GOSSEN METRAWATT

PROFITEST 204 | +
Tester for DIN EN 60204 and VDE 0113

3-348-802-03
17/12.10

- Clear-cut operating menus
- Illuminated display
- Two 4 m measurement cables (4-wire connection)
- Remote control for efficient use
- Limit value adjustment
- Convenient memory and report generating functions
- Data interfaces for PC and printer
- Can be expanded for quick, on-site alphanumeric data entry and reports printing
- Protective Conductor Test with test current 10 A
- Can be retrofitted for high-voltage testing

QUALITY MANAGEMENT SYSTEM
DQS certified per DIN EN ISO 9001:2000 Reg. No.1262

Applications

The PROFITEST 204+ tester has been designed for quick, safe testing of electrical and electronic equipment and systems at machinery in accordance with DIN EN 60204-1 and VDE 0113 with nominal voltages of up to 1000 V.
The following periodic tests must be performed in accordance with the standard:

– Testing for continuity at connections within the protective conductor system with 10 A test current
– Insulation resistance test
– Voltage tests (*optionally HP or HV*)
– Testing for residual voltage

Beyond this, the following tests and measurements may be performed as well:

– Leakage current test
– Voltage measurement
– Frequency measurement

With this instrument, you can measure the values indicated above for the preparation of an acceptance test report. For loop impedance measurement, we recommend PROFITEST C, 2 or an instrument from the PROFITEST MASTER series..

Display

The LCD window consists of an illuminated dot matrix display at which menus, device settings and measurement results, as well as online help can be displayed.

Help Key

Function Selector Switch

Testing, report generating and data management functions are selected with the rotary switch.

Limit Values

Limit values can be assigned for use with each measurement, allowing for individualized adaptation of the various tests to prevailing local conditions, as well as to the latest requirements set forth in the standards.

Data Memory

Depending upon the number of systems for which data logging is performed (max. 254), up to 2800 measurements can be saved to memory.

Remote Control

The test probe with integrated control panel allows for remote control of protective conductor and insulation resistance measurements, as well as storage of the respective values to memory. Integrated lamps indicate measurement progress status.
All PROFITEST 204+ operating functions can also be controlled via the RS 232 interface. Signal and display values can be remote queried as well.

RS 232 Interface for Input Module and PC

This port provides for data transmission and the supply of electrical power to the optionally available SECUTEST SI input module.
Other devices (e.g. a PC) can also be connected to this port with

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CENTRONICS Parallel Port

Any commercially available printer can be connected to this data interface (except for PostScript printers). Detailed report forms which have been uploaded to the instrument can be read out via this port.

Report Generating Functions

The following report generating functions are available:
- Upload report forms to the test instrument with the help of a PC and included PROTOCOL software
- Select one of three report forms stored to the instrument
- Read out measurement data via the CENTRONICS parallel port to commercially available printers
- Transmit measurement data to a PC and process with EXCEL

