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NEW

For daily application in photovoltaic systems

The **I-V600** model is an **I-V Curve** and functional test verification (Voc, Isc) instrument compliant with IEC/EN60891, IECEN60904-1-2 and IEC/EN62446 guidelines. **I-V600** tests the performance and functionality of **Monofacial** and **Bifacial** PV modules/strings.

I-V CURVE TRACER (PERFORMANCE/ACCEPTANCE TEST)

I-V600 verifies the performance of PV strings in compliance with IEC/EN60891 guideline by tracking the I-V curve on installations **up to 1500VDC** and **40ADC**. Through solar irradiation and temperature measurements of the PV modules (in wireless combination with the **SOLAR03** remote unit), I-V600 extrapolates the @STC curves (**S**tandard **T**est **C**ondition: 1000W/m2, 25°C, AM 1.5) comparing them with the ratings provided by the module manufacturer. The large internal database stores up to 1000 different manufacturers and up to 1000 modules associated with each manufacturer directly, easily programmable by touch-screen display.

FUNCTIONAL TEST (IVCK)

I-V600 verifies the functionality of PV strings in accordance with IEC/EN62446 guideline by measuring, with or without solar radiation, the open circuit voltage (Voc) and the short circuit current (Isc) in operating conditions (@OPC) **up to 1500VDC and 40ADC**. By measuring solar radiation and temperature of the PV modules (in wireless combination with the **SOLAR03** remote unit), I-V600 extrapolates the values @ STC (**S**tandard **T**est **C**ondition: 1000W/m2, 25°C, AM 1.5) and compares them with the ratings provided by the module manufacturer.

I-V600 EXTENDS THE CHARGE OF THE INTERNAL BATTERIES

To increase the autonomy of the batteries and allow them to be recharged, I-V600 is equipped with a professional internal **BMS (Battery Management System**) algorithm which automatically recovers energy from the discharge of the module capacities at the end of an I-V test and from the voltage present on the inputs. A valid aid in case you need to carry out many tests in rapid succession.

1. ELECTRICAL SPECIFICATIONS

Accuracy calculated as ±[%reading + (number dgts*resolution)] at 23°C ± 5°C, <80%RH

DMM – Multimeter function – DC Voltage

Range [V]	Resolution [V]	Accuracy
3 ÷ 1500	1	± (1.0%reading + 2dgt)

I-V CURVE TEST

DC Voltage @ OPC

Range [V]	Resolution [V]	Accuracy (*)
15.0 ÷ 1500.0	0.1	±(0.2%Voc)

(*) In compliance with IEC/EN60904-1; The measurement starts if VDC > 15V and module capacitance <30µF

DC Current @ OPC

Range [A]	Resolution [A]	Accuracy (*)
0.20 ÷ 40.00	0.01	±(0.2%isc)

(*) In compliance with IEC/EN60904-1; Iscmin = 0.2A and module capacitance <30µF

DC Power @ OPC (VDC > 30V)

Range [W] (**)	Resolution [W]	Accuracy (*)
50 ÷ 9999	1	±(1.0%reading+6dgt)
10.00k ÷ 99.99k	0.01k	

(*) VDC Voltage ≥ 30V and module capacitance <30µF
(**) Max measurable power considers a FF of 0.7 → Pmax= 1500V x 40A x 0.7 = 42.00kW

DC Voltage @ STC

Range [V]	Resolution [V]	Accuracy
3.0 ÷ 1500.0	0.1	±(4.0%reading+2dgt)

DC Current @ STC

Range [A]	Resolution [A]	Accuracy
0.20 ÷ 40.00	0.01	±(4.0%reading+2dgt)

DC Power @ STC (referred @ 1 module)

Range [W]	Resolution [W]	Accuracy
50 ÷ 9999	1	±(4.0%reading+2dgt)

FUNCTIONAL TEST (IVCK)

DC Voltage @ OPC

Range [V]	Resolution [V]	Accuracy (*)
15.0 ÷ 1500.0	0.1	±(0.2%Voc)

