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Nieaf-Smitt Installation Technology

# Test- & measuring equipment



Solar testers • Installation testers • Power analysers





Nieaf-Smitt Installation Technology

# Test- & measuring equipment



## Nieaf-Smitt Installation Technology

Company NIF (Netherlands Instrumentation Factory, later to become Nieaf-Smitt) started in 1900 as one of the first companies in the world with the design and manufacturing of instrumentation for electrical values.

Since then Nieaf-Smitt has served the ongoing upgrading, upscaling, modernization and technical refinement in the installation sectors. The complexity and diversity in the installation sectors demands the specialism that Nieaf-Smitt provides by offering reliable instrumentation securing the energy efficiency and safety demands installations and appliances.

Design, manufacturing and supply of portable test and measuring equipment, characterized by quality and dependability. The portfolio of test tools, digital multimeters, current clamps, appliance and installation testers and power analysers is focused on solving the industry demands.

Worldwide availability is assured by a network of professional, trained and dedicated subsidiaries, distributors and agents, offering local service and support.

Mors Smitt has certified quality and environmental management systems according to the leading international standards. ISO 9001:2000 and ISO 14001 are obtained.

Mors Smitt not only has a clear eye directed at reliability, dependability, safety and cost-effectiveness, but also to the demands of our planet. Environmental consciousness is woven closely into design, manufacturing and commercial operations. The company is contributing to the safety of the world in more ways than one.



All portable test- and measuring equipment are marketed under the Nieaf-Smitt brand.



Mors Smitt is part of Wabtec Corporation, the NYSE stock exchange listed, global supplier of highly engineered components and solutions for rail and selected industrial markets. Operations in 17 countries and world wide sales in over 100 countries. Wabtec Corporation holds over 1.200 patents and has world class internal processes based on lean manufacturing and continuous improvement principles (Wabtec Performance System).

Within the Wabtec group Mors Smitt has its own name & identity and is focused on satisfying the needs of customers in the power grid, industry and installation sectors.

Utrecht, April 2016

Mors Smitt B.V. continuous to improve its products and services. Specifications can be changed without prior notice. No rights can be derived from specifications in this brochure. Changes and printed errors reserved.

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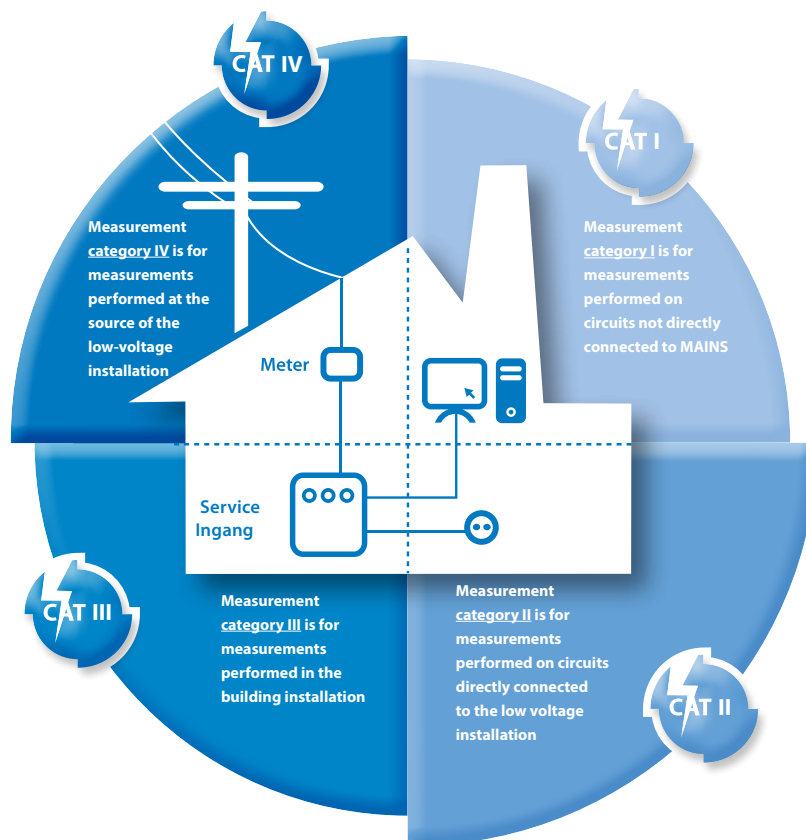
Quality and safety are the drivers of our thinking and doing



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# Symbols

## Overvoltage installation categories according IEC 61010-1



**CAT I**  
 Examples are measurements on circuits not derived from MAINS, and specially protected (internal) MAINS-derived circuits.



**CAT III**  
 Examples are measurements on distribution boards, circuit breakers, wiring, including cables, busbars, junction boxes, switches, socket-outlets in the fixed installation, and equipment for industrial use; also stationary motors with permanent connection to the fixed installation are in this safety category.



**CAT II**  
 Examples are measurement on household appliances, portable tools and similar equipment.



**CAT IV**  
 Examples are electricity meters and measurements on primary overcurrent protection devices and ripple control units.



This product has IP64 protection class



This product can measure True RMS values



This product is in accordance with the IEC / EN 61010-1 Standard

# Calibration, reparatie en support

## Calibration repair services

- Calibration of all brands and types and measurement equipment
- Repair of all Nieaf-Smitt equipment

### Calibration

Nieaf-Smitt has a professional calibration center. All electrical measurement equipment can be calibrated (multimeters, current clamps, temperaturemeters, installation testers, power meters, safety testers, thermal cameras, etc.)

After free registration, you will receive automatically an anual notice to have your instruments calibrated. This way you do not have to worry about the validity of the calibration of your instruments.

### Repairs

Nieaf-Smitt provides a modern state of the art repair division, meeting the ISO 9001 and ISO 14001 standards. Our repair department is run by experienced technicians and provide an rapid and accurate service. Over the years Nieaf-Smitt have gained much know-how in this field, resulting in optimizing our support and services.

## Support

- Helpdesk to support the operation of all Nieaf-Smitt equipment and matching software

### Helpdesk

Nieaf-Smitt has gained a lot of experience over the years. On the support section of our website you will find extensive information on frequently asked questions, application examples, information on education and training and instructions can be found at <http://www.nieaf-smitt.com/support>.

Telephone contact is also possible, for more information check [www.nieaf-smitt.com/support](http://www.nieaf-smitt.com/support) and click on the help and support button for contact details and opening hours of the helpdesk.







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## Solar testers

To meet the demand in PV-quality checks, Nieaf-Smitt has developed measuring equipment for solar panels / installations.

The portfolio consists of a PV-installationtester, an irradiance tester and power-efficiency meters.



Solar



## Test and measurement of solar PV-installations

The production and use of renewable energy is stimulated by the European Union and via government incentives (e.g. through RES directives) and the prices for solar panels are dropping, leading to a growing number of solar panel installations. With this the demand for initial and periodic testing of the solar panels is growing.

Site survey, installation and commissioning of solar installations demands attention to safety, sustainability, reliability and efficiency / output of the solar panel system.

Several guidelines and legislation are applicable:

- IEC 62446:2009 (Minimum requirements for system documentation, commissioning tests and inspection)
- IEC 60364-6 (Low-voltage electrical installation – part 6: verification)
- NEN 1010 / NTA 8013 (The Netherlands)

The IEC 62446 demands several tests & measurements that must be provided to the end-user, when installing a solar panel system:

- Visual inspection: is the installation wired correctly? No damage to cables during installation?
- Insulation resistance measurement ( $R_{iso}$ )
- Earth continuity measurement ( $R_{pe}$ )
- PV string short circuit current ( $I_{sc}$ )
- PV string open circuit Voltage ( $U_{oc}$ )
- Solar irradiance
- Roof orientation and pitch

To safely install new solar panels (in line with the international standards) and to optimise the periodic testing of solar panel installations Nieaf-Smitt has developed the EazyPV tester. Easy and effective testing of all solar installation parameters in one device. The solar panels do not need to be opened/dismantled for this, the uniform solar panel connectors can be connected directly on the EazyPV.