Characteristic Values

Meas. Quantity	Measuring Range	Nominal Range of Use	Resolution	Nom. Voltage U_N	Open-Circuit Voltage U_0	Nom. Current I_N	Short-Circuit Current I_K	Int. Resist. R_I	Meas. Uncertainty	Intrinsic Uncertainty	Overload Capacity	Overload Duration
Protective Conductor Resistance R_{SL}	0 … 85 mΩ	10 … 330 mΩ	100 µΩ	—	12 V ~	10 A [1]	12 A	—	±(8.6% rdg.+6 d)	±(3% rdg. + 5 d)	Fuse: 16 A/1000 V Breaking Capacity: 5 kA	
	85 … 999 mΩ		1 mΩ									
	1.00 … 9.99 Ω	1.00 … 9.99 Ω	10 mΩ		PELV	—	—			±(3% rdg. + 10 d)		
	10.0 … 25.0 Ω	10.0 … 25.0 Ω	100 mΩ									
ΔU [2]	0 … 9.99 V*	—	0.01 V	—	un-grounded	10 A	12 A	—	—	±(2% rdg. + 3 d)		
	10.0 … 12.0 V		0.1 V			—	—			±(10% rdg. + 3 d)		
Insulation Resistance R_{ISO}	0 … 999 kΩ	0.050 … 50 MΩ	1 kΩ	100/250/500/1000 V	max. 1.3 • U_N	1 mA	max. 1.6 mA	—	±(5.5% rdg.+4 d) of 0.05MΩ...50MΩ	±(3% rdg. +2 d)	1200 V	cont.
	1.00 … 9.99 MΩ		10 kΩ									
	10.0 … 99.9 MΩ		100 kΩ									
	100 … 499 MΩ	—	1 MΩ	250 V					—	±(8% rdg. +2 d)		
				500/1000 V						±(5% rdg. +2 d)		
	500 … 999 MΩ		1 MΩ	500/1000 V						±(10% rdg. +2 d)		
	1 … 3 GΩ		10 MΩ	1000 V						±(20% rdg. +2 d)		
Leakage Current ΔI	0.00 … 9.99 mA	0.2 … 9.9 mA	0.01 mA	—	—	—	—	2 kΩ	±(8.6% rdg. +9 d)	±(5% rdg. + 5 d)	250 V	cont.
Voltage U DC/AC	0.0 … 99.9 V	1.0 … 1000 V	0.1 V	—	—	—	—	20 MΩ	±(8.6% rdg. +9 d)	±(5% rdg. + 5 d)	1200 V	cont.
	100 … 999 V		1 V									
	1.00 … 1.2 kV		0.01 kV									
Frequency f~	8.0 …99.9 Hz	10 … 1000 Hz	0.1 Hz	—	—	—	—	20 MΩ	±(8.6% rdg. +2 d)	±(2% rdg. + 1 d)	1200 V	cont.
	100 … 999 Hz		1 Hz									

[1] up to 330 mΩ maximum
[2] related to 10 A nominal current

Applicable Regulations and Standards

IEC 204–1 **DIN EN 60204–1** **VDE 0113 Part 1**	Machine safety: Electrical equipment at machinery Part 1: General requirements
IEC 61010–1 **DIN EN 61010–1** **VDE 0411 Part 1**	Safety requirements for electrical equipment for measurement, control and laboratory use Part 1: General requirements
DIN EN 60529 **DIN VDE 0470–1**	Protection provided by enclosures (IP code)
DIN EN 61326-1 **VDE 0843-20-1**	Electrical equipment for measurement, control and laboratory use – EMC requirements – Part 1: General requirements

Regulations and Standards for Use of the Tester

IEC 204–1 **DIN EN 60204–1** **VDE 0113 Part 1**	Machine safety: Electrical equipment at machinery Part 1: General requirements
DIN EN 60439–1 **VDE 0660 Part 500**	Low-voltage switchgear assemblies Part 1: Type-tested and partially type-tested assemblies
DIN IEC 60–1, HD 588.1 **VDE 0432 Part 1**	High-voltage test methods
DIN EN 60335–1 **DIN VDE 0700–1**	Safety tests for household appliances Part 1: Safety of electrical devices for household use and similar purposes
DIN VDE 0472	Testing cables and insulated conductors
DIN VDE 0404–2:2002	Testing and measuring equipment for checking the electric safety of electric devices – Testing equipment for tests after repair, change or in the case of repeat tests

Reference Conditions

Line Voltage	230 V ± 1%
Line Frequency	50 Hz ± 0.1%
Waveshape	Sine (deviation between effective and rectified value < 1%)
Ambient Temperature	+ 23 °C ± 2 K
Relative Humidity	40% ... 60%
Load Impedance	Ohmic

Nominal Ranges of Use

Line Voltage	207 V ... 253 V
Line Frequency	45 Hz ... 65 Hz
Line Voltage Waveshape	Sine
Temperature Range	0 °C ... + 40 °C

Ambient Conditions

Storage Temperature	– 20 °C ... + 60 °C
Operating Temperature	– 5 °C ... + 40 °C
Accuracy	0 °C ... + 40 °C
Relative Humidity	Max. 75%, no condensation allowed
Elevation	to 2000 m

