

C.A 6292













200A microhmmeter

Thank you for purchasing a **C.A 6292 200A microhmmeter**.

For best results from your instrument:

- **read** these operating instructions carefully,
- **comply** with the precautions for use.

	WARNING, risk of DANGER! The operator must refer to these instructions whenever this danger symbol appears.
	Information or useful tip.
	Equipment protected by double insulation.
	Warning: hot surface.
	The product is declared recyclable following an analysis of the life cycle in accordance with standard ISO 14040.
	Chauvin Arnoux has adopted an Eco-Design approach in order to design this appliance. Analysis of the complete life-cycle has enabled us to control and optimize the effects of the product on the environment. In particular this appliance exceeds regulation requirements with respect to recycling and reuse.
	The CE marking indicates conformity with European directives, in particular LVD and EMC.
	The rubbish bin with a line through it indicates that, in the European Union, the product must undergo selective disposal in compliance with Directive WEEE 2002/96/EC. This equipment must not be treated as household waste.
	Earth.
	USB connector.

PRECAUTIONS FOR USE

This instrument is compliant with safety standard IEC 61010-2-030, and the leads are compliant with IEC 61010-031, for voltages of 30V with respect to earth. Failure to observe the safety instructions may result in electric shock, fire, explosion, and destruction of the instrument and of the installations.

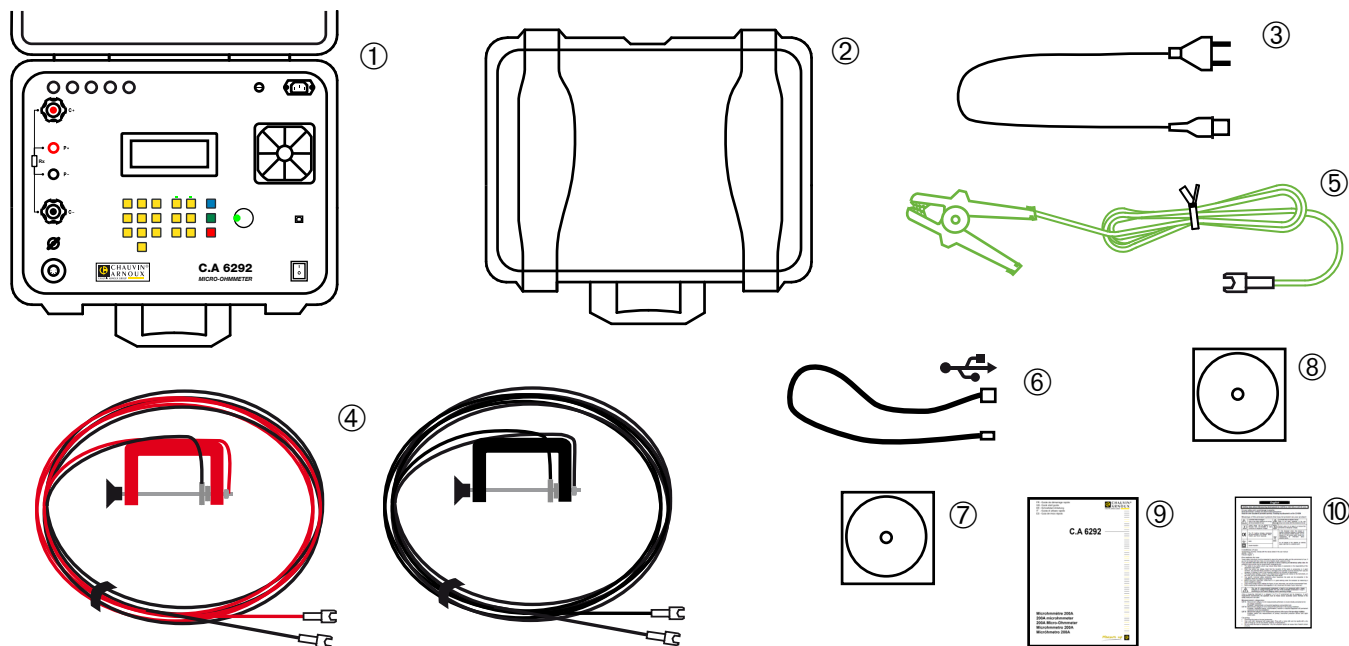
- The operator and/or the responsible authority must carefully read and clearly understand the various precautions to be taken in use. Sound knowledge and a keen awareness of electrical hazards are essential when using this instrument.
- Do not use the instrument on networks of which the voltage exceeds those mentioned.
- Never exceed the protection limits stated in the specifications.
- Observe the conditions of use, namely the temperature, the relative humidity, the altitude, the degree of pollution, and the place of use.
- Do not use the instrument if it seems to be damaged, incomplete, or poorly closed.
- Before each use, check the condition of the insulation on the leads, housing, and accessories. Any item of which the insulation is deteriorated (even partially) must be set aside for repair or scrapping.
- Before using your instrument, check that it is perfectly dry. If it is wet, it must be thoroughly dried before it can be connected or used.
- Use only the leads and accessories supplied.
- When handling the leads, test probes, and crocodile clips, keep your fingers behind the physical guard.
- Use personal protection equipment systematically.
- All troubleshooting and metrological checks must be done by competent, accredited personnel.

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1. FIRST USE

1.1. DELIVERY CONDITION



- ① One 200A C.A 6292 microhmmeter with a protecting fuse.
- ② One carrying case containing the various leads and accessories.
- ③ One mains power cord.
- ④ Two Kelvin cords (one red and one black) 6m long terminated by clamps.
- ⑤ One green lead 3m long terminated by a crocodile clip.
- ⑥ One USB A/B cord 1.5m long.
- ⑦ Two data transfer programs, DataView® and MOT (Micro-Ohmmeter Transfer), on CD-ROM.
- ⑧ One user manual on CD-ROM (1 file per language).
- ⑨ One multilingual getting started guide.
- ⑩ One multilingual safety data sheet.

1.2. ACCESSORIES

Set of two 15m Kelvin cords (red and black) terminated by clamps
MR 6292 current clamp

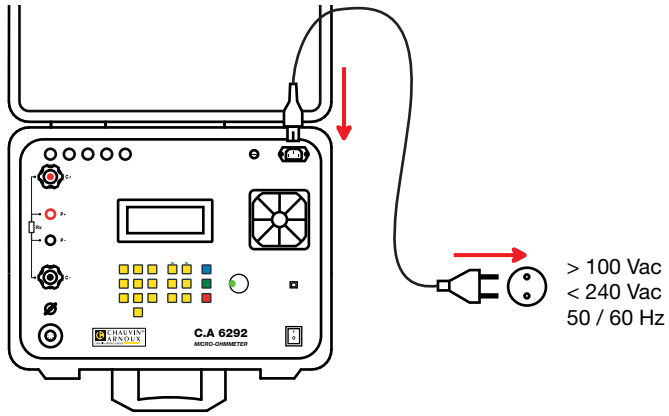
1.3. REPLACEMENT PARTS

Set of two Kelvin cords (one red and one black) 6m long terminated by clamps
One green cord 3m long terminated by a crocodile clip
Set of five thermal fuses (15A, 250V, 5x20mm)
Carrying bag
USB A/B cord 1.5m long

