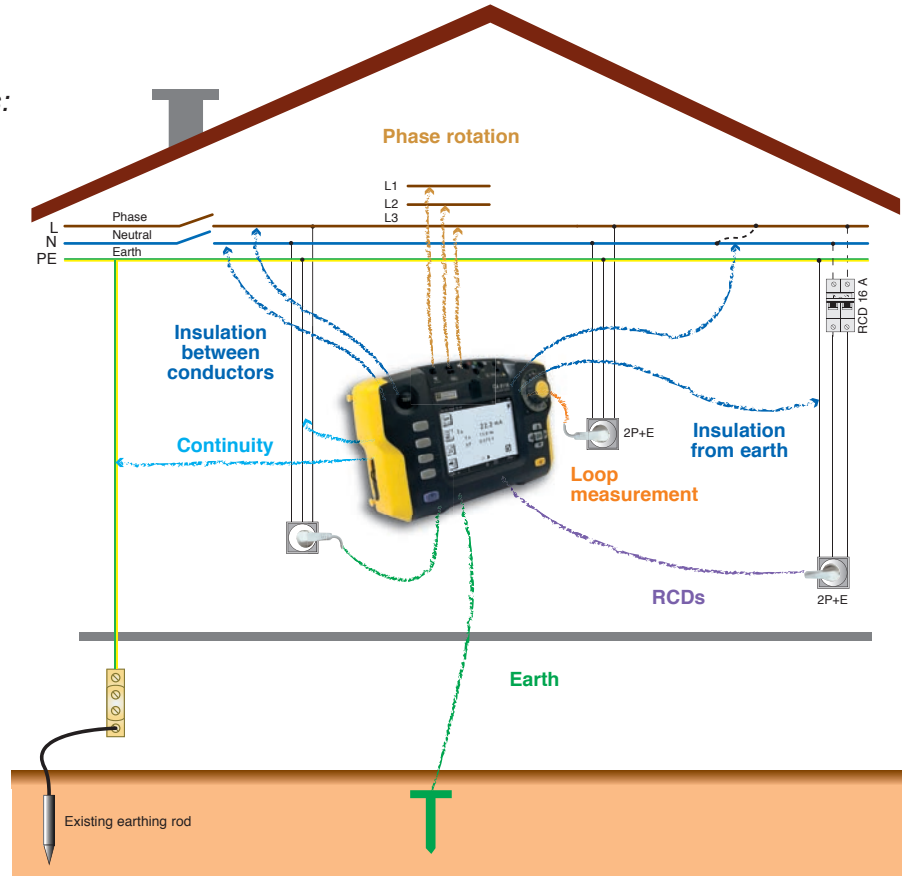
Electrical Testing and Safety

Assess the electrical safety of installations

The measurements according to the applicable European standards: IEC 60364, EN 61557, NF C 15-100, VDE 0100, NIN/NIV, IEE 17th.

Whatever the environment, electrical installation testers help electricians to certify that the infrastructures under their responsibility are safe.



INSULATION (IEC/EN 61557-2) Measurement with power off

Why measure insulation?

- To check that no conductor has suffered mechanical damage
- To check that all conductors are isolated from earth

Voltage of installation	Test voltage	Insulation required
< 50 V	250 V	≥ 250 kΩ
50 V to 500 V	500 V	≥ 500 kΩ or ≥ 1 MΩ depending on the standards
> 500 V	1,000 V	≥ 1 MΩ

CONTINUITY (IEC/EN 61557-4) (I ≥ 200 mA)

Why check continuity?

- A PE conductor in good condition and properly connected to the earth bar will drain faults to earth.

EARTH (IEC/EN 61557-5)

Why and how is the earth measured?

- By the single auxiliary rod method (TT & impedant IT networks)
- The Ra must be as low as possible to allow fault currents to flow to earth

RCDs (IEC/EN 61557-6)

Why test RCDs?

- To check that they trip
  - At Itest = IΔN
  - In preventive maintenance, in less than 300 ms for the the standard types and 500 ms for the selective types, at a current between IΔN/2 and IΔN.

PHASE ROTATION (IEC/EN 61557-7)

How are the different phases in a tree-phase network identified?

- By a clear indication of their rotation direction.

LOOP (IEC/EN 61557-3)

Why measure loops?

