

1. ELECTRICAL SPECIFICATIONS

Accuracy is calculated as \pm [% readings + (no. of digits*resolution)] at $23^{\circ}\text{C} \pm 5^{\circ}\text{C}$, relative humidity <80%RH

SAFETY TEST

DMM – DC Voltage

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

DMM – AC TRMS Voltage

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

Frequency range: 42.5Hz + 69Hz ; Voltage zeroed for measured values <3V

Insulation Resistance (M Ω) – DUAL Mode

Test voltage DC [V]	Range [M Ω]	Resolution [M Ω]	Accuracy (*)
250, 500, 1000, 1500	0.1 ÷ 0.99	0.01	\pm (5%rdg + 5dgt)
	1.0 ÷ 19.9	0.1	
	20 ÷ 100	1	

(*) Accuracy indicatec for $VPN \geq 240V$, $R_{fault} \geq 10\Omega$. Accuracy of R_p and $R(+)$ not declared if $R(+)$ $\geq 0.2M\Omega$ and $R(-)$ $< 0.2M\Omega$

Accuracy of R_p and $R(-)$ not declared if $R(+)$ $< 0.2M\Omega$ and $R(-)$ $\geq 0.2M\Omega$

Open voltage	<1.25 x nominal test voltage
Short circuit current	<15mA (peak) for each test voltage
Nominal measured current	>1mA on $R = 1k\Omega \times V_{nom}$ (with VPN, VPE, VNE= 0)
Managed capacity per poles:	2 μ F

Insulation Resistance (M Ω) –TMR Mode

Test voltage DC [V]	Range [M Ω]	Resolution [M Ω]	Accuracy
250, 500, 1000, 1500	0.01 ÷ 9.99	0.01	\pm (5.0%rdg+ 5dgt)
	10.0 ÷ 99.9	0.1	

Open voltage	<1.25 x nominal test voltage
Short circuit current	<15mA (peak) for each test voltage
Nominal measured current	>1mA on $R = 1k\Omega \times V_{nom}$ (with VPN, VPE, VNE= 0)
Setting timer:	3s + 999s

Continuity of protection conductors (RPE)

Range [Ω]	Resolution [Ω]	Accuracy
0.00 ÷ 9.99	0.01	\pm (2%rdg + 2dgt)
10.0 ÷ 99.9	0.1	
100 ÷ 1999	1	

Test current:	>200mA DC up to 5 Ω (included cables), Resolution 1mA, Accuracy \pm (5.0%rdg + 5dgt)
Open voltage	$4 < V_0 < 10V$

GFL (Ground Fault Locator) function

Test voltage DC [V]	Range [M Ω]	Resolution [M Ω]	Accuracy (*)	Position accuracy
250, 500, 1000, 1500	0.1 ÷ 0.99	0.01	\pm (5%rdg + 5dgt)	\pm 1module (NMOD \leq 35) \pm 3module (NMOD>35)
	1.0 ÷ 19.9	0.1		
	20 ÷ 100	1		

(*) Accuracy indicatec for $VPN \geq 240V$, $R_{fault} \geq 10\Omega$. Accuracy of R_p and $R(+)$ not declared if $R(+)$ $\geq 0.2M\Omega$ and $R(-)$ $< 0.2M\Omega$

Accuracy of R_p and $R(-)$ not declared if $R(+)$ $< 0.2M\Omega$ and $R(-)$ $\geq 0.2M\Omega$

Open voltage	<1.25 x nominal test voltage
Short circuit current	<15mA (peak) for each test voltage
Nominal measured current	>1mA on $R = 1k\Omega \times V_{nom}$ (with VPN, VPE, VNE= 0)
Managed capacity per poles:	2 μ F
Set limit threshold on measure	0.05M Ω , 0.1M Ω , 0.23M Ω , 0.25M Ω , 0.50M Ω , 1.00M Ω
Number of set modules:	4 + 60

The GFL function allows obtaining correct results with the following conditions:

- > Test carried out with $V_{test} \geq V_{nom}$ on a single string disconnected from the inverter, from possible arresters and from earth connections
- > Test performed upstream of any blocking diodes
- > **Single fault** of low insulation located at any position in the string
- > Insulation resistance of the single fault: <1.00M Ω
- > Environmental conditions similar to those in which the fault was reported



