





POWER QUALITY ANALYZER

PQA 8000





Power Quality

Harmonics, THD Supraharmonics, Symmetrical components etc.



System Dynamics

Phasor Measure Unit (PMU), Rate of Change of Frequency (RoCoF), WAMS, etc.



Transients

1/2 period values, Phase Angle jumps, Resonances, Switching etc.



Power

Active, reactive, apparent power, PF, harmonic power, energy, etc.

HIGH ACCURACY
HIGH SAMPLING RATE
HIGH RESOLUTION
HIGH DYNAMIC RANGE
HIGH SAFETY CATEGORY
DATA STORAGE

0.05% 124kS/s or 1MS/s 18bit 0.5mA to 150kA CAT IV 600V up to 1TB SSD Batterie Display

4h 10.1 inch
90 Wh Multi-Touch

Isolation Standards

6kV IEC61000-4-30 Class A

HIGHLIGHTS



SMART TOUCH

The large 10.1 inch full-HD Smart Touch display responds immediately without any delay with intuitive operation like on a mobile phone.

MOBILE OPERATION

The integrated battery pack allows an operating time of up to 4 hours of operation. 5 LEDs indicate the remaining battery capacity. There is no need for an external power supply or special connectors... plug and play.

GPS

Integrated GPS enables high-precision time measurements & synchronization, which is ideal for PMU applications.



LARGE SSD

The instrument is equipped with two SSD disks. One is dedicated for the OS and application software, and the other one is equipped for data storage (up to 1 TB).

INTERFACES

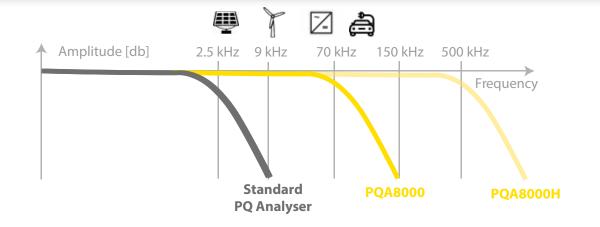
The instrument provides an easy integration with other analog and digital signals such as temperature. The interfaces include USB 3.0, TCP/IP, LAN, Wifi, Bluetooth, RS232, Modbus, 104, DIO, and CAN.

SENSOR SUPPLY

The instrument can provide excitation for your current sensors, and there is no need for batteries or external power supplies.

SUPRAHARMONICS UP TO 500 kHZ FOR VOLTAGE AND CURRENT

Conventional PQ Analyzers, even if they are Class A certified, are not sufficient for modern measurement applications. We use the best available components to ensure the highest safety category and also the highest accuracy. NEO instruments offer high bandwidth (up to 1 MHz) and correct the frequency dependent behavior of current & voltage sensors as well as integrated electronics to achieve the best possible measurement results. THE REFERENCE INSRUMENT

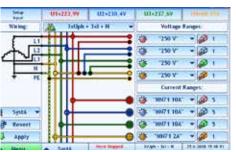


SOFTWARE

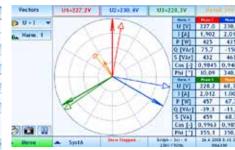
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SETUP

The instrument has a clear structure that shows schematics with explanations.



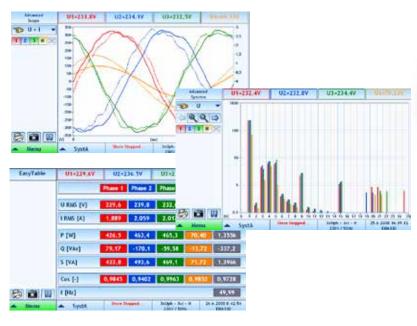




2

MEASURE

During measurements the user can define widgets such as Scopes, Vector Scopes, Harmonic FFTs, Tables, and Recorders.





TRULY INTUITIVE

Intuitive Measurement menus: Cleary structured and explicit menus

HIGHLIGHTS



3

ANALYZE

Sophisticated functions include PQ Data, Transients, Disturbances, and Alarms.





EXPORT

Data can be exported into CSV, XLS, PDF, Comtrade, and PQDiff.



OTHER PROGRAMS

The instrument uses Microsoft Windows© as the operating system. Programs such as Microsoft Excel, Word or Matlab can be added as well as Email messaging services.