The new EazyPV includes all functionalities to perform pre-installation site surveys and measure the electrical safety and performance of installed PV systems in line with the international IEC 62446 standard. Enabling contractors to safely, thoroughly and effectively install and maintain solar PV installations.



Solar



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The new high specification IRM100 combines irradiance measurement with a hosts other features to enable solar PV and solar thermal contractors to carry out site surveys quickly and easily. The versatile device uses a precision PV cell sensor for the highly accurate irradiance measurement, displaying results in either  $W/m^2$  or  $BTU/h/ft^2$ .

The EazyPV and IRM100 testers include all of the necessary functions to measure the electrical safety and performance of PV systems as well as irradiance. Additionally the kit is suitable to conduct site surveys for potential installations; providing the information needed to calculate estimated annual solar irradiation and system yields of PV and solar thermal systems, as described in several local guidelines.



Solar

# EazyPV

Artikelnummer: 626000757



## Including

- 2x MC4 connectors fused)
- 2x testlead + crocodile clamp
- Quickstart manual
- Batteries
- Conformity declaration
- Bag
- Software (PV link)
- Support CD-rom

## Solar PV installationtester

The compact PV-installationtester with digital display is the quickest on the market.

The EazyPV combines all PV electrical test functions required to meet IEC 62446 into one safe, easy-to-use, hand-held device.

The addition of USB and wireless connectivity in combination with the IRM100, make the EazyPV the most versatile PV tester on the market.

## Features

- Visual inspection: is the installation wired up correct?  
No damage to cables during installation?
- Insulation resistance measurement ( $R_{iso}$ )
- Earth continuity measurement ( $R_{pe}$ )
- PV string short circuit current ( $I_{sc}$ )
- PV string open circuit Voltage ( $U_{oc}$ )
- PV link software to download of measured values (included)

The following parameters can be coupled wireless coupled with the IRM100 and EazyPV:

- Irradiance ( $W/m^2$ )
- Panel temperature and outside temperature

## Specifications

Functions	Range
<b>Earth continuity measurement</b>	
Test current in $2 \Omega$	> 200 mA
Range (EN 61557-4)	0.05 $\Omega$ ...199 $\Omega$
<b>Insulation resistance measurement</b>	
Test voltage @ 1 mA	250, 500, 1000 VDC
Display	0.05 M $\Omega$ ...199 M $\Omega$
<b>Open circuit voltage measurement (w/ PV-connections)</b>	
Display	0.0 VDC...1000 VDC
<b>Short circuit current (w/ PV-connections)</b>	
Display	0.00...15 A DC
<b>Current (w/ AC/DC current clamp)</b>	
Display	0.1 A...40.0 A
<b>Power</b>	
Display	0.05 W...40.0 kW
<b>Rpe voltage measurement (4 mm connection)</b>	
Voltage	30 V...440 VDC 30 V...440 VAC 50/60 Hz

Specifications	
Supply	6x AA batteries
Dimensions	26 x 10 x 5.5 cm
Weight	0.8 kg
Warranty	2 years



Solar



# IRM100

Article number: 626000759



## Connecting the EazyPV with the IRM100

The EazyPV and IRM100 includes all of the necessary equipment to measure the electrical safety and performance of PV systems as well as irradiance.

Additionally, the kit is integral to conducting site surveys for potential installations; providing the information needed to calculate estimated annual solar irradiation and system yields of PV and solar thermal systems, as described in several local guidelines.

The measured values can be downloaded with the PV link software (included).

## Irradiance meter

To determine the quality and efficiency of solar panels it is important to check the circumstances in which the measurements are done.

## Features

- Irradiance
- Temperature
- Compass
- Tilt

## Including

- Temperature probes
- Quickstart manual
- Batteries
- Conformity declaration
- USB-cable
- Software (PV Link)
- Support CD-rom
- Bag

## Specifications

Functions	Range
<b>Irradiance</b>	
Display	0...1500 W/m <sup>2</sup>
Measurement	100...1250 W/m <sup>2</sup>
Resolution	1 W/m <sup>2</sup>
<b>Temperature</b>	
Display	-30 °C...+125 °C
Measurement	-30 °C...+125 °C
Resolution	1 °
<b>Compass</b>	
Display	0 °...360 °
Measurement	0 °...360 °
Resolution	1 °
<b>Tilt</b>	
Display	0 °...90 °
Measurement	0 °...90 °
Resolution	1 °
<b>Datalogging</b>	
Datasets	5000
Sample rate	1...60 min
Datalogging	Software Including
Connection	USB download to PC

Specifications	
Supply	2x AA batteries
Dimensions	15 x 8 x 3.3 cm
Weight	265 g
Warranty	2 years

# NI T38

Article number: 626005049



## Compact AC/DC current clamp adapter

The compact current clamp adapter NI T38 is an easy to use solution for measuring high currents (AC+DC) in combination with a multimeter.

The clamp adapter is compatible with the EazyPV solar PV-tester.

### Features

- 4 mm connectors
- 2 ranges 40 A and 400 A
- Non-contact voltage detection
- Compatible with EazyPV solar PV-tester
- AC & DC

### Including

- Manual
- Batteries

### Specifications

Functions	Range	Accuracy
Current	0.1...400 AAC	
Output voltage	1 mV per 1 A	± 2.8 % + 0.5 A
Current	0.01...40 A	
Output voltage	10 mV per 1 A	± 2.5 % + 0.1 A
Frequency	10 kHz	

Specifications	
Max. diameter geleider	30 mm
Max. bek opening	30 mm
Overvoltage category	CAT III 600 V, CAT IV 300 V
Standard	EN 61010-1, EN61010-2-32
Dimensions	150 x 58 x 35 mm
Weight	± 205 g



Solar



## NI 18 plus

Article number: 626005038



### Including



Battery



Test leads



Thermocouple

- Battery
- Manual

## True RMS current clamp with power measurement

The NI 18 plus is a sturdy, high quality multifunctional True RMS current clamp. The clamp can measure up to 600 AAC/DC and 750 VAC / 1000 VDC.

Other functionalities like temperature, power factor, power (Watt) and phase rotation complete the NI 18 plus as the most allround clamp in the range.

### Features

- True RMS
- Current AC/DC
- Voltage AC/DC
- Resistance
- Continuity test
- Resistance
- Total harmonic distortion
- Temperature
- Inrush current
- Power measurement
- Power factor
- Phase rotation
- LCD backlight

### Specifications

Functions	Maximum range	Accuracy
Voltage	750 VAC 1000 VDC	± 1.0 % + 5d ± 0.7 % + 5d
Current	600 AAC/DC	± 1.5 % + 5d
Resistance	20 kΩ	± 10 % + 5d
Frequency	10 kHz	± 0.1 % + 2d
Effective power	600 kW	
Temperature	-50 °C...+1000 °C	± 1.0 % + 3 °C

Specifications	
Max. conductor size	35 mm
Max. jaw opening	40 mm
Display resolution	4000d
Overvoltage category	CAT II 1000 V / CAT III 600 V
Standard	EN 61010-1
Supply	1x 9 V battery
Dimensions	235 x 78 x 51 mm
Weight	± 380 g (incl. battery)



## Accessories solar testers



**Adapter plug**  
(combination with 626001058)

Article number:  
626001059



**Adapter socket**  
(combination with 626001059)

Article number:  
626001058



**MC4 adapter set to 4 mm plug**

Article number:  
626001060



**Sunclix adapter**  
(from sunclix to MC4)

Article number:  
626001064

### 'EazyPV installationkit'

The EazyPV installationkit contains:

- EazyPV installationtester
- IRM100 irradiance meter
- PV Link-software
- NI T38 current clamp adapter
- Testadapters

Article number: 626000765







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## Installationtesters

Electrical installations in buildings age rapidly. Therefore it is essential to regularly inspect them according the proper standards (Europe EN 50110).

