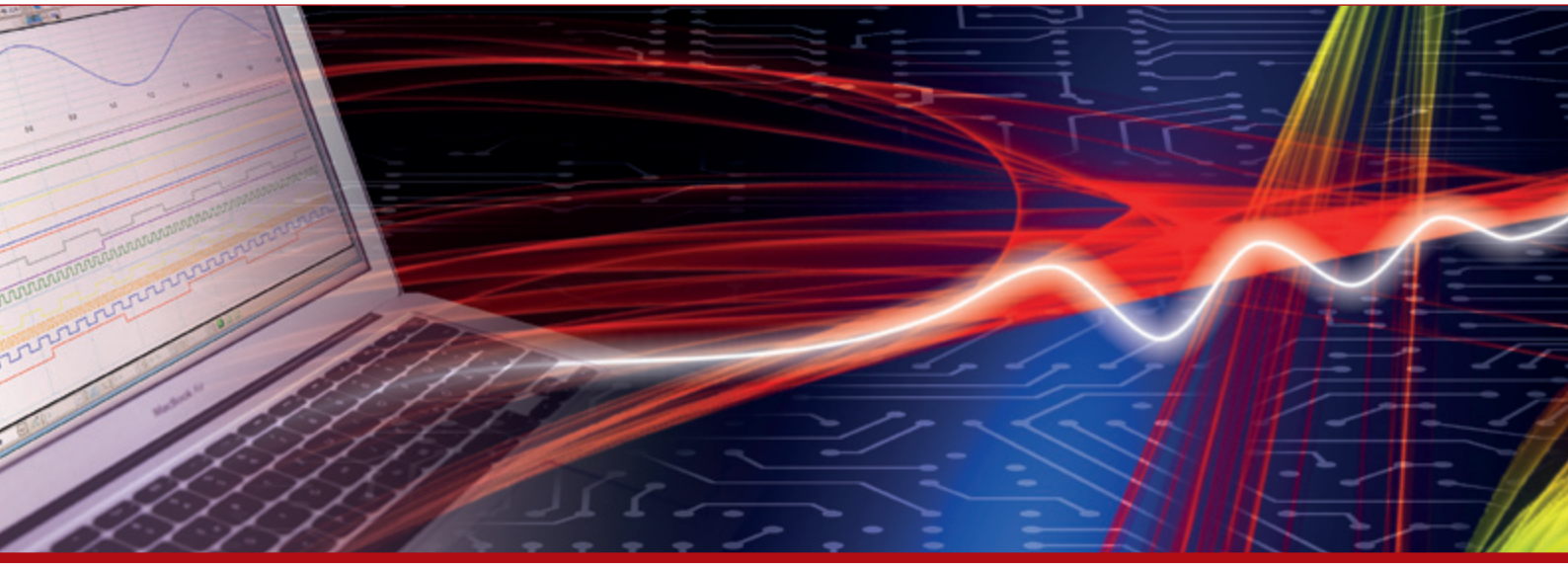
Product Datasheet - Technical Specifications



More information in our Web-Shop at ▸ **www.meilhaus.com**

Your contact

Technical and commercial sales, price information, quotations, demo/test equipment, consulting:

Tel.: **+49 - (0)81 41 - 52 71-0**

E-Mail: **sales@meilhaus.com**

Meilhaus Electronic GmbH
Am Sonnenlicht 2
82239 Alling/Germany
Tel. **+49 - (0)81 41 - 52 71-0** E-Mail **sales@meilhaus.com**

www.meilhaus.com

GOSSEN METRAWATT
GMC-INSTRUMENTS GROUP

PROFITEST H+E CABLE

TESTER FOR STANDARDS-COMPLIANT TESTING OF MODE 2 (IC-CPD) AND MODE 3 CHARGING CABLES

- Tester for standards-compliant testing of mode 2 (IC-CPD) and mode 3 charging cables
- Automatic test sequence
- Interview mode for visual inspection
- Intuitive operation
- Pass/fail display
- Report printing via USB thermal printer
- Entry information text (e.g. chassis number, license plate number or inventory number) via USB keyboard
- Measuring category CAT II / 300 V
- Rugged, impact-resistant case, protection class: IP 40
- Integrated memory for 1000 measurements
- Tests:
  - Low-resistance protective conductor continuity R_{LO}
  - Insulation resistance R_{ISO}
  - RCD AC tripping current and time to trip
  - DC sensor test, 6 mA tripping time/current
  - L/N/PE simulation
  - Function test, states B, C and E
- Editable limit values for single test

APPLICATIONS

The PROFiTEST H+E CABLE tester is used for standards-compliant testing of charging cables for electric vehicles. It's laid out for mobile testing of mode 2 (IC-CPD) and mode 3 charging cables.