- To measure the earth by excess, without using rods
- To calculate the short-circuit current to ensure safety devices are proportionate
- To check fault voltage (with probe connected)

CHAUVIN® ARNOUX
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Installation Testers

	C.A 6116 N	C.A 6117
Insulation		
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 measurement + 3 cts)	
Earth		
3P earth		
Range / Resolution / Accuracy	0.50 Ω to 15 kΩ / 0.01 Ω to 1 Ω / ±(2 % of measurement + 2 cts)	
Others	Measurement of auxiliary-rod resistance (up to 40 kΩ)	
Earth with voltage		
Voltage / frequency of the installation	90 to 500 V / 15.8 to 17.5 Hz - 45 to 65 Hz	
1P Earth		
High-current mode with TRIP	Test current: 5 A	
Range / Resolution / Accuracy	0.10 Ω to 399.9 Ω / 0.001 Ω to 0.1 Ω / ±(5 % of measurement + 2 cts)	
NON-TRIP mode	Test current: 6 mA – 9 mA – 12 mA (as required)	
Range / Resolution / Accuracy	0.20 Ω to 3,999 Ω / 0.01 Ω to 1 Ω / ±(5 % of measurement + 3 cts)	
Selective 1P earth		
Range / Resolution / Accuracy	0.50 Ω to 399.9 Ω / 0.01 Ω to 0.1 Ω / ±(10 % of measurement + 10 cts)	
RCDs		
AC and A-type RCDs		
Voltage / frequency of the installation	90 V to 500 V / 15.8 Hz to 17.5 Hz and 45 Hz to 65 Hz	
IΔn	10/30/100/300/500/650/1,000 mA or variable - Test in step and pulse modes	
Non-trip test	at ½ IΔn – Duration: 1,000 ms or 2,000 ms	
Trip time measurement	at IΔn / 2 IΔn (selective) / 5 IΔn	
Step mode	0.3 IΔn to 1.06 IΔn in increments of 3.3 % IΔn	
B-type RCDs		
Voltage / frequency of the installation		90 V to 500 V / 15.8 Hz to 17.5 Hz and 45 Hz to 65 Hz
IΔn		10/30/100/300/500 mA - Test in step and pulse modes
Non-trip test		at ½ IΔn – Duration: 300 ms or 600 ms
Trip time measurement		at IΔn / 2 IΔn
Continuity		
Test voltage / Rated I	9.5 VDC / I > 200 mA up to 39.99 Ω and 12 mA up to 399.9 Ω with beep	
Range / Resolution / Accuracy	0 Ω to 399.9 kΩ / 0.01 to 100 Ω / ±(1.5 % of measurement + 2 cts)	
Loop impedance (Zi and Zs)		
High-current mode with TRIP	Test current: up to 5 A	
Range / Resolution / Accuracy	0.1 Ω to 399.9 Ω / 0.001 to 0.1 Ω / ± (5 % of measurement + 2 cts)	
Mode without tripping of RCDs >80 mA (Zs only)	Test current: 6 mA – 9 mA – 12 mA (as required)	
Range / Resolution / Accuracy	0.2 Ω to 3,999 Ω / 0.01 to 1 Ω / ± (5 % of measurement + 3 cts)	
Calculation of short-circuit current	0.1 A to 6 kA	
Others	Measurement of resistive and inductive components of the Zs and Zi impedances	
Courant	5.0 mA to 19.99 A (MN77 clamp) / 5.0 mA to 199.9 A (C177A clamp) Possibility of current measurement from 5.0 mA with MN77 and C177 clamps by connecting a voltage to the instrument	
Voltage	0 to 550 V AC/DC	
Frequency	DC and 15.8 to 500 Hz	
Active power	0 to 110 kW single-phase - 0 to 330 kW three-phase Simultaneous display of voltage and current waveform	
Harmonics	Voltage and current / up to 50th order / THD	
Phase rotation	20 to 500 VAC	
General specifications		
Display	Large 5.7-inch graphic colour LCD screen with backlighting, 320 x 240 counts	
Memory/Communication	Via USB for data transfer and report creation	
Power supply	9.6 V – 4 Ah Lithium-ion rechargeable batteries	
Battery life	Up to 24 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	

• *Available for sale mid-2014*

State at delivery

• **C.A 6116N:** C.A 6116N tester delivered in a bag with a wrist strap, a 4-point hands-free strap, 3 x Ø 4mm test probes (red, blue and green), 3 crocodile clips (red, blue and green), 2 elbowed-straight safety leads (red and black) 3 m long, a three-pin mains lead, a three-pin lead - 3 safety leads (red, blue and green), a remote-control probe, a USB A/B cable 1.80 m long with ferrite, a type-2 mains power pack/charger, 1 Li-Ion battery pack, ICT data export software on CD-ROM, 6 operating manuals on CD (one per language) and 1 safety datasheet in 20 languages.

• **C.A 6117:** C.A 6117 tester delivered in a bag with a wrist strap, a 4-point hands-free strap, 3 x Ø 4mm test probes (red, blue and green), 3 crocodile clips (red, blue and green), 2 elbowed-straight safety leads (red and black) 3 m long, a three-pin mains lead, a three-pin lead - 3 safety leads (red, blue and green), a remote-control probe, a USB A/B cable 1.80 m long with ferrite, a type-2 mains power pack/charger, 1 Li-Ion battery pack, ICT data export software on CD-ROM, 6 operating manuals on CD (one per language) and 1 safety datasheet in 20 languages.