

- CONTRÔLEURS D'ISOLEMENT
- INSULATION CONTROLLER
- ISOLATIONSPRÜFER
- CONTROLADORES DE AISLAMIENTO
- CONTROLLORI DI ISOLAMENTO

C.A 6511

C.A 6513

MEGOHMMETER

FRANCAIS
ENGLISH
DEUTSCH
ITALIANO
ESPAÑOL

Mode d'Emploi
User's Manual
Bedienungsanleitung
Manuale di Istruzione
Manual de Instrucciones

 **CHAUVIN
ARNOUX**



SAFETY PRECAUTIONS



- Before any measurement check that there is no voltage present on the circuit to be tested.
- Use the appropriate leads supplied with the instrument.
- At rest, the needle must indicate 0 on the voltmeter scale. If not, adjust it by means of the central (6) zero reset screw.
- When the insulation measurement is finished, leave the instrument connected for a few seconds to allow automatic discharge of the high tension of the device tested.
- During measurement of continuity or resistance, the voltage should be measured first. The presence of a voltage can activate protection and necessitate changing the fuses.

On the -10W $+10\text{W}$ and 1000W ranges, the instrument is protected by an HBC fuse. On the other ranges the instrument is statically protected on all the ranges from a voltage of 600V rms applied permanently between the terminals and from a voltage of 1000V rms accidentally applied for less than 15 seconds between the terminals.

- Position the switch in the OFF position when the instrument is not used.

SUMMARY

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DESCRIPTION

See page 54 and page 55.

- ① - Measurement terminals colour marked
- ② - Log scale on yellow background 0.1 to 1000 M Ω : Insulation measurement.
- ③ - Linear scale 0 to 10 Ω : Continuity measurement
Resistance measurement (C.A 6513 only)
- ④ - Linear scale 0 to 600 V AC : Voltage measurement
- ⑤ - Red / green scale : battery test
- ⑥ - Screw to reset needle to mechanical zero
- ⑦ - Rotary switch : 4 positions (C.A 6511)
6 positions (C.A 6513)
- ⑧ - Press button

USE

BATTERY TEST

Before starting a series of measurements, check that the batteries powering the instrument are good. Place the switch in the OFF position, press the yellow button, and display the condition of the batteries on the  scale of the galvanometer :

- if the needle is in the green zone, the batteries are good
- if the needle is in the red zone, change the four batteries

INSULATION/VOLTAGE MEASUREMENT

Once you are sure the power supply is good (see "Battery test"), you can proceed with insulation measurements.

Connect the instrument to the installation to be tested using the accessories supplied (leads and crocodile clip). It is preferable that the "+" is connected to the earth. Select an insulation measurement position with the switch (500 V for the C.A 6511, 500 or 1000 V for the C.A 6513).



At this stage, the instrument is thus automatically set to AC voltmeter. The instrument makes a voltage measurement between the + and - terminals (scale of voltages up to 600 V AC).

- If the instrument does not indicate any voltage present, the insulation measurement can be made.

- If the instrument indicates the presence of voltage on the circuit to be measured, insulation measurement must not be made. Find the source of this voltage and suppress it. Insulation measurements can only be done on this condition.

Proceed with the insulation measurement, by pressing the yellow button. The instrument generates a high voltage between the + and - terminals. The reading is done on the yellow log scale 0.1 to 1000 M Ω . As soon as the button is released, the instrument switches to voltage measurement. The high tension present on the tested device is discharged via the leads of the instrument. You must therefore leave the instrument connected for a few seconds once the measurement is finished (needle returns to 0 V).

CONTINUITY MEASUREMENT

After having connected the instrument to the installation to be tested, you must check that no voltage is present (see "Insulation measurement/voltage").

Set the switch to the "10 Ω " position.

The measurement is done automatically without having to press the yellow button. Read the value on the white scale 0 to 10 Ω . Then set the switch to the "-10 Ω " position and check that the needle of the instrument indicates the same continuity value. If this second value is different from the preceding one you must make the following calculation :

$$R_{\text{continuity}} = \frac{R+10\ \Omega + R-10\ \Omega}{2}$$

To have a better measurement accuracy on the +10 Ω and -10 Ω ranges, measure the resistance of the leads by short-circuiting them. Then subtract this value from the measured resistances.