The test sequence is run automatically or single tests can be performed by a qualified electrician. Test results appear as a pass/fail display. Test reports can be printed from the integrated thermal printer and/or saved.

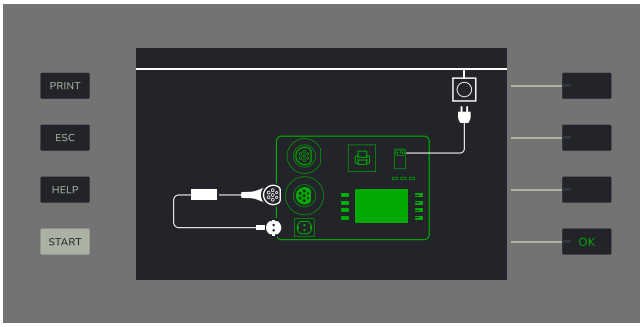
Predefined questions pertaining to the relevant inspection criteria must be answered with yes or no. Evaluation is automatic.

The PROFiTEST H+E CABLE tester is operated using the function keys to the left and right of the display. The settings and values appear at the display.

Entries are made via the connected USB keyboard (included).

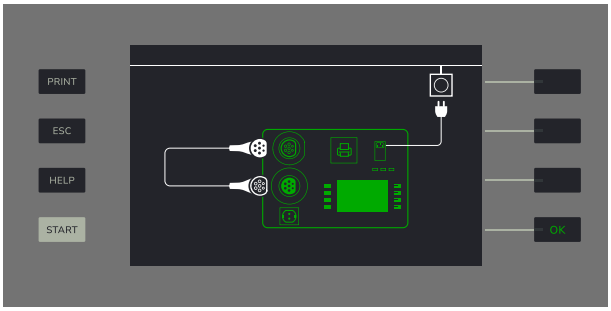
INCLUDED FEATURES

- Automatic Test Sequence, Mode 2



  - R_{PE} PE, 3 mA
  - R_{ISO} VEHICLE N-PE, 500 V
  - R_{ISO} VEHICLE L1-PE, 500 V
  - R_{ISO} N-PE, 500 V
  - R_{ISO} L1-PE, 500 V
  - R_{CD} AC time to trip, 30 mA 0°
  - R_{CD} AC tripping current, 30 mA 0°
  - EVSE CP, state A
  - EVSE CP, state B
  - EVSE CP, state C
  - EVSE CP, state E
  - 14/14: I_{DIFF}

- Automatic Test Sequence, Mode 3



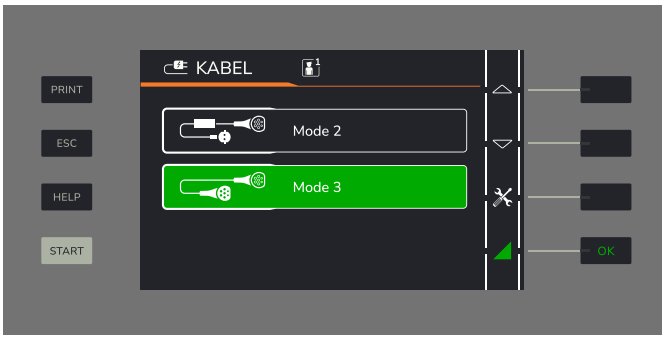
  - R_{PE} L1
  - R_{PE} L2
  - R_{PE} L3
  - R_{PE} N
  - R_{PE} PE
  - R_{PE} CP
  - R_{ISO} L1-L2
  - R_{ISO} L1-L3
  - R_{ISO} L1-PE
  - R_{ISO} L2-L3
  - R_{ISO} L2-N
  - R_{ISO} L2-PE
  - R_{ISO} L2-N
  - R_{ISO} L3-PE
  - R_{ISO} N-PE
  - PP EV
  - PP CH

