

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

**Multi-function  
Installation  
Testers**

**17 1**



• 3-level storage  
600 V CA

- Testing according to the international standards: IEC 60364-6, NF C 15-100, VDE 100, XP 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)
- **Type-B 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 1mΩ resolution

**IEC 61010**



# Ergonomics

Rugged, compact and lightweight, the C.A 6116N and C.A 6117 testers are specially designed for quick familiarization and effective operation.

The large graphic color screen with backlighting is particularly easy to read.

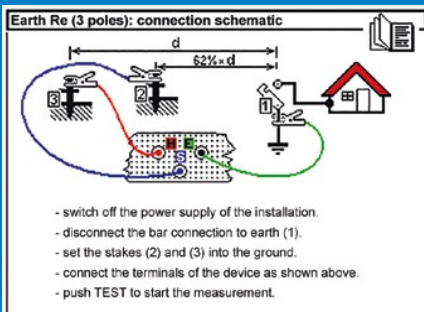
A rotary switch on the instrument's front panel gives direct access to all the functions. A large number of visual symbols and audio signals help with quick interpretation of the results in accordance with the standards. Connections are simplified by clearly-identified input terminals. A neck strap is 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

- 
- Current and leakage current
  - RCD test
  - Test on RCDs: types AC, A and B
  - Loop impedance and PFC
  - Line impedance and PSSC
  - Voltage drop
  - Live earth
  - Live selective earth
  - Harmonics
  - Power
  - Phase sequence
  - Voltage
  - Frequency
  - On all functions
  - Cable compensation  $R_{\Delta}$
  - 3P earth
  - Continuity
  - Insulation



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:

- 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 C.A 6116N & C.A 6117 testers comply with the EN/IEC 61557** international regulation which requires high performance from installation-testing instruments.



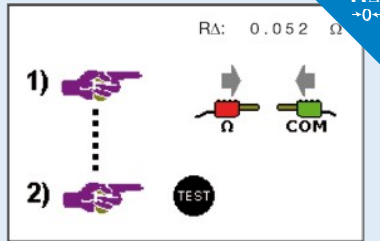
Features	C.A 6116N	C.A 6117
Voltage / frequency measurement	✓	✓
Resistance / continuity	✓	✓
Insulation	✓	✓
3P Earth	✓	✓
Z-loop (L-PE)	✓	✓
Z-line (L-N)	✓	✓
Fuse table	-	✓
RCD delta-T	✓	✓
RCD delta-I	✓	✓
Management of standard RCDs or selective (AC or A)	✓	✓
Management of RCD type B	-	✓
Current: clamp measurement	opt	opt
Voltage drop measurement	-	✓
Phase sequence	✓	✓
Power	✓	✓
Harmonics	✓	✓
3-level storage	✓	✓
I/F ICT/ DataView	✓	✓
B&W LCD display	-	-
Color LCD display	✓	✓
Battery operation	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  $2 \Omega$  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.



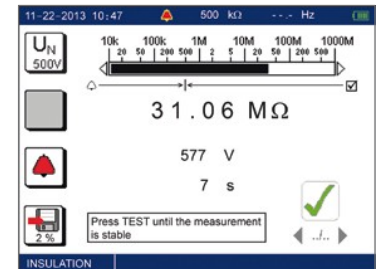
### CABLE COMPENSATION

The tester measures the resistance of the accessories connected to it (cables, test probes, alligator 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 / 1000V) 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  $0.5 M\Omega$ . 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.



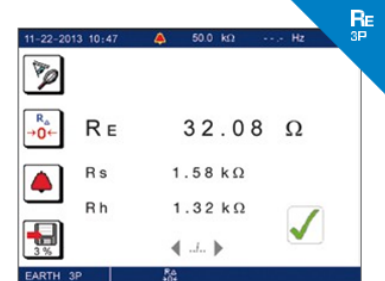
### 3P EARTH MEASUREMENT

Correct grounding 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.



## GROUND 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  $U_{fk}$  phase-earth short-circuit as defined in the SEV 3755 standard.

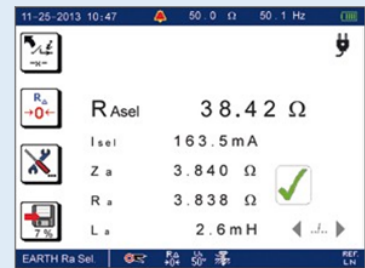
- RA low current and ZA high current



## SELECTIVE GROUND MEASUREMENT ON LIVE CIRCUIT: Ra sel via clamp



In the event of an ground/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 ground/earth measurement on a live circuit allows you to select one of several earths set up in parallel and thus finds 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  $Z_s$  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 grounding impedance of the power supply transformer or even its total isolation in relation to the earth. By default, the  $Z_s$  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  $Z_s$  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  $Z_i$  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  $\Delta V$  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 AND B)

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.  $I_{\Delta n}/2$ .