Nieaf-Smitt has a wide range of testers to test each part of the installation. The combination testers combine multiple functions to perform these tests in an easy and correct way, for both new or existing installations.



# Installation testers

In every country there are several special regulations for testing and approvals of low voltage installations. In many countries these regulations are prescribing installers, inspectors etc. to check the electrical installation periodically.

The basis for the local regulations is in many occasions the IEC EN 60364 "Electrical Installations of Buildings". In relation to this regulation, all important parts of a LV-installation need to be approved.

Prescribed tests that need to be performed are:

- RCD test
- Insulation resistance test
- Earth loop impedance test
- Line impedance test (RS test)
- Earth resistance test

Obviously, values such as voltage and frequency are part of every test as well. Secondly, the regulation EN 50110 'Operation of Electrical Installations' is translated and formed to many national regulations. This regulation is specifically for operation or maintenance of low voltage installations and distribution systems. These installations are mostly in housings, factories or office buildings. Besides the regulations, the growing number of 'aging' installations as well as the increased product liability are important reasons to test all parts of installations thoroughly.

In order to test all necessary components of any installation and to perform all tests within the regulations, Nieaf-Smitt is offering several installation testers. There are individual testers for parts of the regulation and four combination testers.

## Portfolio

The RCT-S is a complete and easy RCD tester. By running the complete test program the quality of the RCD can be indicated. It tests whether the RCD trips on time, if the RCD trips by an earth leakage etc. In case of an incorrect RCD, the tester will not only indicate when the RCD is wrong, but also why.

The insulation resistance tester IRT-C is designed for measuring the insulation of installations or appliances. The instrument is integrated with 4 DC test voltages for measuring high sensitive installations and heavy machines or ground cables.

To perform a complete earth loop / line impedance test, the ELT-S is the most convenient tester. Measuring the loop impedance or net impedance is done with a high test current. For three-phase installations, the tester can indicate the phase rotation (left or right) and the net impedance between two phases. This is very helpful in case of a missing neutral.

The handheld and sturdy earth resistance tester ERT-S has four measuring modes. The integrated Utilitymode has been especially engineered for parallel switched earth connections. For this mode, a current clamp is connected to every single earth connection separately.

The Instaltest XE excels in simplicity. All mandatory elements of the standard, including insulation resistance, earth leakage protection, impedance, voltage and current resistance can be measured. Through memory and software the results can be processed to a certificate.

The Instaltest AT has an unique Autotest option. This feature can save automatically up to 50 results per socket at the same time. This is considerably time saving, complete inspections are up to 5 times faster. Functions such as RCDs, insulation resistance and impedance are available in the Instaltest AT.



	IRT-	RCT-S	ELT-S	ERT-S	Instaltest XE	Instaltest AT
<b>RCD tests</b>						
Contact voltage		•			•	•
Trip current		•			•	•
Trip time		•			•	•
Automatic					•	•
<b>Insulation resistance tests</b>						
50 V test voltage					•	•
100 V test voltage	•				•	•
250 V test voltage	•				•	•
500 V test voltage	•				•	•
1000 V test voltage	•				•	•
<b>Resistance / impedance</b>						
Earthloop impedance			•		•	•
Earthloop without RCD trip			•		•	•
Line impedance			•		•	•
Resistance 200 mA	•	•			•	•
Earth wire resistance 7 mA					•	•
Earth resistance				•	•	•
Earth resistance 3-points				•	•	•
Earth resistance 4-points				•	•	•
Soil resistivity				•		•*
Earth resistance with current clamp				•		
<b>Other measurements</b>						
Voltage	•	•	•		•	•
Frequency		•	•		•	•
Phase rotation			•		•	•
True RMS					•	•
<b>Implementation</b>						
RS232 Interface		•	•	•	•	•
IrDA interface						
Internal memory		•	•	•	•	•
USB interface					•	•
Rechargeable batteries (incl.)					•	•
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\* optional accessory required

# Installation testers

## IRT-C

Article number: 626000826



### Including

- Heavy duty test leads
- Alligator clip test lead
- Batteries
- Rugged hard case
- Manual

### Insulation resistance tester

The insulation resistance tester IRT-C is engineered for accurate measuring of LV-installations and appliances according to the EN 61157 regulation. The tester has been developed to measure voltage and continuity.

Also insulation resistance of high sensitive parts and even heavy machines or ground cables can be measured easily with the four different test voltages.

### Measurements

- Insulation resistance with a test voltage of 100 VDC
- Insulation resistance with a test voltage of 250 VDC
- Insulation resistance with a test voltage of 500 VDC
- Insulation resistance with a test voltage of 1000 VDC
- Partial resistance of earth connection (200 mA)
- Voltage

### Specifications

Function		
<b>Voltage AC</b> 750 V	1 V	± 1.2 % rdg ± 10 dgt
<b>Voltage DC</b> 1000 V	1V	± 0.8 % rdg ± 3 dgt
<b>Resistance</b> 40 Ω, 400 Ω	0.01 Ω, 0.1 Ω	± 1.5 % rdg ± 6 dgt
<b>Insulation resistance</b> 4 M, 40 M, 400 M, 4000 M Ω	1 KΩ~1 MΩ	± 2.0 % rdg ± 6 dgt
<b>Test voltage &amp; current</b>	100 V, 250 V, 500 V, 1000 V @ 1 mA nominal	
<b>Continuity</b>	Test current @ 200 mA, active sound level ≤ 40 Ω	

Specifications	
Overvoltage category	CAT III 1000 V
Standards	EN 61557, EN 61010
Power source	6x 1.5 V AA batteries
Dimensions	200 x 92 x 50 mm
Weight	582 g

# Installation testers

## RCT-S

Article number: 626000349



### RCD tester

The RCD tester RCT-S is engineered to test the RCD according the European regulations EN 61557 and EN 61010 (also selective RCDs). RCDs sensitive to sinusoidal error currents can be tested with the measuring method of this tester as well.

### Following tests

- Contact voltage
- Trip current of the RCD
- Trip time of the RCD
- Voltage measuring Phase – Earth
- Frequency

Testing the RCD is of essential importance. The regulations even subscribe the need to test RCDs and (earth) leakage protection devices periodically. In many cases the RCD is supposed to trip within 300 ms after detecting an earth leakage in the top half of the nominal trip current. This means that in case of a 30 mA RCD, within 300 ms the voltage needs to be switched off automatically when the earth leakage is between 15-30 mA.

The RCT-S has an internal memory with 500 locations for storing the measured values. The stored values can be downloaded to Microsoft Excel on the PC via the RS232 port.

The transfer software can be downloaded from [www.nieaf-smitt.com](http://www.nieaf-smitt.com).