NEO SENSOR CALIBRATION

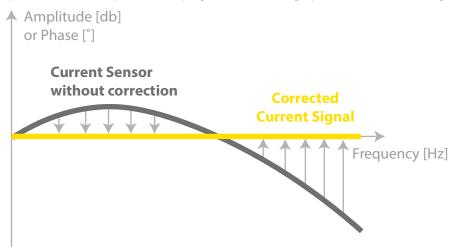
HIGHEST PRECISION

The NEO way of Sensor Integration

All current sensors offered by NEO Messtechnik are industry proven for different applications. We use and improve on the best available sensors in the market.

1) FREQUENCY DEPENDENT CALIBRATION

The NEO sensor integration calibrates each sensor over a wide frequency bandwidth and corrects frequency dependent phase shift and amplitude damping. This enables high precision from DC to high-frequency measurements.



2) MEASUREMENT RANGE DEPENDENT CALIBRATION

In addition, the sensors will calibrated for each measurement range using multiple points.

The calibration will typically cover points from 1% to 100% of the nominal measurement range.

This will improve the accuracy and precision, especially at low current (e.g., 1% of nominal measurement range).

All sensors will be delivered with a standard calibration, which improves the accuracy compared to nominal specifications, whereas the NEO calibration will be performed on each individual sensor and needs to be ordered separately.



INSTRUMENT OPTIONS



PQA8000

4x Voltage Input 1600V DC 4x Current Input (Rogowski, Clamp) CAN / RS485



PQA8000-P

4x Voltage Input 1600V DC 6x Current Input (Rogowski, Clamp) 2x Analog Input (± 10V) CAN / RS485 / DIO



PQA8000-M

4x Voltage Input 1600V DC 8x Current Input (Rogowski, Clamp) CAN / RS485 / DIO



CUSTOMIZE DESIGN



-select the color of the connectors to match cabling or standards

In addition, the transport bag of the PQA8000 device can be embroidered with company logos.



SPECIFICATIONS & ACCESSORIES



GENERAL SPECIFICATIONS		
PC	Microsoft® Windows 10 IOT(64 bit) Intel® Quad Core Processor and 8GB RAM Locked OS for reliable operation Multilanguage Support	
Storage	256GB SSD for OS and application software 256GB SSD dedicated for Data storage	
Display	10.1 inch Capacitive Multi-Touch TFT LCD Sunlight Readable / 800cd	
Battery	Li-lon Battery 90Wh up to 4h operation	
Power Supply	115V / 230V AC	
Interfaces	3x USB, 1x Ethernet, WiFi, 1x HDMI	
Dimensions	298 x 225 x 95 mm 11.8 x 8.8 x 3.7 inch	
Weight	4kg / 8.8pound	
Temperature Range	Operating: 0 to 60°C (32°F to 140°F) Storage: -20 to 80°C (-4°F to 176°F)	
IP Class	IP2X	
Accessories	Transport Bag and Keyboard included	
Standards & Certification	IEC61010-1 (2011) / IEC61010-2-030 / IEC 61000-4-3 / IEC 61000-4-4 / LVD Directive 2014 / EMC Directive 2014/ Rohs Directive 2015 / EN 61000-3-2 / EN 61000-3-3 / EN 61326-1 / EN 55011 +A1, Class A	

OPTIONS AND ACCESSORIES		
SSD Upgrade	Upgrade to 512GB or 1TB data storage	
GPS	Integrated GPS receiver and GPS mouse	
GSM	Integrated Modem for telecommunication	
DC Power	DC Power supply input +9V +36V DC	
Dust Cover	Protect PQA8000 instrument in tough environments	
Transport Case	Ruggedized Pelican-Case (IP67), with foamed insert adapted for the measurement instrument and pullout handle	
color Code	Color code for all voltage and current inputs	
Temperature Sensor	Thermocouple Type K temperature sensor on DSUB15 input	
Radiation Sensor	Pyranometer Sensor on DSUB15 input	
Current Sensor	See Chapter Accessories	
Test Leads	See Chapter Accessories	



SPECIFICATIONS



VOLTAGE INPUTS				
Inputs	4x			
Range	Standard: 1600V/ 800V MV-Version: 600V / 20V			
Accuracy	0.05% f.s.			
Isolation	6kV isolation			
Safety	CAT III 1000V CAT IV 600V			
Impedance	10 ΜΩ			

