PRO*Fi*TEST® *C*
Test Instrument per DIN VDE 0100

3-349-075-03
3/11.00

Applied for

KEMA EUR
Applied for

Applied for

QUALITY MANAGEMENT SYSTEM

DQS Certified per
DIN EN ISO 9001 reg. no. 1262

Testing for Residual-Current Devices (RCDs)

- Measures contact voltage without tripping the RCCB.
  Contact voltage relative to nominal residual current is measured with $^1/_3$ nominal residual current.
- Trip test with nominal residual current and measurement of time to trip

Special Testing for Systems and RCCBs

- Testing for systems and RCCBs
  with rising residual, tripping current is displayed
- Testing for RCCBs (10 and 30 mA) with 5 • $I_{\Delta N}$
- Tests RCCBs with half-waves in order to determine
  contact voltage and tripping current

Testing for Special RCCBs

- Selective [S], type G

Measurement of line voltage and frequency, phase angle and sequence

Measurement of loop and earthing resistance

Special Features

- Allowable fuse types are displayed for the system under test.
- Internal measurement value memory with 32 kB capacity stores up to 255 electrical circuits and up to 2000 measurement values.
- Data interface for the transmission of measurement values and for software updates

Voltage and Frequency Ranges

The measuring device allows for use of the test instrument in all alternating and three phase current systems with voltages ranging from 170 to 253 V, and frequencies from 15 to 70 Hz.

Loop Impedance Measurement

Loop impedance measurement can be performed within a range of 170 to 253 V. Subsequent calculation of short-circuit current is based upon the respective line voltage, assuming that the measured line voltage is within the specified range. If line voltage is not within the specified range, short-circuit current is calculated based upon actual line voltage and measured impedance.
RCCB tripping can be suppressed for the measurement of loop impedance with the PRO*Fi*TEST®DC-II accessory device.

Display

The LCD window consists of a backlit dot matrix which is used to display menus, configuration options and measurement results, as well as online help. Various user interface languages can be selected, depending upon the country in which the test instrument is used.

Operation

The instrument is very easy to operate. A multifunction key allows for one-handed operation when selecting menus and starting measurements. Basic functions and sub-functions are selected with the help of four softkeys. For systems with earthing contact outlets, the instrument is simply connected to the mains outlet with the test plug.

Phase Tester

Protective conductor potential is tested when the finger contact surface is touched. The PE signal lamp lights up if a potential difference of greater than 150 V is detected between the contact surface and the earthing contact at the test plug.

Battery Charge Level Indicator and Device Self-Test

A battery symbol in the main menu with 5 segments ranging from depleted to fully charged keeps the user continuously informed concerning battery charge level.
Test patterns can be queried one after the other in the self-test mode, and display LEDs and relays can be tested. The test instrument is switched off automatically if the batteries are depleted, and it includes a charge control circuit for safe charging of commercially available rechargeable NiMH or NiCd batteries.

Sturdy Housing for Rugged Use

Soft plastic jacketing protects the instrument against impacts, or if it is inadvertently dropped.

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Signal Lamps

The device recognizes errors in the electrical system automatically, which are indicated with four lamps, (see following table).

Lamp	Status	Meas. Function	Function
PE	lights up red	all	Device on and potential difference ≥ 150 V between finger contact and PE (earthing contact), frequency: f > 45 Hz
NETZ/ MAINS	lights up green	I_Δ / R_E / Z_{Loop}	3-pole connection: line voltage approx. 170 V to 253 V, measurement enabled
NETZ/ MAINS	blinks green	I_Δ / R_E / Z_{Loop}	2-pole connection (e.g. N conductor not connected): line voltage approx. 170 V to 253 V, measurement enabled
NETZ/ MAINS	blinks red	I_Δ / R_E / Z_{Loop}	Line voltage < approx. 170 V or > 253 V, measurement disabled
U_L	lights up red	I_Δ	– Contact voltage $U_{I\Delta N}$ or $U_{I\Delta}$ > 25 V or > 50 V – Safety shutdown has occurred.^
		R_E	– Limit value for R_E exceeded
RCD/FI	lights up red	I_Δ	The RCCB was not tripped, or was tripped too late during the trip test.