Power Supply

Line Voltage	207 V ... 253 V
Line Frequency	45 Hz ... 65 Hz
Power Consumption	**204+:** approx. 180 VA *w/o accessories* **204HP:** max. 700 VA **204HV:** max. 100 VA
Max. Leakage Current	0.5 mA *basic device and 204HP or HV*
Current Consumption	Max. 6 A *basic device and 204HP or HV*

RS 232 Data Interface

Type	RS 232C, serial, per DIN 19241
Data Format	9600, 8, N, 1
Connector	9-pin subminiature socket connector

Electrical Safety

Safety Class	**204+:** II **204HP/HV:** I per IEC 61010-1/ EN 61010-1 and VDE 0411-1
Nominal Voltage	230 V
Test Voltage, 204+	5.55 kV 50 Hz
Test Voltage, 204HP/HV	Mains /PE / key switch / external signal lamps to high voltage measuring terminals: **204HP:** 5 kV AC 50 Hz **204HV:** 8 kV AC 50 Hz Mains to PE: 1.5 kV AC Mains to external signal lamps: 2.3 kV AC (type test)
Measuring Category	II
Pollution Degree	2
Safety Shutdown	if instrument overheats
Fuses	**204+:** Mains: T 1.6 / 250 Test probe: T16 / 1000 **204HP/HV:** Mains: F 3.15 / 250

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Electromagnetic Compatibility PROFITEST 204+

Product standard EN 61326-1: 2006

Interference Emission	
EN 55022	Class A
Interference Immunity	Test Value
EN 61000-4-2	Contact/Atmos. - 4 kV/8 kV
EN 61000-4-3	10 V/m
EN 61000-4-4	Mains Connection - 2 kV
EN 61000-4-5	Mains Connection - 1 kV
EN 61000-4-6	Mains Connection - 3 V
EN 61000-4-11	0.5 Period / 100 %

Mechanical Design

Display: Multiple dot matrix display 128 x 128 pixels

Protection: IP 40 per DIN EN 60529 / VDE 0470 part 1

Extract from table on the meaning of IP codes

IP XY (1st digit X)	Protection against foreign object entry	IP XY (2nd digit Y)	Protection against the penetration of water
4	≥ 1.0 mm dia.	0	not protected

Dimensions: **204+:** (WxDxH)
255 mm x 133 mm x 240 mm
204HP/HV:
254 mm x 130 mm x 285 mm
overall height, mounted on caddy:
380 mm x 250 mm x 650 mm

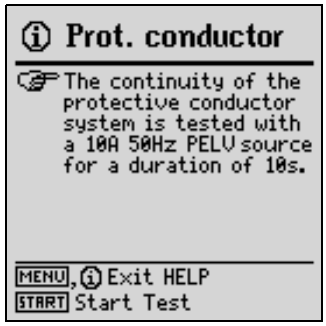
Weight: **204+:** approx. 5.1 kg
204HP/HV: approx. 8 kg

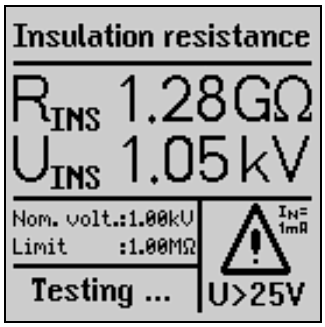
Standard Equipment

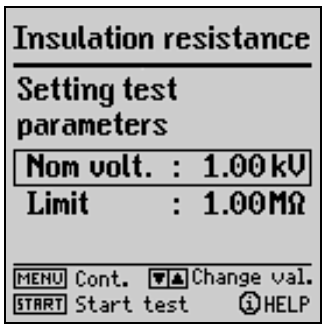
1 PROFITEST 204+ test instrument with data interface (RS 232) and CENTRONICS port for external printer
1 test probe with integrated control panel for remote control of protective conductor and insulation measurement functions, with permanently attached measurement cable
1 test probe with integrated fuse and permanently attached measurement cable
1 cable lug
1 power cable with earthing contact plug
1 CD ROM with download program for report forms
1 maker's calibration certificate
1 RS232 bus cable for connecting the COM interface
1 operating instructions
The free PC starter software WinProfi is used for communication with PROFITEST 204+. WinProfi is available on our website (web address is indicated under item „Order Information") with the following content and functions:

- up-to-date test instrument software
  – for loading other user interface languages
  – for loading firmware version updates
- Exchange of measured data between test instrument and PC
- Preparation and modification of templates for test reports
  at the PC, transfer of templates from PC to test instrument

Sample Displays, Menu-Driven Instrument Operation:







PROFITEST 204+ Accessories

Expanded Features for PROFITEST 204HP-2,5kV and PROFITEST 204HV-5,4kV

- Test voltage selectable in 50 V steps
- Rise time (ramp) adjustable from 0.1 to 99 s
- Test duration adjustable from 1 to 120 s
- Floating test voltage outputs
- Electronically controlled test sequence
- Test sequence can be started with test pistol
- Breakdown voltage display
- Pulse-arc operation
- Phase angle display
- Measured values can be saved to memory
- Acoustic and optical error messages
- Key switch for protection against unauthorized start-up
- Connector terminals for external signal lamps

Expanded Features for PROFITEST 204HP-2,5kV

- Voltage test per EN 60204 / VDE 0113
- Test power: 500 VA (intermittent)
- Breaking current adjustable in 1 mA steps

Expanded Features for PROFITEST 204HV-5,4kV

- Test power: 50 VA
- Breaking current adjustable in 0.5 mA steps

Both of the high-voltage components, either of which can be mounted to the bottom of the basic instrument, allow for high-voltage testing. Voltage, current and phase angle are measured with permanently attached measurement cables.
The bidirectional infrared interface at the base of the PROFITEST 204+ is used for controlling the high-voltage component, as well as for uploading measured values to the basic instrument.

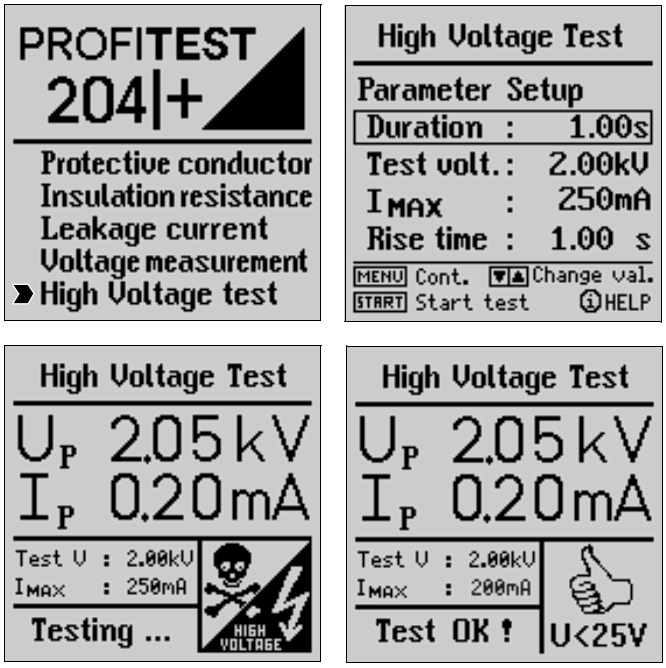
Technical Data, PROFITEST 204HP-2,5kV

	Nominal Range of Use	Resolution	Measuring Uncertainty	Intrinsic Uncertainty
Test Voltage U AC	250 V … 2.5 kV	1 V 10 V	±(5% rdg. + 5 d)	±(2.5% rdg. + 5 d)
Meas. Quantity				
Current I AC	10.0 …200 mA	0.1 mA 1 mA	±(7% rdg. + 5 d)	±(5% rdg. + 5 d)

Technical Data, PROFITEST 204HV-5,4kV

	Nominal Range of Use	Resolution	Measuring Uncertainty	Intrinsic Uncertainty
Test Voltage U AC	650 V…1.00 kV 1.00 kV…5.35 kV	1 V 10 V	+2 … −7% rdg. +2 … −5% rdg.	0 … −5% rdg. 0 … −3% rdg.
Meas. Quantity				
Current I AC	1.0 … 10.0 mA	0.01 mA 0.1 mA	±(7 % rdg. + 5 d)	±(5 % rdg. + 5 d)

Sample Displays, Menu-Driven Instrument Operation:



Extension PROFITEST 204+HP...

