CHAUVIN ARNOUX

CA 6117 – CA 6116N – CA 6113

Multi-function installation testers

Safety for your electrical installations,
high performance of a unique instrument.

IEC 61010
600 V
CAT III

Eco Conception

- Testing according to the international standards: IEC 60364-6, NF C 15-100, VDE 100, FD C 16-600, etc.
- Simple, reliable connection thanks to the contextual help for each function, including all the connection diagrams
- Suitable for all neutral systems (TT, TN, IT)
- **Types-AC, A, F, B, B+, EV RCD** testing available
- Integrated **fuse table** for quick reading of the results on the instrument
- **Li-Ion battery** for a **longer battery life**
- Measurements: voltage, current via clamp, **power, waveforms and harmonics**.
- Measurement of **voltage drop** for correct sizing of conductor diameters
- Loop measurement with 1 mΩ resolution
- 3-level storage

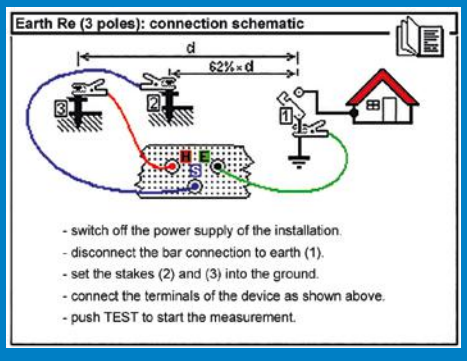
Measure up

Ergonomics

Rugged, compact and lightweight, the CA 6113, CA 6116N and CA 6117 testers are specially designed for quick familiarization and effective operation.
The large graphic colour screen with backlighting is particularly easy to read. A rotary switch on the instrument's front panel gives direct access to all the functions. A large number of visual symbols and audio signals help with quick interpretation of the results in accordance with the standards.
Connections are simplified by clearly-identified input terminals.
A neck strap is provided to allow hands-free testing.

EFFECTIVE CONTEXTUAL HELP AND GUARANTEED SAFETY

The testers are equipped with a **clear, detailed contextual help function.** This makes them ideal for both experts and less experienced users. Dedicated help is available for each measurement, including a guide for the connections required and **assistance for interpretation of the results**. For greater safety, the instrument displays an error message to warn users if the tester is incorrectly connected or if a hazardous voltage is present.



THE SWITCH

17 in 1

- Harmonics
- Power
- Phase sequence
- Current and leakage current
- RCD test
- Test on RCDs: types AC, A, F, B, B+ and EV
- Loop impedance and PFC
- Line impedance and PSCC
- Voltage drop
- Live earth
- Live selective earth
- 3P earth
- Continuity
- Insulation
- Voltage
- Frequency

On all functions

- Cable compensation

$R_{\Delta \rightarrow 0}$

In domestic, tertiary or industrial environments, these new multi-function installation testers can be used to check an electrical installation's compliance with the applicable standards.
This verification is mandatory to ensure that the installation is not hazardous, whatever the type of building tested (domestic, public building, industry, etc.).

They are ideal for electricians and certification organizations for:

- **initial electrical testing of new installations**
- **electrical testing after renovation work**
- **periodic testing of existing installations**
- **servicing and troubleshooting on installations**

All the measurements specified by the European standards concerning electrical installations can be performed easily and without any risk of errors. In addition, **the CA 6113, CA 6116N & CA 6117 testers comply with the EN/IEC 61557** international regulation which requires high performance from installation-testing instruments.

