



CRT-600A

600 A DC Contact Resistance Meter

Four-terminal · 100 to 600 A DC · 0.1 $\mu\Omega$ resolution

Quick Start Guide

Issue 1

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1 Safety

Read this section before using the instrument. The CRT-600A drives up to 600 A DC through the test object, and its supply is a high-power mains connection.

Never connect the instrument to equipment that is live or could become live. Isolate the test object and apply your site's earthing procedure before connecting the test leads.

- Connect the instrument's earth terminal to a reliable earth before connecting the supply, and remove it last.
- The supply connects to the two yellow power input terminals. The instrument is rated AC 220 V $\pm 10\%$, 50 Hz, 6000 W. Contact GPS to confirm the supply connection for your site before first use.
- Connect the supply cord to the instrument before connecting it to the supply, and disconnect the supply before removing the cord. Never touch the power input terminals while the supply is connected.
- Connect the test leads with the power switch off, and tighten the current leads firmly. A loose high-current connection heats up and gives a false reading. Do not disconnect any lead during a test.
- The test object, clamps and current leads can become warm during a long or repeated test at high current. Handle them with care.
- Use the instrument in a dry place between $-10\text{ }^{\circ}\text{C}$ and $40\text{ }^{\circ}\text{C}$, at no more than 80% relative humidity, without condensation.
- There are no user-serviceable parts inside. Return the instrument to GPS for service.

2 In the box

- CRT-600A contact resistance meter, in its aluminium carry case
- Test leads: thick current leads and thin voltage sense leads, red and black
- Power cord
- Earth lead
- Printer paper

Check the contents before you begin and keep the packaging. The instrument ships in a carton of $500 \times 440 \times 460$ mm, 22 kg gross.

3 The panel

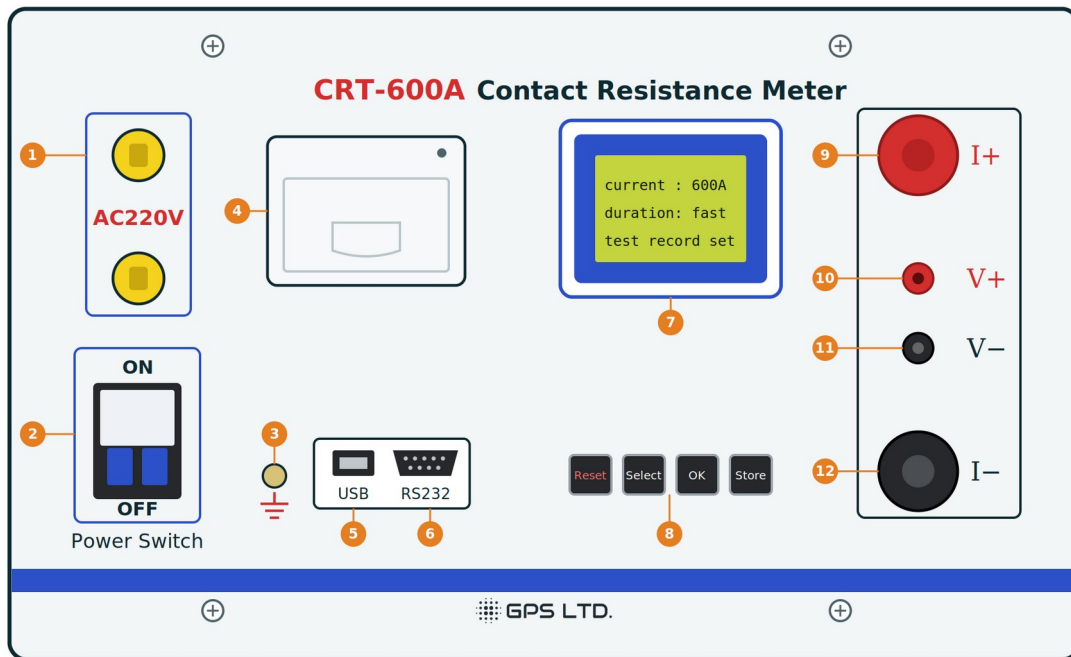


Figure 1 The front panel

No.	Item	What it is
1	Power input	The two yellow terminals marked AC220V. The supply cord connects here
2	Power switch	A circuit breaker: up for ON, down for OFF
3	Earth terminal	Connect to a reliable earth before connecting the supply
4	Printer	Prints the test result
5	USB port	USB connector
6	RS232 port	9-pin RS232 connector
7	Display	128 × 64 dot-matrix display: the settings, the test in progress and the result
8	Keys	Reset, Select, OK and Store. See the table below
9	I+	Current output, positive: the thick red lead
10	V+	Voltage sense, positive: the thin red lead
11	V-	Voltage sense, negative: the thin black lead
12	I-	Current output, negative: the thick black lead

The keys

The four keys change their job with the screen. Before a test they choose the settings; once a result is displayed, Store saves it and Select prints it.

