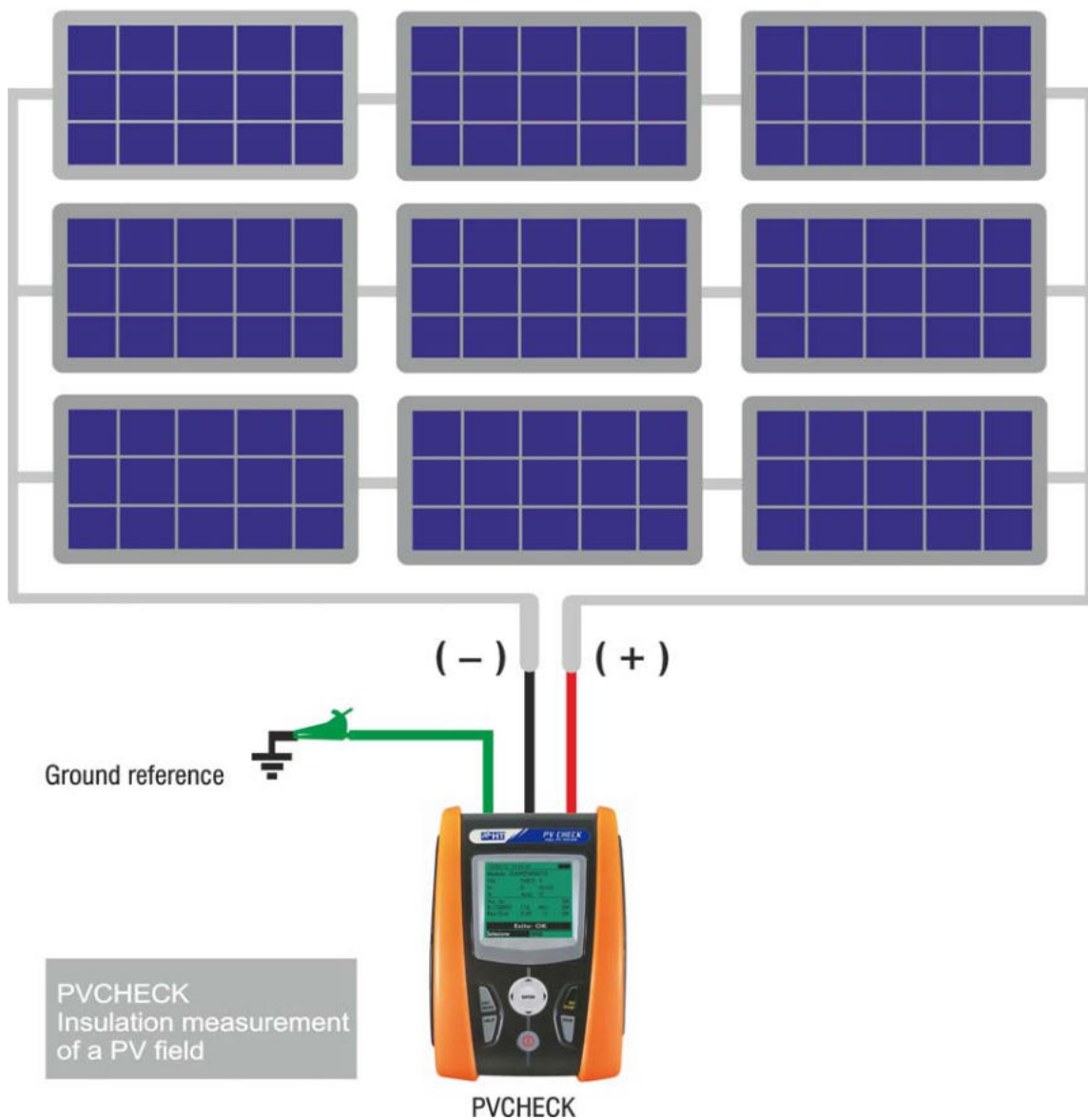


The multifunction instrument PVCHECK performs prompt and safe electrical checks required for a PV system (DC section) and controls of the functionality of modules / strings in accordance with IEC/EN62446 guideline

**PVCHECK: safety checks**

PVCHECK verifies the continuity of the protective conductors (and associated connections) and measures the insulation resistance of the active conductors on a module, a string, or a photovoltaic field in accordance to IEC/EN62446 guideline, without the need of any external switch to short-circuit the positive and negative terminals.

