

MINITEST PRO I (3P) MASTER

Test Instruments per DIN VDE 0701-0702

3-349-357-03

9/5.21

Applications

Testing the electrical safety of mono-phase and 3-phase electrical equipment by measuring:

- Protective conductor resistance
- Insulation resistance
- Differential current
- Touch current
- Absence of voltage by means of current measurement



Convenient Connection

The test instrument is intended for testing and measuring repaired or modified devices. The device under test (DUT) is connected to the test instrument's test socket at this end.

When testing protective conductor current and touch current (absence of voltage at exposed, conductive parts), the device under test is connected to the mains outlet on the test instrument.

Display Functions

Limit value violations are indicated optically by means of nine variously colored LEDs.

All measured values are also clearly read out at a large, two-line digital display.

Rugged Mechanical Design

The handy instrument is furnished with a compact plastic housing with permanently connected mains cable. The respective measured quantity is selected by means of a rotary switch.

Report Functions and PC Analysis Software

The measured values and the result of each test can be transferred to a PC for onward processing via USB port or stored to the internal device memory.

- Transfer via USB

For report generation purposes, the measured values are transmitted to a PC via a USB cable which is connected to the USB port. It is possible to choose between the transmission of individual measured values and continuous transmission.

- Internal memory for measured values (MINITEST Master and MINITEST 3P Master only)

The measured values and the result of each test can be stored to the internal device memory upon keystroke and transferred to a PC via USB port for subsequent read-out and processing.

The following options are available in the memory menu:

- consecutive numerical incrementing of the memory location for the filing of test results,
- selection of a discretionary memory location for the filing or querying of test results,
- consecutive numerical displaying of all measured values of a DUT in the order of their recording,
- deletion of the data of a memory location or of the complete device memory.

- Report generation software

The measured values which have been transferred to a PC can be processed with the associated software.

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- Barcode scanner connection (MINITEST Master and MINITEST 3P Master only)

An optionally available connected barcode scanner allows for the convenient acquisition of DUT data.

Technical Data

Mechanical Design

Housing	MINITEST Master Pro: 200 mm × 150 mm × 77 mm (without integrated outlets, grommets and rotary switch) MINITEST 3P Master: 350 mm × 160 mm × 125 mm (without surface-type outlets, grommets, circuit breaker and rotary switch) (overall dimensions excluding cables)
Weight	MINITEST Master Pro: approx. 1.5 kg MINITEST 3P Master: approx. 3.3 kg
Protection	Housing IP 44 (Protection against foreign object entry: ≥ 1.0 mm dia.; Protection against the penetration of water: 4 = splash water protected) Connections IP 20 (Protection against foreign object entry: ≥ 12.5 mm dia.; Protection against the penetration of water: 0 = not protected) (per DIN VDE 0470 Part 1/EN 60529)

Display and Indicating Devices

LCD

Dot matrix display, two lines of 20 characters each

LEDs

9 LEDs for indicating compliance with, or violation of limit values: 1 red, 7 yellow and 1 green

R_{PE} SOCKET	> 1 Ω	max. 1.0 Ω	max. 0.9 Ω	max. 0.8 Ω	max. 0.7 Ω	max. 0.6 Ω	max. 0.5 Ω	max. 0.4 Ω	max. 0.3 Ω
		< 50m	< 42,5m	< 35m	< 27,5m	< 20m	< 12,5m	< 5m	
R_{PE} FIX	> 1 Ω								max. 1,0 Ω
R_{ISO}	< 1 MΩ			min. 1 MΩ					min. 2 MΩ
I_R	> 3,5mA			max. 3,5 mA					max. 0,5 mA
I_T	> 0,5mA			max. 0,5mA					max. 0,25 mA
LED TEST									

Ambient Conditions

Operating temperature range	0 ... +40 °C
Storage temperature range	-20 ... +70 °C
Humidity	max. 75%, no condensation allowed
Elevation	to 2000 m

Power Supply

Line voltage	MINITEST Master Pro: 230 V 50 Hz MINITEST 3P Master: 230 V/400 V 50 Hz
Throughput rating:	MINITEST Master Pro: 3700 VA max. MINITEST 3P Master: 38.4 kVA max. depending upon load at the mains outlet