Data Interface

Measurement data can be read out to a printer or a PC via the integrated IRDA interface, providing the user with 3 advantages.

- Transmission of stored data to a PC for processing and archiving, or for the generation of official reports
- Immediate print-out of all measurement data (via adapter)

Software Updates

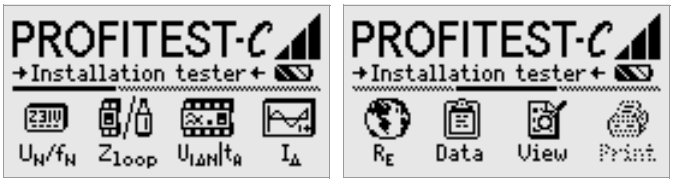
The test instrument will never become obsolete thanks to software updates which can be installed via the IRDA interface. Updates can be performed by our service department as part of our re-calibration service, or by the user himself.

Applicable regulations and Standards

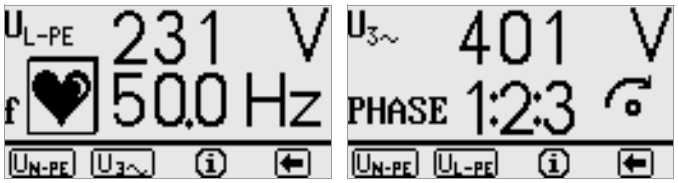
IEC 61010-1/EN 61010-1/ VDE 0411-1	Safety requirements for electrical equipment for measurement, control and laboratory use
IEC 61557/ EN 61557/ VDE 0413	Part 1: General requirements Part 3: Loop resistance measuring instruments Part 6: Devices for testing residual current devices (RCDs) for correct functioning, and for testing the effectiveness of protective safety measures in TT and NT systems Part 7: Phase sequence indicators
DIN 43751 Part 1, 2	Digital measuring instruments
VDE 0106 Part 1	Protection against electric shock, classification of electric and electronic equipment
EN 60529 VDE 0470 Part 1	Test instruments and test procedures, protection provided by enclosures (IP code)
EN 50081-1	Electromagnetic compatibility (EMC) Generic standard for interference emission
EN 50082-1	Electromagnetic compatibility (EMC) Generic standard for interference immunity

Sample Displays

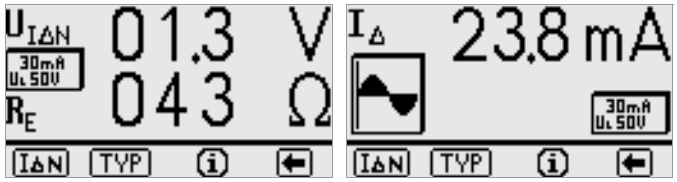
Main Menus

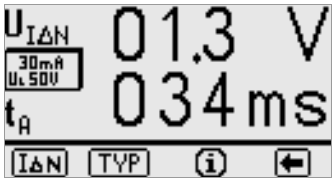


Voltage Measurement

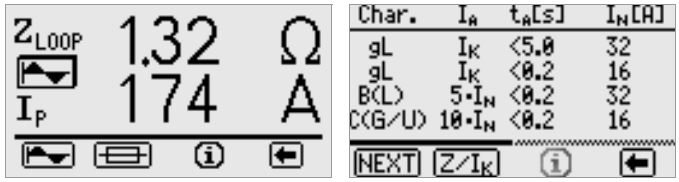


Testing Residual Current Circuit Breakers (RCCBs)