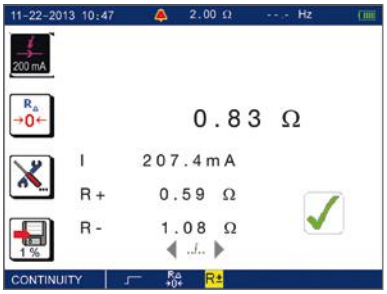


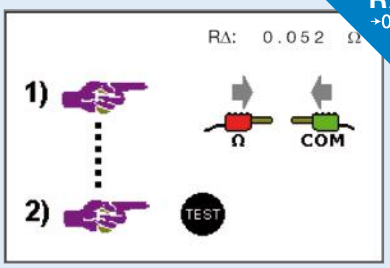
Features	CA 6113	CA 6116N	CA 6117
Voltage / frequency measurement	✓	✓	✓
Resistance / continuity	✓	✓	✓
Insulation	✓	✓	✓
3P Earth	✓	✓	✓
Z-loop (L-PE)	✓	✓	✓
Z-line (L-N)	✓	✓	✓
Fuse table	-	-	✓
RCD delta-T	✓	✓	✓
RCD delta-I	✓	✓	✓
Management of standard RCDs or selective (AC, A or F)	✓	✓	✓
Management of RCD type B, B+ or EV	-	-	✓
Current: clamp measurement	opt	opt	opt
Voltage drop measurement	-	-	✓
Phase sequence	✓	✓	✓
Power	-	✓	✓
Harmonics	-	✓	✓
3-level storage	-	✓	✓
I/F ICT/ DataView	-	✓	✓
B&W LCD display	✓	-	-
Colour LCD display	-	✓	✓
Battery operation	Ni-Mh	Li-Ion	Li-Ion
Optimized connector	-	✓	✓
Alarm management	✓	✓	✓
Online Help	✓	✓	✓
IEC 61010 600 V CAT III	✓	✓	✓
IEC 61557	✓	✓	✓

Multiple applications

CONTINUITY

The purpose of this measurement is to check the resistance of the chassis-earth conductor (PE) which drains faults to earth.
This resistance must be lower than a threshold specified by the applicable standard for the installation tested, which is usually 2 Ω as indicated at the top of the screen. As required by the standards, the testers perform the measurement with a minimum current of 200 mA and a no-load voltage of 4 to 24 V.



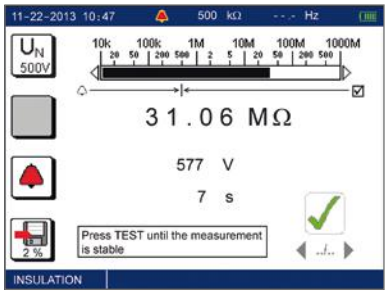


CABLE COMPENSATION

The tester measures the resistance of the accessories connected to it (cables, test probes, crocodile clips, etc.), and then subtracts that value from the measurements before displaying them.
This compensation of the resistance of the measurement leads can be used in the continuity, 3P earth and loop modes.
This increases accuracy when measuring low values.

INSULATION

This measurement can be used to check that the insulation resistance is greater than a minimum value specified in the installation standards (insulation measured between active conductors and between an active conductor and the earth). The testers offer 5 different test voltages (50/100/250/500/1,000 V) so that they can adapt to all types of installations (ELV, low-current domestic or industrial installation). The test current complies with the IEC 61557 standard. By default, insulation measurement is performed at 500 V with an alarm at 0.5 MΩ. Thanks to the dual display (digital and bargraph with logarithmic scale), users can view a quick estimate of the result during the test. Automatic detection of any voltage present and automatic discharging after the test ensure that users remain safe.



3P EARTH MEASUREMENT

Correct earthing guarantees user safety and also protects property and installations in the event of lightning or fault currents. It must always be linked to
a cut-off device.
There are many different methods for earth measurements and choice of the right one depends on the type of neutral system, the type of installation (domestic, industrial, urban, rural, etc.) and the possibility of cutting off the power supply.

3-pole earth measurement using 2 auxiliary stakes (also known as the 62 % method) is the earth measurement of reference which yields a precise resistance value for the earth electrode.
As it is performed with the power off, this is the only earth measurement possible on an installation which has not yet been hooked up to the electrical power distribution network or which is no longer connected to it. Once the cables have been connected, implementation is particularly simple.
All you have to do is set the rotary switch to RE 3P, press test and read off the result. Users can choose the test mode: quick or expert. In expert mode, the resistance values of the auxiliary stakes RS and RH are also measured.

EARTH MEASUREMENT ON LIVE CIRCUIT: Ra (1P)

Equivalent to 3P earth measurement, **the function for earth measurement on a live circuit saves considerable time:** it is not necessary to disconnect the earth bar and only requires a single auxiliary stake (S). Furthermore, **this method also ensures that people and property remain safe because the earth is not disconnected**. The 1P stake must be located outside the area of influence of the earth to be measured.

Two modes are available:

- Measurement without tripping with low current (6, 9 or 12 mA) for installations protected by 30 mA RCDs,
- Measurement with high current (TRIP) providing better measurement accuracy. It is then possible to calculate the fault voltage in the event of a Ufk phase-earth short-circuit as defined in the SEV 3755 standard.

