



Photovoltaic tester **IV 600** is a multifunction **I-V curve tracer** meeting IEC 60891 standard providing information about performance and functionality of single face or bifacial PV systems.

IV 600: I-V curve tracing (performance/acceptance test)

IV 600 verifies performances of a PV string in accordance with IEC/EN 60891 guideline by **tracing I-V curve up to 1,500V, 40A**. By measuring the solar radiation (wireless connection with SOLAR03 required) and PV module temperature, IV 600 extrapolates results to STC (Standard Test Conditions: 1000W/m², 25°C, AM 1.5) and compares them to nominal values provided by the module manufacturer and stored in the internal data base (more than **40,000** modules already present in the database, additional modules can be stored). Finally, IV 600 provides a positive or negative outcome (OK/NO).

IV 600: Functionality checks

IV 600 verifies functionality of a PV string in accordance with IEC/EN62446 guideline by measuring open circuit voltage and short-circuit current under operating conditions **up to 1,500V, 40A**. IV 600 displays measures as well as their comparison to the previously tested PV strings. By measuring the solar radiation (wireless connection with SOLAR03 required) and PV module temperature, IV 600 can also extrapolate measures to STC and compare them with nominal values provided by the module manufacturer stored in the internal data base (more than **40,000** modules already present in the database, additional modules can be stored). Finally, IV 600 provides a positive or negative outcome (OK/NO).

IV 600: A “green” solution that never runs out of battery

To minimize battery consumption and allow battery recharging under any condition, IV 600 includes a revolutionary, **patent pending, BMS** (Battery Management System) that automatically:

- powers the instrument and recharge the batteries from the PV module/string under test (V_{min} = 40V)
- recovers energy from the test procedure to recharge the batteries.

1. GENERAL FEATURES

Feature	Note
Ratings	CAT III 1500VDC
PV module type - all most common types of photovoltaic module	<ul style="list-style-type: none"> • Single face • Bifacial
I-V curve – voltage range	15V – 1500V DC
I-V curve – current range	0.1A – 40A DC
DMM (input voltages)	✓
Wireless environmental parameters measurement (free field; max 100m, bluetooth connection with SOLAR03 required)	<ul style="list-style-type: none"> • Irradiance • Module temperature
Commissioning tests @ OPC (OPerating Conditions)	<ul style="list-style-type: none"> • Open circuit voltage (Voc) • Short circuit current (Isc)
Commissioning tests @ STC (Standard Test Conditions) (free field; max 100m, bluetooth connection with SOLAR03 required)	<ul style="list-style-type: none"> • Open circuit voltage (Voc) • Short circuit current (Isc)
Performance/Acceptance tests @ OPC (OPerating Conditions) – I-V curve:	✓
Performance/Acceptance tests @ STC (Standard Test Conditions) (free field; max 100m, bluetooth connection with SOLAR03 required)	<ul style="list-style-type: none"> • I-V curve • Outcome (OK/NO)
PV module datasheet data base	> 40,000 internal
Memory	9999 Test
Data transfer / Communication port	USB-C and WiFi
Touch screen colour graphic LCD	800 x 600 pxl
Help on line	✓
Buzzer	✓
Power supply	<ul style="list-style-type: none"> • Internal batteries • Instrument inputs • External power supply
Batteries	<ul style="list-style-type: none"> • 8 x 1.5V alkaline AA • 8 x 1.2V rechargeable AA
Temperature range	-10°C – +50°C
Waterproof	IP67 (closed) – IP40 (open)



2. ELECTRICAL SPECIFICATIONS

Accuracy is calculated as \pm [% readings + (no. of digits) * resolution] at 23 °C \pm 5 °C, relative humidity <80%HR

2.1. DMM

DC Voltage

Range (V)	Resolution (V)	Uncertainty
3 ÷ 1500	1	\pm (1.0%rdg + 2dgt)

AC TRMS Voltage

Range (V)	Resolution (V)	Uncertainty
3 ÷ 1000	1	\pm (1.0%rdg + 3dgt)

Frequency range: 42.5 ÷ 69Hz ; Voltages zeroed for measured value <3V

2.2. FUNCTIONAL TEST

IV CHECK - DC Voltage @ OPC

Range (V)	Resolution (V)	Uncertainty
3.0 ÷ 1500.0	0.1	\pm (0.2%rdg + 2dgt)

Minimum VPN voltage to start the test: 15V

IV CHECK - DC Current @ OPC

Range (A)	Resolution (A)	Uncertainty
0.10 ÷ 40.00	0.01	\pm (0.2%rdg + 2dgt)

