

PVA-1500HE2/PVA-1500T2/ SolSensor-300V3

Solmetric I-V Curve Tracer

Product Specifications

1/2024 (English)

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Specifications

PVA-1500HE2/PVA-1500T2

Table 1. Electrical and Mechanical Specifications

Parameter	PVA-1500T2	PVA-1500HE2
Voltage range (V_{oc})	20 V dc to 1500 V dc	
Maximum current range (I_{sc})		
for module efficiency <19 %	0 A dc to 30 A dc	
for module efficiency $\geq$ 19 %	0 A dc to 10 A dc ^[1]	0 A dc to 30 A dc
Voltage accuracy (0 °C to 45 °C) ^[2]	$\pm(0.5 \% + 0.25 \text{ V})$	
Current accuracy (0 °C to 45 °C) ^[2]	$\pm(0.5 \% + 0.04 \text{ A})$	
Power accuracy (0 °C to 45 °C) ^[2]	$\pm(1.7 \% + 1.0 \text{ W})$ (current $\geq$ 3 A, module efficiency <19 %)	
Voltage resolution	25 mV	
Current resolution	2 mA	
Measurement Throughput ^[3]		
Sweep-to-sweep delay (1@VOC < 1350 V)	<9 s	
Max # I-V sweeps per hour (1@VOC < 1350 V)	400 sweeps/hr	
Max megawatts measured per hour	3.5 MW/hr	
Thermal Capacity ^[4]		
# sweeps at 18 s sweep-to-sweep delay	unlimited (25 °C, 77 °F ambient) 550 (45 °C, 113 °F ambient)	
# sweeps at 9s sweep-to-sweep delay	unlimited (25 °C, 77 °F ambient) 330 (45 °C, 113 °F ambient)	
I-V sweep duration ^[5]	0.05 s to 2 s. Typically 0.2 s for PV strings	
Number of I-V trace points	100 or 500 (user controlled)	
Wireless range (open line of sight)	100 m, 328 ft	
Operating temperature range	0 °C to +45 °C, 32 °F to +113 °F	
Storage temperature range	-20 °C to +65 °C, -4 °F to +149 °F	
Operating humidity	<90 % RH, non-condensing. Avoid exposing a cold instrument to warm and humid air as condensation will result. Store the instrument in the same conditions in which the instrument will be used.	

PVA-1500HE2/PVA-1500T2/SolSensor-300V3

Product Specifications

Table 1. Electrical and Mechanical Specifications (cont.)

Parameter	PVA-1500T2	PVA-1500HE2
Altitude	2000 m max	
Battery charging time	6 hr	
Battery run time	Approx. 8 hr ^[6]	Approx. 7 hr ^[6]
General	IEC 61010-1: Pollution Degree 2	
Warning features	Over-voltage, over-current, over-temperature, reverse polarity	
PV connector	Staubli MC4-EVO2	Banana Jacks
Charging/charged LED	Yes	
In-the-field firmware update-ready	Yes	
Interface to Table/Laptop ^[7]	Wi-Fi interface between user tablet or laptop, I-V unit, and SolSensor.	
Weight	6.6 kg, 14.55 lb ^[8]	7.3 kg, 16.09 lb ^[8]
Height	43.2 cm, 1.41 ft (including test lead and strain reliefs)	53.3 cm, 1.74 ft
Width	21.6 cm, 8.50 in	
Depth	15.2 cm, 5.98 in	