The RCD test also allows you to calculate the fault voltage  $U_f$ , such that:  $U_f = Z_s \times I_{\Delta n}$

To perform this test in Ramp mode, the switch must be set to  $I_{\Delta n}$ . In pulse mode, the switch must be set to  $\Delta t$ . Various parameters can be set for this measurement:

- caliber of the RCD tested
- RCD type: STD (standard), S or G (models only tested with a current of  $2 I_{\Delta n}$ ), 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

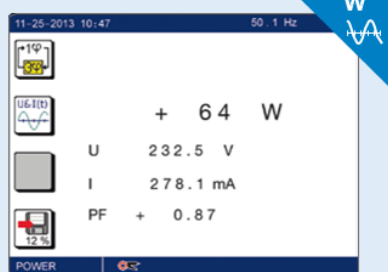
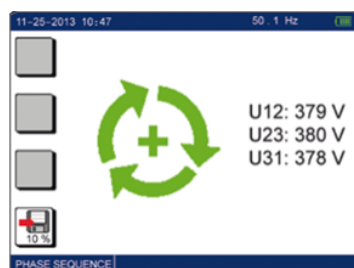
These testers can be used to measure extremely low currents such as fault currents or leakage currents, as well as high currents (several hundred amps). This measurement is performed by using a specific current clamp available as an option.



## 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).



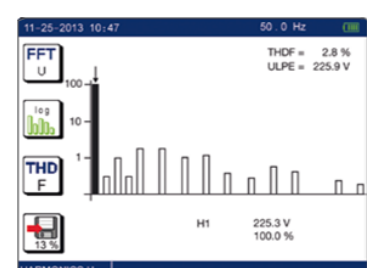
## POWER

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.



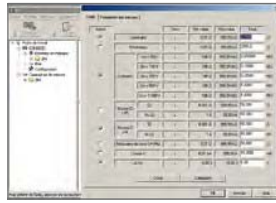
## Software

### DataView®

This specific software for the installation testers can be used for quick, simplified analysis of the measurements recorded by the C.A 6116N and C.A 6117 testers

It offers the following functions:

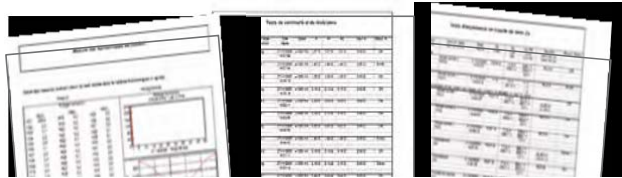
- Data recovery
- Instrument parameter settings
- Customization of measurement sessions with transfer into the instrument
- Printing of first-level reports



▶ 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® 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.



## Ordering Information:

C.A 6116N US	2138.06
C.A 6117 US	2138.07

- 1 tester delivered with a carrying bag
- 1 type-2 AC Power 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 4mm (red, blue and green)
- 3 alligator clips (red, blue and green)
- 2 elbowed-straight safety leads 3 m (red and black)
- 1 three-point US AC Power cable
- 1 x 2P EURO AC Power 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

Replacement parts and accessories	Cat. #
Remote test probe	2118.97
Ground test kit – 150ft (3 pole test)	2135.35
Ground test kit – 300ft (4 pole test)	2135.36
10 ft USB-A USB-B cable	2136.80
AC Current probe C177A clamp (200 A)	2138.52
MN77 Current probe (20 A)	2138.53
Continuity pole	2138.54
Lead – 3 Pin Voltage lead with US plug	2138.55
Lead – 3 Pin Voltage lead with color coded (Rd/Bl/Gr) Stackable Safety Banana Plug	2138.56
Lead – Replacement Set of 2, 10 ft. Color Coded leads (Red/Black 4mm straight, 4mm	2138.57
Strap – Carrying Strap	2138.58
Strap – Wrist Strap	2138.59
Clip – Set of 3, Color-coded Alligator Clips (Rd/Bl/Gr)	2140.70
Probes – Set of 3 Color-coded test probes (Rd/Bl/Gr)	2140.71
Battery – Replacement 5.8A Li-Ion battery pack	2960.47
Adapter – Power adapter 110/230V with US power plug	5000.73

