

# Data sheet

## Safety and Function Tester HandHeld

Revision 1.2 effective from September 2019.

### Basic unit

#### **ELECTRICAL SPECIFICATIONS**

Supply voltage	230 V AC $\pm$ 10%
Mains frequency	50 Hz / option 60 Hz
Current consumption no-load	0.2 A, fuse T2A

#### **GENERAL SPECIFICATIONS**

Display	7-segment, 4-digit
Signal-LEDs	Four test-method LEDs at front panel / PE, IR, LKC, FCT Four measuring-unit LEDs at front panel / s, V, A, $\Omega$ Three condition LEDs at front panel / yellow = test in progress, green = result GO, red = result NO GO
Acoustic message	Signaling device for acoustic messages Short signal = result GO, three short signals = result NO GO
Input	Via push buttons at the front panel of the device
Test-result storage	128 test results incl. all default values, measured values, per test step
Test connections	Test socket <sup>1)</sup> on top of the device Two test-probe inlets at the rear panel of the device
Communication interface	At the rear panel of the device RS232
Calibration	Adjustment via software; no need to open the testing device
Software usability	To avoid incorrect entries, all inputs are subject to a plausibility check.
Language on front panel	US
Development and production	Made in Germany

#### **MECHANICAL SPECIFICATIONS**

Mechanical designs	Table-top unit with rubber feet Incl. attachment points for carrying straps Optional: solid mounting feet allowing to tilt the testing device Optional: carrying straps
Operating environment	Operating temperature 0° - 50° C / 32° - 104° F, designed for a relative humidity of 0 - 80%rF without condensation!
Storage	Storing temperature -10° - 60° C / 14° - 140° F, designed for a relative humidity of 0 - 90%rF without condensation!
Dimensions, if only PE/GB and IR	W 195 x D 195 x H 70 mm (W 7.68" x D 7.68" x H 2.76")
Dimensions, if additional HVDC, function or leakage current	W 195 x D 295 x H 70 mm (W 7.68" x D 11.61" x H 2.76")
Weight	3 kg (6.61 lb)
Housing color	black

1) The layout of the test connections depends on the device variant.

# PE/GB-resistance test AC

## TEST CURRENT AC

Test current	10 A AC
Frequency	50 Hz, depending on the mains supply / option 60 Hz
Current regulation	Automatic electronic constant-current regulation with minimum-current monitoring and power-failure detector
Adjustment	Default current approx. + 0.5 A

## VOLTAGE

Test voltage max.	12 V AC
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## RESISTANCE

Precision	Accurate 4-wire resistance measurement
Total measuring range	0-700 mΩ, depending on the flowing test current and the allowed maximum test voltage 0-20 Ω especially for measurements on wind-power stations
resolution	1 mΩ or 1 mV
Resistance measurement from - to	0-700 mΩ at 12 V and 10 A 0-20 Ω at 12 V and 0,6 A
Measurement accuracy	±2% of final value ±10 mΩ, final value = 700 mΩ

## EVALUATION

Evaluation related to	Resistance or voltage drop
Upper resistance limit PE <sub>Rmax</sub> or upper voltage limit PE <sub>Umax</sub>	0-700 mΩ freely definable, test values equal to or smaller than this limit are GO or alternatively 0-7 V freely definable, test values equal to or smaller than this limit are GO
Undercurrent	If the test current is smaller than the default value during the test, the test result is NO GO.

## GENERAL INFORMATION

Test timer	0.1 s, 0.2 s, 0.3 s ... 1.5 s in steps of 0.1 s
Measurement technology for U & I	RMS-measurement (true RMS value)
Test points	PE probe 1 ↔ PE/GB in the test socket or PE/GB probe 1 ↔ PE/GB probe 2

# Insulation-resistance test

## TEST VOLTAGE

Test voltage	100-1000 V DC, adjustable in steps of 10V
Voltage regulation	Automatic electronic constant-voltage regulation with undervoltage monitoring
Adjustment	Default value + 10 V

## CURRENT

Test current max.	5 mA DC - safety-current limitation
Test-current measuring range	Measurable and evaluable up to 1 mA
Output power	Max. 0.5 W

## RESISTANCE

Measuring range	200 KΩ-30 MΩ
Resolution	10 KΩ
Measurement accuracy	±2% of final value ±10 KΩ at a test voltage of at least 500 V

## EVALUATION

Resistance limit IR <sub>Rmax</sub>	1-20 MΩ freely selectable, test values equal to or larger than this limit are GO
Undervoltage	If the test voltage is smaller than the default value, the test result is NO GO.