- [1] High-efficiency modules have high capacitance which can cause a large in-rush current when I-V curves are measured. This can trigger an over-current warning in the PVA-1500T2 that prevents a complete measurement when measuring strings over 10A I_{sc} . The in-rush current is increased by higher efficiency, higher current strings, higher voltage strings, higher bifaciality, and higher irradiance. For an explanation of flexibility in the 10 A limit and how to handle high efficiency modules, see *High-efficiency Modules* in the Product Users Manual.
- [2] Voltage, current, and power accuracy is specified only for V_{oc} , V_{mp} , I_{sc} , I_{mp} , and P_{max} .
- [3] Measurement Throughput is a specification of how quickly sequential measurements can be made. The specifications shown are for $1000V < V_{oc} \leq 1350 V$. For other voltage ranges, see Table 3 in the Users Manual. Max Megawatts per hour spec assumes reference PV system with $V_{mp} = 1100V$ and $I_{mp} = 25 A$.
- [4] Thermal capacity is the # of I-V sweeps before the PVA must cool down for an extended period. These specs assume a reference PV system with $V_{oc} = 1300 V$, $V_{mp} = 1100 V$, 16 strings per combiner, 5 min to move to the next combiner with no measurements. No direct sunlight on I-V unit.
- [5] Automatically selected. Measurement sweep time depends upon the characteristics of the test device (PV module, string, or array) electrical characteristics.
- [6] Runtimes are at 25 °C internal temperature and are shorter at colder temperatures.
- [7] The measurement is controlled via wireless link from the user's tablet or notebook PC.
- [8] This specification includes the soft case, test leads, and charger.

SolSensor Specifications

Table 2. SolSensor Specifications

Parameter	SolSensor Specification
Irradiance	
Sensor type	Silicon photodiode with corrections for temperature, spectral, and angular effects
Measurement range	100 W/m ² to 1500 W/m ²
Accuracy	±2 % when used to predict the performance of well characterized poly- and monocrystalline PV modules with direct irradiance >600W/m ² . Contact Fluke for more information on accurate irradiance measurements.
Resolution	1 W/m ²
Measurement interval	Typically, 3.5 s
Temperature	
Sensor type	Type K thermocouple. Two inputs.
Measurement range	0 °C to 100 °C, 32 °F to 212 °F
Accuracy	±2 °C, 35.6 °F (not including limits of error of thermocouple)
Resolution	0.1 °C, 32.18 °F
Measurement interval	Typically, 3.5 s
Tilt	
Sensor type	Electronic
Measurement range	0 deg to 90 deg from horizontal
Accuracy	±2 deg typical (0 deg to 45 deg)
General	
Measurement synchronization with I-V curve	Typically, <1 s
Wireless range (open line of sight)	100 m, 328 ft
Operating temperature range	0 °C to 45 °C, 32 °F to 113 °F
Storage temperature range	-20 °C to 65 °C, -4 °F to 149 °F
Operating Humidity	<90% RH, non-condensing. Avoid exposing a cold instrument to warm and humid air as condensation will result. Store the instrument in the same conditions in which the instrument will be used.
Battery charging time	6 hr
Battery run time	>16 hr typical use
Weight	0.9 kg (not including soft case accessories)
Dimensions	H=38 cm x W=11 cm x D=7 cm H=14.96 in x W=4.33 in x D=2.75 in

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Product Specifications

Electromagnetic Compatibility

IEC 61326-1: Basic Electromagnetic Environment

CISPR 11: Group 1, Class A

Group 1: Equipment has intentionally generated and/or use conductively coupled radio frequency energy which is necessary for the internal functioning of the equipment itself.

Class A: Equipment is suitable for use in all establishments other than domestic and those directly connected to a low voltage power supply network which supplies buildings used for domestic purposes. There may be potential difficulties in ensuring electromagnetic compatibility in other environments, due to conducted and radiated disturbances.

Caution: This equipment is not intended for use in residential environments and may not provide adequate protection to radio reception in such environments.

USA (FCC) 47 CFR 15 Intentional Radiators: This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
 - (2) this device must accept any interference received, including interference that may cause undesired operation.
- (15.19). Changes or modifications not expressly approved by Fluke could void the user's authority to operate the equipment.
(15.21)

PVA-1500 Test Lead and Clip Specifications

Table 3. PVA Test Leads and Clip Specifications^[1]

Parameter	Specification
Voltage range	0 V dc to 1500 V dc
Current range	0 A dc to 30 A dc
Temperature	0 °C to 45 °C, 32 °F to 113 °F
Humidity	Maximum relative humidity of 80 % for temperatures up to 31 °C (87.8 °F) decreasing linearly to 50 % relative humidity at 40 °C (104 °F)
Pollution degree	2
Altitude	2000 m, 6561 ft maximum
Lead length	152 cm, 59.84 in
Lead colors	Positive=red, negative=black
Manufacturer (test leads and Dolphin clips)	Staubli
[1] Use only test leads and clips provided by Fluke for the PVA-1500.	