RA low current and ZA high current

SELECTIVE EARTH MEASUREMENT ON LIVE CIRCUIT: Ra sel via clamp

In the event of an earthing system comprising several earths in parallel (TN-type installation), it is possible to use a current clamp (available as an option) with the live earth measurement function. This function for selective earth measurement on a live circuit allows you to select one of several earths set up in parallel and thus find out the precise value without disconnecting the rest of the earth network.

To ensure high measurement accuracy, this Ra sel measurement is only available in high-current mode (TRIP mode). This means that it is impossible to modify the test current for this measurement.

Zs LOOP IMPEDANCE

The Zs measurement represents the impedance of the Phase-Earth loop (L-PE). This measurement allows you to:

- estimate the earth value easily and quickly without setting up any stakes for a TT-type installation
- calculate the short-circuit current and size the circuit-breaker for the installation (TN-type installation).

This measurement is not possible on an IT-type installation, however, because of the high earthing impedance of the power supply transformer or even its total isolation in relation to the earth. By default, the Zs loop measurement is a measurement without tripping of the 30 mA RCDs (test current = 12 mA) with an alarm threshold of 100 Ω. In addition, the Zs switch position also offers the live earth measurement functions (Ra and Ra Sel) thanks to automatic detection of the auxiliary stake S and the current clamp. For greater safety, in the event of incorrect connection or the presence of a hazardous voltage, the instrument displays an error message to warn the user.

Zi LINE IMPEDANCE & VOLTAGE DROP

The Zi measurement represents the impedance of the Phase-Neutral loop (L-N) or the loop between phases (L-L) and can be used to calculate the short-circuit current in order to check the protective systems set up on the installation (fuse or circuit-breaker). This measurement is performed in high-current mode (TRIP mode) to ensure measurement accuracy. The connection can be made either via the three-point/mains lead or by using separate leads for the measurements on electrical cabinets. It is possible to measure the voltage drop in the cable or conductor. This serves to determine whether the cross-section of the conductor is sufficient for the installation. The result of this ΔV measurement is displayed in %; if the value is greater than 5 % or a programmed value, the sizes of the cables for the installation must be recalculated.

RCD TEST (TYPES AC, A, F, B, B+, EV)

3 types of test are available:

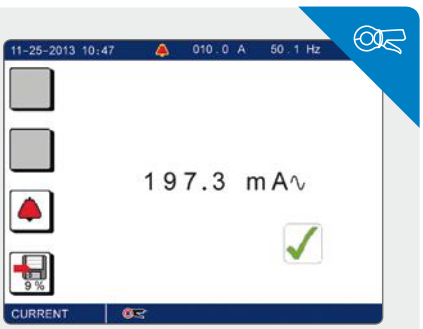
- **test in pulse mode:** measurement of tripping time
- test in ramp mode: measurement of tripping time and precise value of the tripping current
- non-trip test: to check that the circuit-breaker is not tripped when the leakage current is below the trip threshold, i.e. IΔn/2.

The RCD test also allows you to calculate the fault voltage Uf, such that:
Uf = Zs x IΔn.
To perform this test in Ramp mode, the switch must be set to IΔN. In pulse mode, the switch must be set to Δt.
Various parameters can be set for this measurement:

- calibre of the RCD tested
- RCD type: STD (standard), S or G (models only tested with a current of 2 IΔN), AC, A or B.
- type of test signal: **AC** , **pulsed** or **DC**
- activation/deactivation of the Volt beeper in Ramp mode
- activation/deactivation of the alarms in pulse mode

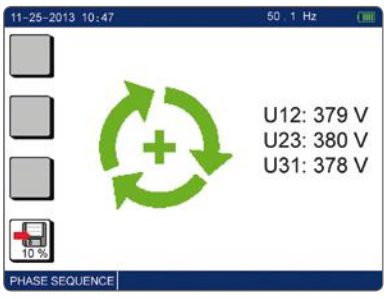
LINE CURRENT AND LEAKAGE CURRENT MEASUREMENT

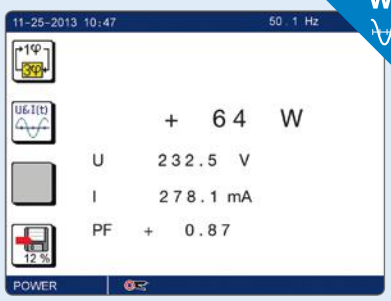
These testers can be used to measure extremely low currents such as fault currents or leakage currents, as well as high currents (several hundred amps). This measurement is performed by using a specific current clamp available as an option.