Loop Impedance Measurement and Fuse Characteristics



Online Help and Earthing Resistance Measurement

Characteristic Values

Function	Measured Quantity	Measuring Range (display range)	Resolution	Input Impedance/ Test Current	Nominal Values	Intrinsic Error	Nominal Range of Use	Measuring Error
U_{L-PE} U_{N-PE}	U_{L-PE} U_{N-PE} / U_{L-N}	0 ... 99.9 V 100 ... 300 V (0 ... 600 V)	0.1 V 1 V	500 kΩ	—	±(2% rdg. + 2 d)	108 ... 253 V	±(4% rdg. + 3 d)
	f	15.0 ... 99.9 Hz (15.0 ... 650 Hz)	0.1 Hz	500 kΩ	—	±(0.1% rdg. + 1 d)	15 ... 70 Hz	±(0.2% rdg. + 1 d)
$U_{3\sim}$	$U_{3\sim}$	0 ... 99.9 V 100 ... 500 V (0 ... 600 V)	0.1 V 1 V	500 kΩ	—	±(2% rdg. + 2 d)	108 ... 440 V	±(4% rdg. + 3 d)
I_Δ	$U_{I\Delta N}$	0 ... 99.9 V	0.1 V	0.3 · $I_{\Delta N}$	U_N = 230 V f_N = 50 Hz U_L = 25/50 V $I_{\Delta N}$ = 10/30/100/ 300/500 mA	+(12.5% rdg. + 2 d) +(2.5% rdg. – 2 d)	5 ... 70 V	+15% rdg. + 2 d +0% rdg. – 0 d
	R_E / $I_{\Delta N}$ = 10 mA	10 Ω ... 9.99 kΩ	10 Ω	0.3 ... 1.3 · $I_{\Delta N}$		—	calculated value	—
	R_E / $I_{\Delta N}$ = 30 mA	3 Ω ... 999 Ω 1 kΩ ... 6.40 kΩ	3 Ω 10 Ω					
	R_E / $I_{\Delta N}$ = 100 mA	1Ω ... 999 Ω	1Ω					
	R_E / $I_{\Delta N}$ = 300 mA	0.3 Ω ... 99.9 Ω 100 Ω ... 640 Ω	0.3 Ω 1 Ω					
	R_E / $I_{\Delta N}$ = 500 mA	0.2 Ω ... 99.9 Ω 100 Ω ... 380 Ω	0.2 Ω 1 Ω					
	I_Δ / $I_{\Delta N}$ = 10 mA	3.0 ... 13.0 mA	0.1 mA	3.0 ... 13.0 mA		±(5% rdg. + 2 d)	3.0 ... 13.0 mA	±(8% rdg. +2 d)
	I_Δ / $I_{\Delta N}$ = 30 mA	9.0 ... 39.0 mA		9.0 ... 39.0 mA			9.0 ... 39.0 mA	
	I_Δ / $I_{\Delta N}$ = 100 mA	30 ... 130 mA	0.1 mA 1 mA	30 ... 130 mA			30 ... 130 mA	
	I_Δ / $I_{\Delta N}$ = 300 mA	90 ... 390 mA		90 ... 390 mA			90 ... 390 mA	
	I_Δ / $I_{\Delta N}$ = 500 mA	150 ... 650 mA	1 mA	150 ... 650 mA			150 ... 650 mA	
	$U_{I\Delta}$ / U_L = 25 V	0 ... 25.0 V	0.1 V	same as I_Δ		+(12.5% rdg. + 2 d) +(2.5% rdg. – 2 d)	0 ... 25.0 V	+15% rdg. +2 d +0% rdg. – 0 d
	$U_{I\Delta}$ / U_L = 50 V	0 ... 50.0 V					0 ... 50.0 V	
	t_A ($I_{\Delta N}$/5 · $I_{\Delta N}$)	0 ... 99.9 ms 100 ... 999 ms	0.1 ms 1 ms	1.05 · $I_{\Delta N}$ / 5 · $I_{\Delta N}$		±3 ms	0 ... 1000 ms	±4 ms
Z_{loop}	Z_{loop}	0 ... 0.5 Ω 0.5 ... 9.99 Ω 10.0 ... 30.0 Ω	10 mΩ 10 mΩ 100 mΩ	740 mA	U_N = 230 V f_N = 50 Hz	±5 d ±(6% rdg. + 3 d) ±(6% rdg. + 3 d)	0.25 ... 0.5 Ω 0.5 ... 30 Ω 0.5 ... 30 Ω	±(15% rdg. + 8 d) ±(10% rdg. + 5 d) ±(10% rdg. + 5 d)
R_E	R_E	0 ... 0.5 Ω 0.5 ... 9.99 Ω 10.0 ... 99.9 Ω 100 ... 999 Ω 1.00 k ... 9.99 kΩ	10 mΩ 10 mΩ 10 mΩ 100 mΩ 1 Ω	740 mA 740 mA 400 mA 40 mA 4 mA		±5 d ±(6% rdg. + 3 d) ±(4% rdg. + 3 d) ±(4% rdg. + 3 d) ±(4% rdg. + 3 d)	0.25 Ω ... 0.5 Ω 0.5 Ω ... 9.99 Ω 10.0 Ω ... 99.9 Ω 100 Ω ...999 Ω 1 kΩ ...9.99 kΩ	±(15% rdg. + 8 d) ±(10% rdg. + 5 d) ±(8% rdg. + 5 d) ±(8% rdg. + 5 d) ±(8% rdg. + 5 d)