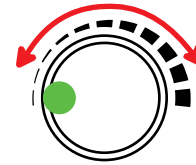
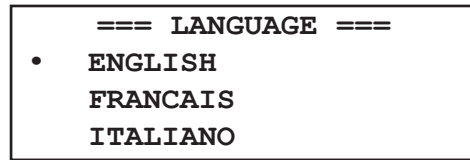
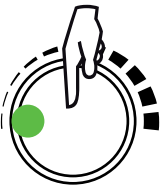
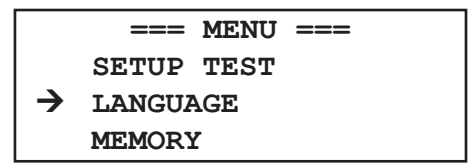
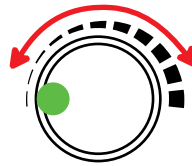
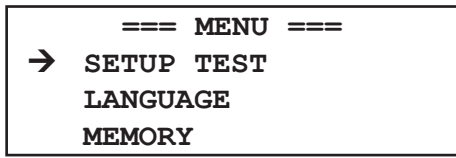
For accessories and spares, visit our web site:
www.chauvin-arnoux.com

1.4. CHOOSING A LANGUAGE

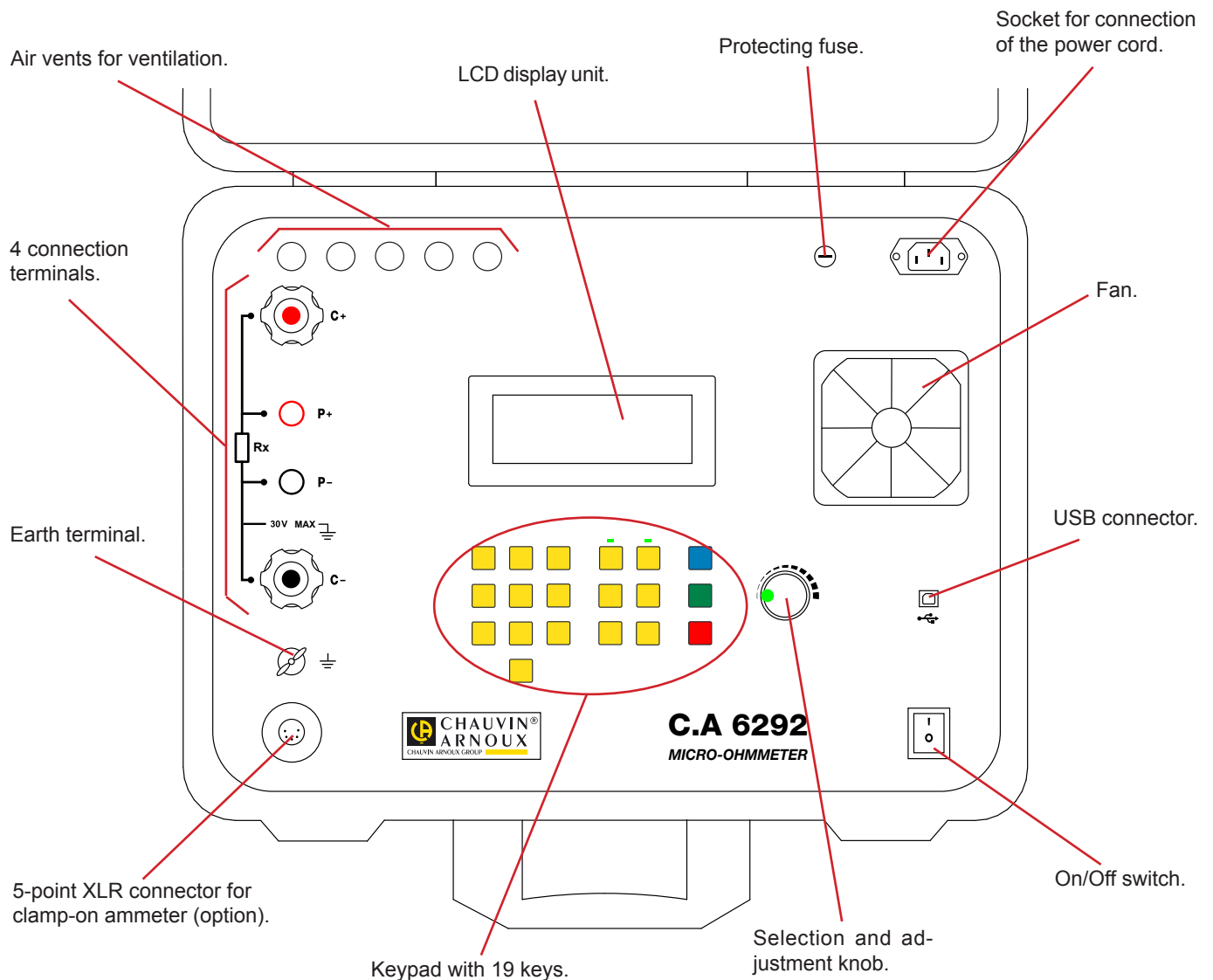
Connect the power cord to the instrument and to a power outlet, then switch the instrument on by setting the switch to I.



The screen lights and the instrument runs a self-test.



2. PRESENTATION OF THE INSTRUMENT



2.1. FUNCTIONS OF THE INSTRUMENT

The C.A 6292 microhmmeter is a portable measuring instrument intended for the measurement of very low resistance values. It is enclosed in a field housing and uses mains power.

The C.A 6292 is used to accurately measure very low contact resistances on circuit-breakers, switches, conducting bars, etc., with test currents of up to 200A.

The measurements can be recorded and uploaded to a computer via a USB interface.

A ventilation system prevents overheating of the instrument.

This instrument is rugged and can be carried by a single individual.

The main characteristics of this instrument are:

- Cooling system that makes it possible to perform several tests in succession.
- Choice of test currents: 50, 100, 150, 200A, or manual between 20 and 200A.
- Accurate measurement of low resistances.
- Measurement of resistances between 0.1μΩ and 1Ω.
- Resolution 0.1μΩ.
- Measurements may be normal or BSG (with both two sides of the object grounded).
- Display available in 5 languages (English, French, Italian, Spanish, and German).
- Test duration programmable between 5 and 120 seconds; unlimited with currents ≤100A.
- Retrieval of recorded measurements on the display unit.
- USB communication interface.
- Direct printing using DataView® software and a PC.
- Possibility of configuring the instrument and the measurements from a PC via DataView®.
- Rugged housing, moderately heavy and water- and dust-tight.

The main applications of this instrument are:

- Measurement of the contact resistances of switches;
- Measurement of the contact resistances of circuit-breakers;
- Measurement of the resistances of bar sets;
- Measurement of the ground continuity of airframes;
- Measurement of the ground continuity of rails;
- Measurement of the ground continuity of oil pipelines.

2.2. DISPLAY UNIT

The LCD display unit is backlit. It can display four lines of 20 characters.

2.3. KEYPAD

The alphanumeric keypad is used to assign names to objects (groups of tests) and to enter the date and time.

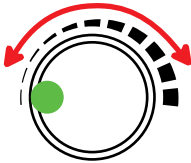
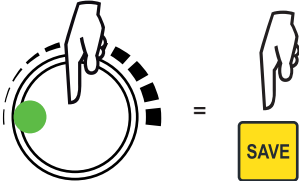
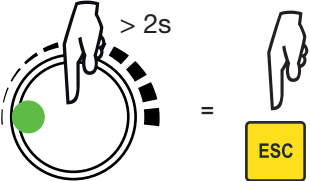
The function keys are used to choose among several configuration parameters.