CURRENT INPUTS				
Inputs	PQA8000: 4x PQA8000-P: 6x PQA8000-M: 8x			
Accuracy	0.05% f.s.			
Туре	Clamp or Rogowski			
Instrument Ranges Clamp	2mV to 10V (15x Ranges)			
Integrator Rogowski Range	1A to 300kA			
Additional Analog Inputs (AIN)	1V, 2V, 5V, 10 V			
Sensor Supply	±15V / 9V			
TEDS	Automatic Sensor Detection*			
Impedance	10 ΜΩ			



ANALOG DIGITAL CONVERSION (A/D)

Sampling Rate /	PQA8000:	124 kS/s / 24bit		
Resolution	PQA8000H:	1 MS/s / 18bit		
Filters	Analogue and Digital Automatic Anti-Aliasing Filte			

DIGITAL I/O & INTERFACES

	Digital In/Out	Adjustable Trigger max. 350V
(CAN, RS485	Selectable Termination



POWER QUALITY

POWER

Voltage Current

Power

Vector

Reactive Power

Power

Finergy

Digital Signalling

Current

ower Calculation	P, Q, S, PF, cos phi, D, DH, QH
requency	10 sec, AVE, MIN, MAX
oltage, Current	RMS, AVE, MIN, MAX, ½ Period-values, 200ms, 10s, 10min
nergy	Total, positive, negative (P, Q, P+, P-, Q+, Q-)
fficiency	DC / AC, U-I Curve for PV
liring	DC, 1-Phase, 2-Phase, 3-Phase Star and Delta
•	

WAVEFORM & TRANSIENTS

DELTA

dU, dI, df, dP, etc.

DERIVATE (RATE OF CHANGE)

dU/dt, df/dt etc. ... per ms, number of periods or half-period

COMBI-TRIGGER

Combination of triggering including mulitple conditions

VOLTAGE SIGNALLING

RAPID VOLTAGE CHANGES (RVC's)

dU, dc, dt

EN50160 Trigger on any EN50160 parameter (Max, Quantil)

COMPLYING STANDARDS

POWER QUALITY, HARMONICS, FLICKER:

IEC61000-4-30 Ed. 3 Class A / IEC61000-4-7 / IEC61000-4-15 / IEC62586-2 Ed. 2 / IEC62586-1

PUBLIC GRID, RAILWAY AND INDUSTRY

EN50160 / EN50163 / IEC61000-2-2 / IEC61000-2-4 (Class 1; 2; 3) /

IEEE519 / IEEE 1159 / IEC61000-2-12 / NRS048

WIND POWER, RENEWABLES AND GRID CODES

IEC61400-21 / IEC61400-12 / FGW-TR3 / VDE N-4105 / VDE N-4100 / VDE N-4110 / D-A-CH-CZ / BDEW / ROCOF / IEEE C37.118-2005 (PMU)

MOTORS, TRANSFORMERS AND ELECTRICAL EQUIPMENT

IEC60034 / IEC 60076-1 / IEC61000-3-2 / IEC61000-3-3 / IEC61000-3-11 / IEC61000-3-12



CLASS A++

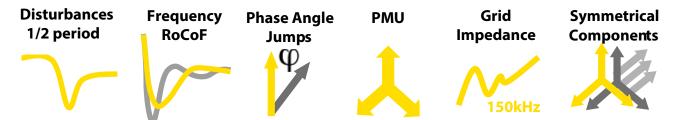


POWER QUALITY

Harmonics Interharmonics Supraharmonics Flicker Unbalance Voltage Variations

according to IEC 61000-4-30 Ed.3 and IEC 62586		
Harmonics (Voltage, Current, Phi, Power)	Class A	
Interharmonics	Class A	
THD U, THD I	Class A	
Higher Frequencies (200Hz band)	2 - 9 kHz (can be calculated from 0 to definable upper limit)	
Higher Frequencies (2000Hz band)	8 - 150 kHz / 500 kHz for voltage and current (PQA 8000H)	
Symmetrical Components & Unbalance (Pos-, Neg- and Zero Sequence)	Class A	
Rapid Voltage Changes	Class A	
Flicker (PST, PLT, Pinst)	Class A	
Voltage Events (dip, swell, interruption – time, extrema, length)	Class A	
Frequency	10 sec, AVE, MIN, MAX	
Voltage, Current	RMS, AVE, MIN, MAX, ½ Period-values, 200ms, 10s, 10min	
Time Synchronisation	Class A	