PRODUCT FEATURES

- 7-inch display
- Integrated thermal printer
- USB Keyboard
- 3 USB ports for various applications, for example:
  - Transfer of measurement data to a PC
  - Connection to a barcode scanner
  - Connection to the USB keyboard

DESCRIPTION OF FEATURES

USER INTERFACE



- Clear-cut 7-inch display (resolution: 1280 × 800 pixels, color depth: 24-bit, backlit)
- Control via function keys or connected USB keyboard

PRINTER

Integrated thermal printer for printing test reports immediately after testing has been completed

TECHNICAL DATA

Power Supply	Nominal line voltage:	220 V_{AC} / 230 V_{AC} 50 … 60 Hz
	Mains connection:	inlet plug Mains connection fuses F_{LN} for L and N
Connections, Test Sockets	Mode 3: Single or 3-phase charging cable, type 2 charging plug	Charging station end / house end: 32 A 480 V~ 2 A, 30 V
		Vehicle end: 250 V_{AC}/ 480 V_{AC} 16 A … 32 A
	Mode 2: Single-phase charging cable	16 A 250 V_{AC}
Ambient Conditions	Operating temperature:	0 … +40 °C
	Storage temperature:	-30 … +60 °C
	Relative atmospheric humidity:	Max. 80%, no condensation allowed
	Elevation:	Max. 2000 m
Electrical Safety	Measuring category:	300 V CAT II
	Pollution degree:	2
	Fuse links:	Mains connection: 5 × 20 mm, 1 A/250 V/T F_L: 6.3 × 32 mm, 400 mA/600 V F_{CP}: 6.3 × 32 mm,100 mA/700 V
Electromagnetic Compatibility (EMC)	Interference emission:	EN 61326-1, class A
	Interference immunity:	DIN EN 61326-1 / IEC 61326-1 DIN EN 61326-2-1 / IEC 61326-2-1
Mechanical Design	Protection:	Tester: IP 40 per DIN EN 60529 / IEC 60529 (protection against ingress of solid foreign objects: ≥ 1.0 mm dia. protection against water ingress: not protected) Housing: IP 67 per DIN EN 60529 / IEC 60529 (protection against ingress of solid foreign objects: dust-proof; protection against water ingress: protected when immersed)
	Housing (W × H × D):	Approx. 469 × 177 × 372 cm
	Weight:	Approx. 8.8 kg
	Display:	7-inch TFT LCD Resolution: 1280 × 800 pixels Color depth: 24-bit Background illumination
Data Interfaces	USB:	Socket: USB-A
Internal Memory		1000 measurements
Printer	Thermal printer, integrated	Direct thermal printing Paper width: 56.5 mm (±0.5 mm) Print width: 48.0 mm Paper length: approx. 11 m

RELEVANT STANDARDS

The tester has been manufactured and tested in accordance with the following safety regulations:

DIN EN 61326-1 IEC 61326-1	Electrical equipment for measurement, control and laboratory use – EMC requirements – Part 1: General requirements
EN 55011 + A1 + A11 + A2	Industrial, scientific and medical equipment – Radio-frequency disturbance characteristics – Limits and methods of measurement
DIN EN 61010-1 +A1 + A1/AC	Safety requirements for electrical equipment for measurement, control and laboratory use – Part 1: General requirements
EN IEC 61010-031	Safety requirements for electrical equipment for measurement, control and laboratory use – Part 031: Safety requirements for hand-held probe assemblies for electrical measurement and test
EN 61557-1	Electrical safety in low voltage distribution systems up to 1000 V AC and 1500 V DC – Equipment for testing, measuring or monitoring of protective measures – Part 1: General requirements
EN 61557-2	Electrical safety in low voltage distribution systems up to 1000 V AC and 1500 V DC – Equipment for testing, measuring or monitoring of protective measures – Part 2: Insulation resistance
EN 61557-4	Electrical safety in low voltage distribution systems up to 1000 V AC and 1500 V DC – Equipment for testing, measuring or monitoring of protective measures – Part 4: Resistance of earth conductors, protective conductors and equipotential bonding conductors
IEC 62321	Electrotechnical products – Determination of levels of six regulated substances (lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls, polybrominated diphenyl ethers)
IEC 62321-3-1	Determination of certain substances in electrotechnical products – Part 3-1: Screening – Lead, mercury, cadmium, total chromium and total bromine by X-ray fluorescence spectrometry
IEC 62321-4 + A1	Determination of certain substances in electrotechnical products – Part 4: Mercury in polymers, metals and electronics by CV-AAS, CV-AFS, ICP-OES and ICP-MS
IEC 62321-5	Determination of certain substances in electrotechnical products – Part 5: Cadmium, lead and chromium in polymers and electronics and cadmium and lead in metals by AAS, AFS, ICP-OES and ICP-MS
DIN EN IEC 61851-1 Revision 2:2024-04, VDE 0122-1 Revision 2:2024-04	Electric vehicle conductive charging systems – Part 1: General requirements
IEC 62955:2018	Residual direct current detecting device (RDC-DD) to be used for mode 3 charging of electric vehicles