- **CAPS LOCK:** When activated (green indicator lit above the key), the letters will be upper-case. When it is not activated, the letters will be lower-case.
- **NUM LOCK:** When activated (green indicator lit above the key), the keypad will be numerical. When it is not activated, the keypad will be alphabetical.
- **MENU:** To display the main menu, from which you can configure the instrument and the measurements.
- **DEL:** To delete.
- **SAVE:** To record the configuration and move up one menu level.
- **ESC:** To cancel and move up one menu level.
- **MODE:** To toggle between the **Normal** and **BSG** (both sides grounded) operating modes.
- **START:** To start the measurement.
- **STOP:** To stop the measurement.

2.4. KNOB

- The knob has two functions:
- Adjustment of the measurement current;
- Navigating in the menu and selecting options.

When the main screen is displayed, pressing the knob has the same effect as pressing the **MENU** key.

<p>In a menu, the knob is turned to browse in the list of options.</p>	<p>In a menu, pressing the knob validates the selected option; it has the same effect as pressing the SAVE key.</p>	<p>In a menu, a long press on the knob has the same effect as pressing the ESC key.</p>
		

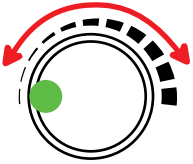
During a measurement in manual mode, it can be pressed to set the test current.

3. SETTINGS OF THE INSTRUMENT

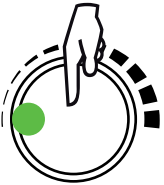
3.1. MAIN MENU



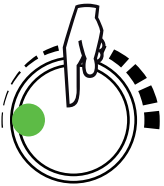
Press the **MENU** key to enter the settings menu or return to the main screen.



Turn the knob clockwise to move up (or anticlockwise to move down) in the list of options.



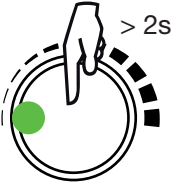
When the desired option is selected, validate it by pressing the knob.



or



Press the knob or the **SAVE** key to record a setting.



or



Press the knob and hold it down, or press the **ESC** key, to cancel.



At any time while browsing, pressing the **MENU** key returns you directly to the main menu.

The various parameters of the main menu are:

SETUP TEST

- Edit Record Name
- Test current
- Test duration
- Return

LANGUAGE

- English
- Français
- Italiano
- Espanol
- Deutsch

MEMORY

- Retrieve
- Clear all
- Usage
- Return

SETTINGS

- Date format
 - MM/DD/YY
 - DD/MM/YY
- Time format
 - 12 H
 - 24 H
- Set date
- Set time
- Auto save
 - Off
 - On
- Fan
 - Auto
 - On
- Display unit
 - Brightness
 - Contrast
 - Return
- System info
- Return

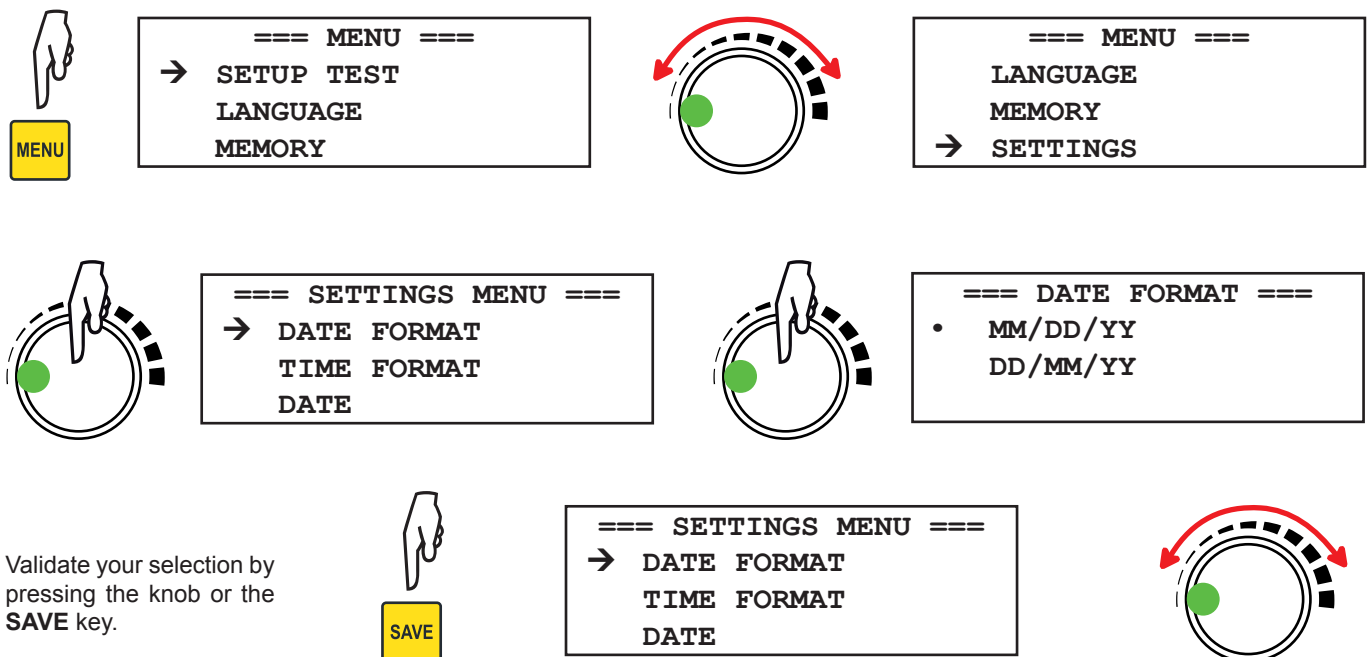


The instrument can also be configured using DataView® software (see §6).

3.2. CHOOSING A LANGUAGE

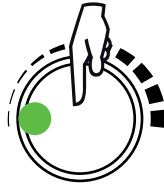
(See §1.4).

3.3. SETTING THE TIME AND DATE



```

=== SETTINGS MENU ===
DATE FORMAT
→ TIME FORMAT
DATE
  
```



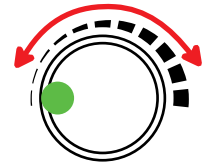
```

=== TIME FORMAT ===
• 12H
  24H
  
```



```

=== SETTINGS MENU ===
→ DATE FORMAT
  TIME FORMAT
  DATE
  
```



```

=== SETTINGS MENU ===
DATE FORMAT
  TIME FORMAT
→ DATE
  
```



```

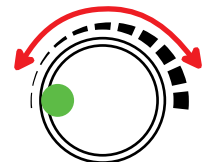
=== DATE ===
24/02/2015
  
```

Use the numerical keypad to enter the current date. Then validate by pressing **SAVE**.



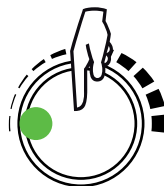
```

=== SETTINGS MENU ===
→ DATE FORMAT
  TIME FORMAT
  DATE
  
```



```

=== SETTINGS MENU ===
  TIME FORMAT
  DATE
→ SET TIME
  
```



```

=== SET TIME ===
10:36
  
```

Use the numerical keypad to enter the time. Then validate by pressing the knob.