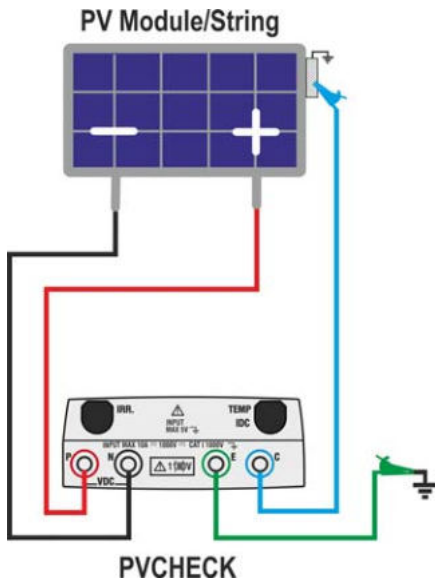
**PV field not connected to ground**



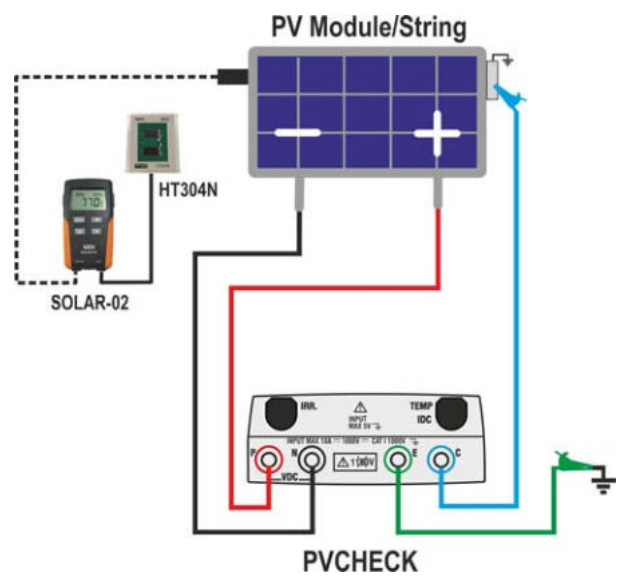
Direct measurement of insulation resistance of a PV Field not connected to ground

**PVCHECK: functionality checks**

PVCHECK verifies the functionality of a PV string in accordance to the IEC/EN62446 guideline by measuring the open circuit voltage and the short-circuit current at operating conditions and extrapolating the results to the STC (by measuring the solar radiation). Finally, it displays the measurements and a comparison to the PV strings previously tested.



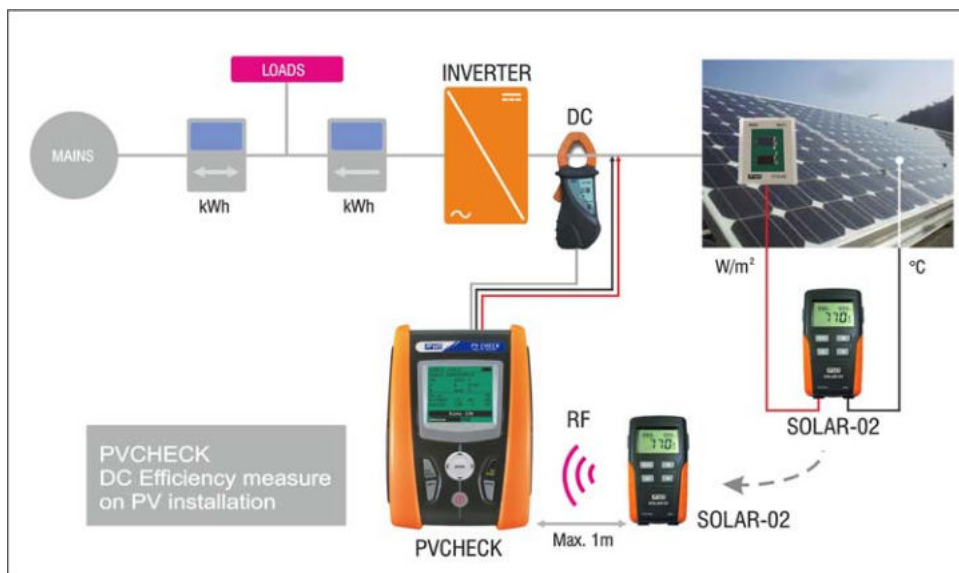
Test IVCK – Automatic measurement of Voc, Isc + Insulation + Continuity on a PV Module/String without irradiance measurement