CHARACTERISTIC VALUES

CONTINUITY TEST, PROTECTIVE CONDUCTOR RESISTANCE R_{PE}, MODE 2 AND MODE 3 CHARGING CABLES

Measurement	Measuring Range	Resolution	Measuring Accuracy (at 23 °C ± 5 °C, ≤ 80% RH)
Measurement with 200 mA ■ Mode 3 cable ■ Mode 2 cable, PE not connected	0.05 Ω … 10.00 Ω	0.01 Ω	± (5% + 2 places)
Specified measuring range	0.05 Ω … 10.00 Ω		
Test current	≥ 200 mA (≤ 2 Ω), automatic polarity reversal (first + then -)		
Open-circuit voltage	< 6 V		
Default pass/fail limit	≤ 0.3 Ω (up to a length of 5 m) Max. limit (to be set at the tester): 1 Ω (in steps of 0.1 Ω)		

Measurement	Measuring Range	Resolution	Measuring Accuracy (at 23 °C ± 5 °C, ≤ 80% RH)
Measurement with 3 mA ■ Mode 2 cable, PE connected	0.1 Ω … 10.00 Ω	0.1 Ω	± (5% + 3 places)
Specified measuring range	0.1 Ω … 10.00 Ω		
Test current	≤ 3 mA (≤ 2 Ω), automatic polarity reversal (first + then -)		
Open-circuit voltage	< 6 V		
Default pass/fail limit	≤ 0.5 Ω … (PE cable continuity: whether connected or not)		

INSULATION RESISTANCE R_{ISO} (SINGLE MEASUREMENT), MODE 2 AND MODE 3 CABLES

Measurement	Measuring Range	Resolution	Measuring Accuracy (at 23 °C ± 5 °C, ≤ 80% RH)
	0.10 MΩ … 19.99 MΩ	0.1 MΩ	± (5% + 2 places) 70% of measuring accuracy
Specified measuring range	0.10 MΩ … 19.99 MΩ		
Test voltage	250 V_{DC} 500 V_{DC}		
Test current	> 1 mA < 2 mA @ 2 kΩ		
Default pass/fail limit	1 MΩ … (protection class 1) The limit values are based on the standard, the tester model etc., and can be set at the instrument.		

RCD TIME TO TRIP AND TRIPPING CURRENT, 230 V SINGLE-PHASE, MODE 2 CHARGING CABLE

Measurement	Measuring Range	Resolution	Measuring Accuracy (at 23 °C ± 5 °C, ≤ 80% RH)
RCD time to trip, 10 mA, 20 mA, 30 mA AC test	10 ms … 500 ms	1 ms	± (5% + 2 places)
Test current	10.5 mA, 21 mA, 31.5 mA AC (5% above nominal tripping current)		
Test current accuracy	± 1.0 mA		
Max. test time	200, 300, 400 ms		
Polarity selection	0° and 180° of an input sine wave		
Default pass/fail limit	Measured tripping time >300 ms = fail Max. limit (to be set at the tester): 200 ms, 300 ms, 400 ms		

Measurement	Measuring Range	Resolution	Measuring Accuracy (at 23 °C ± 5 °C, ≤ 80% RH)
RDC-DD 6 mA DC test (per IEC 62955)	10 ms … 500 ms	1 ms	± (5% + 2 places)
Test current	6 mA DC (0 … 10% above nominal tripping current)		
Test current accuracy	± 0.6 mA		
Polarity	Positive and negative		
Max. test time	10 s		
Polarity selection	0° and 180° of an input sine wave		
Default pass/fail limit	Measured tripping time > 10 s = fail		

