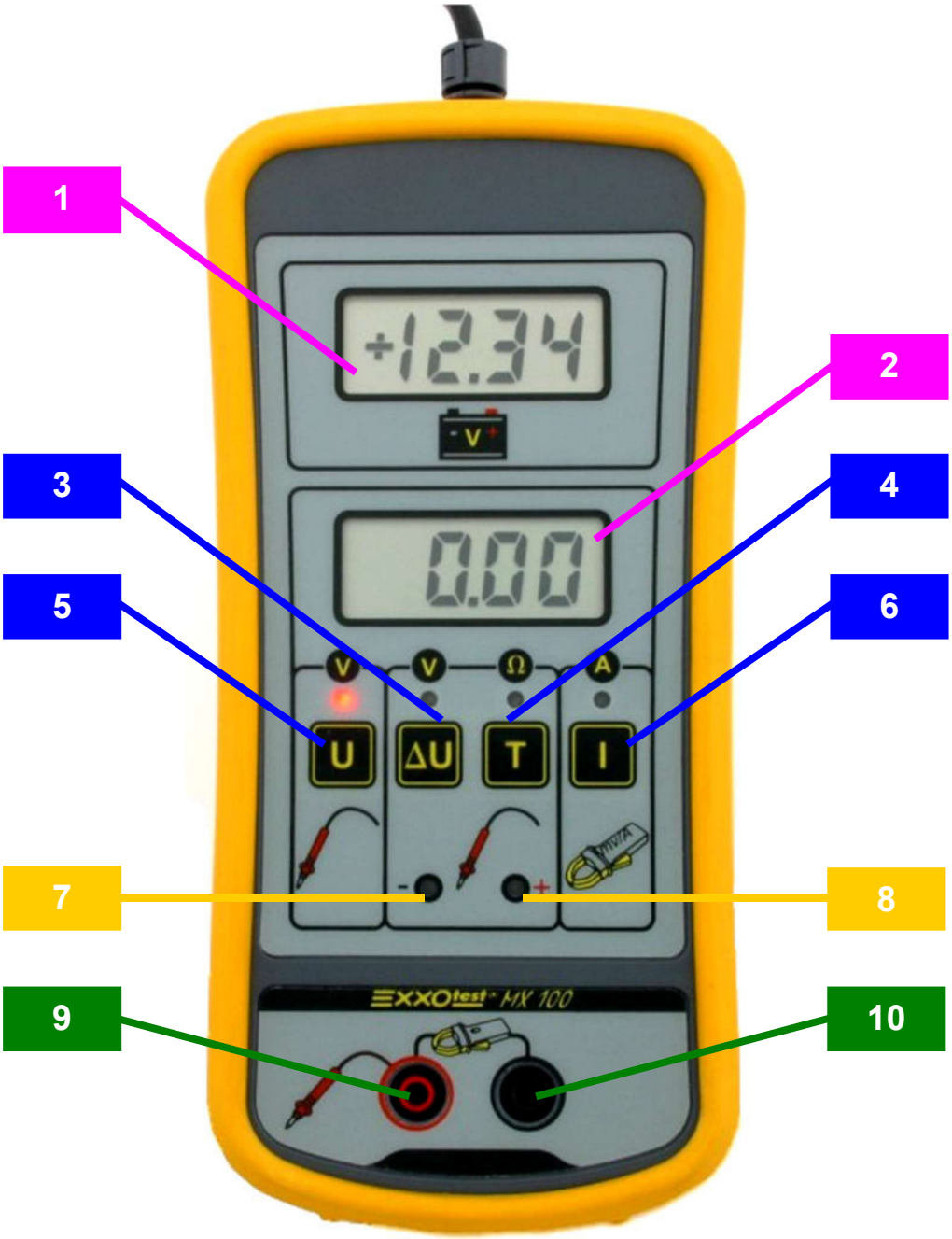
VEHICLE TESTER EXXOTEST MX100

For testing lines and voltage drops (12V)