### Recommended accessories

Carrying bag MSa 7	561260036
Strap	626000587
Protective holster	626000579
Test leads RCT-a2	626000313

### Including



- Manual

Network test lead

### Specifications

Functions	Range
Voltage	0...250 V
Frequency	25...499.9 Hz
Trip time	0...2000 ms
0.5 x Inom	0...2000 ms
1.0 x Inom	0...200 ms
2.0 x Inom	0...50 ms
5.0 x Inom	
Trip current	(0.5 - 1.4) x Inom 1x Inom 0 - 2000 ms
Contact voltage	0...99.9 V

Specifications	
Memory	500 locations
Output	RS232, serial 4800 baud
Overvoltage category	CAT II 600 V / CAT III 300 V
IP protection	IP50
Supply	4x LR14 battery
Dimensions	290 x 110 x 65 cm
Weight	0.9 kg

# Installation testers

## ELT-S

Article number: 626000347)



### Recommended accessories

Carrying bag MSa 7	561260036
Strap	626000587
Protective holster	626000579
Test leads RCT-a2	626000313

### Including



Network test lead

- Manual

### Z-loop, Z-line tester

The Z-loop, Z-line tester ELT-S has been engineered especially for measuring the phase rotation, earth loop resistance via neutral (N), earth loop impedance via phase (L) and net impedance of LV installations, all according to the EN 61557 regulation.

The instrument is fully electronic and can perform line and loop impedance on single- or three phase systems. It is also possible to measure the loop resistance between neutral and earth without tripping the RCDs.

### Following tests

- Earth loop impedance
- Earth loop resistance between neutral and earth
- Prospective short circuit current (Ipsc)
- Net impedance between phase and neutral lines and between two phase lines on a three phase system
- The condition of the protective earth potential (safe or dangerous)
- Voltage
- Frequency three-phase rotation field

The ELT-S has an internal memory with 500 locations for storing the measured values. These stored values can easily be transferred to a PC via the RS232 port.

The transfer software can be downloaded from [www.nieaf-smitt.com](http://www.nieaf-smitt.com).

### Specifications

Functions	Range
Voltage	0...440 V
Frequency	25...199.9 / 200...500 Hz
Network impedance phase-zero / phase-phase / phase-earth	0...1999 $\Omega$
Potential short-circuit current phase-zero / phase-phase	0.06...40 k
Earthloop resistance zero-earth	0...1999 $\Omega$

Specifications	
Memory	500 locations
Output	RS232, serial 4800 baud
Overvoltage category	CAT II 600 V / CAT III 300 V
IP klasse	IP50
Supply	4x LR14 battery
Dimensions	290 x 110 x 65 cm
Weight	0.9 kg

# Installation testers

## ERT-S

Article number: 626000348



### Recommended accessories

Carrying bag MSA 7	561260036
Strap	626000587
Protective holster	626000579
Current clamp ERTa7	626000309
X reel	560410079

### Including



Test leads

Earth pins

Cable supports

- Manual

### Earth resistance tester

The Earth Resistance Tester is developed for measuring earth resistance, possibly with the use of a special current clamp for measuring the soil resistivity on LV-installations according to the EN 61577 regulation.

### Following tests

- 2 Point earth resistance
- 3 Point earth resistance
- 4 Point earth resistance
- Earth resistance by current clamp ('Utility' method)
- Soil resistivity ('Wenner' method)

The integrated 'Utility' measurement is especially designed for measuring partial earth resistance at parallel earth connections. This is performed by using a current clamp. (optional accessory ERT-a7)

The ERT-S has an internal memory of 500 locations for storage of the measured values. These stored values can easily be transferred to a PC (via the RS232 port).

The transfer software can be downloaded from [www.nieaf-smitt.com](http://www.nieaf-smitt.com).

### Specifications

Functions	Range
Earth resistance 2- and 3 points	0...50.0 Ω
Earth resistance 'Utility'	0.5...2.00 kΩ
Soil resistivity	0...1999 Ω

Specifications	
Memory	500 locations
Output	RS232, serial 4800 baud
Overvoltage category	CAT II 600 V / CAT III 300 V
IP protection	IP50
Supply	4x LR14 battery
Dimensions	290 x 110 x 65 cm
Weight	0.9 kg

# Installation testers

## Instaltest XE

Article number: 626000821



### Combination installation tester

The Instaltest XE is a simple and compact installation tester combining EN 61010 and EN 61557. The tester has a huge number of integrated features, each driven by separate accessories.

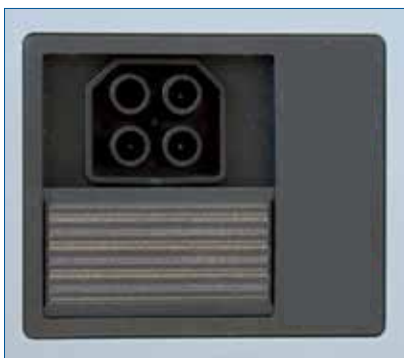
The user selects a measurement easily using the rotary switch. The selected test is also clearly displayed in the large LCD display. Trip time and contact current of the RCD, impedance testing, insulation resistance and phase sequence are some of the functions.

### Following tests

- Insulation resistance
- Continuity
- Contact voltage
- Trip time of RCD
- Automatic RCD test
- Trip current of RCD
- Earthloop impedance without tripping RCD
- Phase rotation
- Line impedance (Z-line)
- Earthloop impedance (Z-loop)
- Voltage
- Earth resistance



### View







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# Installation testers



## Specifications

Functions	Range
<b>Insulation resistance</b> 50, 100, 250, 500 en 1000 V	0.00...999 MΩ
<b>Continuity</b> Test current 200 mA (LPE, NPE)	0.00...1999 Ω
<b>RCD test</b>	
Nominale voltage	93...266 V / 45...65 Hz
RCD trip current	10, 30, 100, 300, 500, 1000 mA
RCD contact voltage	0.0...99.9 V
Test current	< 0.5 x IΔn
RCD trip time	0...999 ms
Test current RCD	0.5 x IΔn / 1 x IΔn / 2 x IΔn / 5 x IΔn
Type RCD	G, S, PRCD
Current type	AC / A / F
<b>Impedance tests</b>	
Loop	0.00...9.99 kΩ
Line	0.00...9.99 kΩ
<b>Voltage</b>	0...550 V
<b>Frequency</b>	45...65 Hz
<b>Phase rotation</b>	100...550 VAC

Specifications	
Memory	
PC-interface	USB/RS232
Overvoltage category	CAT III 600 V / CAT IV 300 V
IP protection	IP40
Supply	6x LR06 AA batteries
Dimensions	230 x 115 x 103 mm
Weight	1.3 kg (excl. batteries)

## Recommended accessories

Tip commander 626000829  
 Plug commander 626000828

## Including



Split test lead



230 V test lead



Carrying bag

- Manual
- Strap
- RS232 and USB cable
- InstallLink Pro software
- Quickstart manual
- Rechargeable batteries
- Charger
- Alligator clamps

# Installation testers

## Instaltest AT

Article number: 626000717



### Automatic installation tester

The Instaltest AT is a versatile and easy to use installation tester according EN 61010-1 and EN 61557. In this installation tester Autotest is integrated. A simple push on the button displays an organized program showing which tests are performed automatically.

The results are immediately stored and transported to the software where they will be transformed into a certificate. Available measurements include insulation resistance, RCD testing, impedance testing (Z-loop and Z-line) and earth resistance.