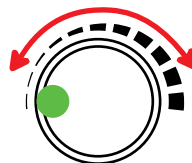
If there is any error, you can press the **ESC** key to return to the **SETTINGS** menu without changing the present settings.

3.4. CONTRAST AND BRIGHTNESS OF THE DISPLAY UNIT



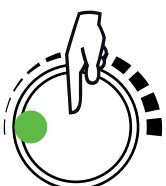
```

=== MENU ===
→ SETUP TEST
  LANGUAGE
  MEMORY
  
```



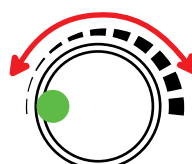
```

=== MENU ===
LANGUAGE
MEMORY
→ SETTINGS
  
```



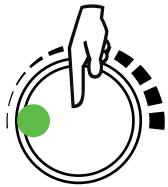
```

=== SETTINGS MENU ===
→ DATE FORMAT
  TIME FORMAT
  DATE
  
```

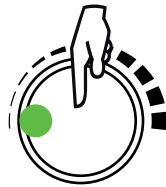


```

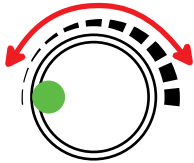
=== SETTINGS MENU ===
AUTO SAVE
FAN
→ DISPLAY
  
```



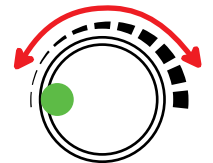
=== DISPLAY ===
 → BACKLIGHT
 CONTRAST
 RETURN



=== BACKLIGHT ===
 MIN [grid] ----- MAX

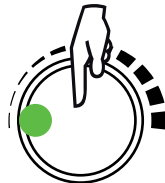


=== DISPLAY ===
 → BACKLIGHT
 CONTRAST
 RETURN

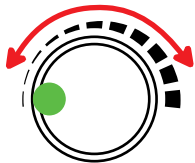


Adjust the brightness to suit you.

=== DISPLAY ===
 BACKLIGHT
 → CONTRAST
 RETURN



=== CONTRAST ===
 MIN [grid] ----- MAX



Adjust the contrast to suit you.

3.5. COOLING SYSTEM

The C.A 6292 has a cooling system that increases the number of measurements you can make in succession without overheating the instrument.

The cooling system includes air vents on the front panel of the instrument, a filter to keep dust from getting into the instrument, and a fan to exhaust the hot air.

You can choose between:

- operation of the fan only when the internal temperature is too high (AUTO)
- or continuous operation of the fan (ON)

=== MENU ===
 LANGUAGE
 MEMORY
 → SETTINGS

=== SETTINGS MENU ===
 SET TIME
 AUTO SAVE
 → FAN

=== FAN ===
 • AUTO
 ON

3.6. OTHER PARAMETERS

The other parameters are explained in §§4 and 5.

4. USE



The instrument must be used in accordance with safety procedures and the rules for use near systems at high voltages. The voltages and currents generated can be dangerous.

4.1. PRECAUTIONS FOR USE

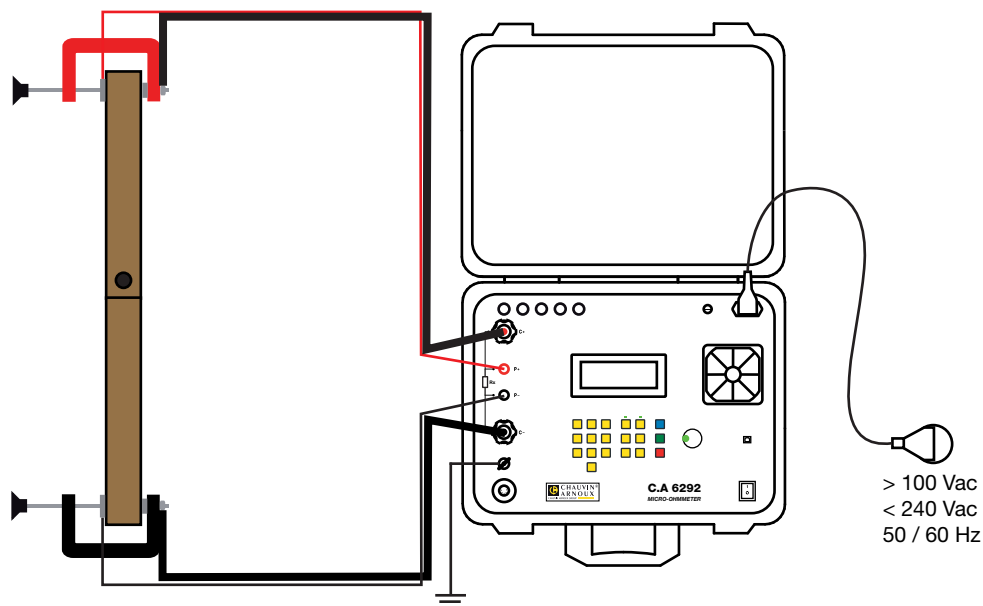
- The instrument must be earthed via the earthing contact of the power cord.
- Use only the cords and leads provided with the instrument.
- During a measurement of the contacts of a circuit-breaker, the contacts must be closed and earthed. The part earthed must be connected to the **C-** terminal.
- Check that there is no voltage on the measurement terminals or the earthing contact.
- High temperatures can be reached on the current terminals.
- Never connect or disconnect the cables during a measurement. Stop the measurement first.
- The instrument must never be used in an explosive environment (like poorly ventilated battery storage rooms).

4.2. CONNECTION

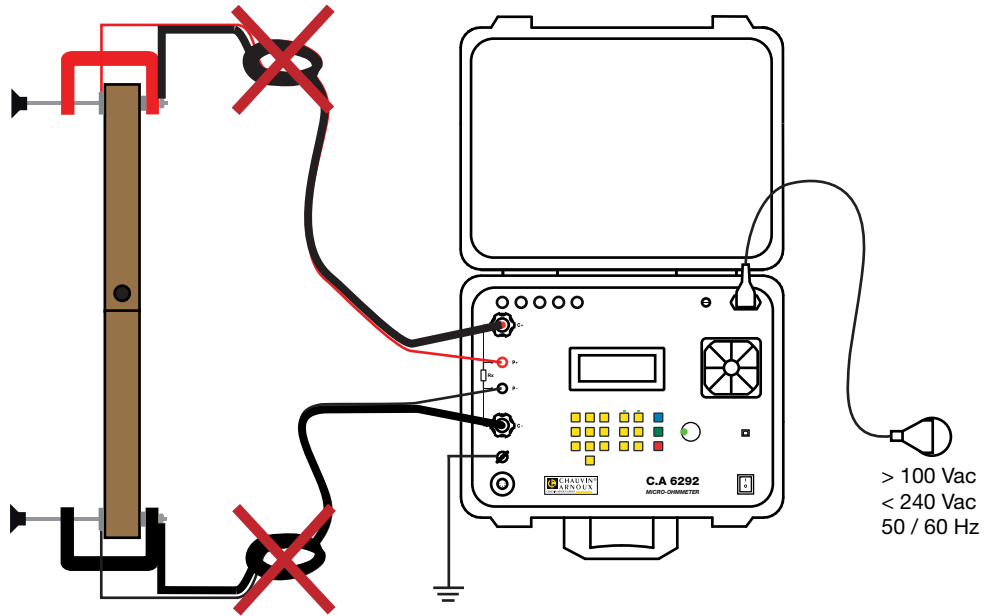
The instrument uses the four-wire measurement method based on Kelvin's principle to eliminate errors due to the resistances of the test leads and to the contact resistances. This makes the measurements very accurate.

