THERE IS A
SCHLEICH
FOR THAT!

MTC2 R7

Multi-purpose winding testers

DESIGNED & PRODUCED
IN GERMANY

SCHLEICH®
Advanced Test Technologies

PUSHING. PRECISION. FURTHER.
The next level of surge testing!

With the MTC2 *R7*, SCHLEICH has redefined speed and precision in surge and partial discharge testing – no other test device offers greater performance and versatility.

The MTC2 *R7* is the high-end device for testing all types of coils, stators, armatures and winding goods. Thanks to modular configuration and extensibility, fully automated, comprehensive testing of all types of winding goods is finally becoming a reality.

The integration of so many different test methods in one device is unparalleled. The MTC2 *R7* offers a clear, straightforward display of the tests and the intuitive operating concept simplifies the daily testing schedule.

State-of-the-art hardware technologies paired with cutting-edge .NET Core software are utilized. This increases the accuracy of the individual test methods and the measuring speed substantially.

More than 35 years of experience, extensive know-how and innovative technological advancements are the foundation for the latest generation of our surge voltage testers.

- Surge voltage up to 50 kV
- Testing of motors and generators up to 500 MW
- 2000 A surge current
- 125 joules surge energy
- Rise time up to 60 ns
- Automatic test method switch-over
- Patented evaluation methods
- **High-speed measurement cycles**

MTC2 R7

SURGE & PD TEST

SPEED MEETS PRECISION

SPEED AND PRECISION REDEFINED

SCHLEICH PATENT NO. 1

The surge voltage test can be performed with a pulse frequency of up to 50 Hz. The time required to measure the partial discharge inception voltage can thus be reduced by up to 75 %. This results in a significantly shorter overall test duration and allows for reduced cycle times in automated applications.

SCHLEICH-PATENT NO. 2

The SCHLEICH "Peak-to-Peak" method for the detection of voltage-dependent winding faults has been completely revised and allows for highly sensitive fault detection even on coils with a very large number of windings, which are connected in series or parallel. Fault analysis on very large devices under test as well as motor repair applications are considerably simplified and the time required for troubleshooting is reduced to a minimum.

Further information: www.schleich.com/en/product/mtc2-r7-en

The test methods

The MTC2 *R7* combines all test methods in one device. This gives you a tool that can be used to test winding goods for all possible faults.

By combining the versatile test methods with our patented and award-winning innovations, the quality of your products and services is ensured.

1 Surge voltage test

The unique surge voltage test is used to inspect the insulation within a winding. It is perfectly suited for testing winding faults and phase-to-phase faults as well as many other winding characteristics. In addition, insulation problems relating to the laminated core can also be tested.

2 Partial discharge test with surge voltage

The partial discharge test is used to evaluate and test the insulation system between the phases and/or to the laminated core. The partial discharge test is of particular significance for motors that are operated using frequency converters.

3 Insulation resistance test

The insulation resistance between the phases and/or to the laminated core must be equal to or greater than the given minimum value.
- PI/DAR
- Step voltage test

4 Resistance test

When testing the winding resistance using the 4-wire method, the winding resistance must be within a specified tolerance range. The MTC2 *R7* compensates the influence of temperature on the measurement result.

5 Inductance & capacity test

Inductance and capacitance measurement which can be switched to the measurement connections fully automatically.

6 High voltage test AC

High voltage AC ensures the dielectric strength between the phases and/or to the laminated core in accordance with applicable standards.

7 High voltage test DC

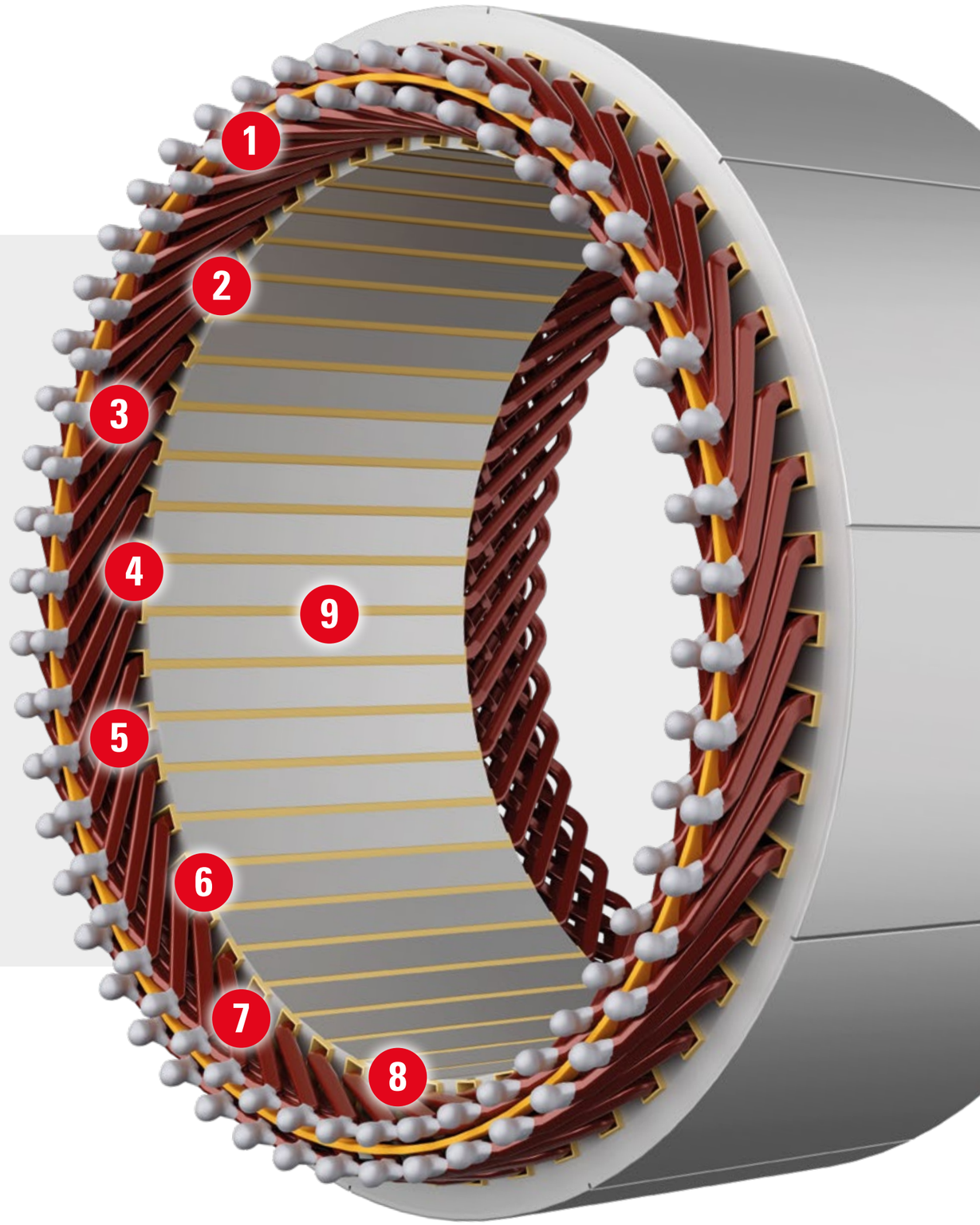
Dielectric strength test with HV DC for inspection between phases and/or to the laminated core.