Reference Conditions

Line Voltage	230 V ± 0.1%
Line Frequency	50 Hz ±0.2 Hz
Measured Quantity Waveshape	sine (deviation between effective and rectified values < 1%)
System Impedance Angle	cos φ = 1
Battery Voltage	5.5 V ± 1%
Ambient Temperature	+ 23 °C ± 2 K
Relative Humidity	45 ... 55%
Finger Contact	for testing potential difference to earth potential

Nominal Ranges of Use

Voltage U_N	230 V	(108 ... 253 V)
Frequency f_N	$16^2/_3$ Hz	(15.4 ... 18 Hz)
	50 Hz	(49.5 ... 50.5 Hz)
	60 Hz	(59.4 ... 60.6 Hz)
Overall Frequency Range	15 ... 70 Hz	
Waveshape	sine	
Temperature Range	0 °C ... + 40 °C	
Battery Voltage	4.6 ... 6.5 V	
System Impedance Angle	corresponds to cosφ = 1 ... 0.95	

Power Supply

Batteries	4 ea.1.5 V baby cell (alkaline-manganese per IEC LR14) or 4 rechargeable NiCd/NiMH batteries
Batter Test	Symbolic display
Battery Saving Circuit	Display illumination can be deactivated. The test instrument is switched off automatically 10 to 60 seconds after the last key operation. ON-time can be selected by the user.
Safety Shutdown	The instrument is switched off if supply voltage drops to below the specified level, or it cannot be switched on.
Charging Socket	Rechargeable batteries can be recharged inside the instrument by connecting the NA0100S (Z501D) charger to the charging socket.

PRO*Fi*TEST®*C*
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Overload Capacity

U_{L-PE}, U_{L-N}	600 V continuous
Fi, R_E, Z_{Loop}	300 V (limited to the number of measurements and the off period, a thermostatic switch prevents execution of the function if overload occurs)
Fine-Wire Fuse Protection	1 A, 10 s, > 2 A – fuses blow

Electrical Safety

Safety Class	II per IEC 61010-1/EN 61010-1/ VDE 0411-1
Operating Voltage	300 V
Test Voltage	3.7 kV 50 Hz
Overvoltage Category	III
Contamination Level	2
EMC, Interference Emission	EN 50081-1
EMC, Interference Immunity	EN 50082-1
Fuses Terminals L and N	1 cartridge fuse link each, F1H250V 5 mm x 20 mm

Ambient Conditions

Operation	–10 ... + 50 °C
Storage	–20 ... + 60 °C (without batteries)
Relative Humidity	max. 75%, no condensation allowed
Climatic Category	3z/-20/50/60/75%
Altitude	max. 2000 m
Deployment	indoors only

Mechanical Design

Display	multiple dot matrix display, 128 x 64 pixels (65 mm x 38 mm), illuminated
Protection	housing: IP 52 per DIN VDE 0470 part 1/EN 60529
Dimensions	275 mm x 140 mm x 65 mm
Weight	approx. 1.2 kg with batteries

