rights continue to exist in the case of processing, mixing or combining with third party goods, the Supplier will acquire co-ownership rights proportionate to the invoice value of the processed, mixed or combined goods. In all other cases, the provisions applicable to the delivered Goods subject to retention of ownership likewise apply to the product produced.
 - The Purchaser undertakes to immediately relinquish to the Supplier in full accounts receivable from third parties in the event of selling on the Goods or product at the rate of the Supplier's coownership share in the case of (a) and/or (b) as security. The Supplier shall accept the surrender of receivables. The duties and obligations of the Purchaser stipulated in paragraph 2 also apply with respect to surrendered receivables.
 - The Purchaser shall remain authorised to collect the receivables alongside the Supplier. The Supplier undertakes not to take action to recover the receivables so long as the Purchaser complies with its payment obligations with respect to the Supplier, is not in default of payment, no application is made to initiate insolvency proceedings concerning the assets of the Purchaser and no other deficiency is identified with respect to the Purchaser's payment capability. In the case of the above, however, the Supplier may demand that the Purchaser notify him of the receivables surrendered and the respective debtors,

General terms and conditions of sale

provide all further information necessary to recover the monies, surrender the associated documentation and notify the debtors (third parties) of the surrender of receivables.

- e) If the attainable value of the securities exceeds the secured receivables of the Supplier by more than 20%, upon request of the Purchaser, the Supplier shall release securities as chosen by the Supplier.

VIII. Material defects

1. Deliveries that exhibit material defects within the statutory period of limitation — irrespective of the duration of operation — will be repaired, redelivered or re-rendered without charge at the Supplier's discretion, provided the cause of the material defect was present at the time of the transfer of risk. Except where otherwise stipulated with respect to liability for damages under Art. XI., the Supplier shall not be liable in accordance with its supplementary performance obligations either to remove a defective item from an alternative item (not supplied by the Supplier) in which the defective item is installed, nor bear the cost of installing a replacement or repaired item.
2. Material defect claims are limited to 12 months under the statute of limitations. This does not apply if longer terms are prescribed under law in accordance with Art. 438 Para. 1 No. 2 (structures and items for structures), Art. 479 Para. 1 (right of recourse) and Art. 634a Para. 1 No. 2 (construction defects) of the German Civil Code, as well as in the case of fatal injury, personal injury or damage to health, or in the case of a breach of duty on the part of the Supplier attributable to wilful intent or gross negligence, or where a defect is wilfully concealed. Statutory provisions governing suspension of expiry, suspension and re-initiation of terms remain unaffected.
3. The Purchaser undertakes to immediately notify the Supplier in writing of material defects (including incorrect and underdelivery). The Purchaser shall not be deemed to have notified the Supplier immediately if notification is not given within two weeks; notification must be given within this period for the term to have been observed under this agreement.
4. The Supplier is entitled to make supplementary performance under this agreement conditional on payment by the Purchaser of the purchase price due. The Purchaser is entitled in this case, however, to without a reasonable portion of the purchase price proportionate to the defect in accordance with Art. III No. 7 Clause. 2. If a defect claim is wrongfully submitted, the Supplier is entitled to demand from the Purchaser expenses incurred in this regard in compensation.
5. The Supplier will first be given the opportunity to perform supplementary works within a reasonable time frame. If supplementary works are ineffective, the Purchaser is entitled to withdraw from the agreement or to reduce the rate of remuneration.
6. Defect claims are excluded in the case of minor deviations from the agreed properties, minor impairment of usability, natural wear and tear or damage resulting after the transfer of risk from incorrect or negligent handling, excessive use, unsuitable equipment, deficient constructional workmanship, unsuitable foundations or from particular external influences not assumed under this agreement, or in the case of non-reproducible software errors. If modifications or repair works are performed improperly by the Purchaser or third parties, defect claims are likewise excluded for these and the resulting consequences.
7. Claims on the part of the Purchaser with respect to expenses incurred for the purpose of supplementary performance, in particular transport, travel, labour and material costs, are excluded if costs increase as a result of the Goods being delivered to an alternative delivery location to the premises of the Purchaser, unless such delivery is consistent with the intended use.
8. The Purchaser's rights of recourse against the Supplier in accordance with Art. 478 of the German Civil Code (recourse of contractor) shall exist only insofar as the Purchaser has not concluded any agreements with its recipient exceeding the scope of statutory defect claim provisions. Art. VIII No. 7 also applies accordingly to the scope of the Purchaser's right of recourse against the Supplier in accordance with Art. 478 Para. 2 of the German Civil Code.
9. Art. XI (other claims for damages) also otherwise applies to claims for damages. Further claims by the Purchaser against the Supplier or its agents or claims other than those stipulated in Art. VIII resulting from a material defect are excluded.