User' guide



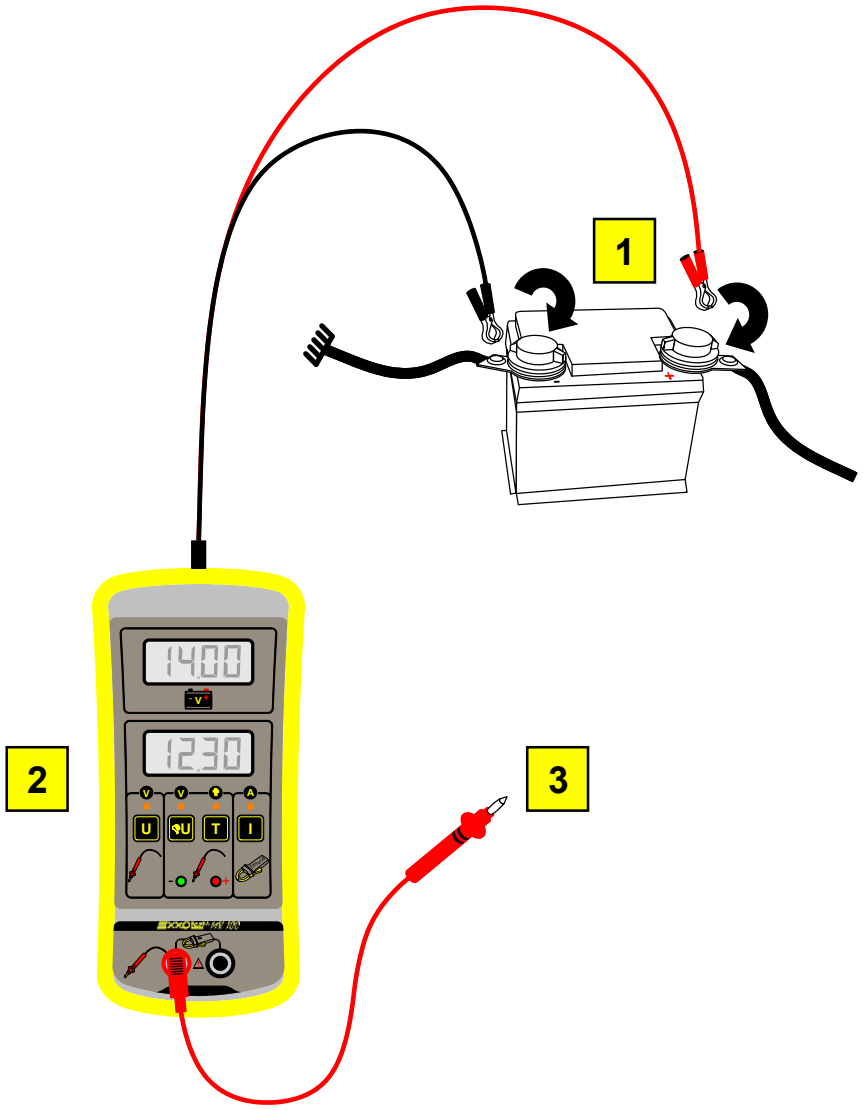
Document n° 00305023-v1

WARNING AND GENERAL PRECAUTIONS
READ BEFORE USING THE MX100

To ensure that the MX100 is used in safe conditions and to avoid damaging the device:

- Only use the MX100 in compliance with the provisions of this manual to avoid hampering its built-in protection devices.
- Do not use the MX100 if the device or its measuring leads are damaged, or if the device does not appear to be operating correctly.
- Check the operation of the MX100 by measuring a direct voltage. If in doubt, ensure the device is checked.
- Never apply voltage in excess of 30V.
- Do not use the device near to explosive gases, vapour or dust.
- Comply with all safety instructions for the equipment being tested.