Data Interface

Type	infrared interface (SIR/IrDa) bidirectional, half-duplex
Format	9600 baud, 1 start bit, 1 stop bit, 8 data bits, no parity, no handshake
Range	max. 10 cm recommended distance: < 4 cm

Standard Equipment

1 PRO*Fi*TEST®*C* test instrument
1 carrying strap
1 set batteries
1 operating instructions
1 CD-ROM demo version PC software PS3 for generating reports

PRO*Fi*TEST®*C* Accessories

Variable Plug Adapter Set

Three self-retaining, contact protected test probes for the connection of measurement cables with 4 mm banana plugs, or with contact protected plugs for sockets with an opening of 3.5 mm to 12 mm, e.g. CEE and Perilex sockets etc. The test probes also fit the square PE jacks on Perilex sockets. Maximum allowable operating voltage: 600 V per IEC 61010.

Three-Phase Current Adapters

A3-16, A3-32 and A3-63 three-phase current adapters allow for trouble-free connection of testers to 5-pole CEE sockets. The three models have different sized plugs which correspond to 5-pole CEE sockets with 16 A, 32 A and 63 A nominal current. Phase sequence is indicated with signal lamps. Testing for the effectiveness of protective measures is conducted with five, 4 mm contact protected sockets.

PRO*Fi*KALIBRATOR 1

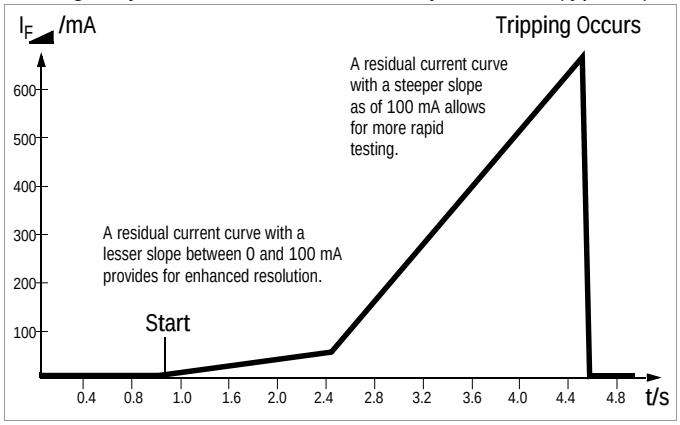
The PRO*Fi*KALIBRATOR 1 is a comparative calibration device for testers per DIN VDE 0100. In conjunction with a test standard and a multimeter (e.g. METRA*Hit*®28S), it allows for testing protective measure test instruments such as PRO*Fi*TEST®*C*, PRO*Fi*TEST®0100S/S-II, M5010, M5011, M5012.
The various function values which must be determined according to DIN VDE 0100, part 610, are first compared with the test standard, and then with the measurement values from the device under test. Measurement values from the test standard serve as reference values.

PRO*Fi*TEST®DC-II

Applications
- Tripping test for AC-DC sensitive RCCBs ⏦ ⎓
  - For measurement of tripping current
  - For measurement of time to trip
  - For testing delayed and undelayed Ⓢ RCCBs
- Loop impedance measurement with the PRO*Fi*TEST®*C* with suppression of RCCB triggering

Tripping Test for AC-DC Sensitive RCCBs ⏦ ⎓ with Rising DC Residual Current and Measurement of Tripping Current

A slowly rising direct current is applied to N and PE with the selector switch in the I_{F}◢ position. The measured current value is displayed continuously. When the RCCB is tripped, the last measured current value is displayed. Measuring is conducted with a greatly reduced rate of rise for delayed RCCBs (type Ⓢ).