Measurement	Measuring Range	Resolution	Measuring Accuracy (at 23 °C ± 5 °C, ≤ 80% RH)
RCD AC ramp test	2 mA … 10 / 20 / 30 mA	2 mA	± (5% + 2 places)
Test current	AC current ramp up to 10 / 20 / 30 mA in steps of 2 mA		
Test current accuracy	± 0.5 mA		
Step time	200, 300, 400 ms		
Max. test time	6 s		
Default pass/fail limit	Measured tripping current < 6 / 10 / 16 mA AC = fail		

Measurement	Measuring Range	Resolution	Measuring Accuracy (at 23 °C ± 5 °C, ≤ 80% RH)
RCD DC ramp test	2 mA … 10 / 20 / 30 mA	2 mA	± (5% + 2 places)
Test current	DC current ramp from 1.2 mA … 6 mA in steps of 0.3 mA		
Step time	1.8 s		
Max. test time	approx. 30 s		
Default pass/fail limit	Measured tripping current < 3 mA = fail		

EV CHARGING FUNCTION TEST, MODE 2 CABLES

Measurement	Setting and Reading States
CP state (control pilot)	State A: unused State B: charge in preparation State C: active charging State E: Error (simulated short-circuit CP-PE) State F: charger error status (read-only status)
Max. voltage	±12 V
Frequency range	940 Hz … 1040 Hz
Duty cycle range	8% … 97%
Maximum charging current display	Per IEC 61851-1:2017/COR1:2023 / DIN EN IEC 61851-1:2017/ COR1:2023 / DIN EN IEC 61851-1:2019 revision 2:2024-04, VDE 0122-1 revision 2:2024-04, tables A.7 and A.8
Default pass/fail limit	Measured voltage and/or frequency out of range = fail

RESISTANCE IN PP CABLE, MODE 3 CHARGING CABLES

Measurement	Measuring Range	Resolution	Measuring Accuracy (at 23 °C ± 5 °C, ≤ 80% RH)
Value of the resistances in the cables/plugs downstream from PP	10 Ω … 4.5 kΩ	10 Ω	± (10% + 2 places)
Default pass/fail limit	Measured resistance deviates from standard = fail (per IEC 61851-1:2017/COR1:2023 / DIN EN IEC 61851-1:2019 revision 2:2024-04, VDE 0122-1 revision 2:2024-04, table B.2 – Current-coding resistor for EV plug and vehicle connector)		

VOLTAGE MEASUREMENT, MODE 2 AND MODE 3 CHARGING CABLES

Measurement	Measuring Range	Resolution	Measuring Accuracy (at 23 °C ± 5 °C, ≤ 80% RH)
Voltage measurement at external, grounded outlet	5 V_{AC} … 270 V_{AC}	1 V	± (10% + 2 places)
Default pass/fail limit	Measured voltage out of range ±10% (207 … 253 V_{AC} = fail		

DIFFERENTIAL LEAKAGE CURRENT I_{PE} – PROTECTIVE CONDUCTOR CURRENT (DIFFERENTIAL CURRENT MEASURING METHOD), MODE 2 CABLES

Measurement	Measuring Range	Resolution	Measuring Accuracy (at 23 °C ± 5 °C, ≤ 80% RH)
Leakage current measurement (differential)	0.30 mA … 19.99 mA	0.01 mA	± (5% + 5 places)
Test voltage	230 V_{AC} ±10%		
Default pass/fail limit	< 3.5 mA (protection class 1)		

SCOPE OF DELIVERY

Standard Scope of Delivery:

1 PROFiTEST H+E CABLE tester, order no. M525K
1 Keyboard
1 Roll of thermal paper
1 3-phase measuring adapter, CEE 16 A to Schuko
1 3-phase measuring adapter, CEE 32 A to Schuko
1 3-phase measuring adapter, Camping to Schuko
1 Calibration certificate
1 Operating instructions

Available accessories ⇨ “Accessories” 🗎8.

ORDER INFORMATION

INSTRUMENT

Type	Description	Article Number
PROFiTEST H+E CABLE	Tester for mode 2 and mode 3 charging cables	M525K

ACCESSORIES

Printer paper PROFiTEST H+E CABLE	Z525V
Barcode scanner	Z751A