SCHLEICH
Advanced Test Technologies

MotorAnalyzer1

Universal tester for electric motors and windings

Made in Germany

Expect more.

The MotorAnalyzer1 – a universal tool

The MotorAnalyzer1 is a universal tester for testing electric motors and windings. It combines 10 different test methods in a user-friendly and mobile device. The combination of test methods, the compact design and the battery operation make the MotorAnalyzer1 an ideal tool for on-site use – even if the DUT is difficult to access.

For testing a three-phase motor, the three winding leads and the motor frame are connected to the tester. With surge and resistance test, the MotorAnalyzer1 now analyzes the motor fully automatically. After that, a high-voltage test is performed at the motor, allowing to evaluate the motor in a fast and reliable manner.

ROBUST INDUSTRIAL STANDARD

Made in Germany

- Surge voltage
- High-voltage DC up to **4 kV**
- Insulation up to 100 GΩ
- Resistance | 4-wire method
- Battery operation
- Automatic switch-overs

KEY FACTS

- Ten test methods
- High-voltage up to 4000 V
- Fully-automatic fault analysis
- Automatic switch-over between the 3 motor-connection leads
- Manual and automatic tests
- Locating winding faults
- Working with AC power and/or battery power
- Light weight
- Rotary switch for a fast selection of test methods
- Integrated result storage for transmission via RS232 or USB interface
- Storing and printing test results via PrintCom

Delivery extent MotorAnalyzer1

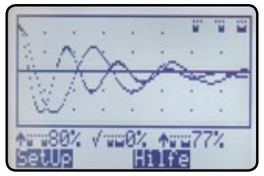
- 9 test leads with alligator clip
- Test probe HV
- Test probe GND
- External charger
- Calibration certificate
- Operating manual

Test methods

❶ Automatic analysis

For the automatic test of a three-phase motor, the three winding leads and the motor frame are connected to the testing device. With surge and resistance test, the MotorAnalyzer1 now analyzes the motor fully automatically. It is checked, whether the winding is ohmic and inductively symmetrical. If the deviations between the three phases are too large, the motor is defective.

❷ Surge test



For inductive winding tests, the MotorAnalyzer1 generates low-level surge voltages. The patented, automatic surge voltage comparison between the windings or to a reference DUT delivers precise information about the symmetry of the windings. Asymmetries are detected by the MotorAnalyzer1 automatically.

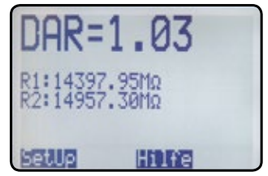
❸ Resistance test

The resistance test is performed with high-precision four-wire method. The symmetry evaluation of the three winding resistances or the comparison to a default value is performed automatically. If required, a temperature compensation converts the copper resistance to 20° C/68° F. This requires an additional ambient-temperature sensor.

❹ 4 High-voltage test DC

For the high-voltage test, the MotorAnalyzer1 generates an extremely stable test voltage between 50 and 4000 V DC. The voltage is adjusted manually via the rotary knob. Alternatively, it can be automatically adjusted to a programmable value.

❺ Polarization-index test

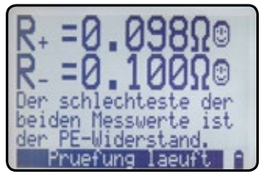


For the DAR and polarization-index test, the MotorAnalyzer1 generates an stable extremely test voltage between 50 and 4000 V DC. The voltage is adjusted manually via the rotary knob. Alternatively, it can be automatically adjusted to a programmable value.

❻ Insulation-resistance test

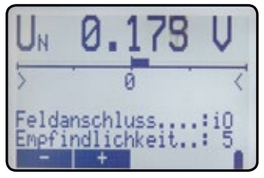
For the insulation-resistance test, the MotorAnalyzer1 generates an extremely stable test voltage between 50 and 4000 V DC. The voltage is adjusted manually via the rotary knob. Alternatively, it can be automatically adjusted to a programmable value. A step voltage measurement is possible, as well.