4.2.1. NORMAL MEASUREMENT

- Use the cord provided to connect the instrument to mains.
- Check that the device to be tested is not live.
- Before switching the instrument on, connect the test leads to the device to be tested and to the terminals of the instrument. Connect the current leads to the **C+** and **C-** terminals and the voltage leads to the **P+** and **P-** terminals.



Tighten the terminals well to reduce the contact resistances and limit heating. Also tighten the clamps well. Make sure that the leads are correctly uncoiled and do not form loops.



- Switch the instrument on by setting the switch to I.
- Press the **MODE** key to define the **NORMAL** mode.

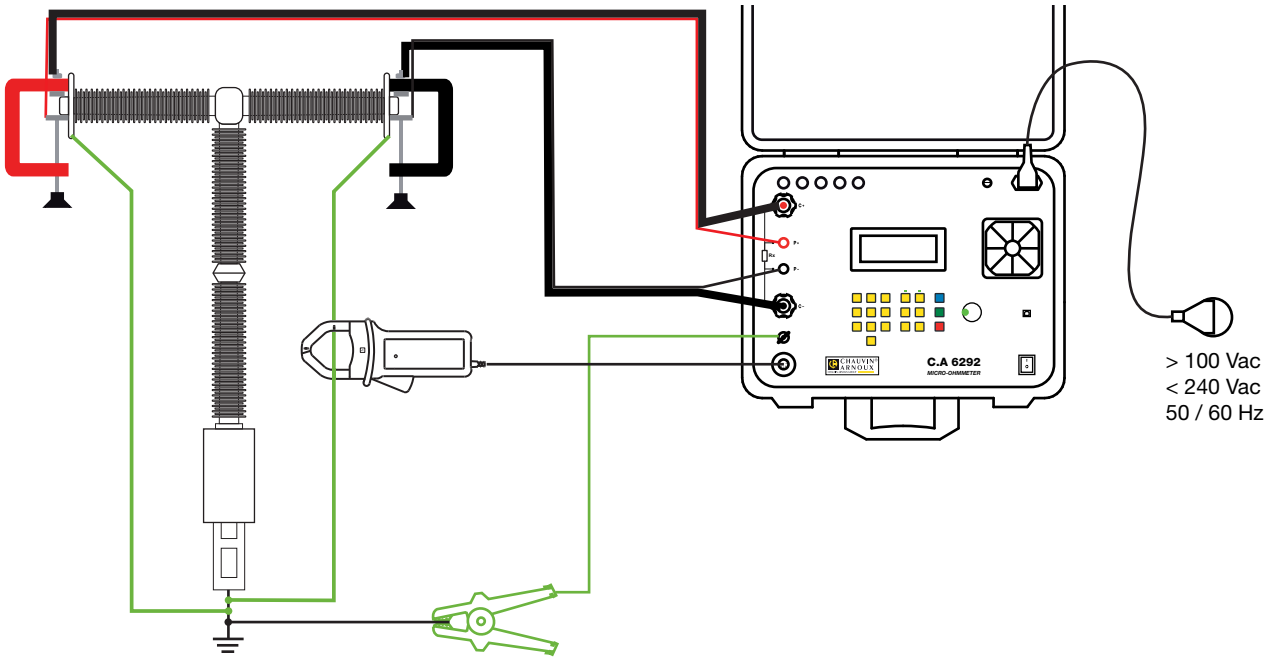


BAR 12	
NORMAL	(150A 60S)
MENU	
02/03/2015	10:20

4.2.2. BSG (BOTH SIDES GROUNDED) MEASUREMENT

The optional MR6292 current clamp is necessary for this measurement (see §1.2).

- As for a normal measurement, connect the instrument to mains.
- Check that the device to be tested is not live.
- Before switching the instrument on, connect the test leads to the device to be tested and to the terminals of the instrument. Connect the current leads to the C+ and C- terminals and the voltage leads to the P+ and P- terminals.
- Add the earth connections. Both sides of the object to be tested must be grounded. The earthing contact of the instrument must also be grounded, using the crocodile clip.
- Connect the current clamp to the instrument and to one of the two earth connections. It measures the current shunted to earth and so eliminates one possible source of measurement error.



Tighten the terminals well to reduce the contact resistances and limit heating. Also tighten the clamps well. Make sure that the leads are correctly uncoiled and do no form loops.

- Switch the instrument on by setting the switch to I.
- Press the **MODE** key to define the **BSG** mode.



<p>8471 CIRCUIT-BREAKER BSG (200A 90S) MENU 02/03/2015 10:20</p>
--

4.3. MAIN SCREEN

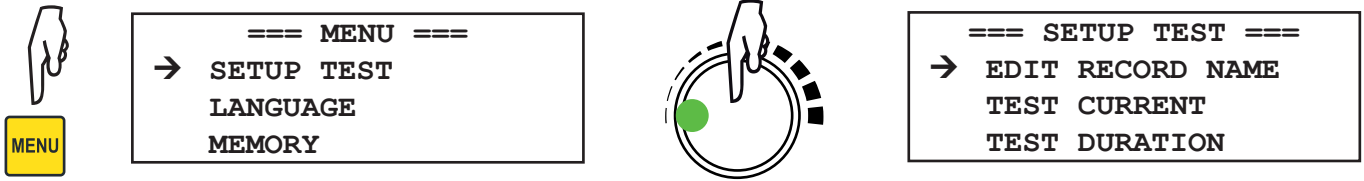
- The main screen displays the parameters of the test in progress:
 - the name of the object,
 - the test mode,
 - the test current,
 - the test duration
 - the date and time.

<p>NAME OF OBJECT NORMAL (100 A---S) MENU 02/03/2015 10:20</p>
--

You must then define the various settings using the **MENU** key.

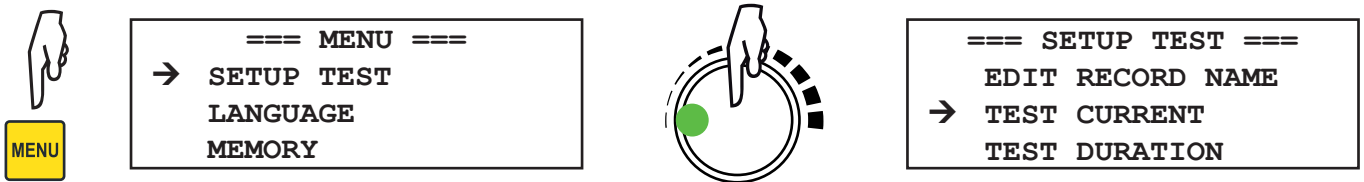
4.4. NAME OF OBJECT

The object name is used to retrieve measurements stored under the name.



To change the object name, press the **DEL** key to erase the characters, then use the alphanumeric keypad to enter a new name up to 20 characters long. Press the **SAVE** key to save or **ESC** to cancel.