### Following tests

- Insulation resistance
- Continuity
- RCD trip current
- RCD Contact voltage
- RCD trip time
- Earthloop impedance without tripping RCD (Z-loop)
- Line impedance (Z-line)
- Automatic Z-loop & Z-line limits
- Voltage
- Frequency
- Earth resistance
- Soil resistivity (adapter required)
- Varistor test
- Phase rotation
- Extra low range loop impedance



### Profiles



# Installation testers

## What is AutoTest?

- Autotest will test an installation automatically and optimally
- There are no limits in combining measurements on a system with the Autotest mode
- The user can select any individual test, which will simplify the use even more
- Comments, suggestions and remarks can be added to the tests to make the use and testing significantly easier
- Any combination of tests can be selected and stored
- Limiting values can be added, to show immediately a OK or reject symbol
- There are several programs available which apply to most of the occurring situations

## Including



Split test lead



Tip commander



Carrying bag

- Manual
- Strap
- RS232 and USB cable
- InstallLink Pro software
- Rechargeable batteries
- Charger
- Test probes
- Alligator clamps
- Quick start guide

## Specifications

Functions	Range
<b>Isolation resistance</b> 100, 250, 500 and 1000 V	0.15...1000 MΩ
<b>Continuity</b>	0.16...1999 Ω
<b>Earth leakage trip test</b>	
Nominal voltage	100...264 V / 45...65 Hz
RCD trip current	10, 30, 100, 300, 500, 1000 mA
Contact voltage	0.0...99.9 V
Test current	< 0.5 x IΔn
RCD trip time	0...300 ms
Test current RCD	0.5 x IΔn / 1 x IΔn (not IΔn = 1000 mA type B) / 2 x IΔn (not n = 1000 mA type A of IΔn ≤ 300 mA type B)
Type RCD	G and S
Current type	AC / A / B
<b>Impedance tests</b>	
Loop	0.00...1999 Ω
Line	0.00...1999 Ω
<b>Voltage</b>	0...550 V
<b>Frequency</b>	0.00...999.99 Hz
<b>Earth resistance</b> (3 point)	0...9999 Ω
<b>Soil resistivity</b> (adapter required)	0...1000 kΩ
<b>Varistor test</b>	0...1000 VDC, 0...625 VAC
<b>Phase rotation</b>	100...550 VAC
Indicate phase sequence	Ja

Specifications	
Memory	
PC-interface	USB/RS232
Overvoltage category	CAT III 600 V
IP protection	IP40
Supply	6x LR06 AA batteries
Dimensions	230 x 115 x 103 mm
Weight	1.32 kg (excl. batteries)

## Recommended accessories

3 phase adapter	626000634
Cable locator	626000622
Tip commander	626000636
Selective probe	626000654
Earth test set 20 meter	626001015
Earth test set 50 meter	626001016
X reel	560410074
Telescope probe 47 - 85 cm	560410066

# Accessories

## Accessories for Installation testers



**Protective holster**

Article numbers:  
626000461 (red)  
626000579 (grey)



**Carrying bag MSA7**  
(Universal model for installation testers)

Article number:  
561260036



**Strap**  
(Universal nylon strap for installation testers)

Article number:  
626000587



**Test leads ELT-a2**  
(ELT-S / Instaltest serie, split test lead and 3 probe tips and alligator clamps, for 3-phase installations)

Article number:  
626000302



**Test lead RCT-a2**  
(RCT-S, split test lead and alligator clamps for 3-phase installations)

Article number:  
626000313



**Test lead CMB-a2**  
(CMB-S, split test lead and 2 probe tips and alligator clamps, 2.2 meter)

Article number:  
626000492



**Mini current clamp**  
(Instaltest XE & XA, Utility- and/or City measurements)

Article number:  
626000637



**Current clamp ERT-a7**  
(ERT-S, for Utility- and City measurements and low range current measurement (Instaltest XE only))

Article number:  
626000309



**RS232 Communication cable**

Article number:  
500181372



**USB / RS232-adaptor**

Article number:  
626000664



**USB cable A/B**  
(Instaltest series)

Article number:  
500181375



**IrDA interface**  
(CMB-S)

Article number:  
626000466

## Accessories for Installation testers



**Alligator clamps**

Article numbers:  
626000314 (black)  
626000608 (green)  
560410076 (blue)



**Test probes**

Article numbers:  
626000525 (black)  
626000524 (blue)  
560410002 (green)



**Probe tips, 4 mm**

Article number:  
560410029 (red)  
560410030 (black)



**Selective measuring probe fuse / cable locator**  
(Instaltest AT only)

Article number:  
626000654



**Test lead + probe**  
(1 meter, red)

Article number:  
560410027 Test lead  
560410029 Probe



**Test lead + probe**  
(1 meter, black)

Article number:  
560410028 Test lead  
560410030 Probe



**Test lead IRTa2**  
(IRT-S, black, 1 meter)

Article number:  
626000311



**Test lead RCT-a1**  
(RCT-S schuko plug, 2 meter)

Article number:  
626000312



**Test lead ELTa1**  
(ERTS-S/CMB-S/Instaltest series, Schuko plug, 2 meter)

Article numbers:  
626000301 (EU version)  
500181370 (UK version)



**Telescope probe**  
49 - 85 cm

Article number:  
560410066



**Telescope probe**  
93 - 172 cm

Article number:  
560410067



**Telescope probe**  
165 cm

Article number:  
560410068

# Accessories

## Accessories for installation testers



**Test lead ERT-a1**  
(ERT-S, 4,5 meter, black)

Article number:  
626000303



**Test lead ERTa2**  
(t.b.v ERT-S, green,  
4.5 meter)

Article number:  
626000304



**Test lead ERTa3**  
(ERT-S, red, 15 meter)

Article number:  
626000305



**Test lead ERTa4**  
(ERT-S, blue, 20 meter)

Article number:  
626000306



**Test lead ERTa10**  
(red, 20 meter )

Article number:  
626000442



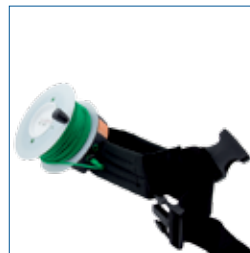
**Test lead ERTa11**  
(blue, 40 meter )

Article number:  
626000443



**X-reel**  
(30 meter, blue)

Article number:  
560410074



**Belt reel**  
(30 meter, green)

Article number:  
560410073



**Handreel**  
(30 meter, black)

Article number:  
560410075



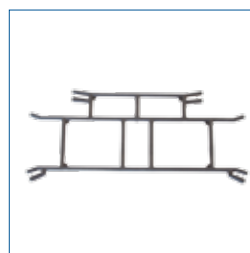
**Cable reel ERTa 13**  
(50 meter, red)

Article number:  
56041058



**Cable reel ERTa 14**  
(blue, 50 meter)

Article number:  
560410059



**Cable support ERTa6**

Article number:  
626000308

## Accessories voor Installation testers



**Earth pin ERTa5**  
(25 cm)

Article number:  
626000307



**ρ adapter**  
(Instaltest AT)

Article number:  
626000715



**3-Wire earth test set**  
(Instaltest AT test leads, 20 meter & earth pins)

Article number:  
626001015



**3-Wire earth test set**  
(Instaltest AT, test leads 50 meter & earth pins)

Article number:  
626 001016



**4-Wire earth test set**  
(Instaltest AT, ρ adapter required, test leads 20 meter & earth pins)

Article number:  
626001019



**4-Wire earth test set**  
(Instaltest AT, ρ adapter required, test leads 50 meter & earth pins)

Article number:  
626001020



**Plug commander**  
(t.b.v. Instaltest series, model <2016)

Article number:  
626001011



**Euro Z adapter**  
(Instaltest AT)

Article number:  
626000726



**Lux measuring probe type B**  
(Instaltest XE)

Article number:  
626001013



**Lux measuring probe type C**  
(Instaltest XE)

Article number:  
626001014



**Meetpen adapter**  
(t.b.v. Instaltest series with test button, model <2016)

Article number:  
626000636



**Plug commander**  
(Instaltest XE, model 2016)

Article number:  
626000828

# Accessories

## Accessories for installation testers



**Tip commander**  
(Instaltest XE, model 2016)

Article number:  
626000829



**Installink Pro Plus**  
(Instaltest AT, software)

Article number:  
62600018



**3-phase adapter**  
(Instaltest series)

Article number:  
626000634



**3-phase cable**  
(Instaltest series)

Article number:  
626 000648



**Luxury case MS-a6**  
(Robust, lockable aluminium profile case for max. 3 installation testers + accessories)

Article number:  
626000377



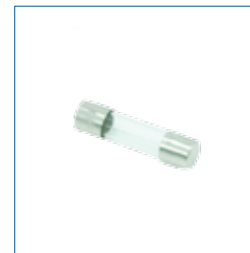
**Luxury case MS-a5**  
(Robust, lockable aluminium profile case for max. 4 installation testers + accessories)