IX. Industrial property rights and copyrights; defects of title

1. Unless agreed otherwise, the Supplier shall render delivery free from industrial property rights and third-party copyrights (hereinafter referred to as Property Rights) solely in the country of the point of delivery. If a third party asserts legitimate claims against the Purchaser due to a violation of Property Rights by deliveries rendered by the Supplier and used in accordance with this agreement, the Supplier shall indemnify the Purchaser as follows within the period stipulated in Art. VIII No. 2:
 - a) The Supplier shall, at its own discretion and expense, either acquire usage rights to the deliveries in question, modify the Goods such that Property Rights are no longer violated or replace the Goods. If this is not possible for the Supplier to achieve this reasonably, the Purchaser is legally entitled to withdraw from the agreement or to reduce the rate of remuneration.
 - b) The duty of the Supplier to pay compensation is governed by Art. XI.
 - c) The above-stipulated obligations of the Supplier apply only if the Purchaser informs the Supplier immediately of any claims asserted by a third party in writing, does not acknowledge a violation and all defensive measures and settlement negotiations remain solely at the Supplier's discretion. If the Purchaser suspends use of the delivered goods for the purposes of damage limitation or for other important reasons, the Purchaser shall be obligated to point out to the third party that the suspension of use does not signal acknowledgement of a violation of Property Rights.

2. Claims on the part of the Purchaser are excluded if the Purchaser is responsible for the violation of Property Rights.
3. Claims on the part of the Purchaser are furthermore excluded if the violation of Property Rights is attributable to special provisions imposed by the Purchaser, to use of the goods not as envisaged by the Supplier or to modification of the goods by the Purchaser or their use with products not supplied by the Supplier.
4. The Supplier retains all propriety rights and copyright on cost estimates, drawings, manuals and other documentation (hereinafter referred to as Documentation) without limitation. The Documentation must not be made accessible to third parties without the prior approval of the Supplier and must be returned to the Supplier immediately on request if the contract is not awarded to the Supplier. Clauses 1 and 2 apply accordingly to the Documentation of the Purchaser; such documentation, however, may be made available to those third parties to whom the Supplier has lawfully transferred deliveries.
5. Unless otherwise expressly agreed in writing, information submitted to the Supplier in connection with orders will not be treated as confidential.
6. The Purchaser shall have the non-exclusive right to use software supplied by the Supplier provided the agreed performance characteristics are observed without modification and on the agreed devices. The Purchaser may produce two back-up copies without express approval.
7. In the case of Property Right violations, the provisions of Art. VIII No. 4, 5 and 9 will otherwise also apply accordingly with respect to claims on the part of the Purchaser regulated under No. 1 a).
8. In the case of other defects of title, the provisions of Art. VIII will apply accordingly.
9. Further claims by the Purchaser against the Supplier or its agents or claims other than those stipulated in Art. IX resulting from a defect of title are excluded.

X. Impossibility of performance, contract modification

1. If delivery is deemed impossible, the Purchaser is entitled to demand compensation unless the Supplier is found not to be responsible in this regard. Claims for compensation on the part of the Purchaser, however, will be restricted to 10% of the value of the respective part of the delivery that cannot be put to its intended use due to the impossibility of performance. This limitation does not apply where mandatory liability is prescribed in cases of wilful intent, gross negligence or due to fatal injury, personal injury or damage to health; the burden of proof in this case does not shift to the detriment of the Purchaser. The right of the Purchaser to withdraw from the contract remains unaffected.
2. If unforeseeable events as defined by Art. IV No. 2 modify substantially the economic significance or content of delivery or significantly affect the Supplier's business, the contract will be reasonably adapted in good faith. If such a contract modification is economically unreasonable, the Supplier shall have the right to withdraw from the contract. If the Supplier intends to exercise its right to withdraw from the contract, the Supplier must notify the Purchaser accordingly within three weeks of becoming aware of the event. If the Purchaser fails to do so within the prescribed term, his right to withdraw from the agreement will expire.

XI. Other claims for damages

1. The Supplier shall be liable for claims for damages — irrespective of the legal basis — only in the case of wilful intent and/or gross negligence. In the case of ordinary negligence, the Supplier shall be liable only for damages associated with fatal injury, bodily injury or damage to health, or for damages associated with the violation of a significant contractual obligation (an obligation essential to the proper performance of the contract and whose performance the contractual partner typically relies upon and is entitled to expect); in such cases, however, the liability of the Supplier is limited to compensation for foreseeable, typically associated damages.
2. Limitations of liability derived from Para. 1 do not apply if the Supplier is found to have wilfully concealed a defect or has provided a guarantee for the quality of the Goods. The manufacturer's warranty does not constitute the provision of a guarantee by the Supplier. The provisions of Clause 1 apply accordingly to claims on the part of the Purchaser in accordance with the German Product Liability Act.
3. If the Purchaser is entitled to claim for damages in accordance with Art. XI, the period of claim applicability expires on completion of the statutory period of limitation applicable to material defect claims in accordance with Art. VIII No. 2. In the case of claims for damages in accordance with the German Product Liability Act, the statutory provisions of the statute of limitations apply.

XII. Place of jurisdiction and applicable law

1. The exclusive place of jurisdiction for all disputes arising either directly or indirectly from the contractual relationship will be the place of domicile of the Supplier if the Purchaser is a merchant, a corporate body under public law or a special fund under public law. The Supplier is also entitled, however, to file a suit at the general place of jurisdiction of the Purchaser.
2. German substantive law shall apply to legal relationships in connection with this contract, to the exclusion of the United Nations Convention on Contracts for the International Sale of Goods (CISG). The preconditions for and effects of the retention of ownership as agreed above shall be governed by the law applicable at the respective storage location of the Goods, insofar as the choice of law in favour of German law proves inadmissible or ineffective in accordance with the respective law.

XIII. Severability clause:

Should a provision of this contract be or become invalid or null and void, the validity of the remaining provisions is not affected



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