Remarks :

- In order to save battery power, it is preferable to disconnect the leads once the continuity measurement has been finished.
- If the instrument, on continuity measurement, is not connected, or is badly connected, the needle then positions itself to the far right.

RESISTANCE MEASUREMENT (C.A 6513 only)

After having connected the instrument to the installation to be tested, you must check that no voltage is present (see "Insulation measurement/voltage").

Set the switch to the "1000 Ω " position.

The measurement is done automatically without the need to press the yellow button.

Read the value on the white scale 0 to 10 Ω , applying a coefficient x100.

Remarks :

- If the instrument, on resistance measurement, is not connected, or is badly connected, the needle then positions itself to the far right.
- In order to save battery power, it is preferable to disconnect the leads once the resistance measurement is finished.

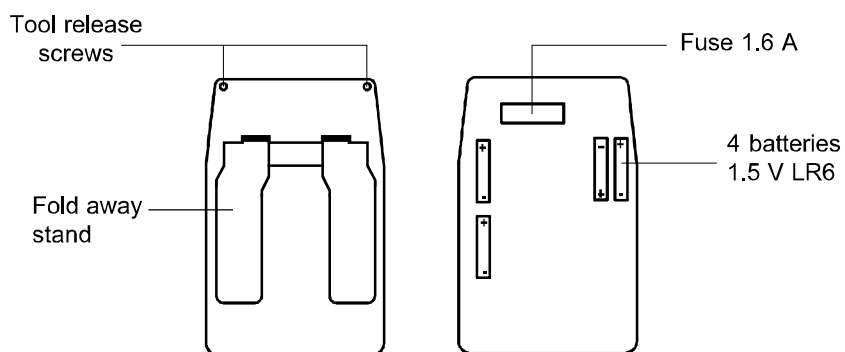
MAINTENANCE

CHANGING THE BATTERIES/FUSE

Check that no terminals are connected and that the switch is in the OFF position before opening the instrument. For safety, the instrument can only be opened if the leads are disconnected from the terminals. Access to the fuses and the batteries is by opening the back of the case.

Remove the shockproof case if there is one, then undo the tool release screws with a screwdriver and remove the back of the case.

Warning : never press the yellow button when the case is open.



FITTING THE SHOCKPROOF CASE

In order not to damage the window protecting the display, it is preferable to first engage the upper part of the instrument in the case, then to push the lower part in.

CLEANING

Clean the case of the instrument with a soft damp cloth. Use soapy water but not alcohol, solvents or hydrocarbons.

REPAIRS-MAINTENANCE

The maintenance operations must be done with original parts, and by an approved service department. To obtain a good quality measurement, it is preferable to recalibrate every two years, or every year in case of intensive use.

SPECIFICATIONS

FUNCTIONAL SPECIFICATIONS

Insulation

Measurement range : 0.1 to 1000 M Ω

Scale	0,1 M Ω to 1000 M Ω
Accuracy	$\pm 5\%$ of the measurement

Range	500 V	1000V*
Empty voltage	600V	1200V
Test current	≈ 1 mA for R ≤ 500 k Ω	≈ 1 mA for R ≤ 1 M Ω
Short circuit current	≤ 6 mA	≤ 6 mA

* C.A 6513 only

The time required for the voltage present on the terminals to decrease by 90% of its value, once the M Ω button is released (= discharge time), is 1s/ μ F.

Continuity

Measurement range : 0 to 10 Ω with reversal of the measurement current

Scale	0 - 10 Ω
Accuracy	$\pm 3\%$ of end of scale
Short circuit current	≈ 200 mA
Empty voltage	4.5 V $\leq$ V $\leq$ 6.5 V

Resistance (C.A 6513 only)

Measurement range : 0 to 1000 Ω

Scale	0 - 1000 Ω
Accuracy	$\pm 3\%$ of end of scale
Short circuit current	≈ 2 mA
Empty voltage	4.5 V $\leq$ V $\leq$ 6.5 V