Article number:  
626000376



**Fuse F2 & F3**  
(4 A 500V)

Article number:  
626006035



**Fuse F1**  
(315 mA 250 V)

Article number:  
626006036



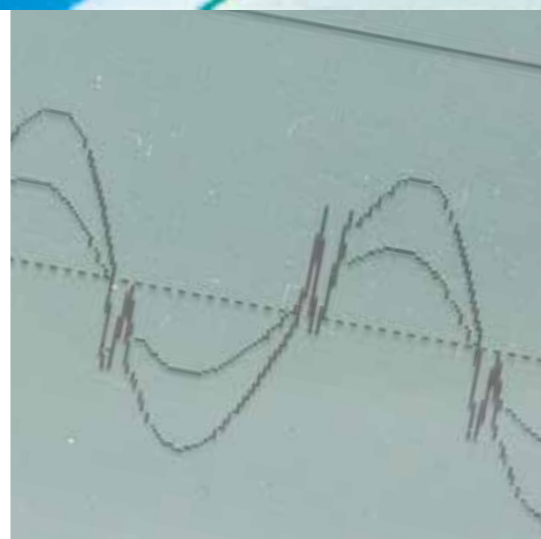


SERVING  
SAFETY

## Power analysers

The quality of all kinds of products is vital and so is the quality of the energy network. This does not mean that the network is actually meeting its specifications. Different processes are detected, such as flicker and voltage dips.

It is necessary to include these processes to a minimum. The power analyzers will help the user to draw conclusions on the basis of periodic measurements, so that these problems can be solved.



# Power analysers

The quality of all kinds of products is vital and the energy network as well. This does not mean that the electricity network is actually clean. Different processes are detected, such as Flicker, surges and voltage dips. It is necessary to include these processes to a minimum. The power analysers will help the user to draw conclusions on the basis of periodic measurements, so that these problems can be solved.

The European regulation EN 50160 is one of the most important regulations for measurements of LV-installations. The essential values for LV-installations are subscribed in this regulation. Besides the EN 50160 there is another important standard, the EN 61000-4-30. This standard ensures that different power quality instruments use the same definitions, and measurement techniques, for various power quality parameters: sags/dips, swells, frequency, harmonics, flicker etc.. Use of this standard ensures that users use the same terms, measurements and definitions.

In order to measure and analyse a LV-installation, according to the EN 50160, two power analysers are available within the Nieaf-Smitt program:

## **PHA 4400**

The PHA 4400 is a lightweight, handheld, 3-phase analyser for quick power quality assessment in low and middle voltage systems. All major power quality parameters like U, I, PF,  $\cos \phi$ , P, Q and S can be monitored on-line, measured or recorded. Thanks to various pre-set measuring profiles, different diagnostics can be performed on-site, even without a PC!

## **PQA 7700**

The PQA 7700 is a handheld, simple to use, portable power quality analyser with four current and four voltage measuring channels. Integrated in a rugged housing and packed with powerful functions it can be effectively used for monitoring, troubleshooting and analysing of power quality conditions in power distribution networks either in industry or utilities.

For optimal analyses of the measured values, the included Windows software can be used. This software can be used for storing the test data and to make several reports and graphic displays, all according to the EN 50160 regulation. Obviously, the data and the reports can be stored and printed. For report modification into a customized report, the data and reports can be exported to .doc and .xls-files.

The PQA7700 meets the demands of the standards IEC 61000-4-30 and IEC 61557-12.



# Power analysers



## Selection schedule



	PHA 4400	PQA 7700
<b>Inputs</b>		
Number of current measuring inputs	3	4
Number of voltage measuring inputs	3	4
<b>Measurements</b>		
TRMS current (min, max, avg)	•	•
TRMS voltage (min, max, avg)	•	•
Scope function		•
Online harmonics		•
Frequency	•	•
Power (W, VA, Var)	•	•
THD and harmonics analysis	•	•
Power factor and cos φ	•	•
Current in neutral conductor	Calculated value	•
Phase diagram	•	•
Unbalance		•
EN 50160 analysis		•
Flicker measurement		•
Waveform recording		•
Inrush currents	•	•
Integration period	1...1800 s	1...3600 s
<b>Communication ports</b>		
USB	•	•
RS232	•	•
<b>General</b>		
Graphical LCD with backlight	160 x 116	320 x 200
On site analysis of recorded date	•	•
Built-in power supply for flexible clamps	•	•
Max. recording time	3.5 days	4...8 weeks
PC-software	•	•
Max. testvoltage - interphase value	952 V RMS	1730 V RMS
Max. testvoltage - between phase and PE conductors	550 V RMS	1000 V RMS
Frequency range	45...66 Hz	10...70 Hz
Overvoltage category	CAT III 600 V	CAT IV 600 V
AC power supply	•	•
Built-in battery charger	•	•
Rechargeable batteries (NiMH)	6x AA	6x AA
Battery life (typical)	12 hour	15 hour
Weight (kg)	0.65	0.65
Dimensions (mm)	220 x 115 x 90	220 x 115 x 90
Page	38	40

# Power analysers

## PHA 4400

Article number: 626000734

Article number: 626020028 (incl. calibration)



### Power harmonics analyser

The PHA 4400 is a lightweight, handheld, 3-phase analyser for quick power quality assessment in low and middle voltage systems.

#### Features

- Simultaneous analysis of basic power quality parameters (U, I, P, Q, S, PF)
- Harmonics analysis up to the 50th component
- Phase diagram for 3-phase systems
- Voltage and current
- Voltage events (dip, swells and interrupts) evaluations
- Three current and three voltage inputs
- Lightweight design
- Quick set-up functions

#### Metingen

- TRMS voltage
- TRMS current
- Power (active, reactive, apparent)
- Power factor,  $\cos \varphi$
- Energy (active, reactive, generated, consumed)
- Harmonic analysis up to 50th harmonics, THD measurement
- Phase diagram and unbalance
- Oscilloscope mode on instrument



#### Profiles



## Specifications

Functions	Range
<b>AC voltage input</b>	
Number of inputs	3
Input voltage range	3.0...550.0 V rms L-N (952.0 V rms L-L)
Accuracy	$\pm 1.0\%$ of reading + 0.5 V
Resolution	0.1 V
Sampling rate	1024 samples per 10 periods
<b>AC current input</b>	
Number of inputs	3
Input current range	4...100 A 40...100 A w/ Current clamp A1033
Accuracy	$\pm 2.0\%$ of reading + 0.3 V
Resolution	0.1 A
Sampling rate	1024 samples per 10 sec
<b>Recording</b>	
Integration period	1...1800 s
Max. number of signals	6

Functions	Resolution	Accuracy
<b>Frequency</b>		
45...66 Hz	10 mHz	$\pm 0.5\%$ of reading + 0.02 Hz
0.000...0.999 k	1	
0.00...9.99 k	10	
0.0...999.9 k	100	
<b>Power (W, VA, VAR)</b>		
0.000...0.999 M	1 k	$\pm 3\%$ of reading + 0.02 Hz
0.00...99.99 M	10 k	
0.0...999.9 M	100 k	
0.000...9.999 G	1 M	
0.00...40.00 G	10M	
<b>Power factor, <math>\cos \varphi</math></b>		
0.00...0.39	0.01	$\pm 0.06$
0.40...1.00	0.01	$\pm 0.03$