❼ PE/GB-resistance test



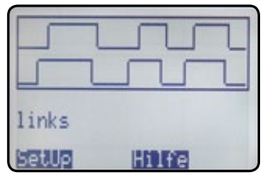
The PE/GB-resistance test is performed with DC and high-precision four-wire method.

❽ Neutral-zone adjustment



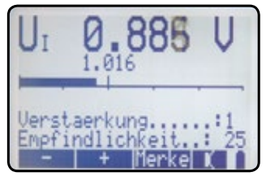
Graphically displaying the incorrect position of the brush holder facilitates the adjustment of the "neutral zone" at DC motors. The MotorAnalyzer1 guarantees a user-friendly and comfortable adjustment. Via a bar chart with center, the operator can directly see, whether the brush holder is in the "neutral zone" respectively in which direction he needs to turn it.

❾ Rotary-field test at stators and motors



While turning the shaft of a single-phase or a three-phase motor manually, it is indicated, whether the operator turns the shaft to the right or to the left. Via a rotary-field probe in the stator and with externally applied voltage, you can detect the rotary field at a stator.

❿ Detection of turn-to-turn faults



At stators or armatures, you can locate the slots with turn-to-turn faults by means of an induction test probe. The probe also serves for detecting bar-to-bar faults at squirrel-cage rotors.

Test protocol with PrintCom7

With the PrintCom7 software, you can export all test results from the MotorAnalyzer1 to a PC. The test results can be printed directly after the test or at a later time.

The test results are stored in Excel® format – based on Excel® protocol forms preconfigured by us.

By adding additional information or through an individual design, e.g. with your logo, PrintCom7 allows you to adapt the test protocol to your requirements. The delivery extent already includes a large number of forms that can easily be adapted. Of course, you can also create completely new protocols.

PrintCom7 is the ideal tool for creating test protocols containing all necessary information in no time at all.