PHASE ROTATION

On a three-phase network, this measurement can be used to check the phase sequence on the network. The tester checks the frequency of the 3 signals and then compares them to detect their sequence (negative or positive).



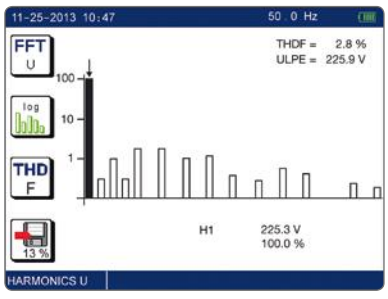


POWER

The power measurements offered by the instrument are particularly useful for initial analysis of the energy quality on the installation concerned. Power measurement can be selected by setting the switch to W. It is then possible to view the corresponding voltage and current curves.

HARMONICS

The tester can measure harmonics up to the 50th order and displays the graph.
The THD-F, THD-R and voltage values are displayed simultaneously, along with the name of the line selected and its amplitude.
In this mode, users can choose between FFT analysis of the voltage or the current and display with a linear or logarithmic scale.

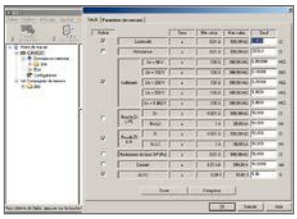


Software

ICT

This specific software for the installation testers can be used for quick, simplified analysis of the measurements recorded by the CA 6116N and CA 6117 testers. It is part of the standard delivery and offers the following functions:

- Data recovery
- Instrument parameter settings
- Customization of measurement sessions with transfer into the instrument
- Printing of first-level reports



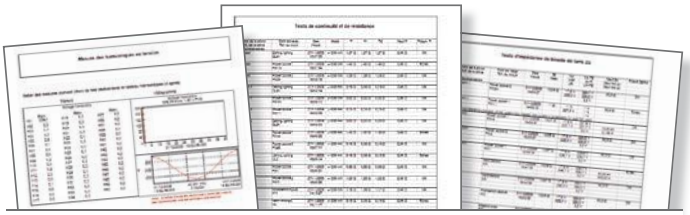
The menu presents the tree structure of the data present in the product and measurement campaigns, clearly identified (customer, location, type of measurements, etc.).

DataView®

The measurements made can also be processed by the **DataView®** multi-product expert software.

DataView® automatically recognizes the instrument when it is connected to the PC and opens the corresponding menu. This menu, displayed as a tree structure, **gives users direct access to the data recorded in the instrument**, its configuration, etc.

DataView® contains multiple predefined report templates for quick printing in compliance with the applicable standards. Users can also create their own templates to meet their specific requirements.



Accessories

State at delivery of the CA 6116N and CA 6117

Li-Ion battery charger

Remote control probe

Earth kit

State at delivery and references

CA 6116N EURO	**P01145455X***
CA 6117 EURO	**P01145460X***

* GB version X = A, IT version X = B, CH version X = C, US version X = D

- 1 tester delivered with a carrying bag
- 1 type-2 mains power pack / charger
- 1 Li-Ion battery pack
- 1 USB A/B cable, 1.80 m, with ferrite
- 1 three-point cable - 3 safety leads (red, blue and green)
- 3 test probes, Ø 4 mm (red, blue and green)
- 3 crocodile clips (red, blue and green)
- 2 elbowed-straight safety leads 3 m (red and black)
- 1 three-point Euro mains cable
- 1 x 2P EURO mains cable
- 1 remote-control probe
- 1 wrist strap
- 1 scratch-proof film mounted on the instrument
- 1 x 4-point hands-free strap
- ICT data export software on CD-ROM
- 6 operating manuals on CD (one per language)
- 1 safety datasheet in 20 languages

CA 6113 EURO	**P01145445X***

* GB version X = A, IT version X = B, CH version X = C, US version X = D

- 1 tester delivered in a carrying bag with PA 30 W power pack
- 1 three-point cable - 3 safety leads (red, blue and green)
- 3 test probes, Ø 4 mm (red, blue and green)
- 3 crocodile clips (red, blue and green)
- 2 elbowed-straight safety leads (red and black) 3 m long
- 1 three-point Euro mains cable
- 1 remote-control probe
- 1 scratch-proof film mounted on the instrument
- 1 wrist strap
- 1 x 4-point hands-free strap
- 6 operating manuals on CD
- 1 safety datasheet in 20 languages