(*) In compliance with IEC/EN60904-1; The measurement starts if VDC > 15V and module capacitance <30µF

DC Current @ OPC

Range [A]	Resolution [A]	Accuracy (*)
0.20 ÷ 40.00	0.01	±(0.2%isc)

(*) In compliance with IEC/EN60904-1; Iscmin = 0.2A and module capacitance <30µF

DC Voltage @ STC

Range [V]	Resolution [V]	Accuracy
3.0 ÷ 1500.0	0.1	±(4.0%reading+2dgts)

DC Current @ STC

Range [A]	Resolution [A]	Accuracy
0.20 ÷ 40.00	0.01	±(4.0%reading+2dgts)

2. GENERAL SPECIFICATIONS

DISPLAY AND MEMORY	
Characteristics:	Color TFT, capacitive touch screen, 7”, 800x480pxl
Type of memory:	Memory card, max 32GB (not expandable)
Module database:	ca. 63,000 saved modules
Storable data:	9999 test IVCK or I-V curve
POWER SUPPLY:	
Internal power supply:	8x1.5V alkaline battery type LR6, AA or 8x1.2V rechargeable battery NiMH type LR6, AA
External power supply:	100-440VAC/15VDC, 50/60Hz CAT IV 300V (**use only HT adapter)**
Battery charging algorithm:	via inputs P1, C1, P2, C2
Battery charging system (BMS):	energy recovered from I-V curve measurements
Consumption:	8W
Low battery indication:	“ “ symbol shown on the display
Charging time:	approx. 4 hours
Battery life (@ 0°C ÷ 40°C):	8 hours in the following conditions: ➢ Battery capacity: 2000mAh ➢ PV string voltage: 800V ➢ Work cycles: 80 measurements/hour ➢ Instrument connected to the modules for 30s/measurement ➢ Instrument disconnected for 15s/measurement
Auto Power OFF:	1 ÷ 10min selectable (disabling)
OUTPUT INTERFACE	
PC interface:	USB-C and WiFi
Interface with SOLAR03:	Bluetooth connection (up to 100m in free space)
MECHANICAL CHARACTERISTICS	
Dimensions (L x W x H):	336 x 300 x 132mm (13 x 12 x 5in)
Weight (included batteries):	5.5kg (11lv)
Mechanical protection:	IP40 (open case), IP67 (closed case)
ENVIRONMENTAL CONDITIONS OF USE	
Reference temperature:	23°C ± 5°C (73°F ± 41°F)
Operating temperature:	-10°C ÷ 50°C (14°F ÷ 122°F)
Operating humidity:	<80%RH
Storage temperature:	-20°C ÷ 60°C (-4°F ÷ 140°F)
Storage humidity:	<80%RH
Max. height of use:	2000m (6562ft)
REFERENCE GUIDELINES	
Safety:	IEC/EN61010-1, IEC/EN61010-2-030,
EMC:	IEC/EN61326-1
Safety measurement accessories:	IEC/EN61010-031
I-V Test:	IEC/EN60891, IECEN60904-1-2
IVCK Test:	IEC/EN62446, IECEN60904-1-2
Insulation:	double insulation
Pollution degree:	2
Radio:	ETSI EN300328, ETSIEN301489-1, ETSIEN301489-17
Measurement category:	CAT III 1500VDC, max 1500VDC between inputs

This instrument complies with the requirements of the European Low Voltage Directive 2014/35/EU (LVD), the Directive 2014/30/EU (EMC) and the RED regulation 2014/53/EU
This instrument complies with the requirements of the European Directive 2011/65/EU (RoHS) and the European Directive 2012/19/EU (WEEE)