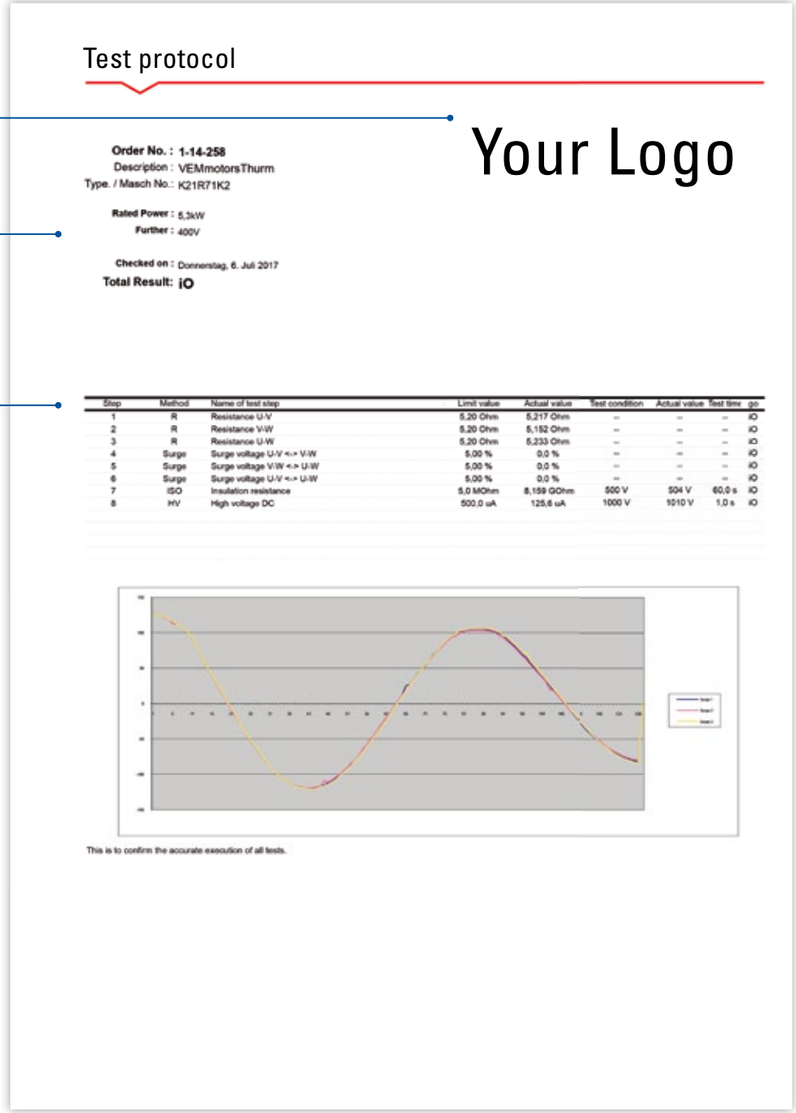
KEY FACTS

- Customizable protocol with your company data and your logo
- Editable Excel® protocol forms
- Representative test protocol with test values and graphics
- Printing on all Windows-compatible printers
- Creating PDF-files
- Test protocols in various languages

Editable field with your company logo and your address

General motor data, date and time, etc.

Overview of all test results



Test protocol

Your Logo

Order No. : 1-14-258
Description : VEMmotorsThurm
Type. / Masch No.: K21R71K2

Rated Power : 5,3kW
Further : 400V

Checked on : Donnerstag, 6. Juli 2017
Total Result: iO

Step	Method	Name of test step	Limit value	Actual value	Test condition	Actual value	Test time	go
1	R	Resistance U-V	5,20 Ohm	5,217 Ohm	--	--	--	iO
2	R	Resistance V-W	5,20 Ohm	5,152 Ohm	--	--	--	iO
3	R	Resistance U-W	5,20 Ohm	5,233 Ohm	--	--	--	iO
4	Surge	Surge voltage U-V <-> V-W	5,00 %	0,0 %	--	--	--	iO
5	Surge	Surge voltage V-W <-> U-W	5,00 %	0,0 %	--	--	--	iO
6	Surge	Surge voltage U-V <-> U-W	5,00 %	0,0 %	--	--	--	iO
7	ISO	Insulation resistance	5,0 MOhm	8,159 GOhm	500 V	504 V	60,0 s	iO
8	HV	High voltage DC	500,0 uA	125,6 uA	1000 V	1010 V	1,0 s	iO

This is to confirm the accurate execution of all tests.

Technical data

Test methods

Surge voltage

Test voltage	12 V
Evaluations	Correlation (SCHLEICH patent)
Display of deviations	in %
Comparison method	between the phases
Automatic switch-over of test connections	yes

Resistance

Measuring range		2 mΩ to 500 kΩ
Resolution		1 µΩ
Accuracy		1 mΩ - 499 kΩ ±0.5% of test value ±1digit
Display of deviations/asymmetries		in %
Comparison method		between the phases
Test current		max. 1A
Test time	manual	without test time
	automatic cycle	presettable
4-wire method		yes
Automatic switch-over of test connections		yes
Temperature compensation to 20°C/68°F (25°C / 77°F)		yes*

* The ambient-temperature sensor needs to be ordered separately (part number 403109)

High-voltage DC

Test voltage | measurement between two test probes		max. 4 kV
Current		max. 1 mA
Test time	manual	without test time
	automatic process	presettable