DISTURBANCES AND SYSTEM DYNAMICS



1/2 PERIOD TRIGGER	U, I, P, Q, S, f, PF, phi, THD, Harmonics, Interharm., Unbalance, etc.		
PHASE ANGLE TRIGGER	phi		
SYMMETRICAL COMPONENTS	Pos., Neg., Zerosequence		
RATE OF CHANGE FREQUENCY (ROCOF)	df/dt		
Phasor Measure Unit (PMU) according to IEEE C37.118	Total Vector Error 0.01% (typ.) Angle Error 0.003°(typ) Timestamp Accuracy 0.1 µs up to 50 fps / via TCP / open PDC format / Offline storage possible		

ADDITIONAL FEATURES INCLUDE









AC CLAMPS

Dimensions 102 x 34 x 24 mm (Clamp Opening d = 15mm)

Туре	Iron-Core		
Range	5 A		
Bandwidth	20 kHz		
Accuracy	0,5 - 6A: 0,1 - 0,5A: 5mA -0,1 A:	\pm 0,5 % of reading \pm 1 % of reading \pm 2 % of reading	(with NEO calibration typ. $\leq 0.2 \%$) (with NEO calibration typ. $\leq 0.3 \%$) (with NEO calibration typ. $\leq 0.8 \%$)
Phase	1 - 12A: 0,5 - 1A: 5mA - 0,5 A:	± 0,5 ° ± 1 ° ± 2 °	(with NEO calibration typ. ≤ 0.5 °) (with NEO calibration typ. ≤ 0.5 °) (with NEO calibration typ. ≤ 1 °)
Sensitivity	100 mV/A		
Dimensions	102 x 34 x 24 mi	m (Clamp Opening d :	= 15mm)
Туре	Iron-Core		
Range	20 A		
Bandwidth	20 kHz		
Accuracy	0,5 - 20A: 5mA - 0,5 A:	± 1 % of reading ± 2 % of reading	(with NEO calibration typ. \leq 0.5 %) (with NEO calibration typ. \leq 1 %)
Phase	0,5 - 20A: 5mA - 0,5 A:	± 2 ° ± 2 °	(with NEO calibration typ. \pm 0.5 °) (with NEO calibration typ. \pm 1 °)
	Range Bandwidth Accuracy Phase Sensitivity Dimensions Type Range Bandwidth Accuracy	Accuracy 0,5 - 6A: 0,1 - 0,5A: 5mA - 0,1 A: Phase 1 - 12A: 0,5 - 1A: 5mA - 0,5 A: 5mA - 0,5 A: Sensitivity 100 mV/A Dimensions 102 x 34 x 24 mi Type Iron-Core Range 20 A Bandwidth 20 kHz Accuracy 0,5 - 20A: 5mA - 0,5 A:	Range 5 A Bandwidth 20 kHz Accuracy 0,5 - 6A: ± 0,5 % of reading 5mA - 0,1 A: ± 1 % of reading 5mA - 0,1 A: ± 2 % of reading Phase 1 - 12A: ± 0,5 ° 0,5 - 1A: ± 1 ° 5mA - 0,5 A: ± 2 ° Sensitivity 100 mV/A Dimensions 102 x 34 x 24 mm (Clamp Opening d states and states an

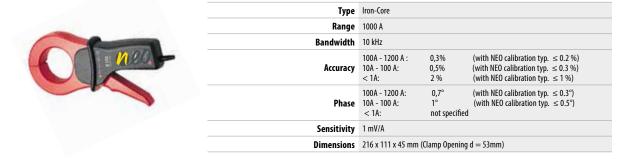
CLAMP-200AC

	Туре	Iron-Core		
	Range	200 A		
no n	Bandwidth	10 kHz		
	Accuracy	10 - 100 A:	± 2,5% of reading	(with NEO calibration typ. \leq 0.8 %) (with NEO calibration typ. \leq 1 %) (with NEO calibration typ. \leq 2 %)
	Phase	10 - 100 A:		(with NEO calibration typ. $\leq 1.5^{\circ}$) (with NEO calibration typ. $\leq 3^{\circ}$)
	Sensitivity	10 mV/A		
	Dimensions	135 x 51 x 30 mm (Clamp Opening d =	= 22mm)

Sensitivity

10 mV/A

CLAMP-1000AC



CENTER ADAPTER



This adapter can be used for small cable diameters to optimize the cable position and improve accuracy. This adapter is available upon request for all current sensors.