VOLTMETER MODE



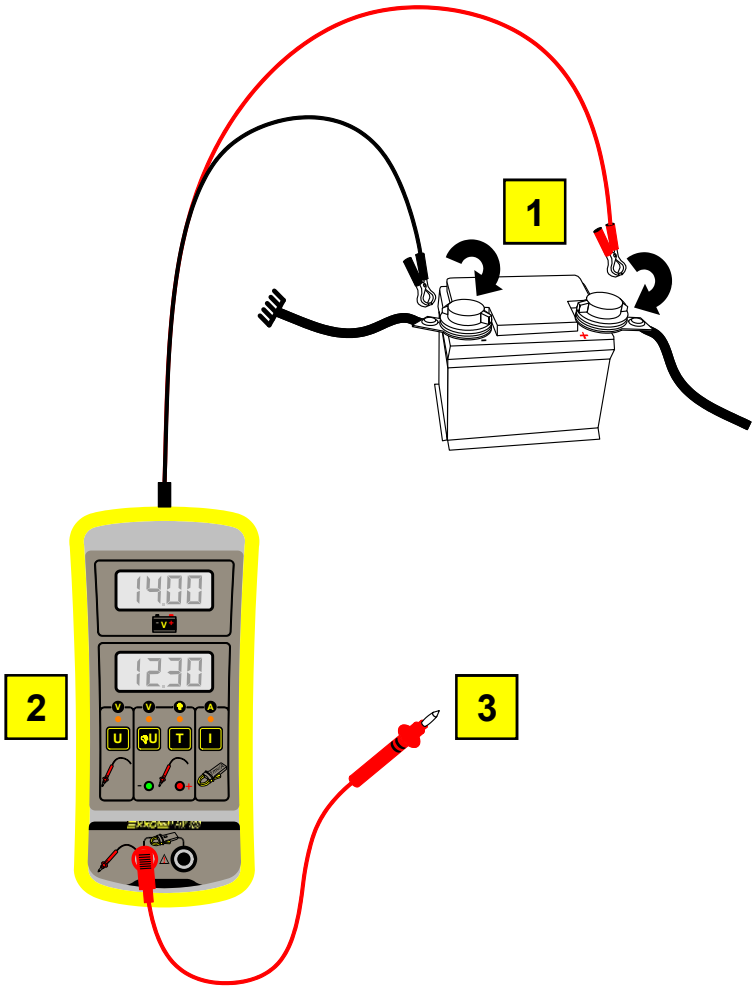
Carry out the following operations:

1 Connect the power clamps on the device to the battery terminals, the device will turn on and indicate the battery voltage on the display **1**

2 Switch the device to **Voltmeter** mode by pressing **5**
(This mode is selected by default when starting the device)

3 Take measurements using the test lead, with the device connected to the vehicle earth, and using this lead alone. The result will appear on the display **2**

DIFFERENTIAL VOLTMETER MODE



Carry out the following operations:

1 Connect the power clamps on the device to the battery terminals, the device will turn on and indicate the battery voltage on the display **1**