Insulation resistance | PI & DAR

Test voltage		max. 4 kV
Test-voltage selection manual		potentiometer 300 degrees
Test-voltage selection		yes
Insulation resistance		max. 100 GΩ
Accuracy		
Test voltage 250 V	< 500 kΩ	without specification
	500 kΩ to 200 MΩ	±5 %
	200 MΩ to 1 GΩ	±7.5 %
	> 1 GΩ	outside measuring range
Test voltage 500 V	< 500 kΩ	without specification
	500 kΩ to 200 MΩ	±2.5 %
	200 MΩ to 1 GΩ	±10 %
	1 GΩ to 10 GΩ	±25 %
	10 GΩ to 20 GΩ	±50 %
	> 20 GΩ	outside measuring range
Test voltage 1000 V	< 1 MΩ	without specification
	1 MΩ to 10 GΩ	±2.5 %
	10 GΩ to 50 MΩ	±30 %
	50 GΩ to 100 MΩ	±50 %
	> 100 MΩ	outside measuring range
Test voltage 3000 V	< 10 MΩ	without specification
	10 MΩ to 10 GΩ	±2.5 %
	10 GΩ to 50 GΩ	±20 %
	50 GΩ to 100 GΩ	±50 %
	> 100 GΩ	outside measuring range
Polarization index (PI)		yes
Dielectric absorption ratio (DAR)		yes
Current		max. 3 mA
Measurement between 2 test probes		yes – up to 4 KV
With graphic progress display		yes
Test time	manual	without test time
	automatic process	presettable

Technical data – testing device

Line voltage	external plug-in charger 230V or 110V
Battery	lead-acid 12 V, 1.2 Ah
Battery charging time	4 h, fully charged
Battery operating time	0.5 to 4 h, depending on the tests
Interface	RS232 / optional USB
Storage capacity	128 individual test values
Dimensions (W x D x H)	280 x 170 x 95 mm (11.0" x 6.7" x 3.7")
Weight	2.7 kg (6 lbs)

Accessories

Robust Kelvin clamps

Robust 4-wire Kelvin clamps for high-precision resistance tests

Type	small	medium	large
Opening width	10 mm	20 mm	33 mm
Pressure force	20 N	30 N	100 N
4-wire method	yes	yes	yes
Test lead pluggable	yes	yes	yes
Dimensions (L x H x W)	90 x 35 x 13 mm	165 x 65 x 20 mm	255 x 95 x 25 mm
Part #	4023184	4023122	4023109

〉Note: the Kelvin clamps require additional connection leads.

Robust Kelvin clamp for the pins of terminal boards

Special Kelvin clamp for contacting terminal boards

Pin diameter	4-10 mm	8-14 mm
4-wire method	yes	yes
Part #	40001182	40001183

〉Note: the Kelvin clamps require additional connection leads.

Connection cables

Connection cable per robust Kelvin clamp

Cable length	2 m
Part # (1 piece)	403154

The connection cables can be plugged into the Kelvin clamps (4023184, 4023122 and 4023109)! For testing, you require 3 connection cables.

Ambient-temperature sensor

Ambient-temperature compensation for resistance test and insulation-resistance test

Part #	403109

Set of Kelvin clamps

Set consisting of 3 Kelvin clamps for high-precision resistance measurement incl. connection cables – the set is part of the delivery extent.

Cable length	1.1 m
Opening width	approx. 20 mm
4-wire method	yes
Part #	40001100

4-wire test probe

For high-precision resistance measurement, e.g. at DC-motor bars

Cable length	3 m
Part # (1 piece)	4000395

〉Note: for testing, you require 2 four-wire test probes.

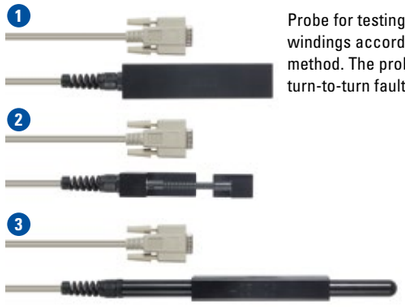
Start/Stop button for 4-wire test probes

Ideally suited for starting and stopping the test, while holding both test probes.

Cable length	3.2 m
Part #	403111

〉Note: suitable for test probe 4000395.

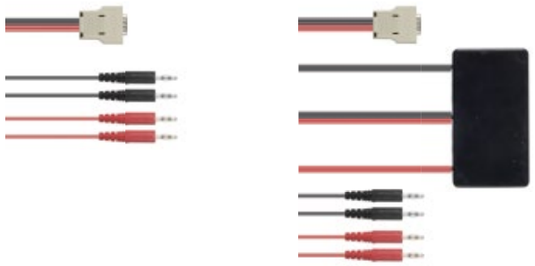
Induction probes for fault location



Probe for testing stator and armature windings according to the induction method. The probes serve to locate turn-to-turn faults.