CA 6113	CA 6116N CA 6117	Accessories / Replacement Parts	References
-	R	Li-Ion battery pack	P01296047
R	-	35 Wh NiMH battery pack	P01296024
R	R	4-point hands-free strap - Model 2	P01298081
R	-	PA 30 W mains power pack	P01102057
R	R	Replacement black test probe for remote-control probe	P01101943
-	R	Mains power pack / charger (type 2) without mains lead (requires P01295174)	P01102129
A	A	15 m earth kit (red / blue / green)	P01102017
A	A	Black 30 m 1P earth kit	P01102018
A	A	3P earth kit (50 m)	P01102021
A	A	3P earth kit (100 m)	P01102022
A	A	Continuity rod	P01102084A
A	A	C177A clamp (200 A)	P01120336
A	A	MN77 clamp (20 A)	P01120460
A	-	DC/DC in-vehicle charger	HX0061
A	R	USB-A USB-B cable	P01295293
-	A	Li-Ion battery charger	P01102130
R	R	CA 61 screen protection film	P01102094
R	R	Carrying bag no. 22	P01298056
R	R	CA 6116N remote-control probe	P01102092
R	R	2.5 m three-point lead with separated wires	P01295398
R	R	3 test probes Ø 4 mm (red, blue and green)	P01101921
R	R	3 crocodile clips (red, blue and green)	P01101922
R	R	Three-point cable for EURO mains socket testing	P01295393
R	R	2 elbowed-straight safety leads (red and black) 3 m long	P01295094
R	R	Wrist strap	P01298057
-	A	Software DataView®	P01102095
A	-	Clamp C177 (20 A)	P01120335
R	R	Mains lead 2P EURO	P01295174