2 Switch the device to **Differential voltmeter mode** by pressing **3**

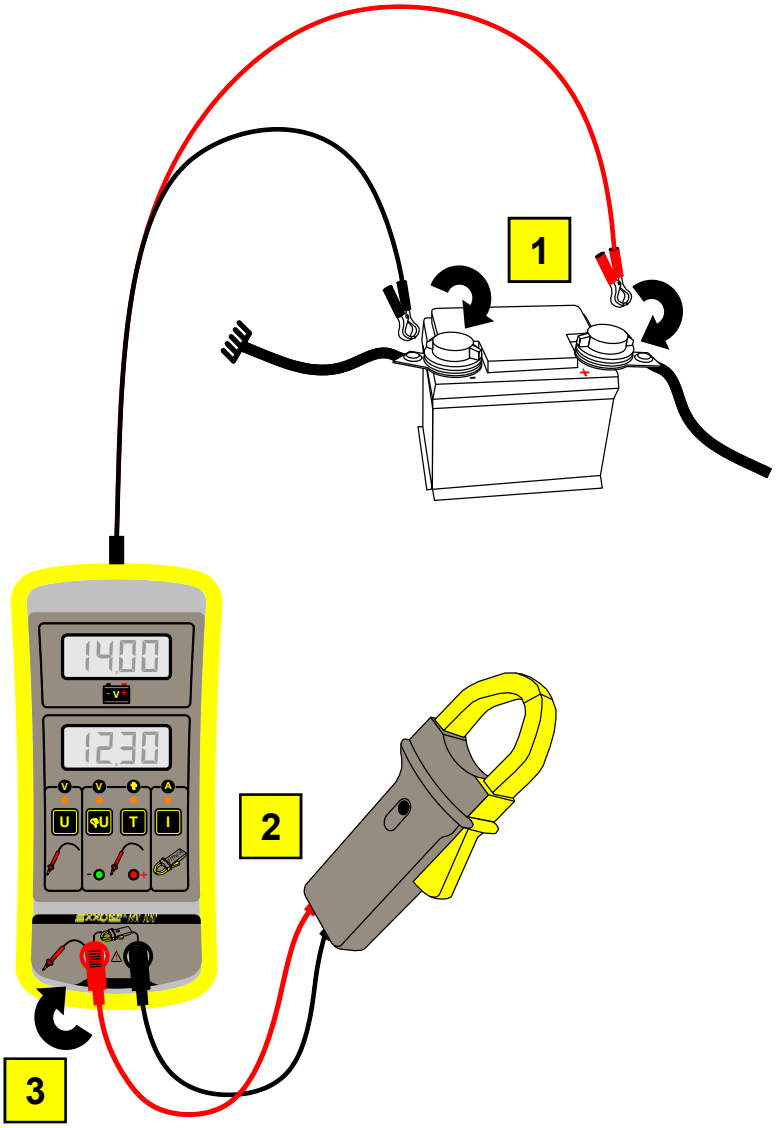
3 Take measurements using the test lead, the device will automatically display the voltage difference between the point measured and the reference value. This difference may be positive or negative:

- Green LED **7** on: measurement with reference to the battery earth
- Red LED **8** on: measurement with reference to the battery + terminal

IMPORTANT

MEASUREMENTS ARE ALWAYS TAKEN *WITH REFERENCE TO* A REFERENCE VOLTAGE (BATTERY EARTH OR + TERMINAL)

MODE AMPEREMETRE



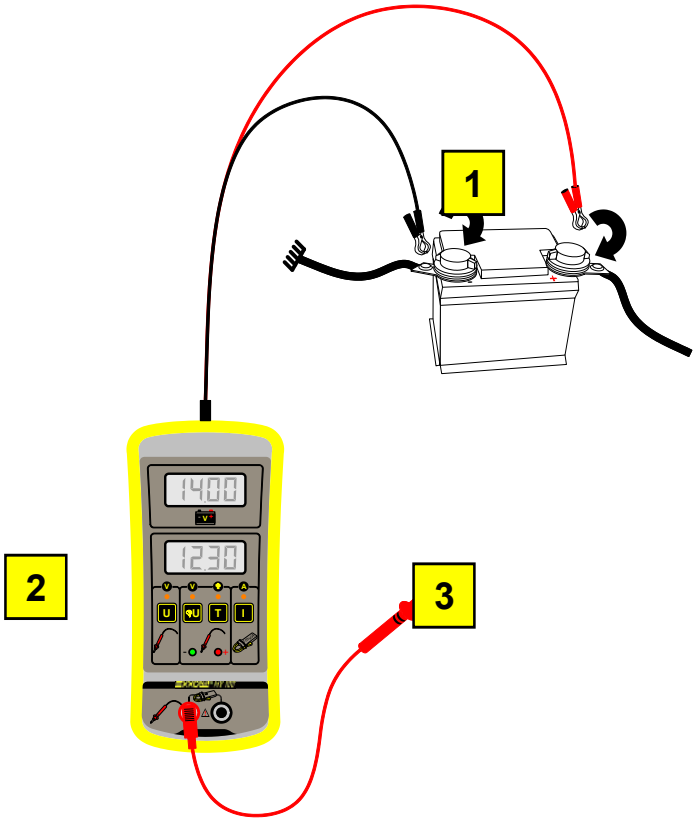
1 Connect the power clamps on the device to the battery terminals, the device will turn on and indicate the battery voltage on the display **1**