AC COILS & SPLIT-CORE



AC ROGOWSKI COILS

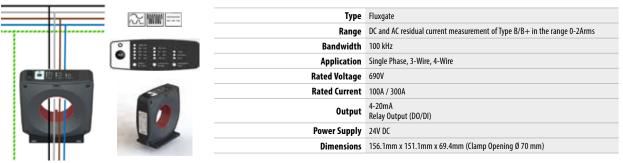
FLEX-MINI-3000		
_	Туре	Rogowski coil
	Range	30A / 300A / 3000A / 30kA
Ø 45mm	Bandwidth	PQA7000: up to 20 kHz PQA8000: up to 70 kHz PQA8000H: up to 500 kHz
	Accuracy	1% (with NEO calibration typ. \leq 0.3 %)
	Coil Length	170 mm (Ø 45 mm)
FLEX 3000		
_	Туре	Rogowski coil
	Range	30A / 300A / 3000A / 30kA
Ø 125mm	Bandwidth	PQA7000: up to 20 kHz PQA8000: up to 70 kHz PQA8000H: up to 500 kHz
	Accuracy	1% (with NEO calibration typ. \leq 0.3 %)
	Coil Length	450 mm (Ø 125 mm)
FLEX 6000		
	Туре	Rogowski coil
	Range	30A / 300A / 3000A / 30kA
Ø 250mm	Bandwidth	PQA7000: up to 20 kHz PQA8000: up to 70 kHz PQA8000H: up to 500 kHz
	Accuracy	1% (with NEO calibration typ. \leq 0.3 %)
	Coil Length	800 mm (Ø 250 mm)

Flexible Length, Flexible Coil Diameter, Flexible Bandwidth, Flexible Scaling, Flexible cable length on request Rogowski Coils for measurements up to 150kA are available.

AC SPLIT-CORE SENSORS

SPLIT-10A / 32A / 63A Type Split-Core Version 10 Arms / 32 A ms / 63A rms Bandwidth 3 kHz Accuracy Class 1 (IEC 61869-2) (with NEO calibration typ. $\leq 0.5 \%$) Sensitivity 333mV at nominal current Dimensions 32mm x 33.5mm 45.5mm (Clamp Opening Ø 10 mm) SPLIT-10A / 32A / 63A Type Split-Core Version 10 Arms / 600 Arms Bandwidth 20 kHz Accuracy Class 1 (IEC 61869-2) (with NEO calibration typ. \leq 0.5 %) Sensitivity 333mV at nominal current **Dimensions** 59.2mm x 89.2mm 32.5mm (Clamp Opening Ø 32,5 mm)

RESIDUAL CURRENT SENSOR AC+DC (RCM)





AC/DC HALL CLAMPS

AC/DC HALL CLAMPS

CLAMP-300DC



Туре	Hall sensor
Range	300A DC
Bandwidth	DC to 150 kHz
Accuracy	$1\% + 2 \text{ mA}$ (with NEO calibration typ. $\leq 0.3\%$)
Sensitivity	20 mV/A
Overload Capability	500A DC (1min)
Dimensions	205 mm x 60 mm x 15 mm (Clamp opening d = 32 mm)

CLAMP-2000DC



Туре	Hall sensor
Range	2000A DC
Bandwidth	DC to 20 kHz
Accuracy	$2.5\% +/-0.5A$ (with NEO calibration typ. $\leq 1.5\%$)
Sensitivity	1 mV/A
Dimensions	205 mm x 60 mm x 15 mm (Clamp opening d = 32 mm)

AC/DC SPLIT CORE

SPLIT-300DC



Туре	Hall sensor
Range	300A DC
Bandwidth	DC to 150 kHz
Accuracy	1 % + 2 mA (with NEO calibration typ. \leq 0.3 %)
Sensitivity	10 mV/A
Dimensions	205 mm x 60 mm x 15 mm (Clamp opening d = 32 mm)

ICS-10A



Туре	Hall sensor
Range	10 A peak (Overload Capabilty 80A for 1sec)
Bandwidth	150 kHz
Accuracy	0.5% (with NEO calibration typ. \leq 0.1%)
Sensitivity	208 mV/A
Dimensions	62 mm x 42 mm x 25 mm
Safety Category	CAT II 1000V / CAT III 600V