Specifications	
Display	Graphic LCD with backlight, 160 x 160 dots
COM-port	RS232 and USB
Overvoltage category	CAT III 600 V
IP Protection	IP42
Supply	230 VAC or 6x 1.2 NiMH, rechargeable batteries, type AA
Dimensions	220 x 115 x 900 mm
Weight	0.65 kg

## Including



Carrying bag



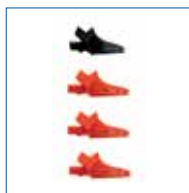
3x current clamp  
30 A / 300 A / 3000 A



Test leads  
3x red, 1x black



Test probes  
3x red, 1x black



Alligator clamps  
3x red, 1x black

- Manual
- Power supply adapter
- RS232-cable
- PowerManager software
- USB-cable
- 6x NiMH rechargeable batteries

# Power analysers

## PQA 7700

Article number: 626000732

Article number: 626020029 (incl. calibration)



### Profiles



### Power quality analyser

The PQA 7700 is a handheld, simple to use, portable power quality analyser with four current and four voltage measuring channels. Integrated in rugged housing and packed with powerful functions it can be effectively used for monitoring, troubleshooting and analysing of power quality conditions in power distribution networks either in industry or utilities.

The PQA 7700 is compliant with power quality standard IEC 61000-4-30 Class S and standard IEC 61557-12. Powerful PC-software package PowerManager comes delivered as part of a standard set and enables downloading, analysing of recorded data and creation of test reports. Through a simple but powerful interface PowerManager helps to find recorded data quickly and allows to make complex analysis and data comparison.

### Features

- 4 voltage channels with wide measurement range 0...1000 Vrms (CAT III / 1000 V)
- 4 current channels with support for automatic clamp recognition
- Compliance with power quality standard IEC 61000-4-30 Class S
- Power measurements compliance with IEC 61557-12 and IEEE 1448 standards
- Simultaneous measurement and recording of basic power quality parameters (U, I, P, Q, S, PF, cos $\phi$ , THD)
- Power quality analysis according to EN 50160 including flicker measurement and standardized report printout in graphic and table form
- 4-quadrant measurements (generator and load with capacitive or inductive character)
- Up to 509 parameters can be monitored or recorded simultaneously
- On-line scope, trend and metering modes
- On-screen displaying of trends and captured events and simultaneous recording in the background
- Flexible clamps (without additional supply) are included in the standard set
- Simultaneous 8 channels - 16 bit AD conversion for accurate power measurements (minimal phase shift error)
- 15 hours of autonomous (battery) supply
- Powerful PC SW PowerManager enables downloading, view, analysis of recorded data and professional report creation

## Measurements

- Voltage: TRMS, peak, crest factor (4-channel)
- Current: TRMS, peak, crest factor (4-channel)
- Power (active, reactive, apparent)
- Power factor,  $\cos\phi$
- Unbalance, flicker measurement
- Harmonic analysis up to 50th harmonics, THD measurement
- Energy (active, reactive, generated, consumed)
- Capturing and recording of power supply events (shutdowns, interruptions, swells, dips)
- Inrush currents monitoring and recording
- Waveform displaying and snapshot
- Power quality analysis according to EN 50160
- Recording up to 10 adjustable alarms

## Specifications

Functions	Range
<b>AC voltage inputs</b>	
Number of inputs	4
Input voltage	20...1500 V rms L-N (20...26000 V rms L-L)
Accuracy	0.2 % of reading
Resolution	10 mV, 100 mV
Sampling rate	1024 samples per 10 periods
Frequency	10...70 Hz
<b>AC current inputs</b>	
Number of inputs	4
Input current	3...6000 A
Accuracy	0.25 % of reading
Resolution	0.1 A
Sampling rate	1024 samples per 10 periods
<b>Recording</b>	
Integration interval	1...3600 s
Max. number of signals	509

Functions	Resolution	Accuracy
<b>Frequency</b> 10.00...70.00 Hz	2 mHz	$\pm 10$ mHz
<b>Power (W, VA, VAR)</b> 0.000 k ... 9.999M	4 digits	$\pm 0.5$ % of reading
<b>Power factor</b> -1.00...1.00	0.01	$\pm 0.02$
<b>Cos <math>\phi</math></b> 0.00...1.00	0.01	$\pm 0.02$
<b>Harmonic analysis up to 50th component</b>		
U <sub>hN</sub> < 10 % Unom	10 mV	0.15 % Unom
3% Unom < I <sub>hN</sub> < 20% Unom	10 mV	5 % U <sub>hN</sub>
I <sub>hN</sub> < 10% I <sub>N</sub>	10 mV	0.15 % I <sub>N</sub>
10% I <sub>N</sub> < I <sub>hN</sub> < 100% Unom	10 mV	5 % I <sub>hN</sub>
<b>THD</b>		
0 % Unom < THDU < 20% Unom	0.1 %	$\pm 0.3$
0 % I <sub>N</sub> < THDI < 100% I <sub>N</sub>	0.1 %	$\pm 0.6$
100 % I <sub>N</sub> < THDI < 200% I <sub>N</sub>	0.1 %	$\pm 1.5$
<b>Voltage dips and swells</b>		
Amplitude : 2...1500 V	10 mV, 100 mV	0.5 % of reading
Duur: 30 ms...7 d	1 ms	$\pm 20$ ms

Specifications	
Display	Graphic LCD with backlight, 320 x 320 dots
PC-communicatie	RS232 en USB
Overvoltage category	CAT III 1000 V / CAT IV 600 V
Protectie degree	Double insulation
Supply	230 VAC or 6x 1.2 NiMH, AA rechargeable batteries
Dimensions	220 x 115 x 900 mm
Weight	0.65 kg

## Including



Carrying bag



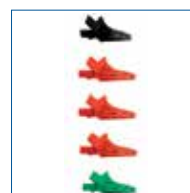
4x current clamp  
30 A / 300 A / 3000 A



Test leads  
3x red, 1x black, 1x green



Test probes  
3x red, 1x black



Alligator clamps  
3x red, 1x black, 1x green

- Manual
- Power supply adapter
- RS232-cable
- PowerManager software
- USB-cable
- 6x NiMH rechargeable batteries

# Power analysers

## PowerManager

### PowerManager software

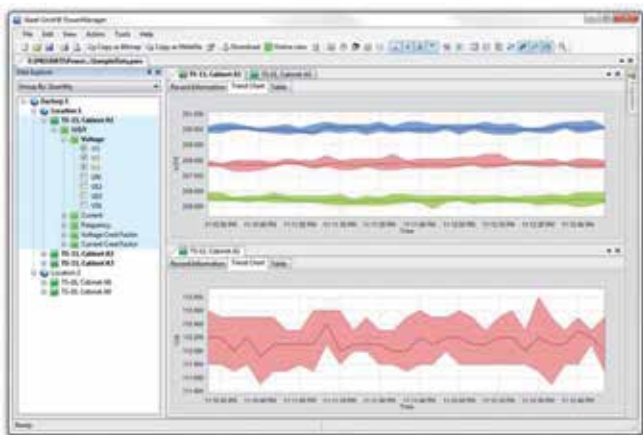
PowerManager software is a powerful platform for downloading, analysing recorded data and creation of power quality test reports. PC-software contains a package of functionalities needed for profound evaluation of power quality phenomena, data comparison and creation of complex test reports. It works in conjunction with Nieaf-Smitt new generation power quality analysers.

For the instruments equipped with GPRS functionality PowerManager enables remote control of the instrument as well.