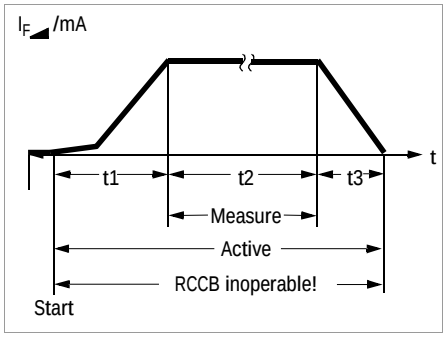


Tripping Test for AC-DC Sensitive RCCBs with Constant DC Residual Current and Measurement of Time to Trip

With the selector switch set to the respective nominal residual current, twice the nominal current is applied to N and PE. Time to trip is measured and displayed for the RCCB.

Loop Impedance Measurement with the PRO*Fi*TEST®*C* with Suppression of RCCB Triggering

The PRO*Fi*TEST®DC-II allows for the measurement of loop impedance in TN systems with RCCBs (10, 30, 100, 300, 500 mA nominal residual current).



The test instrument generates a DC residual current which saturates the magnetic circuit of the RCCB. The PRO*Fi*TEST®*C* superimposes a measuring current which demonstrates only half-waves of like polarity. The RCCB cannot detect this measuring current and can thus no longer be tripped during measurement.

PRO*Fi*TEST®*C*
Test Instrument per DIN VDE 0100

PC Software for PRO*Fi*TEST®*C*

PS3 Intelligent Modular Software for Test Instruments

PS3 imports measurement data acquired with test instruments, and automatically assigns them to tasks such as testing, maintenance or inspection. Ready-to-sign test reports and instrument transfer reports are thus completed with just a few work steps in a very short period of time.

Standard tasks such as the import of measurement data and report printing are managed by the basic software module and the device module.

Additional tasks such as deadline monitoring, test data history, the selection of any desired data and list generation, right on up to complete object management (devices and buildings) with inventory management, work orders and repairs are accomplished with the add-on module and any required additional modules.

Device Modules

Device modules allow for the read-out of measured values from test instruments from the following device series: PRO*Fi*TEST®, METRISO®*C*, GEOHM®*C* and SECUTEST®.

Basic Module

In combination with a device module, the basic module allows for the read-in of measurement data from test instruments, the maintenance of inventory data and reports printing. Data can be read in from any number of test instruments of a given type with the device module. The basic module can also be enabled to interact with additional device modules so that only a single basic module is required for all device types.

The following hierarchical levels are available:

“Electrical circuit”, “distributor” and “building” for the following test instruments:

- PRO*Fi*TEST®PSI (all)
- PRO*Fi*TEST®*C*
- METRISO®*C*
- GEOHM®*C*

“System” for the following test instrument

- SECUTEST® (all)

Machines / systems

- PROFITEST 204

All relevant data for the last performed test are saved and displayed in the “activities” index card. Data from previous tests are overwritten in the basic module when a new test is performed (no history).

“Reports Print-Out – PS3” assigns measurement data from the last performed test to the hierarchical levels for the appropriate test instrument.

Additional entries can be made to the registry cards by activating the “reports” button” before the respective report is printed out. Selection can be made from a variety of form templates.

Add-On Module

The add-on module expands the basic module with several convenient functions which facilitate administration, processing and the read-out of data, and increases efficiency as well. The following additional functions are included with the add-on module:

- Deadline Monitoring
  “Deadline” index card for monitoring deadlines and carrying them forward, with expired deadline alarm.
- History
  Any number of (previously performed) tests can be saved to the “activities” index card and managed.
- Batch Printing
  A batch function allows for automatic overnight printing of innumerable reports.
- Forms Generator
  Included report templates can be changed with the forms generator, and new forms can be created.

The add-on module can only be used after having installed and enabled the basic module and at least one device module at your PC.

Additional Modules

The following additional modules are available for convenient management of large quantities of data:

- The LH Navigator allows users to locate objects in any hierarchical level, and to represent them in freely configurable lists or index cards.
  Bitmap and JPEG files (letters, documents, photos and drawings) can be attached to any index card with the help of the documents administration function, and their contents are displayed by the LH Viewer.
- Client capability allows the user to manage an unlimited number of customers in his own personalized file.
- Functions such as inventory transactions, purchasing, requirements planning, deadlines monitoring, dunning etc. are significantly simplified with STORE inventory management.
- The easy to use REMOTE test software module facilitates the recording of measurement data and controls SECUTEST series test instruments.
- A network version is also available upon request.