Test IVCK – Automatic measurement of Voc, Isc + Insulation + Continuity on a PV Module/String with irradiance measurement with optional accessories SOLAR-02 and HT304N

**PVCHECK: performance checks**

PVCHECK analyses the performance of a PV array (DC) under the operating conditions (connected to the inverter) displaying the generated power and the efficiency of the PV plant in accordance to the IEC/EN62446



## 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. PERFORMANCE TEST

#### DC Voltage

Range (V)	Resolution (V)	Uncertainty
5.0 ÷ 199.9	0.1	$\pm$ (1.0%rdg + 2dgt)
200.0 ÷ 999.9	0.5	

#### DC current (by mean external clamp)

Range (mV)	Resolution (mV)	Uncertainty
-1100 ÷ -5	0.1	$\pm$ (0.5%rdg + 0.6mV)
5 ÷ 1100		

DC current is always positive ;DC current zeroed if the related voltage value is < 5mV

FS DC clamp [A]	Resolution [A]	Minimum read value [A]
1 < FS $\leq$ 10	0.001	0.05
10 < FS $\leq$ 100	0.01	0.5
100 < FS $\leq$ 1000	0.1	5

#### DC Power (Vmeas > 150V)

Clamp FS (A)	Range (W)	Resolution (W)	Uncertainty
1 < FS $\leq$ 10	0.000k ÷ 9.999k	0.001k	$\pm$ (1.5%rdg + 3dgt) (Imeas < 10%FS) $\pm$ (1.5%rdg) (Imeas $\geq$ 10%FS)
10 < FS $\leq$ 100	0.00k ÷ 99.99k	0.01k	
100 < FS $\leq$ 1000	0.0k ÷ 999.9k	0.1k	

#### Irradiance (by mean HT304N)

Range (mV)	Resolution (mV)	Uncertainty
1 ÷ 40.0	0.02	$\pm$ (1.0%rdg + 0.1mV)

#### Temperature (by mean PT300N)

Range (°C)	Resolution (°C)	Uncertainty
-20.0 ÷ 100.0	0.1	$\pm$ (1.0%rdg + 1°C)

## 2.2. FUNCTIONALITY TEST

### DC Voltage @ OPC

Range (V)	Resolution (V)	Uncertainty
5.0 ÷ 199.9	0.1	±(1.0%rdg+2dgt)
200 ÷ 999	1	

Minimum VPN voltage to start the test: 15V

### DC Current @ OPC

Range (A)	Resolution (A)	Uncertainty
0.10 ÷ 10.00	0.01	±(1.0%rdg+2dgt)

### DC Voltage @ STC

Range (V)	Resolution (V)	Uncertainty
5.0 ÷ 199.9	0.1	±(4.0%rdg+2dgt)
200 ÷ 999	1	

### DC Current @ STC

Range (A)	Resolution (A)	Uncertainty
0.10 ÷ 10.00	0.01	±(4.0%rdg+2dgt)

### Irradiance (by mean HT304N)

Range (mV)	Resolution (mV)	Uncertainty
1 ÷ 40.0	0.02	±(1.0%rdg + 0.1mV)

### Temperature (by mean PT300N)

Range (°C)	Resolution (°C)	Uncertainty
-20.0 ÷ 100.0	0.1	± (1.0%rdg + 1°C)