4.5. TEST CURRENT



The available test currents are: **50**, **100**, **150**, **200A**, or **MANUAL**.

When you select **MANUAL**, you adjust the test current during the measurement by turning the knob. Press the **SAVE** key to save or **ESC** to cancel.

During a test with a preset current, it is also possible to change the current during the measurement. To do this, press the knob to activate the **MANUAL** mode, then turn it to change the current. The current adjustment step depends on the current. Note that if the test current becomes greater than 100A, the maximum test duration will be reduced to 120s. At the end of the test, the preset current is restored.

4.6. TEST DURATION



If you choose **TIMED**, program a test duration between 5 and 120 seconds using either the numerical keypad or the knob.

If you choose **UNLIMITED**, there is no longer any limit on the duration of the test, but the test current must be less than or equal to 100A. The instrument displays - - -.

Press the **SAVE** key to save or **ESC** to cancel.

4.7. RESISTANCE MEASUREMENT

Once the instrument is connected and the measurement has been configured, you can make a measurement.



STARTING OF TEST
BAR 12
NUMBER: 0001

In normal mode
R=103.6 $\mu\Omega$
I=150A
DURATION: 015/060s
02/03/2015 10:20

In BSG mode

R=284.7 $\mu\Omega$
It=192A Ig=8.0A
DURATION: 020/090s
02/03/2015 10:20

It is the current in the resistance to be measured.
Ig is the current shunted to earth, measured by the clamp.

To change the current during the measurement:



To stop a test of unlimited duration, or a timed test before its normal end.



At the end of the measurement, if you chose automatic save (see §5.1), when the measurement is terminated the instrument records it. If you stop the measurement by pressing the **STOP** key, there is no automatic save.

R=103.6 $\mu\Omega$
I=150A
TEST OVER
SAVED! 90% FREE MEM

R=103.6 $\mu\Omega$
I=150A
TEST OVER
02/03/2015 10:20



The C.A 6292 has a filter to eliminate 50 or 60Hz noise on the object to be measured because of induction by high-voltage substations.



Press the **ESC** key to exit from the measurement and return to the menu.

4.8. MESSAGES

The following messages may be displayed during the measurements:

- **TEST OVER:** Indicates that the measurement has been successfully completed.
- **LOW CURRENT:** Indicates that the current is too low (<20A) to measure the resistance.
- **OVERRANGE:** Indicates that the resistance is >1Ω.
- **TOO HOT:** Indicates that the instrument has reached its internal temperature limit.
- **PROTECTION ACTIVATED:** Indicates that the instrument has aborted the measurement because of a problem. Check the connections, the power supply, and the earthing.
- **VOLTAGE DETECTED:** Indicates that the instrument has detected a voltage greater than 20V on the input terminals and that measurement is impossible. Check the connections and the earthing.



When a message flashes, press the **ESC** key to return to the main screen.



4.9. DISCONNECTING

At the end of the measurement, switch the instrument off, then disconnect the measurement leads and power cord.

5. RECORDING

The C.A 6292 can record between 1,600 and 8,000 measurements, depending on how they are recorded. If a new object is created for each measurement, there will be only 1,600 records. But if the name of the object is never changed, there will be 8,000.

5.1. RECORDING MEASUREMENTS

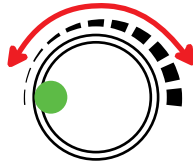


To record a measurement result, press the **SAVE** key during or at the end of the measurement. The measurement is recorded with all of its information: name of object, test number, resistance, test current, test duration, date and time.

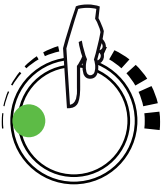
To record all measurements (when they are terminated without error), activate automatic recording.



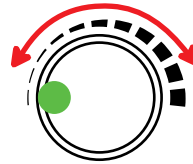
=== MENU ===
→ SETUP TEST
LANGUAGE
MEMORY



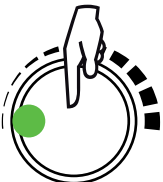
=== MENU ===
LANGUAGE
MEMORY
→ SETTINGS



=== SETTINGS MENU ===
→ DATE FORMAT
TIME FORMAT
DATE



=== SETTINGS MENU ===
DATE
SET TIME
→ AUTO SAVE



=== AUTO SAVE ===
OFF
• ON



A message is displayed at the bottom of the screen when a measurement is recorded. It indicates the percentage of memory free:

R=33.1 $\mu\Omega$
I=10A
TEST OVER
SAVED! 73% FREE MEM

5.2. MEMORY FULL

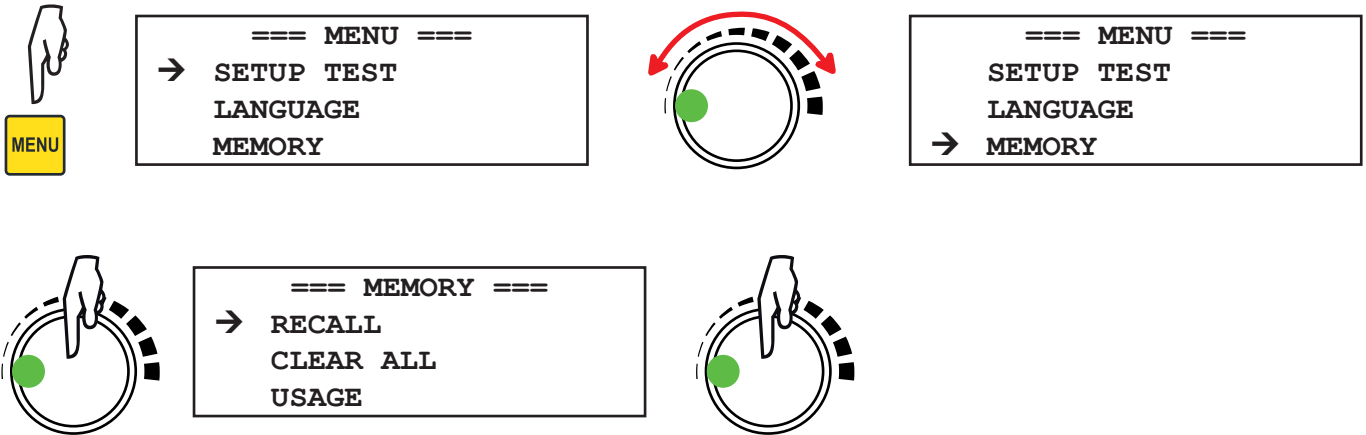
When the memory is full and you want to record another measurement, the instrument reports:

```

R=33.1μΩ
I=10A
TEST OVER
MEMORY FULL
    
```

You must then delete some objects or measurements to be able to record others.