Additional modules can only be used after having installed and enabled the basic module, at least one device module and the add-on module at your PC.

Red index card corner:
Data are available here.

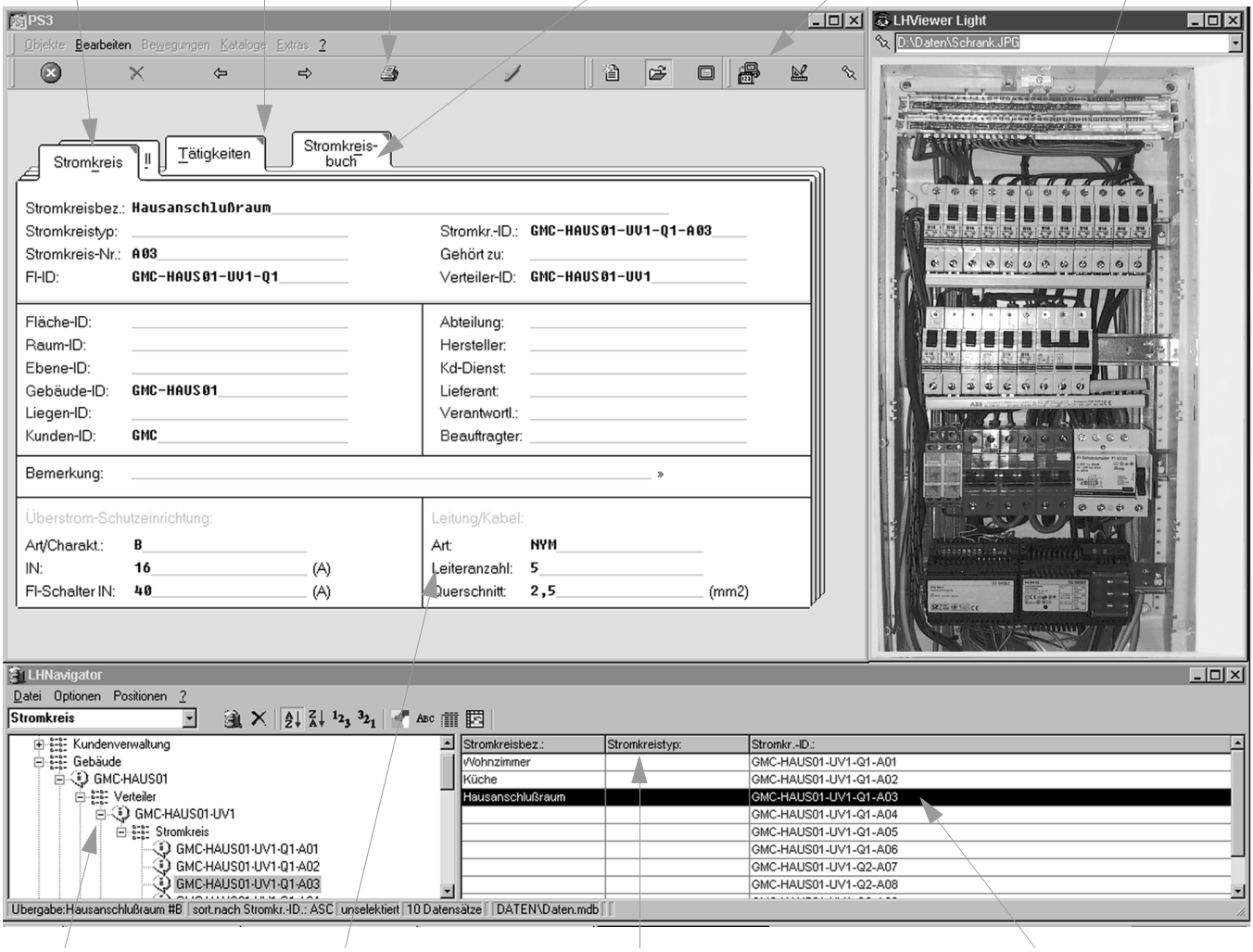
Index card system assures clarity.