Key	What it does
Reset	Returns the instrument to the ready state
Select	Steps through the values of the highlighted setting. When a result is displayed, prints it
OK	Confirms the setting and moves to the next. With test highlighted, starts the test
Store	When a result is displayed, saves it

4 Connecting the test object

The CRT-600A uses the four-terminal method. Two thick leads carry the test current through the object, and two thin leads measure the voltage across it, on the object itself. Because no current flows in the sense leads, the resistance of the leads and of the current clamps is left out of the result.

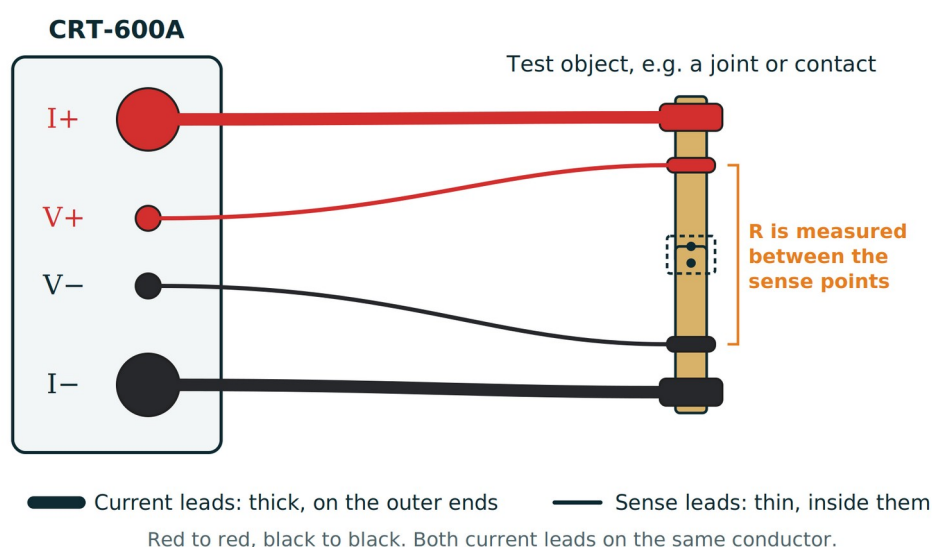


Figure 2 The four-terminal connection: current on the outer ends, sense inside them

- 1 Make sure the test object is isolated and earthed under your site procedure.
- 2 With the power switch off, connect the thick red lead to I+ and the thick black lead to I-, and tighten both.
- 3 Plug the thin red lead into V+ and the thin black lead into V-.
- 4 Clamp the two current leads onto the outer ends of the part you want to measure, both on the same conductor.
- 5 Clamp the two sense leads onto the object just inside the current clamps, red beside red and black beside black. The result is the resistance between the two sense points.

All contact surfaces must be clean and firmly in contact with the object. If a clamp jaw is oxidised or dirty, clean it until bright metal shows.

5 Switching on

- 1 Connect the earth lead from the earth terminal to a reliable earth.
- 2 Connect the supply cord to the two yellow power input terminals, then to the supply.
- 3 Switch the power switch on. The settings screen appears, with the date and time at the top.

6 Running a test

The settings screen has two settings, current and duration, and a row of three items: test, record and set. The highlighted item is the one the keys act on. Select steps through its values, and OK confirms it and moves to the next.

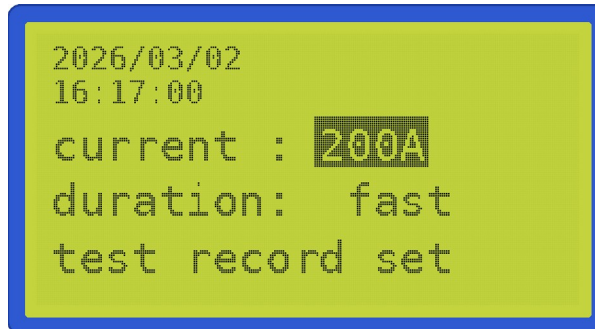


Figure 3 The settings screen, with the current highlighted

- 1 With current highlighted, press Select until the test current you want is shown: 100 A, 200 A, 300 A or 600 A. Press OK.
- 2 With duration highlighted, press Select to choose how long the current is applied. Fast gives a result in about 8 seconds; the instrument also offers timed and continuous durations. Press OK.
- 3 With test highlighted, press OK to start the test.