### Features

- User friendly interface: wide range of quick buttons, possibility to customize the environment by dragging, docking and resizing the window tabs
- Structure: downloaded data is organized into Windows Explorer-like tree structure
- "Drag and drop": downloaded data can be easily organized into multiple sites and sub-site locations
- Data filtering: data in a structure can be grouped by quantity or by phase
- Views: depending on selected record type, different views are available (record Information view, trend chart view, table view, waveform scope view, voltage quality view, etc)
- EN 50160 analysis: automatic voltage quality analysis in compliance with custom or predefined EN 50160 power quality criteria and quick report printing
- Chart zoom: chart can be zoomed depending on selected in a table value range
- On-line monitoring: when instrument is connected with PC, real-time observing of signals and parameters is possible via PowerManager while instrument is measuring / recording in the background
- Export of test results: test results can be exported to other programs (MS Excel, MS Word)
- Reports: automatic generation of test reports from the selected views and data with attached graphs

Simple interface with tree view organized data structure and possibility to customize the environment in numerous ways by using drag – drop capabilities.



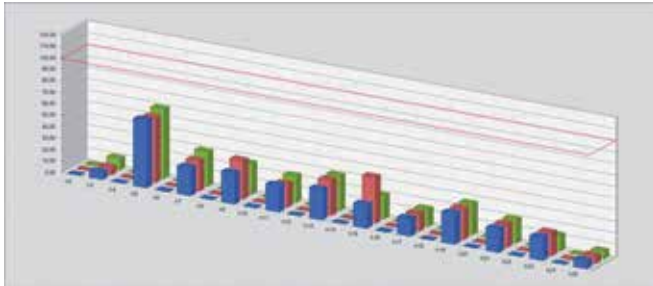


# Power analysers



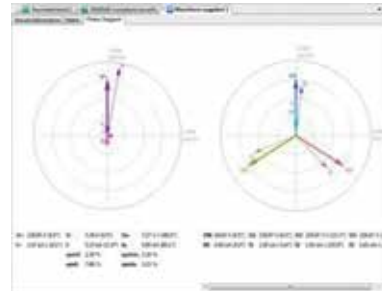
## Creating EN 50160 analysis

Logged data can be analysed according to custom or predefined EN 50160 power quality criteria.



## Vector diagram view

Phase diagram and symmetry diagram, similar to screens on the instrument, are available.



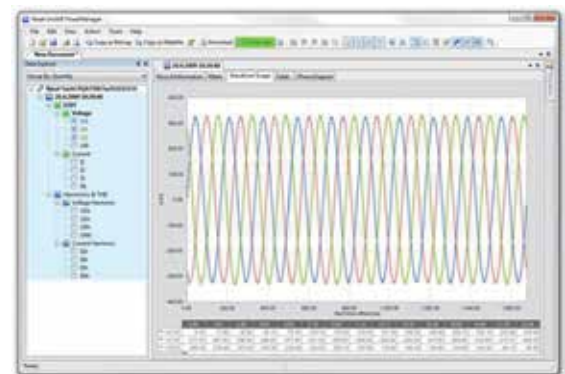
## Meter view

This view is displayed for waveform snapshots ("Scopes"). It contains RMS and other recorded and calculated values, similar to the meter view in an instrument.

Channel	Name	U1	U2	U3	U4	Total	Unit
U	Voltage	230.0	230.0	230.0	230.0	230.0	V
I	Current	2.000	2.000	2.000	2.000	2.000	A
P	Power	460.0	460.0	460.0	460.0	460.0	W
THD-U	Voltage THD	0.200	0.200	0.200	0.200	0.200	%
THD-I	Current THD	0.400	0.400	0.400	0.400	0.400	%
PF	Power Factor	0.900	0.900	0.900	0.900	0.900	
Q	Reactive Power	0.000	0.000	0.000	0.000	0.000	VAR
S	Apparent Power	1.840	1.840	1.840	1.840	1.840	VA
Useq	Unbalanced Sequence Voltage Ratio	0.000	0.000	0.000	0.000	0.000	%
Iseq	Unbalanced Sequence Current Ratio	0.000	0.000	0.000	0.000	0.000	%
PFseq	Unbalanced Sequence Power Factor	0.000	0.000	0.000	0.000	0.000	
UUF	Voltage Unbalance Factor	0.000	0.000	0.000	0.000	0.000	%
IUF	Current Unbalance Factor	0.000	0.000	0.000	0.000	0.000	%
PFUF	Power Unbalance Factor	0.000	0.000	0.000	0.000	0.000	
Ud	Voltage Dip	0.000	0.000	0.000	0.000	0.000	%
Id	Current Dip	0.000	0.000	0.000	0.000	0.000	%
PFd	Power Dip	0.000	0.000	0.000	0.000	0.000	
Udmax	Voltage Dip Peak	0.000	0.000	0.000	0.000	0.000	%
Idmax	Current Dip Peak	0.000	0.000	0.000	0.000	0.000	%
PFdmax	Power Dip Peak	0.000	0.000	0.000	0.000	0.000	
Udmin	Voltage Dip Trough	0.000	0.000	0.000	0.000	0.000	%
Idmin	Current Dip Trough	0.000	0.000	0.000	0.000	0.000	%
PFdmin	Power Dip Trough	0.000	0.000	0.000	0.000	0.000	

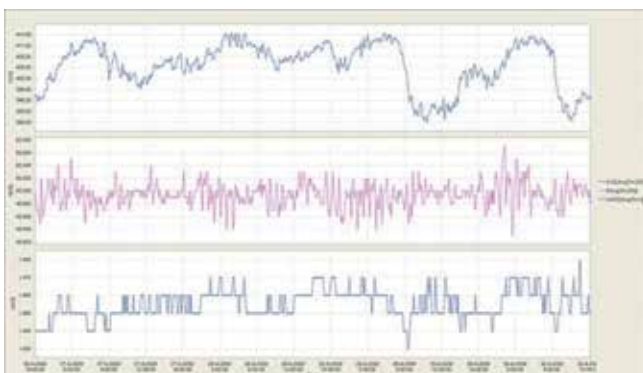
## Online View

Using PowerManager, it is possible to connect to the instrument while it is measuring, and examine the data online. As usual, data explorer tool window is shown, which allows selection of individual channels. When selected, data is displayed using same views as waveform snapshot records.



## Multiple result screen

Several results can be organized in 1 screen for a detailed overview.



## System requirements

Operating system	- Windows 2000 Service Pack 4 - Windows XP Service Pack 2 - Windows Server 2003 - Windows Vista 32-bit & 64-bit - Windows 7 32-bit & 64-bit
Memory	Windows 2000 & XP 512 Mb Windows Vista & 7 1 GB
Available	25 Mb
CD-rom player	Yes

# Accessories

## Accessories for power analysers



**Test lead, black**

Article number:  
560410028



**Test lead, red**

Article number:  
560410027



**Alligator clamp, black**

Article number:  
626000314



**Alligator clamp, red**

Article number:  
560410048



**USB-adaptor**

Article number:  
626000664

Mors Smitt brochures are also available on our website: [www.morssmitt.com](http://www.morssmitt.com)



Heavy duty relays



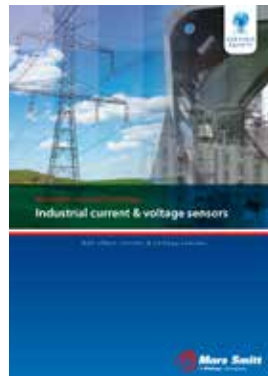
General purpose relays



Actus relays



Surge protection devices



Industrial sensors

Nieaf-Smitt brochures are also available on our website: [www.nieaf-smitt.com](http://www.nieaf-smitt.com)



Instruments 1



Nieaf-Smitt Installation Technology

**Test- en measuring equipment**





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