ACCESSORIES

	SOLAR I-Ve	I-V400w	I-V500w	PVCHECKs	PV-ISOTEST	PVCHECKs PRO	IV-600
TOPVIEW2006 PC Windows software + USB/optical cable	S	S	S	S	S	-	-
PT300N Temperature probe	S	O	O	O	-	-	-
PT305 PT1000 probe for module temperature measurement	-	-	-	-	-	O	S
SOLAR-02 Remote unit	S	O	O	O	-	-	-
SOLAR03 Remote unit	-	-	-	-	-	O	S
HT305 Reference cell for irradiance measurement with module mount	-	-	-	-	-	O	S
KIT2PRO15 Set of 2 cables banana-banana 3 meter long + 2 alligator clips (red and black) - 2 units	-	-	-	-	-	-	S
KIT4PRO15 Set of 4 cables banana-banana 4mm + 4 alligator clips (red, green, blu and black)	-	-	-	-	-	S	-
KITGSC4 Set of 4 cables + 4 alligator clips	S	S	S	S	S	-	-
KITPVMC4150 Set of 2 adapters male 4mm banana to MC4 compatible connector, 3 meter long	-	-	-	-	-	S	S
KITPVMC3 Set of 2 adapters with MC3 connectors	S	S	S	-	-	-	-
KITPVMC4 Set of 2 adapters with MC4 connectors	S	S	S	-	-	-	-
KITPCMC3 Set of 2 adapters with MC3 connectors	-	-	-	S	O	-	-
KITPCMC4 Set of 2 adapters with MC4 connectors	-	-	-	S	S	-	-
KITPVEXT25M 25 meter green and black extension cord	O	O	O	O	-	-	-
KITKELVIN Twin-cable set for AUTO SEQUENCE tests	O	O	O	-	-	-	-
KITK2TIPS15 Set of 2 PV4 compatible plugs	-	-	-	-	-	-	O
KITPVPROEXT20 2 banana male to female extension cables 20m (green and black)	-	-	-	-	-	O	O
606-IECN Connector with magnetic tip	O	O	O	O	O	-	-
HT304N Reference cell	S	S	S	O	-	-	-
M304 Mechanical inclinometer	S	S	S	O	-	O	S
HT4004 Standard 10-100A DC clamp, 30 mm	S	-	-	O	-	-	-
HT98U Standard 1000A DC clamp, 50 mm	O	-	-	O	-	-	-
HP30D1 Standard 1000A DC clamp, 83 mm	O	-	-	O	-	-	-
HT4005K Standard 200A AC clamp, 40 mm	S	-	-	-	-	-	-
HT4005N Standard 5-100A AC clamp, 20 mm	O	-	-	-	-	-	-
HT96U Standard 1-100-1000A AC clamp, 54 mm	O	-	-	-	-	-	-
HT97U Standard 10-100-1000A AC clamp, 54 mm	O	-	-	-	-	-	-
HP30C2 Standard 200-2000A AC clamp, 70 mm	O	-	-	-	-	-	-
HP30C3 Standard 3000A AC clamp, 70 mm	O	-	-	-	-	-	-
BORSA2051 Soft carrying bag	-	-	-	S	-	-	-
VA500 Rigid carrying case	S	S	S	O	-	-	-
VA507 Rigid carrying case	-	-	-	O	S	S	-
SP-2002 Magnetic strip for HT Instruments	-	-	-	-	-	-	S
SP-2003 Shoulder strap	-	-	-	-	-	-	S
SP-0400 Free hands kit	O	O	O	O	O	-	-
SP-0500 Free hands kit	O	O	O	O	O	-	-
SP-5100 Set of straps	-	-	-	-	-	S	-
CF832 32GB Memory card	-	-	-	-	-	-	S
A0061 External power charger with shuko-plug cable	-	-	-	-	-	-	S
C2006 Optical/U connection cable	-	-	-	-	-	S	-
C2010 Cable UsbA-UsbC 1,5mt	-	-	-	-	-	-	S
YABAT0003000 Rechargeable battery NiMH, 1.2V, type AA - 10 units	-	-	-	-	-	S (6pz)	S (10pz)
YABAT0004001 External battery charger for AA batteries	-	-	-	-	-	S	-
BORSAZAINO Professional HT backpack	-	-	-	-	-	-	S
ISO9000 test report Provided with I-V600, SOLAR-03 and HT305	-	-	-	-	-	S	S

- : Not compatible | **S:** Standard | **O:** Optional