R = Replacement Parts / **A** = Accessories

Technical specifications

	CA 6113	CA 6116N	CA 6117
CONTINUITY / RESISTANCE			
I rated / Range / Resolution	I > 200 mA / 39.99 Ω/ 0.01Ω / ± (1.5 % of measurement + 2 cts) 12 mA / 39.99 Ω & 399.9 Ω / 0.01 & 0.1 Ω /± (1.5 % of measurement + 5 cts) with beep		
Range / Resolution / Accuracy	4 kΩ/ 1 Ω / ±(1.5 % of measurement + 5 cts) 40 kΩ - 400 kΩ/ 10 Ω - 100 Ω / ±(1.5 % of measurement + 2 cts)		
INSULATION			
Rated voltage	Utest: 50 /100 / 250 / 500 / 1,000 Vdc		
Range / Resolution / Accuracy	0.01 MΩ to 2 GΩ / 10 kΩ to 1 MΩ / ±(5 % of measurement + 3 cts)		
Short-circuit current	≤ 3 mA		
EARTH			
3P EARTH **Range / Resolution / Accuracy**	0.50 Ω to 40 Ω/ 0.01 Ω / ±(2 % of measurement + 10 cts) 40 Ω to 15 kΩ / 0.1 Ω to 1 Ω / ±(2 % of measurement + 2 cts) 15 kΩ to 40 kΩ / 10 Ω/ ±(10 % of measurement + 2 cts)		
Others	Measurement of resistance of auxiliary stakes RH & RS (up to 40 kΩ)		
Ufk	Complies with SEV 3569		
1P SELECTIVE EARTH **Range / Resolution / Accuracy**	0.20 Ω to 39.99 Ω - 40 Ω to 399.9 Ω / 0.01 Ω – 0.1 Ω / ±(10 % of measurement + 10 cts) (ISel via clamp)		
LOOP IMPEDANCE (Zs (L-PE) and Zi (L-N or L-L)) – 1P LIVE EARTH			
LIVE EARTH **Installation voltage / Freq.**	90 to 500 V / 15.8 to 17.5 Hz - 45 to 65 Hz		
High-current mode with TRIP **Zs (L-PE) & Zi (L-N or L-L)** **Range / Resolution / Accuracy**	Max. test current: 7.5 A (0.050) 0.100 Ω to 0.5 Ω / 0.001 Ω/ ±(10 % of measurement + 20 cts) · 0.5 Ω to 3.999 Ω / 0.001 Ω/ ±(5 % of measurement + 20 cts) 3.999 to 39.99 Ω/ 0.01Ω / ±(5 % of measurement + 2 cts) · 39.99 Ω to 399.99 Ω / 0.1 Ω/ ±(5 % of measurement + 2 cts)		
NO TRIP mode (Zs (L-PE) only)	Test current: 6 mA – 9 mA – 12 mA (as required) 0.20 Ω to 0.99 Ω / 0.01 Ω / ±(15 % of measurement + 10 cts) 1.00 to 1.99 Ω / 0.01 Ω / ±(15 % of measurement + 3 cts) 2.00 to 39.99 Ω / 0.01 Ω / ±(10 % of measurement + 3 cts) 40.00 Ω to 399.9 Ω / 0.1 Ω / ±(5 % of measurement + 2 cts) 400 to 3999 Ω / 1 Ω / ±(5 % of measurement + 2 cts)		
Calculation of Ik short-circuit current (PFC (Zs), I Sc PSCC (Zi)	Fault current and short-circuit current: 0.1 A to 20 kA		
Integrated fuse table	-		Yes
Voltage drop ΔV%(Zi)	-		-40 % to +40 %
Others	Measurement of the resistive and inductive components of the Zs and Zi impedances		
AC, A and F-type RCDs			
Installation voltage / Frequency	90 V to 500 V / 15.8 Hz to 17.5 Hz and 45 Hz to 65 Hz		
IΔn	6*/10/30/100/300/500/650/1,000 mA (90 V – 280 V) or 6*/10/30/100/300/500 mA (280-550 V) or variable Ramp and pulse test		
No-trip test	at ½ IΔn – Duration: 1,000 ms or 2,000 ms		
Ramp mode	0.2 to 0.5 x IΔn (Uf) / 0.3 x IΔn to 1.06 x IΔn in increments of 3.3 % x IΔn		
Trip time measurement: **Range / Resolution / Accuracy**	0.2 to 0.5 x IΔn (Uf) / 0.5 x IΔn / 2 x IΔn (selective) / 5 x IΔn Pulse: 0 to 500 ms / 0.1 and 1 ms / 2 ms, Ramp mode: 0 to 200 ms / 0.1 ms / 2 ms		
B, B+ and EV-type RCDs			
Installation voltage / Frequency	-		90 V to 280 V / 15.8 Hz to 17.5 Hz and 45 Hz to 65 Hz
Test in ramp mode: IΔn	-		6/10/30/100/300/500 mA or variable 6-499 mA
Test in ramp mode	-		0.2 x IΔN to 2.2 x IΔn
Test in pulse mode at 2 x IΔn: IΔn			6/10/30/100/ 300 mA or variable ≤ 250 mA 2.2 x 2 x IΔN
Test in pulse mode at 4 x IΔn: IΔn	-		6/10/30/100 mA or variable ≤ 125 mA 2.4 x 4 x IΔN
OTHER MEASUREMENTS			
Current by clamps C177/C177A	(0.5 mA**) 5 mA to 19.99 A (C177) / 20 mA to 199.9 A (C177A)	5.0 mA to 199.9 A (C177A)	
Current by clamp MN77	(1 mA**) 5.0 mA to 19.99 A		
Voltage	0 to 550 Vac/dc / dc and 15.8 to 500 Hz		
Frequency	10 to 500 Hz		
Phase rotation	20 to 500 Vac		
Active power	-	0 to 110 kW single-phase - 0 to 330 kW three-phase Simultaneous display of voltage and current waveforms	
Harmonics	-	Voltage and current / up to 50th order / THD-F /THD-R	
GENERAL SPECIFICATIONS			
Display	Large 5.7" backlit graphic monochrome LCD screen, 320 x 240 points	Large 5.7" backlit graphic colour LCD screen, 320 x 240 points	
Storage/Communication	-	via USB for data transfer and report creation	
Power supply: rechargeable battery	NiMH 9.6 V rated 4 Ah	Lithium-ion 10.8 V rated 5.8 Ah	
Battery life	up to 24 hours	up to 30 hours	
Dimensions / weight	280 x 190 x 128 mm / 2.2 kg		
Protection	IP 53 / IK04		
EMC	IEC 61326-1		
Electrical safety	IEC 61010 -1 – 600 V CAT III – 300 V CAT IV – IEC 61557		

*except CA 6113. ** If a voltage is connected to the instrument.

906211380 - Ed. 5 - 04/2019 - Non contractual document.

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