Signal 204

Signal lamp set for high-voltage testing in accordance with DIN VDE 0104.

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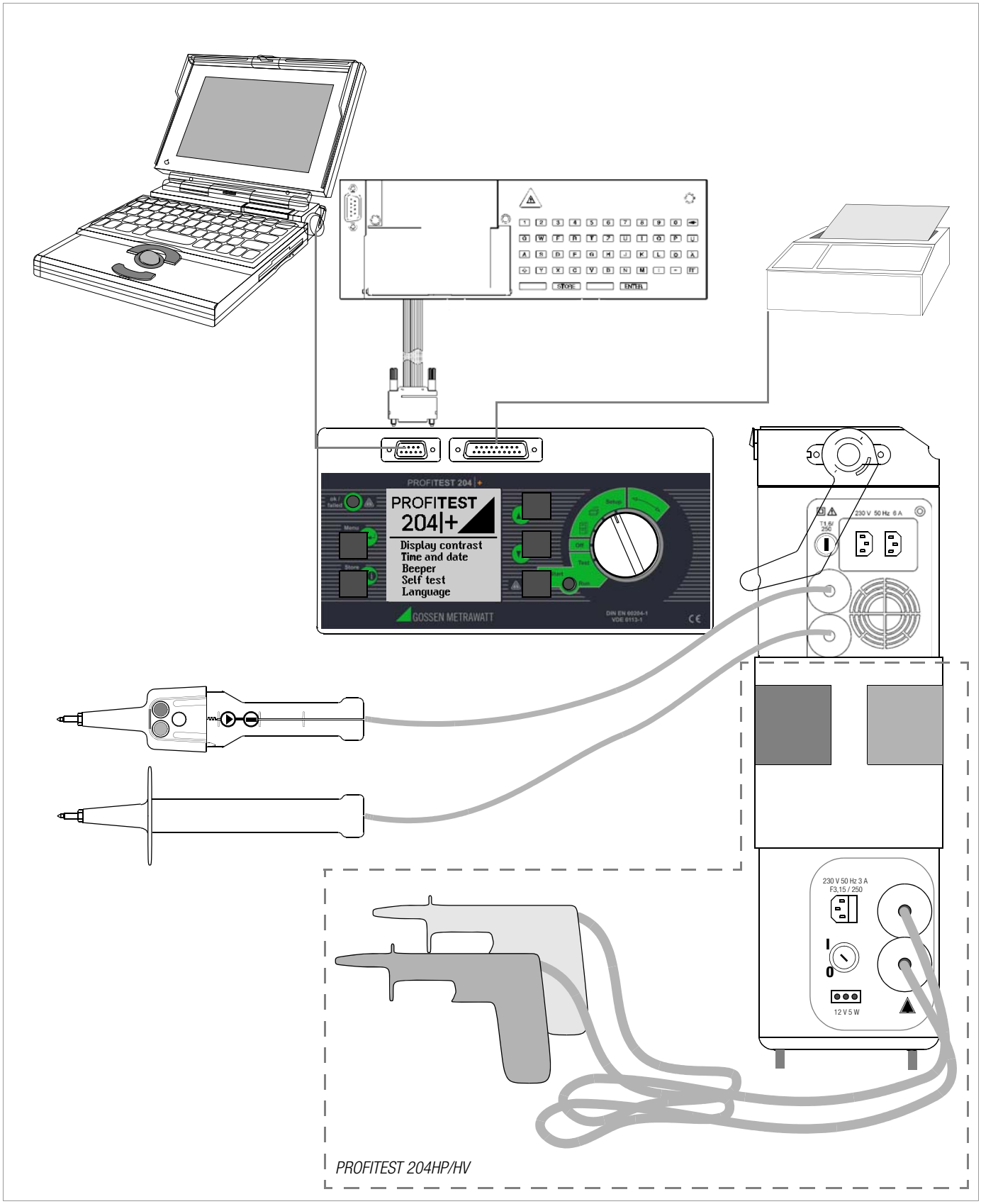

SECUTEST SI

The alphanumeric keypad allows for the entry of descriptions for each individual system. These descriptions are automatically saved to memory along with the appropriate data record.
The SI module is screwed into the lid of the PROFITEST 204+ for space-saving storage.