8 Partial discharge test at high voltage AC

The partial discharge test is used to evaluate the insulation system between phases and/or to the laminated core. Defects such as a wire touching the laminated core can be found by this method.

9 Sense of rotation test

The MTC2 *R7* supplies the stator with three-phase current. Sensors measure the rotating field contact-free and detect faulty circuits.



Further information: www.schleich.com/en/product/mtc2-r7-en

SCHLEICH Advanced Test Technologies

Unique variety of housings

The MTC2 *R7* was designed for a wide range of applications.
It can be adapted precisely to your needs. This can be achieved not only through a variety of configurable technological options, but also through our unique range of housings.

Only SCHLEICH is able to provide you with this. Simply select the housing that is suitable for your specific requirements.

1

Mobile all-round housing

- Universal application
- Carrying and mounting bracket, adjustable tilt angle
- All connections on the right side
- Operation on a table or standing on the floor

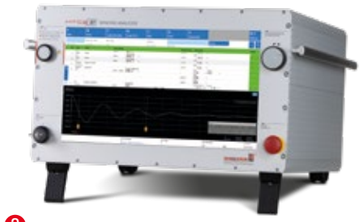
SHOCK PROTECTION INSIDE

2

Mobile workshop housing

- Universal application
- Carrying and mounting bracket, adjustable tilt angle
- All connections on the right side
- Control panel and display protected by sturdy flip-up cover
- Lid and base reinforced with aluminum plates
- Spacious accessory bag

SHOCK PROTECTION INSIDE



3

Desktop housing

- All connections on the rear
- Sturdy side handles
- Convenient support feet

4

19" rack mount housing

- All connections on the rear
- Ready for installation in a 19" cabinet

5

Heavy-duty housing

- Robust outdoor housing with built-in shock absorbers
- Lift-up cover to protect the front and back

HIGH PERFORMANCE SHOCK PROTECTION

6

Heavy-duty mobile cabinet

- For device versions with 30 kV, 40 kV, and 50 kV
- Robust metal housing with large casters
- Sturdy handle for pushing or maneuvering
- Also available as an option for device versions with 6 kV, 12 kV, and 15 kV

SHOCK PROTECTION INSIDE

Typical range of application

1	2	3	4	5	6
Motor repair	Motor repair	Motor production	Motor production	Motor repair	Motor repair
Motor production	Motor production	Laboratory Type testing R & D			Motor production
Laboratory Type testing R & D					Laboratory Type testing R & D