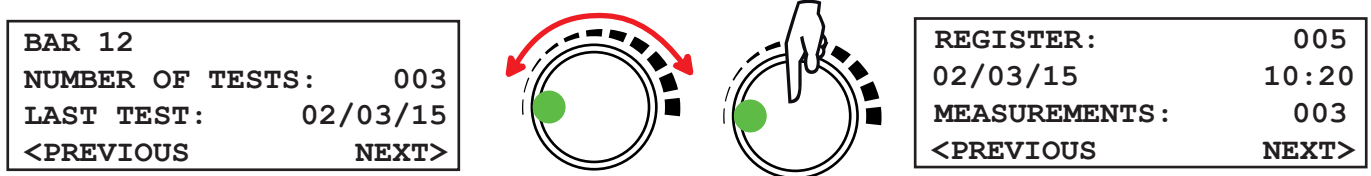
5.3. RETRIEVAL FROM MEMORY



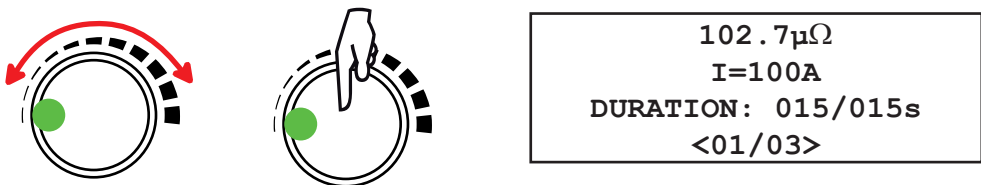
If the memory is empty, the following message is displayed:



Otherwise, it is the last measurement recorded that is displayed. To go from one object to another, turn the knob. To select an object, press the knob.



For go from one measurement to another in the object, turn the knob. To select a measurement, press the knob.



This measurement contains 3 results. To scroll them, use the knob. To exit, press the **ESC** key.

5.4. CLEARING MEMORY

5.4.1. DELETING A MEASUREMENT

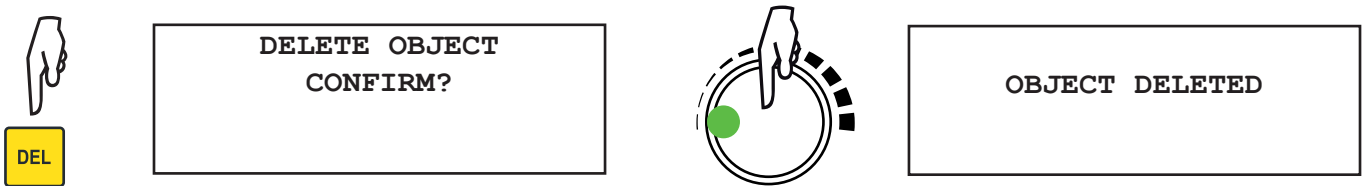
Proceed as for a retrieval from memory, but when you reach the measurement to be deleted, press the **DEL** key.



Or press the **ESC** key to cancel.

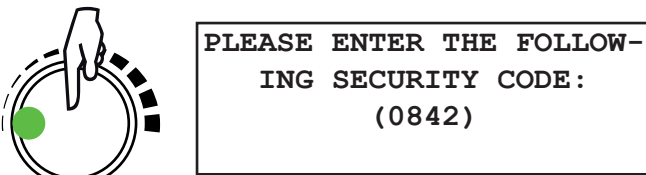
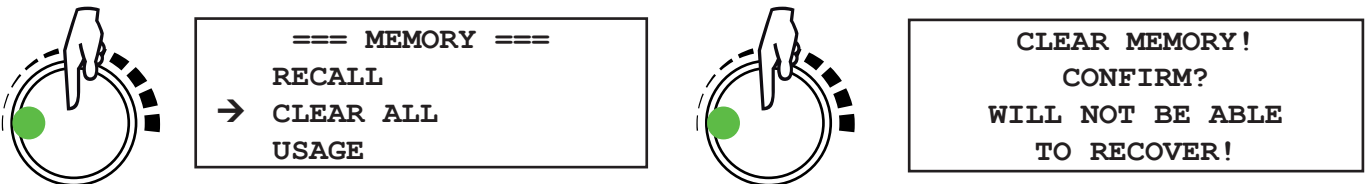
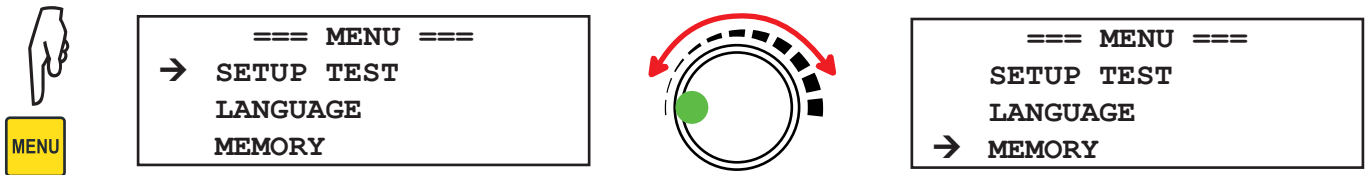
5.4.2. DELETING AN OBJECT

Proceed as for a memory recall, but when you reach the object to be deleted, press the **DEL** key.

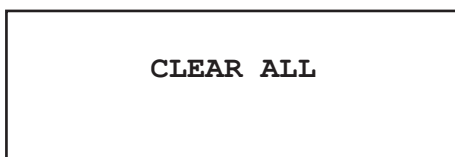


Or press the **ESC** key to cancel.

5.4.3. CLEARING ALL MEMORY



The instrument asks you to type a security code on the alphanumeric keypad. This is in order to avoid clearing the memory by mistake. Then validate by pressing the knob.

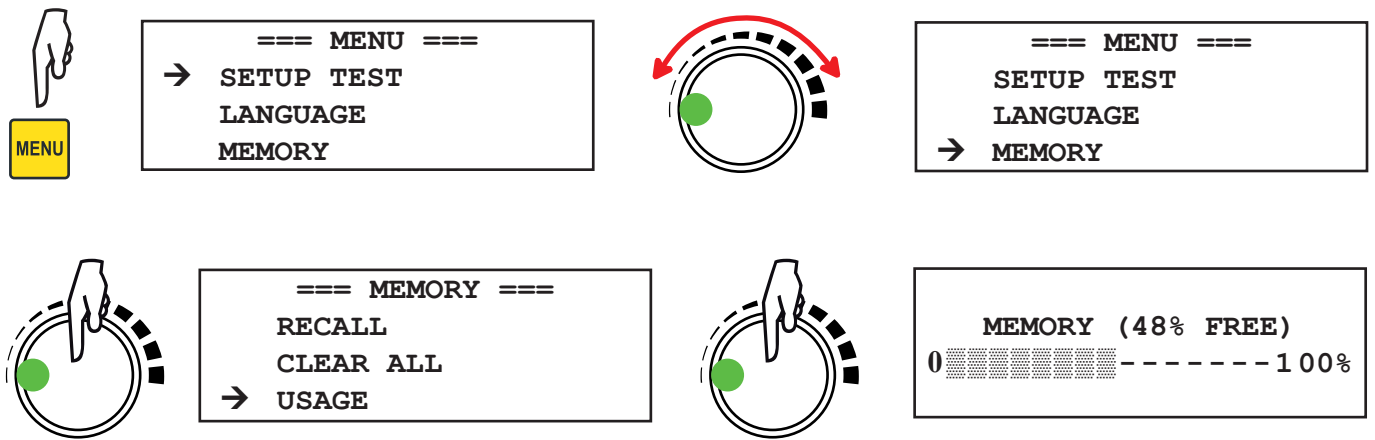


At any time, you can press the **ESC** key to cancel.

5.4.4. COMPACTING OF THE MEMORY

After each deletion, the instrument compacts the memory. This can take several seconds.