# Technical Specifications

	Model C.A 6116N	Model C.A 6117
<b>CONTINUITY / RESISTANCE</b>		
I rated / Range / Resolution	I > 200 mA / 39.99 Ω / 0.01Ω / ± (1.5% of reading + 2 cts) 12 mA / 39.99 Ω & 399.9 Ω / 0.01 & 0.1 Ω / ± (1.5% of reading + 5 cts) with beep	
Range / Resolution / Accuracy	4 kΩ / 1 Ω / ±(1.5 % of reading + 5 cts) 40 kΩ - 400 kΩ / 10 Ω - 100 Ω / ±(1.5 % of reading + 2 cts)	
<b>INSULATION</b>		
Rated voltage	Utest: 50 /100 / 250 / 500 / 1,000 V DC	
Range / Resolution / Accuracy	0.01 MΩ to 2 GΩ / 10 kΩ to 1 MΩ / ±(5 % of reading + 3 cts)	
Short circuit current	≤ 3 mA	
<b>GROUND</b>		
3P GROUND Range / Resolution / Accuracy	0.50 Ω to 40 Ω / 0.01 Ω / ±(2 % of reading + 10 cts) 40 Ω to 15 kΩ / 0.1 Ω to 1 Ω / ±(2 % of reading + 2 cts ) 15 kΩ to 40 kΩ / 10 Ω / ±(10 % of reading + 2 cts )	
Other	Measurement of resistance of auxiliary stakes RH & RS (up to 40 kΩ)	
Ufk	Complies with SEV 3569	
1P SELECTIVE GROUND Range / Resolution / Accuracy	0.20 Ω to 39.99 Ω - 40 Ω to 399.9 Ω / 0.01 Ω - 0.1 Ω / ±(10 % of reading + 10 cts) (ISel via clamp)	
<b>LOOP IMPEDANCE (Zs (L-PE0 AND Zi (L-N OR L-L) – 1P LIVE GROUND</b>		
Live Ground 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 reading + 20 cts) • 0.5 Ω to 3.999 Ω / 0.001 Ω / ±(5 % of reading + 20 cts) 3.999 to 39.99 Ω / 0.01Ω / ±(5% of reading + 2 cts) • 39.99 Ω to 399.99 Ω / 0.1 Ω / ±(5 % of reading + 2 cts)	
NO TRIP mode (Zs (L – PE) Only)	Test current 6 mA – 9 mA – 12 mA (as required) 0.20 to 0.99 Ω / 0.01 Ω / ±(15% of reading + 10 cts) 1.00 to 1.99 Ω / 0.01 Ω / ± (15 % of reading + 3 cts) 2.00 to 39.99 / 0.01 Ω / ± (10% of reading + 3 cts) 40.00 to 399.9 Ω / 0.1 Ω ± (5 % of reading + 2 cts) 400 to 3999 Ω / 1 Ω ±(5 % of reading + 2 cts)	
Calculation of IK short circuit current (PFC (Zs), I Sc PSCC (Zi)	Fault current and short-circuit current: 0.1 to 20 kA	
Integrated fuse	Yes	
Voltage drop ΔV%(Zi)	-40% to +40%	
Others	measurement of the resistive and inductive components of Zs and Zi impedances	
<b>AC and type RCDs</b>		
Installation voltage / Frequency	90 V to 500 V / 15.8 Hz to 17.5 Hz and 45 Hz to 65 Hz	
IΔn	10/30/100/500/650/1,000 (90 V _ 280 V) or variable ramp and pulse test	
N-trip test	At ½ IΔn – Duration 1000 ms or 2000 ms	
Ramp mode	0.2 to 0.5 x IΔn(Uf) / 0.3 x IΔn to 1.06 IΔn increments of 3.3% x IΔn	
Trip test: reading: 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-Type RCDs</b>		
Installation voltage / Frequency	90 V to 275 V / 15.8 Hz to 17.5 Hz and 45 Hz to 65 Hz	
IΔn: ramp / pulse 2 x IΔn pulse 4 x IΔn	10/30/100/500 mA 10/30/100/500 mA with pulse 4 IΔn Duration: 150 ms with 4 x IΔn or 300 ms with 2 x IΔn	
Test in ramp mode	0.2 x IΔn to 2.2 x IΔn	
Trip test: 2 x IΔn 4 x IΔn	IΔn ≤ 200 mA: 2.2 x 2 x IΔn IΔn ≤ 200 mA: 1.1 x 2 x IΔn IΔn ≤ 100 mA: 2.2 x 4 x IΔn	
<b>OTHER MEASUREMENTS</b>		
Current by current probe C177A	5.0 mA to 199.9 A	
Current by current probe MN77	(1mA*) 5.0 mA to 19.99 A	
Voltage	0 to 550 V <sub>AC/DC</sub> / DC and 158 to 500 Hz	
Frequency	10 to 500 Hz	
Phase rotation	20 to 500 V <sub>AC</sub>	
Active power	0 to 110kW single phase – 0 to 330 kW three-phase Simultaneous display of voltage and current waveforms	
Harmonics	Voltage and Current / up to 50 <sup>th</sup> order / THD-F / THD-R	
<b>GENERAL SPECIFICATIONS</b>		
Display	Large 5.7" backlit graphic color LCD 320 x 240 pixels	
Storage/Communication	USB for data transfer to Dataview software (Included)	
Power Supply	Lithium-Ion 10.8V, 5.8Ah (rechargeable)	
Battery life	Up to 30 hours	
Protection	IP 53 / IK04	
Dimension / Weight	280 X 190 X 128MM / 2.2 Kg (11 X 7.48 X 5.04" / 4.85 lbs.)	
EMC	IEC61326-1	
Electrical safety	IEC61010-1 – 600V CAT III – 300V CAT IV – IEC 61557	

\* If a voltage is connected to the instrument