The MTC2 *R7* in the mobile all-round housing

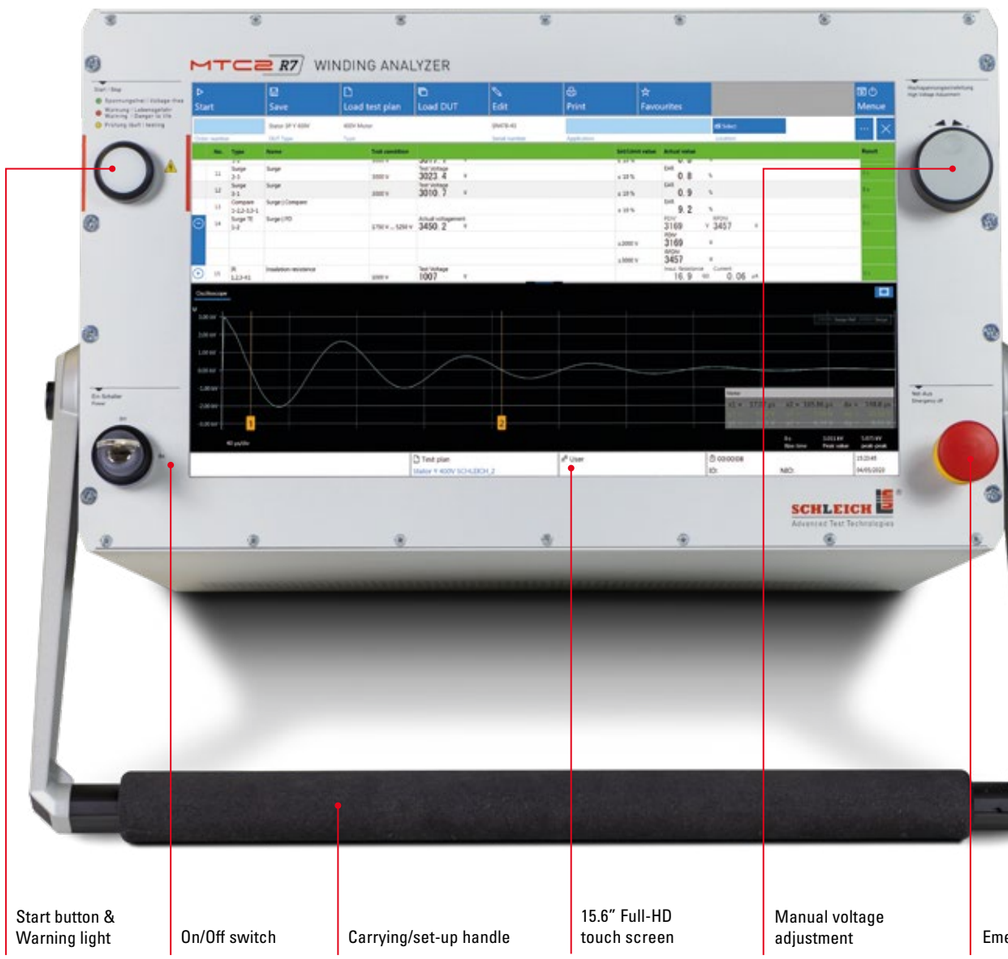
6 kV, 12 kV and 15 kV

All components are installed in a custom-made, robust industrial housing. The precision measurement technology is additionally protected against shocks and vibrations through shock absorbers.

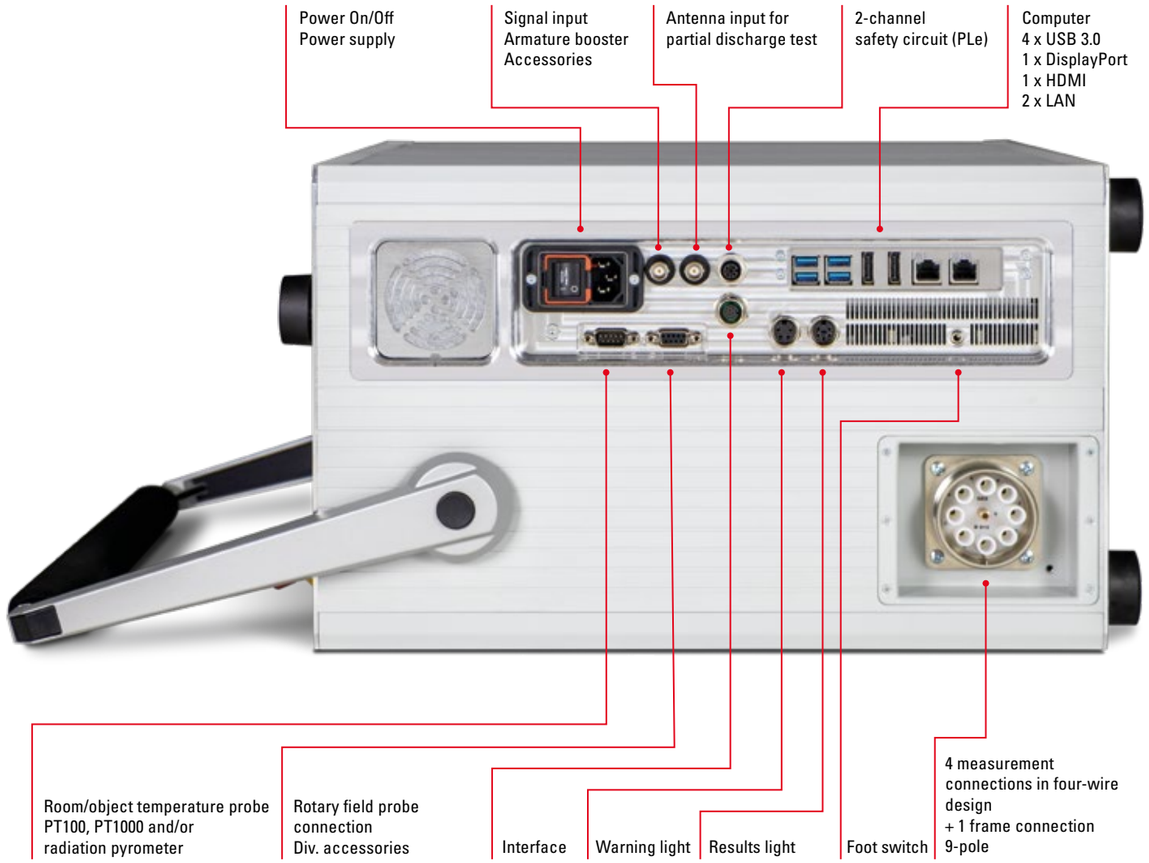
The MTC2 *R7* adapts to your needs - whether it is in the workshop on the floor or the workbench, in manufacturing, in laboratories or for outdoor applications. We have designed special housing options for different areas of application.

A test device can be as good as it is – it must fit into an established infrastructure and extend and refine existing possibilities. For this reason, the discreetly recessed connection panel of the MTC2 *R7* base model has been placed on the side to make it easily accessible. Whether you operate the device on a table or standing on the floor, all connections are conveniently within reach at all times.