Electrical Safety

Nominal line voltage	230 V
Test voltage	mains + PE (mains) to test socket, probe socket PE/I _T or R _{ISO} : 1.5 kV~ mains to PE (mains): 3 kV~
Measuring category	CAT II 300 V
Protection class	I per DIN EN 61140/VDE 0140-1/ IEC 61140
Pollution degree	2
Fuse	FF0,315H1000V or FF0,315H500V or FF0,315H250V MINITEST 3P Master only: 3 x C16A
Residual current protective device (MINITEST Master Pro only)	30 mA with undervoltage trigger and inhibiting of automatic restart.

Electromagnetic Compatibility

Interference emission	EN 61 326-1, class B
Interference immunity	EN 61 326-1

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Product Standards

The instrument has been manufactured and tested in compliance with the following safety regulations:

IEC 61010-1 Safety requirements for electrical equipment for measurement, control and laboratory use – general requirements
 EN 61010-1
 VDE 0411-1

IEC 61557-2/-4 Electrical safety in low voltage distribution systems up to 1000 V AC and 1500 V DC – Equipment for testing, measuring and monitoring of protective measures
 DIN EN 61557-2/-4
 DIN VDE 0413-2/-4

Characteristic Values

Measurements

Measured Quantity	Measuring Range	Resolution	$U_{NO-LOAD}$	R_i	I_K	I_N
Protective conductor resistance	0 ... 1.30 Ω	10 m Ω	< 5 V –			> 200 mA *
	1.0 ... 99.9 Ω	100 m Ω	< 5 V –			–
Insulation resistance	0 ... 9.99 M Ω	10 k Ω	520 V –	ca. 5.0 k Ω	< 3.5 mA	> 1 mA
Contact current measurement (verification of absence of voltage)	0 ... 9.99 mA ~	10 μ A		1 k Ω		
Differential current MINITEST Master Pro	0.1 ... 9.99 mA~	10 μ A				
Differential current MINITEST 3P Master	0.2 ... 9.99 mA~	10 μ A				

* with automatic polarity reversal

Intrinsic Uncertainty and Measuring Uncertainty

Measured Quantity	Intrinsic Uncertainty	Measuring Uncertainty
Protective conductor resistance	\pm (5% rdg. + 4 d)	\pm (10% rdg. + 6 d)
Insulation resistance	\pm (7% rdg. + 2 d)	\pm (10% rdg. + 5 d)
Contact current measurement (verification of absence of voltage)	\pm (5% rdg. + 4 d)	\pm (10% rdg. + 5 d)
Differential current MINITEST Master Pro	\pm (5% rdg. + 6 d)	\pm (10% rdg. + 6 d)
Differential current MINITEST 3P Master	\pm (5% rdg. + 10 d)	\pm (10% rdg. + 10 d)

Influencing Quantities and Influence Error

Influencing Quantity / Sphere of Influence	Influence Error \pm ... % of Measured Value
Change of position	–
Change to test equipment supply voltage	2.5
Temperature fluctuation 0 ... 21 °C and 25 ... 40 °C	Specified influence error applicable per temperature change of 10 K 1 for protective conductor resistance 0.5 for all other measuring ranges
Amount of current at DUT	2.5
Low frequency magnetic fields	2.5
DUT impedance	2.5
Capacitance during insulation measurement	2.5
Waveshape of measured current 49 ... 51 Hz 45 ... 60 Hz	2 with capacitive load (for equivalent leakage current) 1 (for touch current) 2.5 for all other measuring ranges

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Reference Conditions

Ambient temperature	+23 °C ±2 K	
Relative humidity	40 ... 60 %	
Line voltage	MINITEST Master Pro:	230 V ±1 %
	MINITEST 3P Master:	230 V/400 V ±1 %
Measured quantity frequency	50 Hz ±0.2 %	
Measured quantity waveshape	Sine (deviation between effective and rectified value: ±0.5 %)	