Caddy 204

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Order Information

Designation	Type	Article number
Device for tests in accordance with VDE 0113 / EN 60204 with RS232 interface and CENTRONICS port for external printer, 2 test probes firmly connected via measuring cables with a length of 4 m, 1 plug-on cable lug, power cable with earthing contact plug, test report, operating instructions, PS3 CD-ROM containing the PC software Winprofi for loading another user interface language into the test instrument, for updating the test instrument firmware, for preparing test report templates at the PC and transferring them to the test instrument as well as for completing, storing and printing out test reports from the PC	PROFITEST 204+	GTM5027000R0001
Same test instrument as PROFITEST 204+, however, with firmly connected measuring cable with a length of 12 m with START/MEMORY operation in the test plug	PROFITEST 204L+	M505C
Sets		
Complete system for tests in accordance with DIN EN 60204-1/VDE 0113 part 1, consisting of: PROFITEST 204+, PROFITEST 204+HP, Signal 204, Leadex 204, Caddy 204, test report	MetraMachine 204/2.5	M504D
Complete system for tests in accordance with DIN EN 60204-1/VDE 0113 part 1, consisting of: PROFITEST 204+, PROFITEST 204HP, Caddy 204, test report	MetraMachine 204-I/2.5	M504E
Complete system for tests in accordance with DIN EN 60439-1/VDE 0660 part 500, consisting of: PROFITEST 204+, PROFITEST 204HV, Signal 204, Leadex 204 and Caddy 204, test report	MetraMachine 439/5.4	M504F
Extensions		
Special variant, High-voltage component to 2.5 kV	PROFITEST 204+HP -2.5kV	M505A
Special variant, High-voltage component to 5.4 kV	PROFITEST 204+HV -5.4kV	M505B
PSI module, 2 rolls paper chart, 1 ribbon cartridge, batteries and operating instructions	SECUTEST PSI [D)]	GTM5016000R0001
SI-Modul including batteries and operating instructions	SECUTEST SI [D)]	M702F

Designation	Type	Article number
PC Analysis Software		
http://www.gossenmetrawatt.com (→ Products → Electrical Testing → Testing of Electr. Machines... → PROFITEST 204+) or http://www.gossenmetrawatt.com (→ Produts → Software → Software for Testers)		
Accessory equipment		
RS232 interface cable, 2 m	Z3241	GTZ3241000R0001
Signal lamp set for high-voltage testing in accordance with DIN VDE 0104	Signal 204	Z504D
Plug-on cable lug for secure attachment of the test probe to the terminals	Kabelschuh 204	Z504E
12 m extension cable for use with the measuement cable and test probe with integrated measuring circuit fuse	Leadex 204	Z504C
Transport caddy for PROFITEST 204+ and 204HP/HV, including rubber straps for securing test cables and protective cover	Caddy 204	Z504A
For securing sites against unauthorized presence during high-voltage testing	Claim 204	Z504G
Interface adapter for keyboards	PROFI-MFII	Z504H
Pack of 10 rolls recording chart for PSI module (1 roll = approx. 6.7 m)	PS-10P	GTZ3229000R0001
Pack of 10 ink ribbon cartridges for PSI module	Z3210	GTZ3210000R0001
Universal carrying bag (for PROFITEST 204+ and SECUTEST... without HV-module)	F2000 [D)]	Z700D

[D)] Data sheet available

For additional information on accessories, please refer to
- *our Measuring Instruments and Testers Catalog*
- *our website www.gossenmetrawatt.com*