SHOCK PROTECTION INSIDE



The side connection panel



The measurement connection options

MTC2 *R7* 6 kV
- Pluggable 6 kV test leads
- 4 mm mating connector for alligator clips and Kelvin tongs

MTC2 *R7* 12 kV and 15 kV
- Pluggable 12 kV and 15 kV test lead set
- Robust industrial connector

Further information: www.schleich.com/en/product/mtc2-r7-en

SCHLEICH Advanced Test Technologies

The MTC2 *R7* in the mobile workshop housing

6 kV, 12 kV and 15 kV

The workshop housing is based on the all-round housing and is additionally reinforced with solid aluminum plates on the lid and base. The sturdy, hinged front cover protects the control panel and display from damage during transport.

The accessory bag, which is attached to the lid of the device, provides space for connection cables, connection terminals, and other accessories.

Flip-up front cover

Secured for transport with snap locks

Quick and easy to remove

SHOCK PROTECTION INSIDE

Accessory bag

Built-in warning light

Solid aluminum reinforcement on the lid and base

Side connection panel
(see page 9 for details)

Carrying and setup handle with adjustable tilt angle

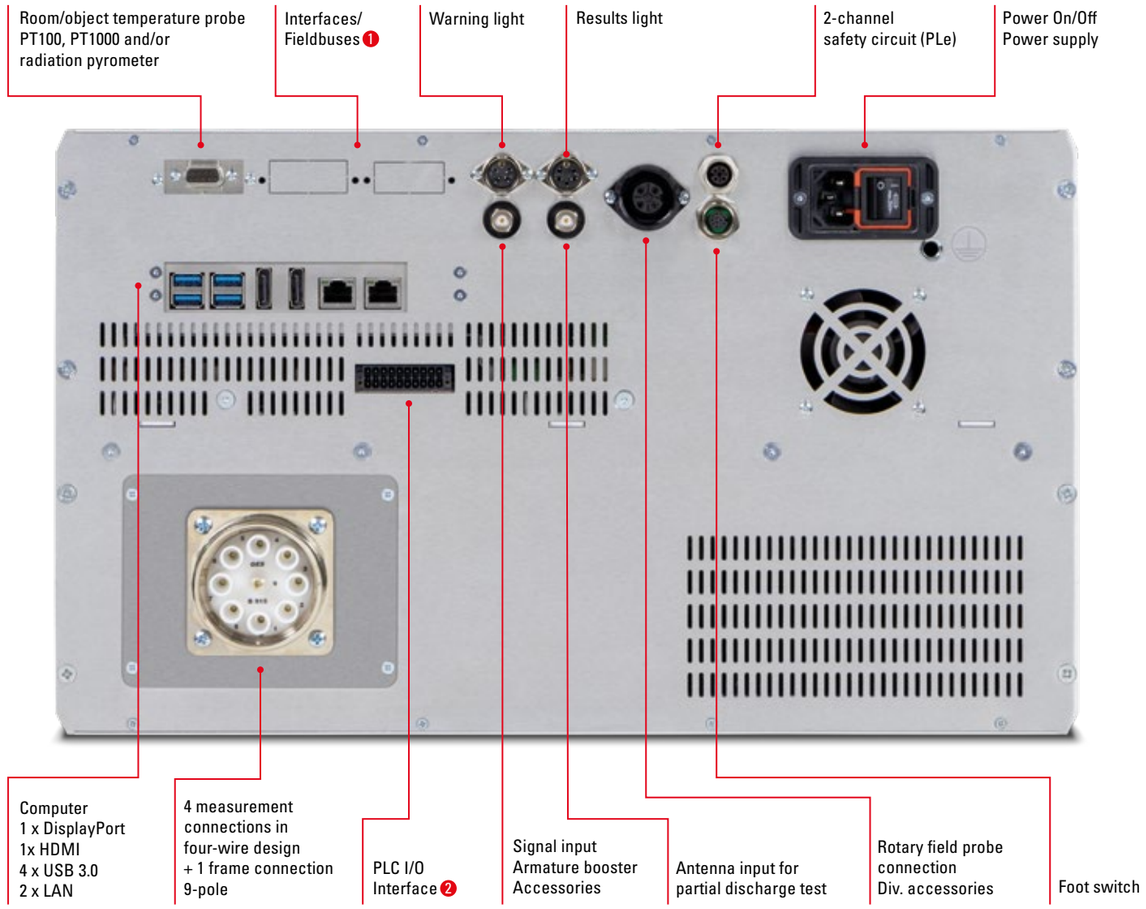
The MTC2 *R7* in table-top & 19” rack mount housing

6 kV, 12 kV and 15 kV

For the table top and 19” rack mount devices, all connections are on the rear panel. This makes it easy and convenient to integrate the MTC2 *R7* into a 19” rack.

For remote control, these devices are by default equipped with an additional PLC I/O interface. Furthermore, they can be upgraded with additional interfaces and fieldbuses.

The rear connection panel



1 Interfaces and fieldbuses

Ethernet TCP/IP · PROFINET · EtherCAT · PROFIBUS · * optional

The logos shown are registered trademarks of the respective owners.

2 PLC I/O interface 24 V signal level

Outputs: GO, NOGO, test in progress, ready status and 8 configurable outputs
Inputs: Start and 4 configurable inputs

The measurement connection options

Standard equipment 6 kV:
Pluggable test leads

Optional equipment 6 kV:
Robust industrial connector

Standard equipment 12 kV & 15 kV:
Pluggable test lead set

SCHLEICH Advanced Test Technologies

Further information: www.schleich.com/en/product/mtc2-r7-en

The MTC2 *R7* in the heavy-duty mobile cabinet

30 kV, 40 kV and 50 kV

The MTC2 *R7* with 30 kV, 40 kV and 50 kV surge voltage is the test device for stators, motors and generators that are operated with high voltage.

The test device is installed in a sturdy, robust housing with wheels. Additional shock absorbers in the housing protect the precision measurement technology against impacts and strong vibrations.