Voltage

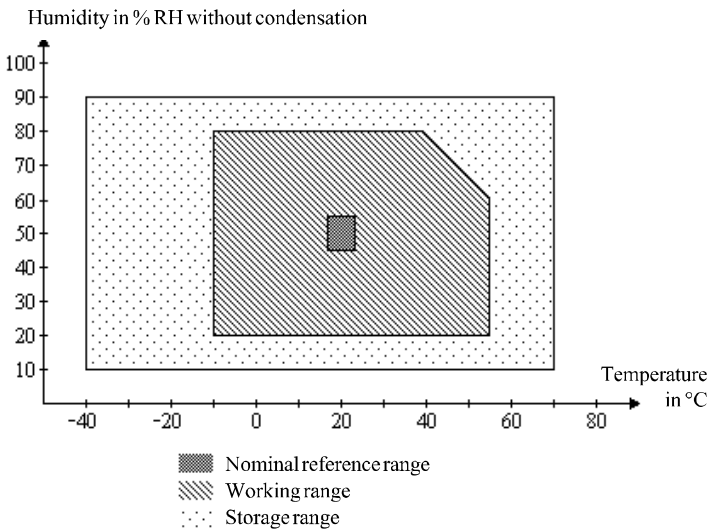
Measurement range : 0 to 600 V AC

Scale	0 - 600 V
Accuracy	± 3% of end of scale
Input impedance	300 kΩ

Reference conditions

Distortion quantities	Reference conditions
Temperature	20 °C ± 3K
Relative humidity	45 to 55 % RH
Supply voltage	5.5 V ± 0.2 V
Voltage frequency	45 Hz to 65 Hz
Electric field	< 1 V/m
Magnetic field	< 40 A/m
Position	Horizontale ± 5°

Climatic conditions



Variations in the nominal working range.

Distortion quantities	Limits of working range	% variation of the measurement	
		Typical	Max.
Operating position	0 + 90 ° 0 - 90 °	- -	± 5 % of the measurement
Temperature	-10 to + 55 °C	3 % / 10°C (1)	5 % / 10°C (1)
Humidity	20 to 80 % RH (2)	5 % of the measurement	10 % of the measurement
Supply voltage	4.5 to 6.5 V	0.1 % of the measurement	0.2 % of the measurement
Frequency (on voltmeter)	45 to 400 Hz	-	± 0.1 % of the measurement
Electromagnetic field	0 to 400 A/m (3)	-	1/2 class

- (1) For measurements in M_W , it is a % of the measurement.
For the other measurements, it is end of scale.
- (2) For insulation measurements from 0.1 to 100 M_W , voltage measurements from 0 to 600 V, continuity measurements from 0 to $\pm 10 \text{ } \Omega$ and resistance measurements from 0 to 1000 Ω .
- (3) The magnetic fields envisaged are fields with stable amplitude and direction, and of frequency between 0 and 60Hz.

ELECTRICAL SPECIFICATIONS

Power supply

The instrument is powered by 4 batteries 1.5V type R6 alkaline
The voltage range ensuring correct operation is from 4.5V to 6.5V
Check correct operation by testing the battery (see "Use").

Consumption is approximately :

300mA for $R = 0.5 \text{ } M_W$ on the M_W 500V range
600mA for $R = 1 \text{ } M_W$ on the M_W 1000V range (C.A 6513 only)
200mA on continuity on the $+10 \text{ } \Omega$ and $-10 \text{ } \Omega$ ranges
10mA on ohmmeter on the $1k\Omega$ range (C.A 6513 only)

The average service life is :

1000 insulation measurements of 10s on the M_W 500 V range for $R = 500 \text{ } k\Omega$,
200 insulation measurements of 10s on the M_W 1000 V range for $R = 1 \text{ } M_W$ (C.A 6513 only)
1500 continuity measurements of 10s on the 10 range.

Electrical safety

Dual insulation instrument in accordance with standard IEC 1010-1, for a set live-earth voltage of 600 V, installation category III, and degree of pollution 2.

Reminders of definitions :

- Installation category : classification of installations in accordance with standardised limits for transient access voltages depending on the nominal voltage of the network in relation to ground.
- Degree of pollution : classification of micro-environments. See IEC 1010.
- Set voltage : nominal voltage in relation to the earth.