5.5. DISPLAYING MEMORY USAGE



6. DATAVIEW® SOFTWARE



For contextual information about the use of DataView®, refer to the program's Help menu.

Minimum computer requirements:

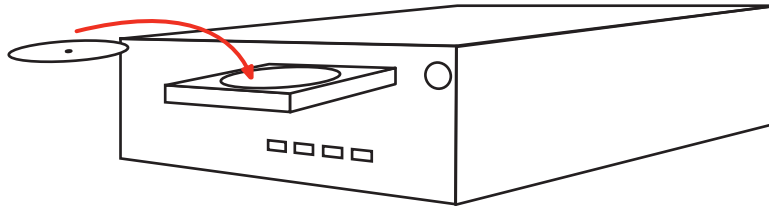
- Windows XP/Windows Vista or Windows 7 (32/64 bits)
- 2GB of RAM
- 200MB of disc space
- 1 USB port
- 1 CD-ROM drive

DataView® is a registered trade mark of Chauvin Arnoux®.
Windows® is a registered trade mark of Microsoft®.

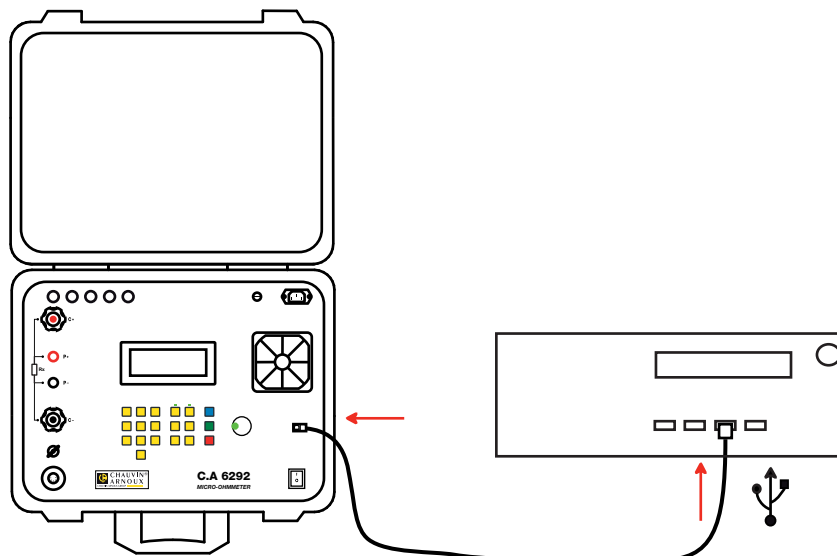


Do not connect the instrument to the PC until the software and the driver have been installed.

- Insert the CD in the CD-ROM drive.
If automatic execution is activated, the program starts automatically.
Otherwise, select **Setup.exe**



- Then follow the instructions to install the program.
- When the software and driver have been installed, you can connect the instrument to the PC.



Then simply connect the instrument in DataView® to access the measurements it contains.

7. TECHNICAL CHARACTERISTICS

7.1. REFERENCE CONDITIONS

Quantity of influence	Reference values
Temperature	20 ± 3 °C
Relative humidity	≤ 50 %HR
Supply voltage	110 to 240 V 50 / 60 Hz
Electric field	< 1 V/m
Magnetic field	< 40 A/m

The **intrinsic uncertainty** is the error specified for the reference conditions.

7.2. ELECTRICAL CHARACTERISTICS

7.2.1. VOLTAGE MEASUREMENTS

Particular reference conditions

Inductance of the leads: zero.

External voltage on the terminals: zero.

Inductance in series with the resistance: zero.

Measurement range	0.1 μΩ à 2 mΩ	2 à 200 mΩ	200 mΩ à 1 Ω
Resolution	0.1 μΩ	10 μΩ maximum current from 25 A to 200 mΩ	1 mΩ maximum current from 5 A to 1 Ω
Measurement current	20 to 200 A _{DC}		
Intrinsic uncertainty	± 1% de 50 μΩ to 1 Ω		
Output voltage	110 V _{AC} : 4.2 V to 200 A 220 V _{AC} : 8.6 V to 200 A		
Maximum load resistance	110 V _{AC} : 20 mΩ to 200 A 220 V _{AC} : 42 mΩ to 200 A		

Test duration: 5 to 120 seconds if current >100A
Unlimited if current ≤100A

The instrument is protected against overcurrents, short circuits, overheating, and overvoltages on the output terminals.

7.2.2. CURRENT MEASUREMENT WITH THE OPTIONAL MR6292 CLAMP

Measurement range	1.0 - 50.0 A _{DC}
Resolution	0.1 mA
Intrinsic uncertainty	± (1.5% + 2 pt)
Output signal	10 mV / A _{DC}
Load impedance	> 100 kΩ // 100 pF
Influence of the position of the conductor in the jaws	0.5%

7.3. MEMORY

The C.A 6292 can record between 1,600 and 8,000 measurements, depending on how they are recorded.

7.4. ENVIRONMENTAL CONDITIONS

Indoor and outdoor use.

Range of operation	0 to 55°C and 10 to 95%RH without condensation
Range of storage	-10 to +70°C and 10 to 95%RH without condensation
Altitude	< 2000m
Degree of pollution	2

7.5. MECHANICAL CHARACTERISTICS

Dimensions (L x W x H)	502 x 394 x 190mm
Weight	approximately 13kg for the instrument and 9kg for the accessory carrying case.

Inrush protection with cover closed, IP54 per IEC 60-529.

Drop test per IEC 61010-1

7.6. COMPLIANCE WITH INTERNATIONAL STANDARDS

The device is compliant per IEC 61010-1 and IEC 61010-2-030.

7.7. ELECTROMAGNETIC COMPATIBILITY (CEM)

The instrument is compliant with standard IEC 61326-1.

8. MAINTENANCE



Except for the fuse, the instrument contains no parts that can be replaced by personnel who have not been specially trained and accredited. Any unauthorized repair or replacement of a part by an “equivalent” may gravely impair safety.

8.1. CLEANING

Disconnect the unit completely and turn the rotary switch to 0.

Use a soft cloth, dampened with soapy water. Rinse with a damp cloth and dry rapidly with a dry cloth or forced air. Do not use alcohol, solvents, or hydrocarbons.

8.2. REPLACING THE FUSE

If the instrument fails to switch on when you connect the instrument and set the On/Off switch to I, the fuse may have blown. Check and if necessary replace it.

Replacement procedure:

1. Switch the instrument off by setting the On/Off switch to 0.
2. Disconnect everything connected to the instrument: measurement leads, power cord, clamp, and earth.
3. Use a tool to unscrew the fuse holder on the front panel of the instrument.
4. Withdraw the fuse and replace it with an equivalent fuse (15A 250V 5x20mm)
5. Put the new fuse in the holder and screw the fuse holder back in place.

9. WARRANTY

Except as otherwise stated, our warranty is valid for **twelve months** starting from the date on which the equipment was sold. Extract from our General Conditions of Sale provided on request.

The warranty does not apply in the following cases:

- Inappropriate use of the equipment or use with incompatible equipment;
- Modifications made to the equipment without the explicit permission of the manufacturer’s technical staff;
- Work done on the device by a person not approved by the manufacturer;
- Adaptation to a particular application not anticipated in the definition of the equipment or not indicated in the user’s manual;
- Damage caused by shocks, falls, or floods.

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