The large caster wheels ensure excellent maneuverability even on rough surfaces.Thanks to a large, adjustable monitor, the stand-alone device with keyboard and mouse can be operated comfortably and ergonomically in any situation.

The entire test sequence – including inductance and capacitance measurement – is fully automatic. The built-in test method switch-over in the MTC2 *R7* switches the individual tests to the predefined winding connections.

Adjustable monitor

Ergonomic height surface for keyboard and mouse

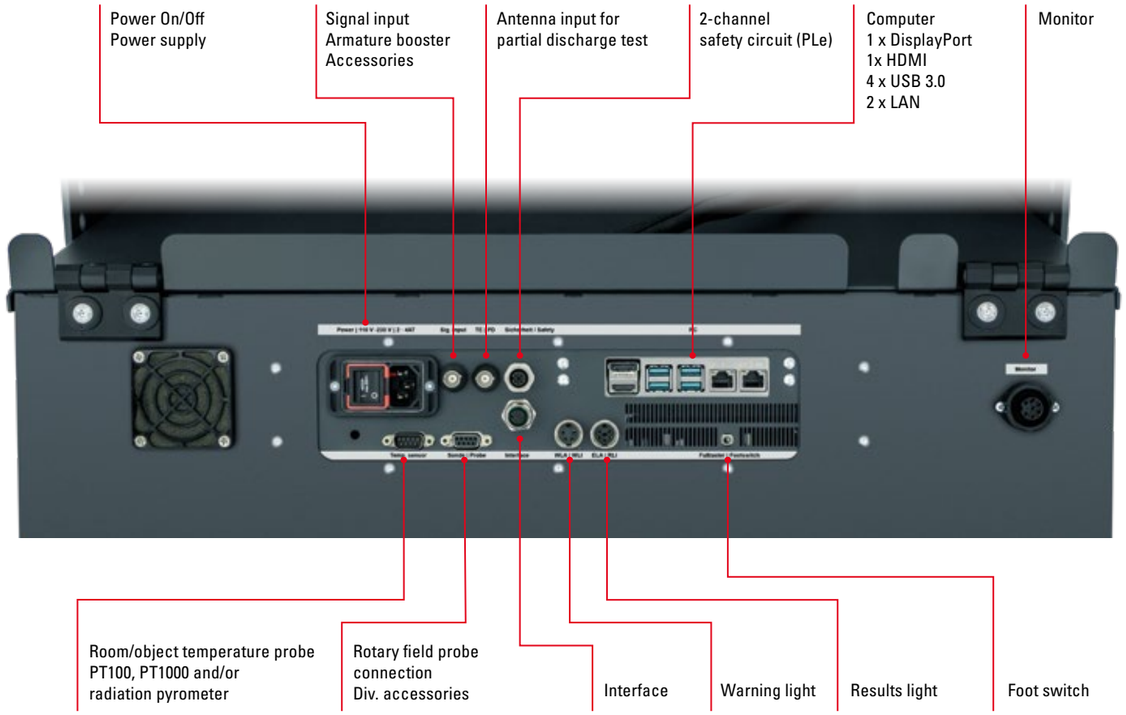
Sturdy handle for pushing and maneuvering

Convenient: The rear-mounted winding reel for the measuring leads and the easily accessible storage space for accessories such as Kelvin tongs, foot switches, etc.

Large caster wheels, 360° rotatable

- Mobile stand-alone device
- 2 or 3 winding connections (+ frame)
- Internal test method switch-over
- Fully automatic test sequence incl. LCR measurement

The rear connection panel



The MTC2 *R7* is equipped with two winding connections (HV+ and HV-) and one body connection as standard. This means that both moulded coils and complete stator windings can be tested. Optionally, we offer the extension to three winding connections (U, V, W and body).

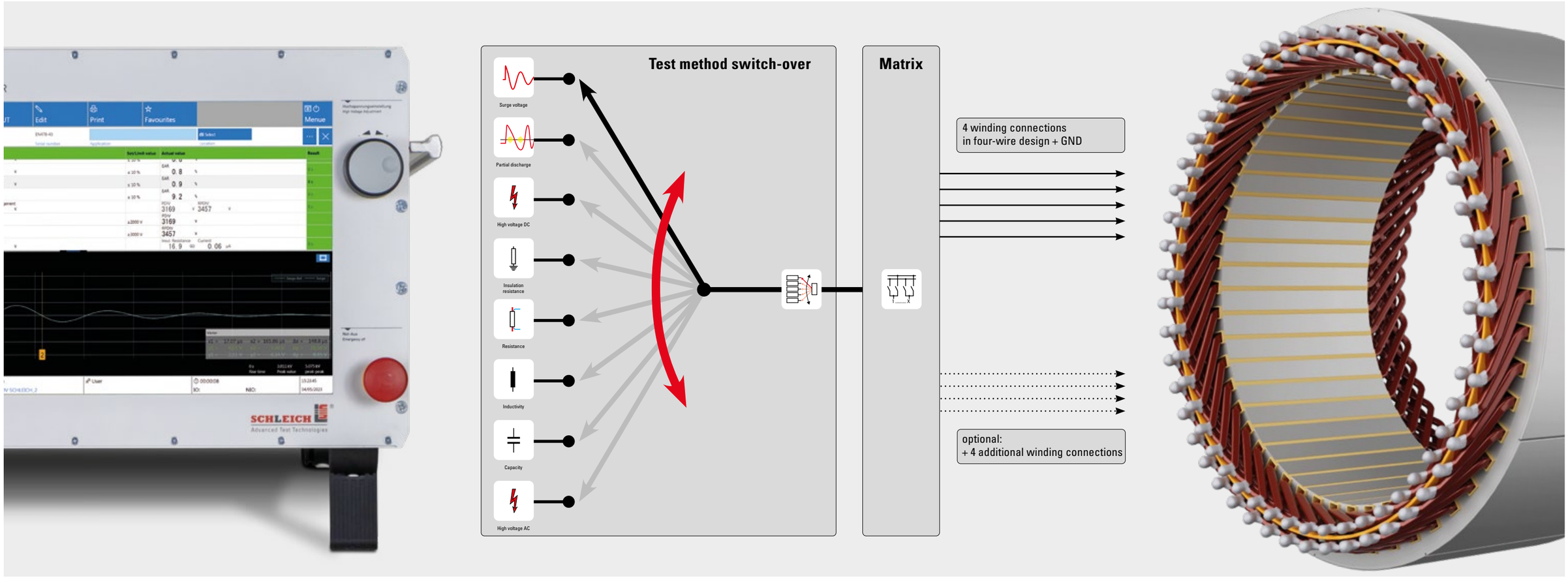
For the 30 kV and 40 kV device versions, the connections are also available as plug-in options, whereas for the 50 kV device version, the connections are always permanently installed.