Slot distance	❶ 19 mm	❷ 9 mm flexible	❸ 9 mm
Dimensions (L x H x W)	130 x 30 x 25.5 mm	115 x 40 x 20 mm	120 x 20 x 25.5 mm
Cable length	3 m	3 m	3 m
Part #	403107	403123	403106

Neutral-zone measuring lead



To adjust the neutral zone of DC-motors, the field and the armature (the carbon brushes) are connected to the MotorAnalyzer. The "neutral zone" is adjusted by turning the brushes.

Type	standard	with booster for large sizes
Cable length	1.5 m	1.5 m
Part #	403102	403133

〉For our complete range of accessories, please check our website.

Rotary-field probe to measure the sense of rotation of stators

The sense of rotation of a stator is detected by means of a Hall rotary field probe. In the test field, the stator is operated with a low rotary-field voltage and the rotary-field probe is placed in the stator to be tested.

Cable length	3 m
Part #	403103

Motor-direction measuring lead

This connection lead is required to determine the direction of the motor. The de-energized, assembled and connected 3-phase motor (squirrel-cage rotor) is connected to the tester and the motor shaft is turned by hand.

Cable length	1.5 m
Part #	403112

Foot switch for starting the test

Cable length	2 m
Part #	4010611

Software

PrintCom

PrintCom allows you to log and store your test results in a fast and convenient manner.

Part #	4018182

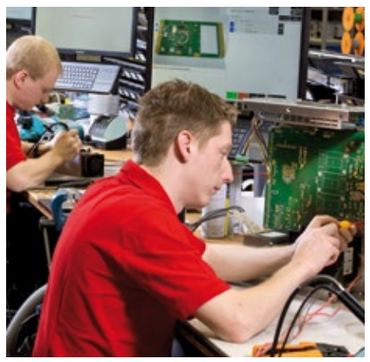
SCHLEICH.Care for service abroad

CARE

Within Germany, our testers are delivered including a full warranty. With SCHLEICH. Care, you can get this full warranty also worldwide!

SCHLEICH.Care | Europe	Part # 403174
SCHLEICH.Care | Worldwide	Part # 403175

Another word for “Made in Germany”:
SCHLEICH



Extensive production facilities allow designing and manufacturing almost all tester components at our site in Hemer.

For example, our measuring and electronic PCBs are produced with an ultra-modern in-line-SMD-placement system, which assures a stable quality of our products.

Modern high-end processors in our testers process the test tasks in a fast, precise and reliable manner. With our modern CNC-machines, we also design and manufacture a great number of accessory components such as test covers, contacting units, workpiece carriers with DUT-holders or robot gripping tools as well as complete automatic production lines.

Whatever you want to test…
…SCHLEICH has the solution!

SCHLEICH is a leading system provider in the area of testing motors and windings. Our extensive range of products allows us to provide you with testers, test systems and complete production lines for almost every test task.

Decades of experience, listening to our customers and satisfying their wishes – facing individual tasks with technical creativity and realize them in a team of highly skilled engineers and designers – this is what we do. This is SCHLEICH.

Every single one of our more than 120 employees works on guaranteeing and optimizing the high quality standard of our testing devices each and every day. Our customers, our sales department, our motivated engineers and manufacturing staff – with infinite curiosity, new ideas and suggestions for improvement they are all part of the innovation process.

MotorAnalyzer2

Surge tester MTC2

EncoderAnalyzer

Dynamic-MotorAnalyzer

Service without limits.
We are there for you – wherever you are.