2 Switch the device to **Ammeter** mode by pressing **6**

3 Take measurements using an ammeter clamp (not supplied), check that the clamp is on and at the appropriate rating (refer to the manufacturer manual), read the result on the display **2**.

AUTOMATIC TEST LINE MODE

This mode can be used to locate an unsatisfactory connection. This mode is used if a difference in potential is detected between one of the battery terminals and a point which should be connected. In this case, the device calculates the resistance between the point measured and the reference (battery).



Carry out the following operations:

1 Connect the power clamps on the device to the battery terminals, the device will turn on and indicate the battery voltage on the display **1**

2 Switch the device to **Automatic test line** by pressing **4**

3 Take measurements using the test lead, the result will appear on the display **2**.

- The device automatically displays the value of the resistance between the measuring points and one of the battery terminals, one of the LEDs (**7** or **8**) will light up to indicate if the point measured is closer to the + terminal or the earth of the battery.

IMPORTANT

MEASUREMENTS SHOULD BE TAKEN ON A ***DE-ENERGISED*** LINE (NO LOAD)

WHICH MODE SHOULD BE USED?

Here are a few examples of measurements taken with the EXXOTEST MX100:

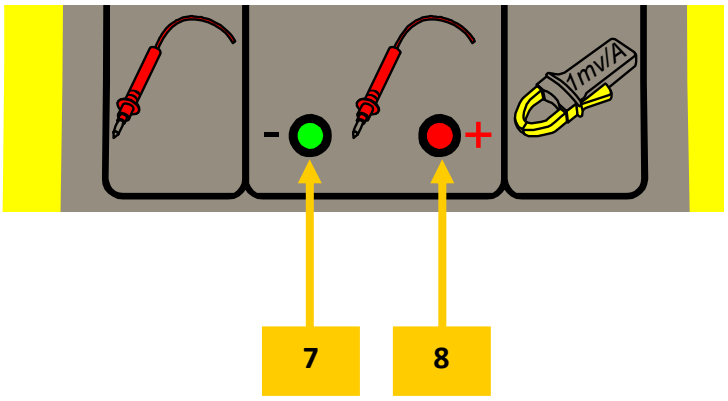
	U	ΔU	T	I
Measuring a probe voltage	✓			
Measuring a supply voltage	✓	✓		
Measuring an "earth"	✓	✓		
Measuring a voltage drop triggered by a unsatisfactory contact		✓		
Measuring the quality of a battery earth or + terminal		✓		
Measuring the resistance of a line*			✓	
Measuring an intensity using an ammeter clamp				✓

*after having detected a voltage drop in Differential Voltmeter mode (**ΔU**).

INTERPRETING POLARITY LEDS

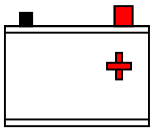
INDICATIONS FOR MEASURING POLARITY

FOR ΔU AND T MODES.



Voltage measured using the test lead:

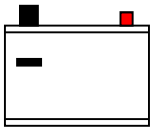
100% of battery voltage



If the red LED **8** is on:

Measurements are taken with reference to the battery plus terminal.