Further information: www.schleich.com/en/product/mtc2-r7-en

SCHLEICH Advanced Test Technologies

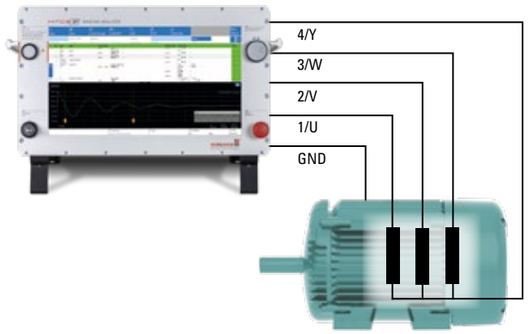
The test method switch-over

To save time, all connections of the device under test can be plugged using a contacting adapter. The test device then performs the scheduled tests fully automatically without the need for manual intervention. This is made possible by the SCHLEICH-typical automatic test method switch-over.



Our test method switch-over ensures fast and automatic switching between the different test methods. Because the voltage differences between the test methods can be immense, reliability is the top priority for switch-overs. A resistance test with 3 V is switched to the device under test just as reliably as a high voltage test with 15 kV. Without compromise!

For test devices with multiple connections, it is more cost-effective to simultaneously connect all terminals of the device under test to the MTC2 *R7*. The test device then automatically performs all tests between all connections. This procedure reduces the required cycle rate and thus the cost of a test. We achieve the switch-over between the different connections by utilizing flexible switch-over matrixes.



We provide the right relay matrix for almost any task. Matrixes differ in the number of connections and the level of the test voltage to be switched. A matrix must be able to switch 15 kV just as safely and reliably as signals in the millivolt range. This is precisely what our engineers have developed the matrixes for. Matrixes are designed for four-wire applications. The MTC2 *R7* has 4 connection terminals. Optionally, an extension to 8 terminals is available.

For switching and matrixes, we only use high-quality components from our own production or from well-known manufacturers that have been tried and tested thousands of times.

The surge voltage test

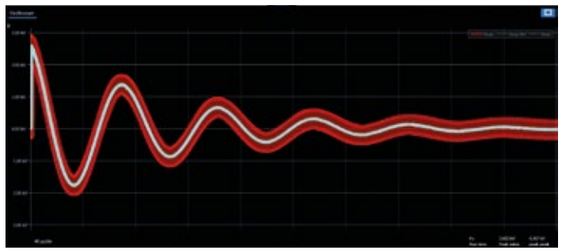
For precision fanatics: Even the smallest faults do not go unnoticed by the MTC2 *R7*. With the elaborate variety of outstanding evaluation methods, that can be combined as required, you can realize the 360° analysis of your device under test. In combination with state-of-the-art hardware for signal acquisition, SCHLEICH offers an exceptionally detailed and very accurate fault analysis. As a result, misinterpretations are reduced to a minimum.

The parameterization to the signals to be evaluated is executed virtually fully automatically. The test device independently selects the most favorable settings for the signal in order to achieve maximum sensitivity. Furthermore, the MTC2 *R7* is equipped with automatic voltage correction. The test voltage is always adjusted optimally, depending on the device under test. This makes fault diagnosis much easier, allowing you to draw qualified and routine conclusions about the condition of your motors very quickly.

The assessment is either based on a reference signal stored previously, on an automatic comparison of all three phases against each other, or is carried out using the new, patented peak-to-peak method.

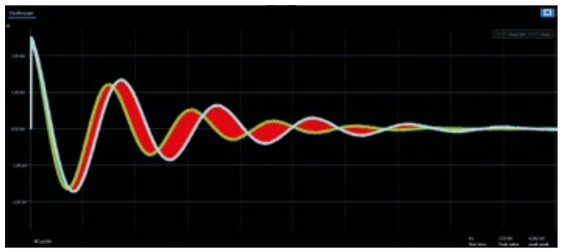
- 125 joules surge energy
- 2000 A surge current
- Rise time up to 60 ns
- Patented evaluation methods
- Pulse repetition rate up to 50 Hz

SPEED AND PRECISION REDEFINED



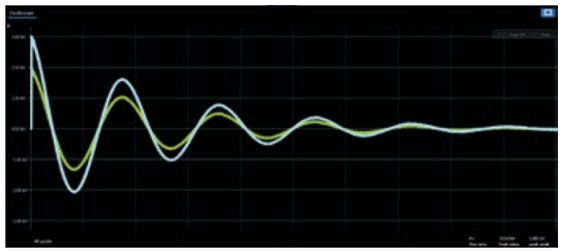
Tolerance band

The tolerance band is one of the more straightforward evaluation methods in which an envelope curve is wrapped around the signal. The surge wave must be within a defined tolerance band.