OPT (Insulation test with optimizers and MLPE devices) function

Test voltage DC [V]	Range [MΩ]	Resolution [MΩ]	Accuracy Rp (*)
100 (**), 250, 500 1000, 1500 (MLPE with RSD)	0.1 ÷ 0.99	0.01	±(5%rdg + 5dgt)
	1.0 ÷ 19.9	0.1	
	20 ÷ 250	1	
100 (MLPE without RSD)	0.1 ÷ 0.99	0.01	
	1.0 ÷ 19.9	0.1	
	20 ÷ 100	1	

(*) Accuracy indicated for $VPN \geq 240V$, $R_{fault} \geq 10\Omega$. Accuracy of R_p and $R(+)$ not declared if $R(+)$ $\geq 0.2M\Omega$ and $R(-)$ $< 0.2M\Omega$. Accuracy of R_p and $R(-)$ not declared if $R(+)$ $< 0.2M\Omega$ and $R(-)$ $\geq 0.2M\Omega$.

Open voltage	<1.25 x nominal test voltage
Short circuit current	<15mA (peak) for each test voltage
Nominal measured current	>1mA on R = 1kΩ x Vnom (with VPN, VPE, VNE= 0)
Managed capacity per poles:	2μF
Set limit threshold on measure	0.25MΩ, 0.50MΩ, 0.60MΩ, 1.00MΩ, 50MΩ, 100MΩ, 200MΩ (MLPE with RSD) 0.25MΩ, 0.50MΩ, 0.60MΩ, 1.00MΩ, 50MΩ (MLPE without RSD)
Number optimizers:	1 ÷ 60
Max current in RSD mode:	1A

FUNCTIONALITY TEST (IVCK)

DC Voltage @ OPC

Range [V]	Resolution [V]	Accuracy
3.0 ÷ 1500.0	0.1	±(1.0%rdg+2dgt)

Minimum VPN voltage to start the test: 15V

IDC Current @ OPC

Range [A]	Resolution [A]	Accuracy
0.10 ÷ 40.00	0.01	±(1.0%rdg+2dgt)

DC Voltage @ STC

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

IDC Current @ STC

Range [A]	Resolution [A]	Accuracy
0.10 ÷ 40.00	0.01	±(4.0%rdg+2dgt)



2. GENERAL SPECIFICATIONS

DISPLAY AND MEMORY

Features:	240x240pxl custom LCD with backlight
Memory:	max 999 test
Internal database for PV modules:	max 64 saving modules

POWER SUPPLY

Internal power supply:	6x1.5V alkaline batteries type LR6, AA or 6x1.2V rechargeable NiMH batteries type LR6, AA (External adapter needed for NiMH batteries recharging)
Battery life (@Temp = 20°C):	RPE: >500 Test (RPE \geq 0.1 Ω) GFL, M Ω : >500 test (Riso \geq 1k Ω xVTest) IVCK: >500 test (no SOLAR03)
Auto Power OFF:	after 5 minutes of idleness

OUTPUT INTERFACE

PC communication port:	optical/USB and WiFi
Interface with SOLAR03:	Bluetooth BLE communication (up to 100m/328ft in free space)

MECHANICAL FEATURES

Dimensions (L x W x H):	235 x 165 x 75mm
Weight (batteries included):	1.2kg
Mechanical protection:	IP40

ENVIRONMENTAL CONDITIONS

Reference temperature:	23°C \pm 5°C
Working temperature:	-10°C \div 50°C
Working humidity:	<80%RH (without condensation)
Storage temperature:	-10°C \div 60°C
Storage humidity:	<80%RH (without condensation)
Max height of use:	2000m

REFERENCE GUIDELINES

Safety:	IEC/EN61010-1, IEC/EN61010-2-030 IEC/EN61010-2-033, IEC/EN61010-2-034
EMC:	IEC/EN61326-1, IEC/EN61326-2-2
Safety of measurement accessories:	IEC/EN61010-031
Measurements:	IEC/EN62446-1, IEC/EN60891 (IVCK) IEC/EN61557-1, IEC/EN61557-2 (M Ω), IEC/EN61557-4 (RPE)
Bifacial module measurements:	IEC/EN60904-1-2
Temperature module calculation:	IEC/EN60904-5
EMC environment of use :	portable, Class A, Group 1
Insulation:	double insulation
Pollution degree:	2
Radio:	ETSI EN300328, ETSIEN301489-1, ETSIEN301489-17
Measurement category:	CAT III 1000VAC, CAT III 1500VDC to ground Max 1000VAC, 1500VDC between inputs

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