50% of battery voltage

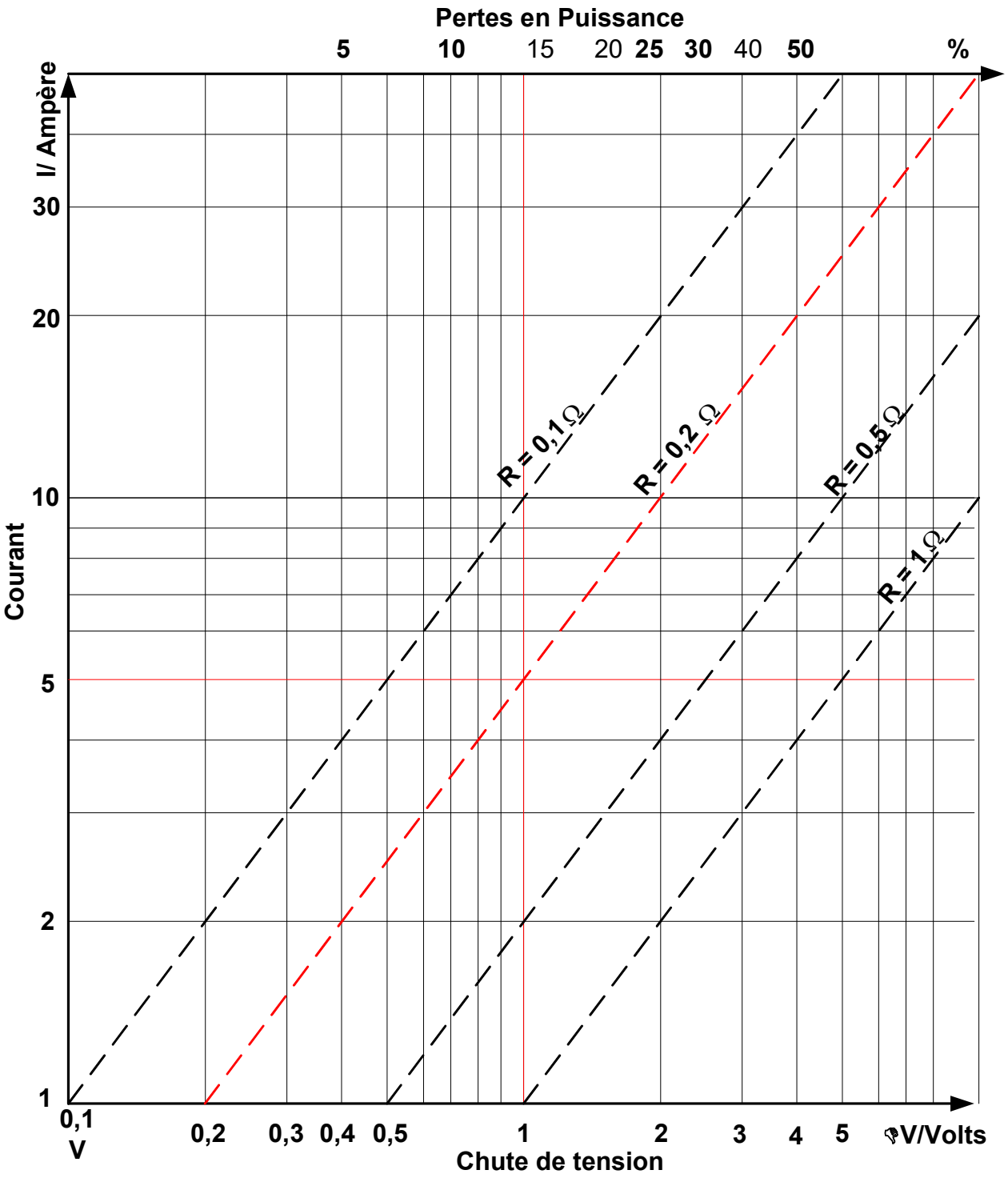


If the green LED **7** is on:

Measurements are taken with reference to the battery earth.