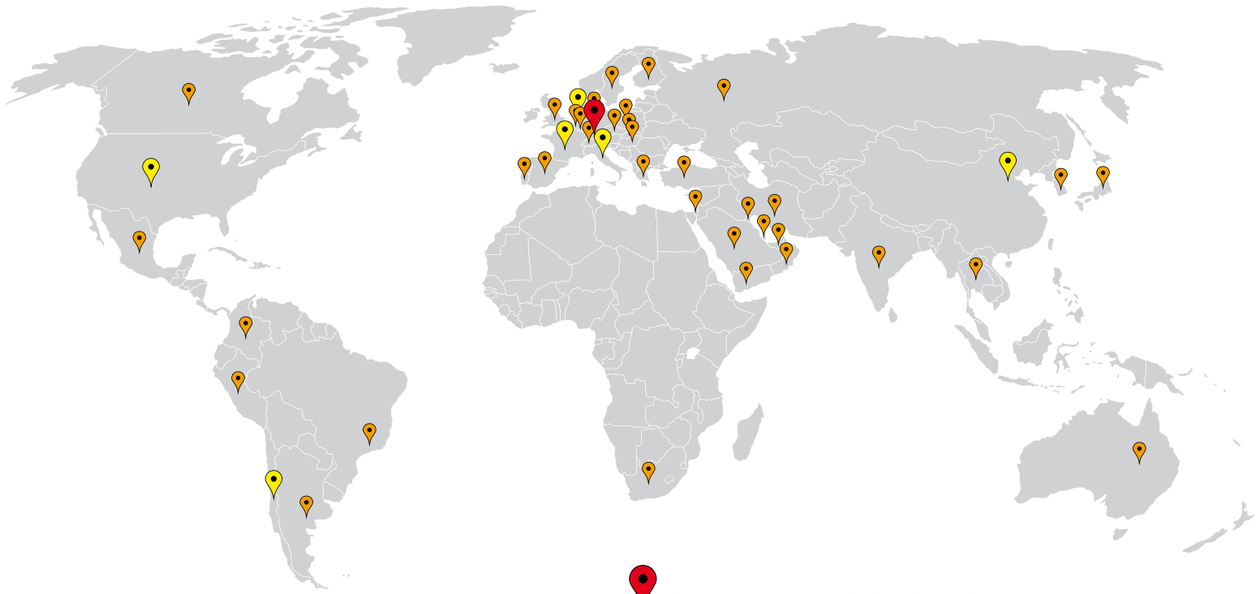
First-class customer service is our top priority. From detailed consulting during the planning phase to training and After-Sales-Service – we support you during the entire process.

In training sessions adapted to your requirements, our technicians will teach you the necessary know-how allowing you to avail yourself of the functional variety of our testing devices to the full extent. Should there be questions or technical problems, our technical support team will assist you by phone, on-line or on-site fast and reliably. Constant software updates and extensions make sure that you can always work with state-of-the-art test software.

The periodic calibration of test equipment is an essential precondition for quality assurance. We calibrate your test equipment according to standards – on site or in our factory in Hemer. It goes without saying that we calibrate in accordance with national and international standards.

Our Service Centers support you aroundthe world – with dedication, competence and reliability.

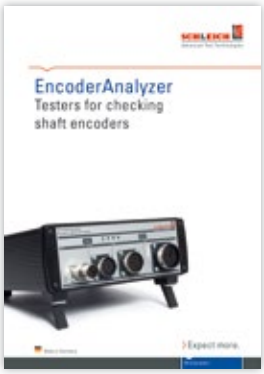
Sales and Service Centers

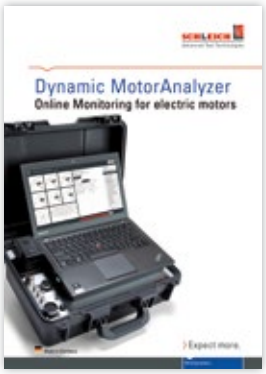


Experts in tests and measurements.

Whatever you want to test, SCHLEICH has the solution! As a leading supplier of electric safety and function test systems as well as motor and winding testers, we offer solutions for any task in this sector. Our owner-managed company, founded more than 50 years ago, is present in over 40 markets all around the globe.

Testers for electric motors and windings





Electrical safety- and function testers

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Advanced Test Technologies

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› Expect more.

Subject to technical modifications and errors. | 0917-EN