MECHANICAL SPECIFICATIONS

Dimensions : 167 x 106 x 55mm

Weight : 500g approx/650g with sheath (batteries included)

STANDARDS RESPECTED

Standards	Titles
VDE 0413-1 VDE 0413-4	VDE specifications for testing protective devices in electrical installations. Part 1 : insulation testers Part 4 : ohmmeters
VDE 0100	Specifications for the creation of high current installations of nominal voltage less than 1000V.
NFC 15100	Design, production, checking and maintenance of electrical installations powered by a voltage at most equal to 1000V (rms value) on AC current and at 1500V on DC current.
IEC 1010-1	Safety rules for electronic instruments
NFC 42 100	Electrical measurement instruments analogue direct movement panel meters and their accessories. Part 1 : Definitions and general regulations Part 7 : Special regulations for multi-function instruments.
NF EN 50 081-1 NF EN 50 082-1	Electromagnetic compatibility. Generic emission standard. Part 1 : Residential, commercial and light industry. Electromagnetic compatibility. Generic immunity standard. Part 1 : Residential, commercial and light industry.
NF EN 60 555	Disturbances produced in power supply networks by electrical domestic equipment and analogous equipment. Part 2 : Harmonics Part 3 : Voltage fluctuations
NF EN 55 014	Limits and measurement methods for the specifications of electric domestic appliances, portable tools and similar electric instruments, relating to radioelectric disturbances.
NF EN 55 022	Limits and measurement methods of the specifications of data processing equipment relating to radioelectric disturbances.
IEC 801	Electromagnetic compatibility for measurement and control equipment in industrial processes. Part 2 : Sections relating to electrostatic discharges Level 3 : 8 kV close to the instrument, aptitude criteria B. The instrument holds 15 kV with contact with an aptitude criteria A. Part 3 : Sections relating to radiated electric fields Level 2 : 3 V/m from 27 to 500 MHz not modulated, aptitude criteria A Part 4 : Sections relating to rapid electric transients in salvos Level 2 : 1kV peak, wave 5/50ns, repetition frequency 5 kHz, aptitude criteria B. The instrument holds 4 kV with an aptitude criteria A. Part 5 : Sections relating to electric shocks Level 3 : 2 kV. (not defined in NF EN 55 082-1 at present)
Publication 160	Normal atmospheric conditions for tests and measurements
NF EN 60 529	Degrees of protection obtained by the case.
IEC 68.2.6	Fundamental climatic tests and mechanical sturdiness Vibrations The instrument in its operating position withstands vertical vibrations of 0.15 mm amplitude the frequency range from 10 to 55 Hz. The sweep speed is one octave per minute and duration of the test is 30 min (in accordance with IEC 1010-1 and NF C 42-100).
IEC 68.2.27	The instrument withstands vibrations of ± 1 mm amplitude (i.e 2.5 g) at 25 Hz and for 20 min (in accordance with VDE 0413). Shocks The instrument withstands 3 shocks of 15 g for 11 ms in both directions on the 3 axes (in accordance with NFC 42-100).
IEC 68.2.29	Shakes The instrument withstands 1000 shakes of 10 g for 16 ms in both directions on the 3 axes at a rate of 1 shake per second.
IEC 68.2.31	Bumps The instrument withstands drops of 5 cm. (in accordance with VDE 0413).
IEC 68.2.32	Free fall The instrument which is hand-hold portable, withstands free fall of 1 m with or without the case (in accordance with IEC 1010-1)
UL 94	Self-extinguishing capability.

TO ORDER

C.A 6511 Megohmmeter P01.140201
supplied with 1 set of leads, 1 red crocodile clip, 1 spare fuse
and 1 User manual

C.A 6513 Megohmmeter P01.140301
supplied with 1 set of leads, 1 red crocodile clip, 1 spare fuse
and 1 User manual

Spares :

Shockproof case P01.298016
Leads 181A/181B P03.100819
Red crocodile clip P01.101803
Fuse 6.3 x 32 1.6A HBC P01.297022
Set of 4 batteries 1.5 V LR6 P01.100759

Accessory :

Black crocodile clip P01.1018.02

WARRANTY

Unless dispensation to the contrary, our instruments are guaranteed from any manufacturing defect or matériel defect.

They do not bear the specification known as the safety specification. Our guarantee, which may not under any circumstances exceed the amount of the invoiced price, goes no further than the repair of our faulty equipment, carriage paid to our workshops. It is applicable for normal use of our instruments, and does not apply to damage or destruction caused, notably by error in mounting, mechanical accident, faulty maintenance, defective use, overload or excess voltage, calibration performed by third parties.

Our responsibility being strictly limited to the pure and simple replacement of the faulty parts of our equipment, the buyer expressly renounces any attempt to find us responsible for damages or losses caused directly or indirectly.

Our guarantee is applicable for twelve (12) months after the date on which the equipment is made available. The repair, modification or replacement of a part during the guarantee period will not result in this guarantee being extended.