Photovoltaic tester **IV 600** is a multifunction **I-V curve tracer** meeting IEC/EN60891. **IV 600** tests performance and functionality of **single face** and **bifacial** modules in PV systems.

IV 600: I-V curve tracing (performance/acceptance test)
IV 600 verifies the performance of PV strings in accordance with IEC/EN60891 by **tracing the I-V curve up to 1,500V and 40A**. Through the solar radiation and PV module temperature measurements (main unit wirelessly connected and/or synchronized to the remote unit SOLAR03), IV 600 extrapolates curves to the STC (Standard Test Conditions: 1000W/m^2, 25°C, AM 1.5) and compares them to the nominal values provided by the module manufacturer. The wide internal database already stores more than **40,000** modules, more modules can be added. Finally, IV 600 provides a positive or negative outcome (OK/NO).

IV 600: Functionality checks
IV 600 verifies the functionality of PV strings in accordance with IEC/EN62446 by measuring the open circuit voltage and short-circuit current under operating conditions **up to 1,500V and 40A**. According to the requirements of IEC/EN62446, IV 600 displays measures as well as their comparison to the previously tested PV strings. Through the solar radiation and PV module temperature measurements (main unit wirelessly connected and/or synchronized to the remote unit SOLAR03), IV 600 extrapolates measures to the STC (Standard Test Conditions: 1000W/m^2, 25°C, AM 1.5) and compares them to the nominal values provided by the module manufacturer. The wide internal database already stores more than **40,000** modules, more modules can be added. 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 recovers energy from the test procedure to recharge the batteries. In addition, IV 600 is powered by the PV module/string under test that also recharges the instrument's batteries to never run out of power.

1. GENERAL FEATURES

Feature		Note
Ratings		CAT III 1500VDC
PV module type - all most common types of photovoltaic module	• Single face	✔
	• Bifacial	✔
I-V curve – voltage range		15V – 1500V DC
I-V curve – current range		0.2A – 40A DC
DMM (input voltages)		✔
Wireless environmental parameters measurement (free field; max 100m, bluetooth connection with SOLAR03 required)	• Irradiance	✔
	• Module temperature	✔
Commissioning tests @ OPC (OPerating Conditions)	• Open circuit voltage (Voc)	✔
	• Short circuit current (Isc)	✔
Commissioning tests @ STC (Standard Test Conditions) (free field; max 100m, bluetooth connection with SOLAR03 required)	• 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)	• 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		✔
Battery recharging	• Instrument inputs	✔ **with BMS**
	• External power supply	✔
Batteries	• 8 x 1.5V alkaline AA	✔
	• 8 x 1.2V rechargeable AA	✔
Temperature range		-10°C – +50°C 14°F – 122°F
Waterproof		IP67 (closed) – IP40 (open)

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2. ELECTRICAL SPECIFICATIONS

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

2.1. DMM

DC Voltage

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

AC TRMS Voltage

Range (V)	Resolution (V)	Uncertainty
3 ÷ 1000	1	± (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	±(0.2% Voc)

Minimum VPN voltage to start the test: 15V

IV CHECK - DC Current @ OPC

Range (A)	Resolution (A)	Uncertainty
0.20 ÷ 40.00	0.01	±(0.2% Isc)

PV module stray capacitance: max 30uF

IV CHECK - DC Voltage @ STC

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

IV CHECK - DC Current @ STC

Range (A)	Resolution (A)	Uncertainty
0.20 ÷ 40.00	0.01	±(4.0%rdg + 2dgt)

PV module stray capacitance: max 30uF

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2.3. I-V CURVE TRACING

IV TEST- DC Voltage @ OPC

Range (V)	Resolution (V)	Uncertainty
3.0 ÷ 1500.0	0.1	±(0.2% Voc)

Minimum VPN voltage to start the test: 15V

IV TEST - DC Current @ OPC

Range (A)	Resolution (A)	Uncertainty
0.20 ÷ 40.00	0.01	±(0.2% Isc)

PV module stray capacitance: max 30uF

IV TEST - DC Voltage @ STC

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

IV TEST - DC Current @ STC

Range (A)	Resolution (A)	Uncertainty
0.20 ÷ 40.00	0.01	±(4.0%rdg+2dgt)

PV module stray capacitance: max 30uF

IV TEST - DC Power @ OPC

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

PV module stray capacitance: max 30uF
(*) The max power the instrument can measure considers a FF = 0.7. Therefore Pmax= 1500V x 40A x 0.7 = 42.00kW

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

Range (W)	Resolution (W)	Uncertainty
50 ÷ 9999	1	±(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 **bi-facial**

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, 50/60Hz, CAT IV 300V)
Battery life (@ 20°C):	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.
According to battery manufacturers prescriptions, batteries are charged with environmental temperature within 0°C and +40°C to protect the batteries, enhance their life and prevent explosion or acid leak.

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