All common approval reports can be generated.

Freely selectable index cards

Link to test instruments

LH Viewer Light displays Bitmaps and JPEG images



LH Navigator:
Rapid overview of customers, buildings, distributors, electrical circuits and systems / devices

Frequently required entries can be specified automatically

Freely definable column layout

Automatic branching to corresponding electrical circuit card or any other hierarchical level is accomplished by double clicking

System Requirements for PS3

- Windows PC with 300 MHz Pentium processor or higher
- MS Windows 95, 98 or NT 4.0
- 64 MB RAM for Win 95 or 98; 128 MB RAM for Win NT 4.0
- CD ROM drive
- Approximately 150 MB hard disk space (not including data)
- Floppy disk drive or e-mail for downloading control and enable files

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Order Information

Designation	Type	Article Number
Basic Instruments		
Universal instrument for testing protective safety measures per DIN VDE 0100 in accordance with DIN VDE 0413, parts 1, 3, 6 and 7	PRO*Fi*TEST®*C*	M521A
Same as above but with Swiss plug instead of earthing contact plug	PRO*Fi*TEST®*C*-CH	M521B
Set consisting of PROFiTEST C, METRISO C, 3-pole adapter, IrDa 0100 adapter cable and measurement cables KS17 in carrying case HC 40	Set PROFiTEST C/ METRISO C	M508A
Expansions		
Test instrument as described on page 5 including connector cable and operating instructions	PRO*Fi* TEST DC-II [D]	M523A
Residual current monitor	DI-Mon 1	M662B
IR interface for connection to an RS 232 PC port for transmission of data between the PC and the PRO*Fi*TEST®*C*, e.g. for software updates at the test instrument or for visualization of measured values at the PC	IrDa 0100S	Z501C
Plug Inserts and Adapters		
3-phase measuring adapter	3-Pole Adapter	Z521A
3-phase measuring adapter for PROFiTEST C with Swiss plug	3-Pole Adapter/CH	Z521B
Adapter for PRO*Fi*TEST®DC-II for use in systems without earthing contact outlets	3-Pole Adapter f. DC-II	Z523A
5-pole 3-phase adapter for 16 A CEE outlets	A3-16	GTZ 3602 000 R0001
5-pole 3-phase adapter for 32 A CEE outlets	A3-32	GTZ 3603 000 R0001
5-pole 3-phase adapter for 63 A CEE outlets	A3-63	GTZ 3604 000 R0001
Variable Plug Adapter Set	Z500A	Z500A
Accessories		
Charger for recharging batteries while inside the PRO*Fi*TEST®*C*	NA 0100S	Z501D
Carrying Case	HC30-C	Z541C
Carrying Case	HC40	Z541 D

Designation	Type	Article Number
PS3 Intelligent Modular Software for Test Instruments		
Device module		
PRO*Fi*TEST®*C* + METRISO®*C*	Z530B	Z530B
Basic module	Z531A	Z531A
Add-on module [1]	Z531B	Z531B
Additional modules [2]		
– LH Navigator + LH Viewer	Z531C	Z531C
– Client capability	Z531D	Z531D
– STORE inventory management	Z531E	Z531E
– Network version	upon request	upon request
Calibration Devices		
Comparative instrument for calibrating the PRO*Fi*TEST®*C*	PRO*Fi* KALIBRATOR 1	M661A

[D] Data sheet available
[1] Prerequisites: device module and basic module
[2] Prerequisites: device module, basic module and add-on module

Please refer to our Measuring Instruments and Testers Catalog for additional information concerning accessories.

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GOSSEN-METRAWATT GMBH
Thomas-Mann-Str. 16-20
90471 Nuremberg, Germany
Phone: +49 911 8602-0
Fax: +49 911 8602-669
e-mail: info@gmc-instruments.com
http://www.gmc-instruments.com