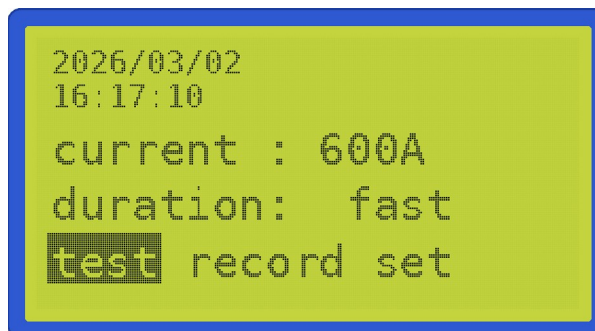


Figure 4 Ready to test: 600 A, fast, with test highlighted

While the test runs, the screen shows the elapsed time and the test current as it is applied.

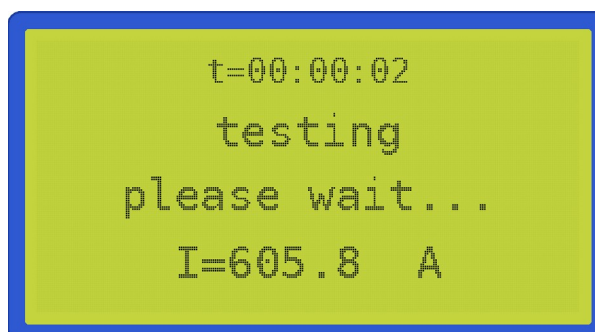


Figure 5 A test in progress

When the test ends, the screen shows the elapsed time, the test current and the resistance.

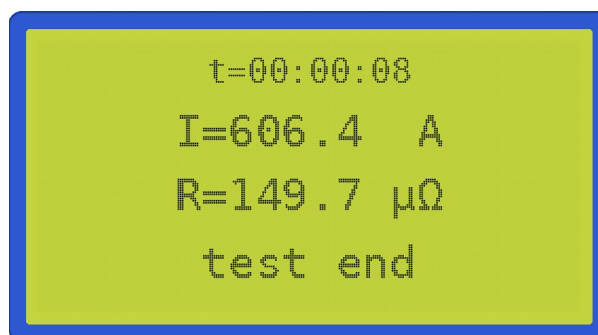


Figure 6 The result: here a 150 $\mu\Omega$ reference resistor measured at 600 A

7 Saving and printing a result

- Press Store to save the result. The instrument keeps the date and time with its stored data.
- Press Select to print the result on the built-in printer.
- Press Reset to return to the ready state for the next test.

The record and set items on the settings screen give access to stored results and to the instrument's settings. Full instructions for them are available from GPS on request.

8 When you have finished

- 1 Switch the power switch off.
- 2 Disconnect the supply, then remove the supply cord from the power input terminals.
- 3 Remove the test leads from the test object and from the instrument.
- 4 Remove the earth lead last.

9 Specification

Item	Specification
Test current	DC 100 A, 200 A, 300 A, 600 A
Measurement range	1 – 1999 $\mu\Omega$
Range by test current	0 – 50 m Ω (100 A) • 0 – 25 m Ω (200 A) • 0 – 16 m Ω (300 A) • 0 – 8 m Ω (600 A)
Resolution	0.1 $\mu\Omega$
Accuracy	0.5% ± 2 digits
Method	Four-terminal (Kelvin) connection, constant-current DC from a switching supply
Test duration	Fast • 30 s • 1 min • continuous
Test time	Result displayed in about 8 s (fast)
Display	128 × 64 dot-matrix LCD, English
Printer	Built-in, prints the test result
Data	Clock and data storage

Item	Specification
Interfaces	USB • RS232
Power	6000 W
Supply	AC 220 V $\pm 10\%$, 50 Hz. Contact GPS to confirm the supply connection for your site
Working environment	-10 °C to 40 °C • $\leq 80\%$ RH, non-condensing
Shipping	Carton 500 × 440 × 460 mm • 22 kg gross

Specifications as published. Contact GPS for the supply connection and for any detail not shown here.

10 Care and warranty

- Switch off and disconnect the supply before cleaning. Wipe the panel with a soft, dry or slightly damp cloth; do not use solvents or abrasive cleaners.
- Keep the test leads and clamps clean and undamaged; replace a lead with damaged insulation or a loose clamp before use.
- Close the lid and fasten the latches before carrying the instrument.

One year warranty from purchase, subject to registration at www.gpslimited.com/register-product. Service, calibration and support: sales@gpslimited.com or +44 (0) 203 093 0914.