## 2.3. SAFETY TEST

### Continuity Test (LOW $\Omega$ )

Range [ $\Omega$ ]	Resolution [ $\Omega$ ]	Uncertainty
0.00 ÷ 1.99	0.01	±(2.0%rdg + 2dgt)
2.0 ÷ 19.9	0.1	
20 ÷ 199	1	

Test current >200mA DC up to 2 $\Omega$  (test leads included), Resolution 1mA, Uncertainty ±(5.0%rdg + 5dgt)  
Open loop voltage  $4 < V_o < 10V$

### Insulation Test (M $\Omega$ ) – Mode TIMER

Test voltage [V]	Range [M $\Omega$ ]	Resolution [M $\Omega$ ]	Uncertainty
250, 500, 1000	0.01 ÷ 1.99	0.01	±(5.0%rdg+ 5dgt)
	2.0 ÷ 19.9	0.1	
	20 ÷ 199	1	

Open voltage: < 1.25 \* nominal test voltage  
Short circuit current: <15mA (peak) for all test voltages  
Generated voltage: Resolution 1V, uncertainty ±(5.0%rdg + 5dgt) @ Rmis > 0.5% FS  
Test current: > 1mA with load = 1k $\Omega$  x Vnom

### Insulation Test (M $\Omega$ ) – Mode FIELD (\*), STRING (\*\*)

Test voltage [V]	Range [M $\Omega$ ]	Resolution [M $\Omega$ ]	Uncertainty (***)
250	0.1 ÷ 1.9	0.1	±(20.0%rdg+ 5dgt)
	2 ÷ 99	1	
500	0.1 ÷ 1.9	0.1	
	2 ÷ 99	1	
1000	0.1 ÷ 1.9	0.1	
	2 ÷ 99	1	

(\*) For FIELD mode: if VPN >1V the minimum voltage VEP and VEN for the calculation of Ri(+) and Ri(-) is 1V  
(\*\*) For STRING mode: minimum VPN voltage to start the test: 15V  
Open voltage: <1.25 x nominal test voltage  
Short circuit current: < 15mA (peak) for each test voltage  
Generated voltage: resolution 1V, accuracy ±(5.0%reading + 5digits) @ Rmis > 0.5% FS  
Rated current measured: > 1mA with 1k $\Omega$  @ Vnom

(\*\*\*) For FIELD mode: add 5 dgts to the accuracy if 
$$\frac{\max\{R^+, R^-\}}{\min\{R^+, R^-\}} \geq 100$$

## 3. GENERAL SPECIFICATIONS

### DISPLAY AND MEMORY:

Features: 128x128pxl custom LCD with backlight  
Memory: max 999 test

### POWER SUPPLY:

PVCHECK internal power supply: 6x1.5V alkaline batteries type LR6, AA, AM3, MN 1500  
Battery life: approx. 120 hours (DC efficiency test)  
SOLAR-02 power supply: 4x1.5V alkaline batteries type AAA LR03  
SOLAR-02 max recording time (@ IP=5s): approx. 1.5h

### OUTPUT INTERFACE

PC communication port: optical/USB  
Interface with SOLAR-02: wireless RF communication (max distance 1m)

### MECHANICAL FEATURES

Size (L x W x H): 235 x 165 x 75mm  
Weight (batteries included): 1.2kg

### ENVIRONMENTAL CONDITIONS:

Reference temperature: 23°C ± 5°C  
Working temperature: 0° ÷ 40°C  
Working humidity: <80%HR  
Storage temperature (remove the batteries): -10 ÷ 60°C  
Storage humidity: <80%HR

### GENERAL REFERENCE STANDARDS:

Safety: IEC/EN61010-1  
Safety of measurement accessories: IEC/EN61010-031  
Measurements: IEC/EN62446 (PV performance, IVCK)  
IEC/EN 61557-1, 2, -4 (LOWΩ, MΩ)  
Insulation: double insulation  
Pollution degree: 2  
Overvoltage category: CAT III 300V to ground  
Max 1000V DC among inputs P, N, E, C  
Max height of use: 2000m

**This instrument complies with the requirements of the European Low Voltage Directives 2006/95/EEC (LVD) and EMC 2004/108/EEC**