## GENERAL INFORMATION

Test timer	0.5 s, 0.6 s, 0.7 s ... 60 s in steps of 0.1 s
Measurement technology for U & I	Average measurement
Discharge	≤200 ms – at a DUT with pure ohmic load Precondition: after the test, the test leads still need to be connected to the DUT during the discharge process.
Internal resistance	330 KΩ for IR with max. 1000 V test voltage The internal resistance determines the charging time of your DUT. Min. charging time = internal resistance x DUT capacity [s]
Test points	L&N ↔ PE in the test socket or L&N ↔ test probe 1

# High-voltage test DC

## TEST VOLTAGE

Test voltage	100-2500 V DC, adjustable in steps of 10V
Voltage regulation	Automatic electronic constant-voltage regulation with under-voltage monitoring
Adjustment	Default value + 10 V

## CURRENT

Test current max.	5 mA DC – safety-current-limited
Test current measuring range	Measureable and evaluable up to 1 mA
Output power	Max. 0.5 W

## RESISTANCE

Measuring range	200 K $\Omega$ -30 M $\Omega$ Test voltage 500V >> resistance measurement starting at 1 M $\Omega$ Test voltage 1000V >> resistance measurement starting at 2 M $\Omega$ Test voltage 2000V >> resistance measurement starting at 8 M $\Omega$ Test voltage 2500V >> resistance measurement starting at 12.5 M $\Omega$
Resolution	10 K $\Omega$
Measurement accuracy	$\pm 2\%$ of final value $\pm 10$ K $\Omega$ at a test voltage of at least 500 V

## EVALUATION

Resistance limit IR <sub>Rmax</sub>	1 M $\Omega$ -20 M $\Omega$ freely definable, test values equal to or larger than this limit are GO
Undervoltage	If the test voltage is smaller than the default value, the test result is NO GO.

## GENERAL INFORMATION

Test timer	0.5 s, 0.6 s, 0.7 s ... 160 s in steps of 0.1 s
Measurement technology for U & I	Average measurement
Discharge	$\leq 200$ ms – at a DUT with pure ohmic load Precondition: after the test, the test leads still need to be connected to the DUT during the discharge process.
Internal resistance	330 K $\Omega$ for IR with max. 1000 V test voltage The internal resistance determines the charging time of your DUT. Min. charging time = internal resistance x DUT capacity [s]
Test points	L&N ↔ PE in the test socket or L&N ↔ test probe 1

# Function test

## TEST VOLTAGE

Test voltage	230 V AC single-phase voltage directly from mains supply
Voltage measurement	No voltage measurement

## CURRENT

Test current	2 A AC maximum continuous current
resolution	1 mA
Current measurement and evaluation	True RMS
Measurement accuracy	$\pm 2\%$ of final value $\pm 10$ mA

## EVALUATION

Upper & lower limit $\pm$ tolerance in % from default value	Current: 0-2 A, test values within the tolerance limits are GO
Short-circuit detection	Integrated fuse accessible from the bottom
Fault detector	Optically and acoustically

## GENERAL INFORMATION

Test timer	0.5 s, 0.6 s, 0.7 s ... 10 s in steps of 0.1 s
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# Substitute-leakage-current test

## TEST VOLTAGE

Test voltage	approx. 40 V AC single-phase
Calculated test voltage	230 V

## LEAKAGE CURRENT

Leakage current $I_{\text{eff}}$	max. 20 mA
Resolution	1 mA
Accuracy	2% of final value $\pm$ 1 mA
Calculated test current	1 mA-20 mA
Test method	Ground leakage current, enclosure leakage current
Standards	DIN VDE 0701-0702
Test points	L+N ↔ PE, L+N ↔ test probe 1

## EVALUATION

Upper limit	0-20 mA
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## Glossary

DUT	Device Under Test (test object)
True RMS value	The RMS value is detected quickly and precisely following exact mathematical definitions. This is independent from the distortion of the sine signal. Therefore, SCHLEICH units always indicate the true RMS value.
GO	go, OK, pass
Adjustment	Correction of a test value, if the calibration showed too large a deviation.
Calibration	Annual inspection and documentation of deviations in relation to comparison values.
Condensation	Condensation (dew) means that moisture is built at the inside or at the outside of the testing device, which has to be avoided under all circumstances.
Connection check	The connection check serves to monitor, whether the DUT is properly connected to the testing device.
Limit (upper)	A value that must not be exceeded.
Limit (lower)	A value that must not be fallen below.
Measurement accuracy	The measurement accuracy refers to the test value.
Average	The average is calculated at DC voltages. It is the mathematical average of a number of test values.
NO GO	no go, not OK, fail
Safety inputs	The device is enabled via two safety inputs. This function is defined as two-circuit.
Peak value	For the high-voltage test AC, the peak value of the sine wave is often an important factor. Regardless of positive or negative sign of the sine half-wave, the display of the peak value shows the highest measured peak value.
Current-interruption detector	During the PE/GB-resistance test it is checked, whether the current is interrupted. If the current is interrupted and comes back again, the test timer restarts automatically. This automatic process can be repeated up to three times.

## Further information

### Further information

For further information, please refer to our website [www.schleich.com](http://www.schleich.com)

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