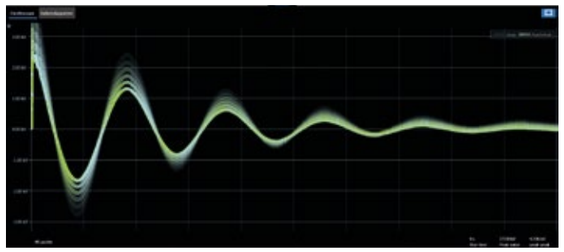
Error area EAR

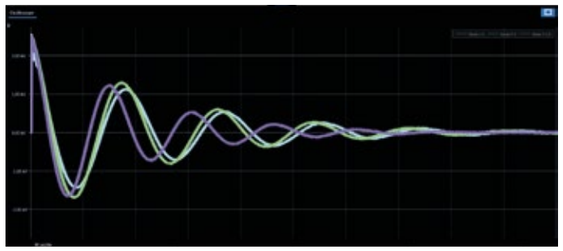
The error area is the difference in area between two signals (surge waves). The surface difference between the reference surge wave and the currently measured surge wave is determined automatically and the deviation is displayed in %.



Correlation | Patented evaluation method

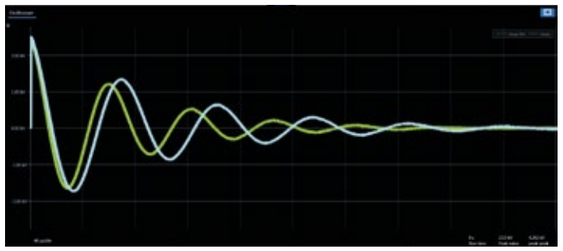
The correlation between the reference surge wave and the currently measured surge wave is automatically determined and the difference is displayed in %.





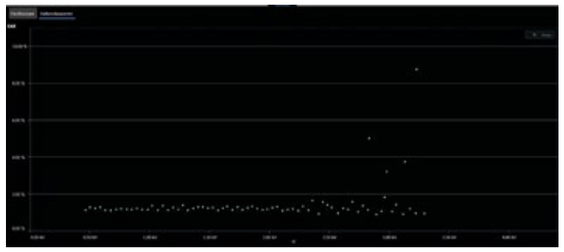
Phase comparison

Phase comparison automatically compares all three phases of a motor and presents them in a diagram. This makes it possible to determine and evaluate symmetry directly. This method is usually applied in motor repair.



Reference comparison

Comparison to a reference is possible when a "good" device under test has been previously recorded. This method is typically used in production.



Peak-to-Peak | Patented evaluation method

The peak-to-peak method increases the test voltage step by step. If there is an increased deviation from one step to the next, the test is stopped. The deviation from step to step is displayed in %.

Surge voltage test

Model MTC2 *R7*	6 kV	12 kV	15 kV
Test voltage	200 V - 6 kV	500 V - 12 kV	500 V - 15 kV
Surge capacity 100 nF*	Yes | 1,8 J	Yes | 7,2 J	Yes | 11,25 J
Surge capacity 200 nF	Optional | 3,6 J	Optional | 14,4 J	Optional | 22,5 J
Automatic switch-over	Yes	Yes	Yes

*With optional surge current boost

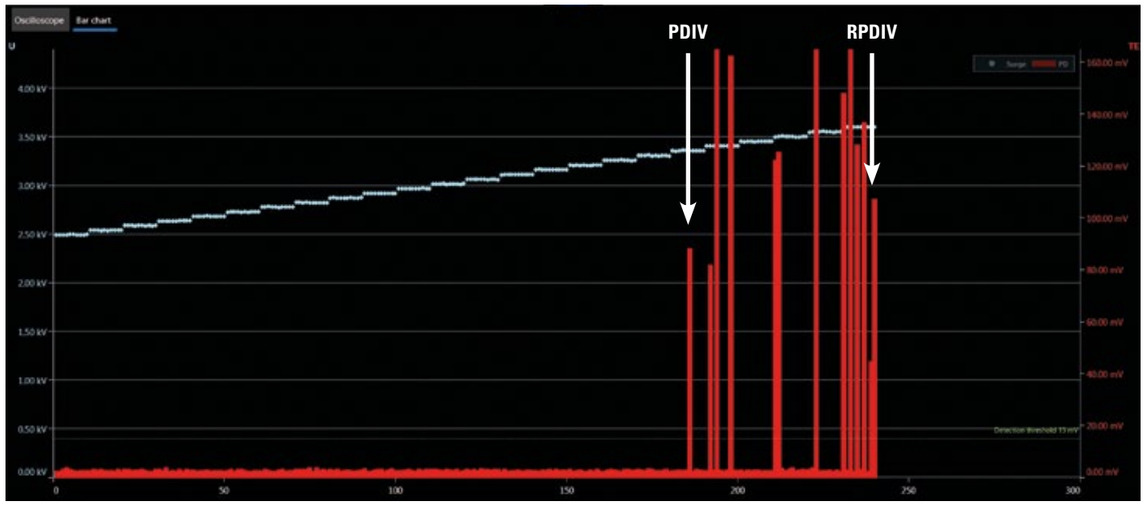
The partial discharge test in accordance with IEC 61934 and DIN EN 60034-18-41

Optional extension

The partial discharge test is used to check the winding quality of winding goods. The test can be performed in conjunction with both the high voltage test (sine wave) and the surge voltage test. Essentially, the aim is to detect quality defects in windings that cannot be detected with the standard high voltage test or even the surge voltage test alone.

Coupling technology in combination with high-frequency filter technology makes the system highly resistant to interference. It is therefore ideally suited for field operation or in manufacturing applications.

Automatic run of the standard-compliant PD test



The test is carried out either manually or fully automatically. In manual mode, the user increases the voltage while simultaneously monitoring the partial discharge signal.