0% of battery voltage

CHARTS FOR RATIOS BETWEEN VOLTAGE, CURRENT, LINE RESISTENCE AND POWER OUTPUT



Pertes en puissance	Power losses
Courant	Current
Chute de tension	Voltage drop
Volts	Volts

Example:

With a 14V battery, a voltage drop of 1V corresponds to a 15% loss in power.
i.e. R=0.2Ω to 5A or R=0.1Ω to 10A

CHARACTERISTICS

These technical characteristics imply:

- *a one-year calibration cycle*
- *an operating temperature of 2 - 40°C*
- *a maximum humidity level of 80%*
- *a power supply between +10 and +15 V*

Function	Measuring span	Resolution	Precision +/- (% display) + (digits)	Comments
Battery Voltmeter	19.99V	0.01V	0.2% +/-1	Input impedance = 750kΩ
DC Voltmeter	19.99V	0.01V	0.4% +/-2	Input impedance = 150kΩ
Differential voltmeter	19.99V	0.01V	0.4% +/-2	Input impedance = 150kΩ Display "**---**" if the measurement is out-of-tolerance
Line resistance measurement	19.99Ω	0.01Ω	3% +/-50mΩ	Measuring current 0.1A Max. voltage = battery voltage
Ammeter with AC/DC clamp 1mV/A or 10mV/A	+/-2V 1999 A or 199.9 A	1mV 1A 0.1A	0.2% +/- 2 (+ clamp error)	Measurement +/- 2V DC Input impedance = 500kΩ

Maximum electrical specifications	
Power voltage	From +9 to +30V (protection against overvoltage and polarity reversal)
Consumption	0.03A (max. 0.15A for a resistance measurement)
Out-of-tolerance	Display " --- "
Operating T°	from +2°C to +50°C
Storage T°	from -20°C to +60°C

DECLARATION CE OF CONFORMITY

By means of this declaration of conformity, as defined by the European Directive on Electromagnetic Conformity 2004/108/EC, the company:

ANNECY ELECTRONIQUE S.A.S.
Parc Altaïs
1, rue Callisto
74650 CHAVANOD

Declares that the following product:

Brand	Model	Description
EXXOTEST	MX100	Vehicle tester

I. has been manufactured in accordance with the requirements of the European directive:

- EMC Directive 2004/108/EC - 15/12/2004

and satisfies the requirements of the following standard:

- NF EN 61326-1 dated 07/1997 +A1 of 10/1998 +A2 of 09/2001
  Electrical measurement, control and laboratory equipment, EMC-related requirements.

II. has been manufactured in accordance with the requirements of the European Directives relating to EEE design and WEEE management for the EU. :

- Directive 2002/96/EC dated 27 January 2003 on Waste Electronic and Electrical Equipment (WEEE)
- Directive 2002/95/EC dated 27 January 2003 on the limitations for the use of certain hazardous substances in the construction of Electronic and Electrical Equipment (EEE).

Drawn up in Saint-Jorioz on 20 July 2007.

CEO - Stéphane SORLIN

	ID	DESCRIPTION
DISPLAYS	1	Permanent display of reference voltage: **Battery voltage**
	2	Display of the measurement depending on the **Selected mode**
OPERATING MODES	3	**Differential voltmeter mode selector** Displays the voltage difference with reference to the positive or negative battery terminal (voltage drop)
	4	**Automatic line test mode selector** Displays the resistance of a line with reference to the battery terminals (positive or negative)
	5	**Voltmeter mode selector** Displays the voltage with reference to the battery earth
	6	**Ammeter mode selector** Displays intensity using an ammeter clamp (not supplied)
POLARITIES	7	This indicator lights up in *Differential voltmeter* or *Automatic line test* mode if the measurement is taken with reference to the battery earth
	8	This indicator lights up in *Differential voltmeter* or *Automatic line test* mode if the measurement is taken with reference to the battery plus terminal
CONNECTIONS	9	Connecting socket for the **measuring lead** for *Voltmeter, Differential voltmeter* and *Line test*. In *Ammeter* mode, this socket is used to plug in the positive terminal of the ammeter clamp
	10	In *Ammeter* mode, this socket is used to plug in the negative terminal of the ammeter clamp

Description of the device shown on the first page.