IPCS-XXA



Туре	Zero-Flux transducer
Range	IPCS-10A: 10A rms IPCS-25A: 25A rms IPCS-50A: 50A rms
Bandwidth	500 kHz
Accuracy	0.01%
Sensitivity	IPCS-10A: 40 mV/A IPCS-25A: 20 mV/A IPCS-50A: 10 mV/A
Dimensions	130 mm x 65 mm x 50 mm
Safety Category	CAT II 600V

AC/DC ZERO-FLUX SENSORS



AC/DC ZERO FLUX TRANSDUCERS

100	-		ral
		_	



Type	Zero-Flux	
	60A rms (from -40° to +85°C)	
Bandwidth	DC to 800 kHz	
Accuracy	0.0033% of f.s.	
Sensitivity	600:1	
Dimensions	77 mm x 93mm x 78 mm (Opening d = 26 mm)	

IN-500S



Zero-Flux
500A rms (from -40° to +85°C)
DC to 520 kHz
0.0015% of f.s.
750:1
106 mm x 128 mm x 104 mm (Opening $d = 36$ mm)

IN-1000S



Туре	Zero-Flux
Range	1000A rms (from -40° to +85°C)
Bandwidth	DC to 440 kHz
Accuracy	0.0012% of f.s.
Sensitivity	1500:1
Dimensions	106 mm x 128 mm x 104 mm (Opening d = 38 mm)

IN-2000S



	Туре	Zero-Flux
	Range	2000A rms (from -40° to +85°C)
	Bandwidth	DC to 140 kHz
	Accuracy	0.0012% of f.s.
	Sensitivity	2000:1
	Dimensions	191 mm x 231 mm x 153 mm (Opening d = 70 mm)
_		

POWER SUPPLY

SINGLE CHANNEL POWER SUPPLY WITH INTEGRATED SHUNT



Power Supply	±15V (for Zero-Flux Transducers, AC/DC Clamps, etc.)	
Max. Power Output	1200 mA	
Integrated Measuring Resistor	selectable - 1 0hm, 5 0hm, 10 0hm with 0.01% Accuracy	
Power Supply	DC Version: 10-30 V DC AC Version: 100-230V AC	
Dimensions / Weight	106x120x36mm (l x w x h) / Weight: 350g	
Temperature Range	-10°C to +45°C	
Connector	Sensor supply: DSUB9 Output Signal: BNC	



VOLTAGE MEASUREMENT

HIGH VOLTAGE DIVIDERS, TRANSFORMERS AND ISOLATED TRANSDUCERS



We offer different types of high-voltage adapters for measurements above 1600V DC. The portfolio covers voltage dividers, voltage transformers and isolated voltage dividers. Please contact your local sales partner or support@neo-messtechnik.com.

ALIGATOR CLIP



Voltage CAT III 1000V / CAT IV 600V **Colours** red, black, blue, green, yellow, white, purple, brown, grey, yellow-green Plugs Ø 4 mm Dimensions 92 x 38 mm



Current max. 25A Voltage CAT III 1000 V Cross Section 1,5 mm² Colours red, black, blue, green, yellow, white, purple, brown, grey, yellow-green Plugs Ø4 mm Length 0,25 m / 1 m / 2 m ... others on request

SAFETY TEST LEAD FUSED



Current max. 25 A (Fuse: 0.5A) Voltage CAT III 1000 V Cross Section 1,5 mm² Colours red, black, blue, green, yellow, white Plugs Ø4mm **Length** 0,25 m / 1 m / 2 m ... others on request



ACCESSORIES



We offer a wide range of testing and measurement accessories. Please check our webpage or contact us for more information regarding the following accessories. In addition we also provide custom-made solutions according to your needs.

Ø 4MM & Ø 2MM ACCESSORIES



ADAPTERS



MEASURING KITS



ADDITIONAL HARDWARE



CABLE REELS



STORAGE



The catalogue with all products and detailed information can be downloaded at: www.neo-messtechnik.com

HIGH VOLTAGE



BNC / HF / Micro Test



TESTING POLES / PROBES



CABLES



GROUND RODS / LEAD HOLDERS



DIDACTIC ACCESSORIES



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