Features

Features of MINITEST—... series	MINITEST 3P Master	MINITEST Master	MINITEST Pro
Connection types			
Power supply via permanently connected mains cable	x	x	x
Tests on monophasic DUTs	x	x	x
Tests on 3-phase DUTs via additional test sockets CEE 16A / CEE 32A	x	-	-
Fusing devices			
Fuse for probe connection	x	x	x
RCCB in mains plug	-	x	x
Miniature circuit breaker	x	-	-
Report functions			
Illuminated two-line LCD *	x	x	x
Memory for 2,000 tests (10 measured values per test)	x	x	-
Key for transmission of measured values	x	x	x
Key for storing measured values	x	x	-
Data interface (USB port)	x	x	x
Barcode scanner connection (9 pin, subminiature plug) for reading ident. numbers in text form with a maximum of 24 characters as description of DUT	x	x	-

* as from series issued in March 2007

Standard Equipment

1 Test instrument

Accessories, see table "Order Information":

	MINITEST 3P Master	MINITEST Master	MINITEST Pro
Probe cable with test probe	x	x	x
Adapter for earthing contact plug to CEE coupling 3P+N+PE 32 A-6h	x	-	-
Adapter for plug 1P+N+PE 16 A to CEE coupling 3P+N+PE 32 A-6h	x	-	-
Adapter for plug 3P+N+PE 16 A to CEE coupling 3P+N+PE 32 A-6h	x	-	-
Adapter for plug 1P+N+PE 32 A to CEE coupling 3P+N+PE 32 A-6h	x	-	-
USB connector cable	x	x	x
Operating instructions	x	x	x

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Optional Accessories

Calibration Adapter SECU-cal 10



The calibration adapter is designed for testing the measuring safety of test instruments per DIN VDE 0701-0702/0751. As a rule, according to the requirements

set forth in the accident prevention regulation DGUV Regulation 3 (formerly BGV A3) and as part of a certification in accordance with the ISO 9000 quality standard, these test instruments must be inspected once a year.

All limit values for the required tests per DIN VDE must be tested, such as protective conductor resistance, insulation resistance, equivalent leakage current, differential current and/or contact or housing leakage current.

Test adapter VL2 E



The VL2 E test adapter in addition to the test instrument allows for the measuring and testing of electrical devices and extension cables with CEE plug-and-socket devices.

Brush Probe Z745G



The brush probe allows for contacting rotating or vibrating DUTs in order to measure protective conductor resistance.

Case Z740B



Outer dimensions:
W x H x D
394 x 294 x
106 mm

Universal Carrying Pouch F2000



Outer dimensions:
W x H x D
380 x 310 x
200 mm
(without buckles,
handle and carrying
strap)

Universal Carrying Pouch Big F2020



Outer dimensions:
W x H x D
430 x 310 x
300 mm
(without buckles,
handle and carrying
strap)

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Order Information

Description	Type	Article Number
Basic instruments		
Test instrument for monophas tests, with dot matrix display, with USB interface for data recording	MINITEST Pro	M712D
Test instrument for monophas tests, with dot matrix display, with USB port for data recording and connection for barcode scanner, with memory for 2,000 tests	MINITEST Master	M712U
Test instrument for monophas and three-phase tests, with dot matrix display, with USB port for data recording and connection for barcode scanner, with memory for 2,000 tests	MINITEST 3P Master	M712X
PC Analysis Software		
Information on the software can be found on the Internet at http://www.gossenmetrawatt.com on the respective product page.		
Accessories		
Barcode scanner, printer and RFID scanner see separate datasheet ID systems		
Probe for measuring protective conductor resistance, e.g. at rotating devices under test	Brush probe	Z745G
Calibration adapter for test instruments per DIN VDE 0701-0702/0751 (max. 200 mA)	SECU-cal 10	Z715A
Test adapter for electrical devices and extension cables with CEE plug-and-socket devices	VL2 E ^{D)}	Z745W
Case for MINITEST Master or MINITEST Pro	Case	Z740B
Universal carrying pouch for MINITEST Master or MINITEST Pro	F2000 ^{D)}	Z700D

Description	Type	Article Number
Universal carrying pouch big for MINITEST 3P Master	F2020	Z700F

^{D)} Datasheet available

For additional information regarding accessories please see:

- Measuring Instruments and Testers catalog
- www.gossenmetrawatt.com

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