PV module stray capacitance: max 30uF

IV CHECK - DC Voltage @ STC

Range (V)	Resolution (V)	Uncertainty
3.0 ÷ 1500.0	0.1	\pm (4.0%rdg + 2dgt)

IV CHECK - DC Current @ STC

Range (A)	Resolution (A)	Uncertainty
0.10 ÷ 40.00	0.01	\pm (4.0%rdg + 2dgt)

PV module stray capacitance: max 30uF



2.3. PERFORMANCE TEST

IV TEST - DC Voltage @ OPC

Range (V)	Resolution (V)	Uncertainty
3.0 ÷ 1500.0	0.1	$\pm(0.2\%rdg+2dgt)$

Minimum VPN voltage to start the test: 15V

IV TEST - DC Current @ OPC

Range (A)	Resolution (A)	Uncertainty
0.10 ÷ 40.00	0.01	$\pm(0.2\%rdg+2dgt)$

PV module stray capacitance: max 30uF

IV TEST - DC Voltage @ STC

Range (V)	Resolution (V)	Uncertainty
3.0 ÷ 1500.0	0.1	$\pm(4.0\%rdg+2dgt)$

IV TEST - DC Current @ STC

Range (A)	Resolution (A)	Uncertainty
0.10 ÷ 40.00	0.01	$\pm(4.0\%rdg+2dgt)$

PV module stray capacitance: max 30uF

IV TEST - DC Power @ OPC

Range (W)	Resolution (W)	Uncertainty
50 ÷ 9999	1	$\pm(1.0\%rdg+6dgt)$
10.00k ÷ 99.99k	0.01k	$\pm(1.0\%rdg+6dgt)$

PV module stray capacitance: max 30uF

IV TEST - DC Power @ STC (ref. to 1 PV module)

Range (W)	Resolution (W)	Uncertainty
50 ÷ 9999	1	$\pm(4.0\%rdg+2dgt)$

PV module stray capacitance: max 30uF

PV module type

All most common types of photovoltaic module, single face as well as **bifacial**



3. GENERAL SPECIFICATIONS

DISPLAY AND MEMORY:

Features:	Color graphic touch screen LCD 800x600
Memory:	max 9999 test, 3 levels of marker
Internal Data Base of PV module:	> 40,000

POWER SUPPLY:

Internal:	8x1.5V type AA alkaline or 8x1.2V type AA NiMH rechargeable battery
External:	PV inputs (Vmin 40V) Power supply adapter A0061 (100-415V, CAT IV 300, CAT III 600V)
Battery life:	IV and IVCK: >1,000 tests

IV 600 battery life is also extended by BMS (**Battery Management System – patent pending**) that recovers energy absorbed while tracing the IV curve to recharge the batteries.

OUTPUT INTERFACE

PC communication:	USB Type C and WiFi
SOLAR-03 communication:	BT communication (max distance 100m – outdoor free field)

MECHANICAL FEATURES

Dimensions (L x W x H):	335 x 289 x 155mm; (13.1 x 11.4 x 6.1in)
Weight (batteries included):	6kg; (212 ounces)
Mechanical protection:	IP67 (case closed), IP40 (open)

ENVIRONMENTAL CONDITIONS:

Reference temperature:	23°C ± 5°C ; (73°F ± 41°F)
Operating temperature:	-10°C ÷ 50°C ; (14°F ÷ 122°F)
Allowable relative humidity:	<80%RH
Storage temperature:	-20°C ÷ 60°C ; (-4°F ÷ 140°F)
Storage humidity:	<80%RH
Max. operating altitude:	2000m (6562ft)

GENERAL REFERENCE STANDARDS:

Safety:	IEC/EN61010-1, 61010-2-030
EMC:	IEC/EN61326-1
Safety of measurement accessories:	IEC/EN61010-031
Measurements:	IEC 60891, IEC/EN62446-1 (PV performance, IVCK)
Technical documentation:	IEC EN 61187
Insulation:	double insulation
Pollution degree:	2
Overvoltage category:	CAT III 1500V to ground, Max 1500VDC among inputs
Max. operating altitude:	2000m (6562ft)

This instrument satisfies the requirements of Directives:
RED: Directive 2014/53/EU, LVD: Directive 2014/35/EU, EMCD: Directive 2014/30/EU
RoHS: Directive 2011/65/EU, WEEE: Directive 2012/19/EU