Automatic operation allows all three phases to be analyzed fully automatically via a test sequence. The following values are evaluated for each phase:

- PDIV (inception voltage)
- PDEV (extinction voltage)
- RPDIV (repetitive inception voltage)
- RPDEV (repetitive extinction voltage)

It is not necessary to run the entire ramp. If a quick distinction needs to be made between GO and NOGO in production, the patented **50 Hz high-speed** test can be carried out as an option. Alternatively, a fixed test voltage can be used.

Surge voltage pulse with 150 ns rise time and PD effects

Determination of PDIV, RPDIV, RPDEV and PDEV
Partial discharge test up to 15 kV
Uniquely fast test method

The partial discharge test – ***now up to 75 % faster!***

50 Hz high-speed-test

ca. 50 s

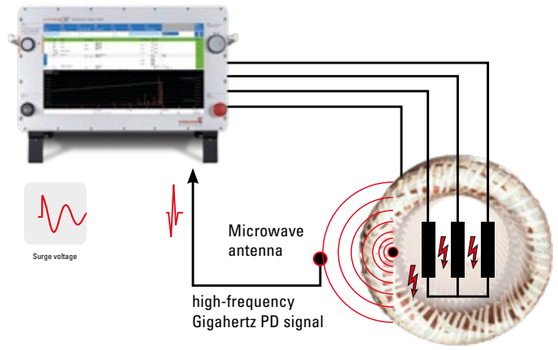
Previous test duration

ca. 218 s

The illustration is exemplary. The test time savings depend on the test settings and are based on a normative test in accordance with DIN EN 60034-18-41!

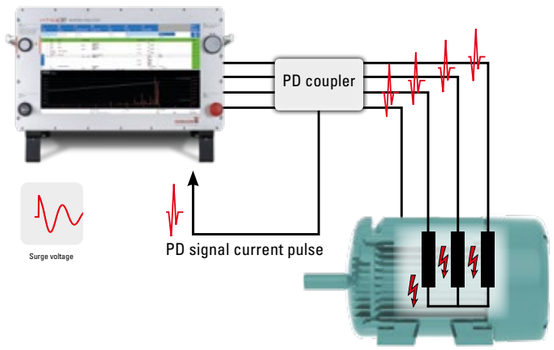
Partial discharge test on an open stator winding

The partial discharge measurement on an open stator winding is realized by means of a highly sensitive measuring antenna, which is placed in the device under test or in its direct vicinity.



Partial discharge test on an assembled motor

Measurements on a fully assembled motor cannot be made with an antenna, since the high-frequency signals are being shielded by the sealed motor housing. In such cases, measurements are made using a special coupler which is looped into the measuring leads.



The combination of these two measurement methods is unique worldwide

The partial discharge measurement (filtering and analysis) is fully integrated in the MTC2 *R7*. Only the decoupling (measurement) of the actual partial discharge signal takes place outside the device.

This is essential in order to optimally adapt to the respective measurement conditions. Both the antenna and the special coupler (available as an option) can be connected to the MTC2 *R7*.

The insulation resistance test

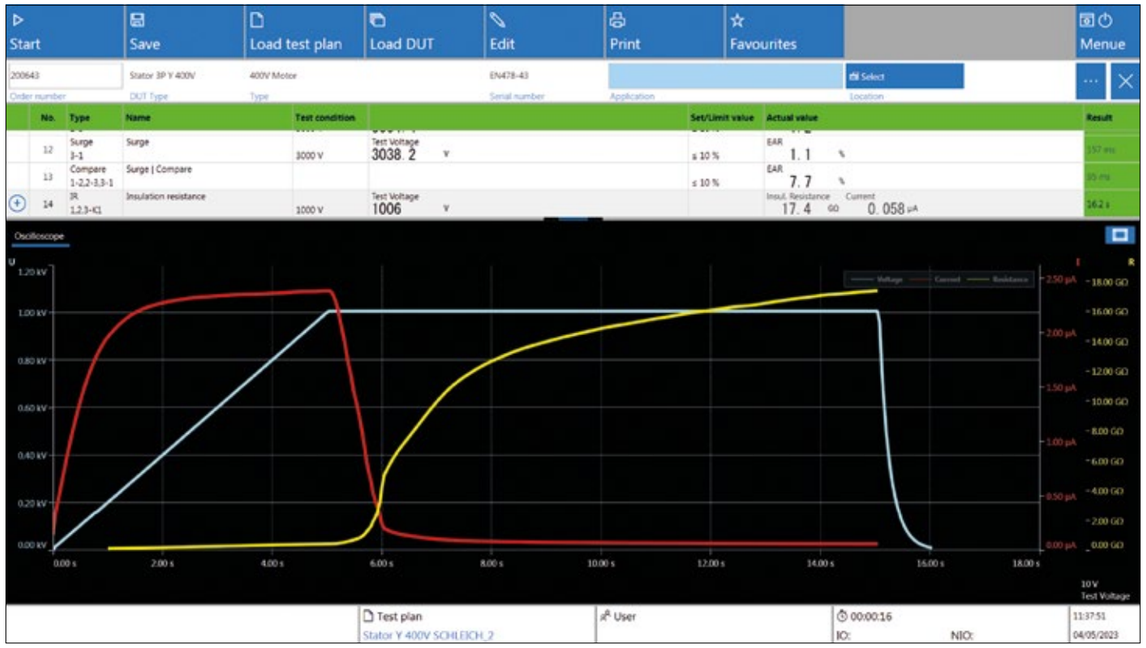
The insulation resistance test integrated in the basic device was specifically designed for testing electric drives. Conveniently, the test voltage is automatically switched to the test lead, which is also in use for surge voltage and resistance testing. Switching over the test leads between measurements is not necessary. The switch-over is fully automatic up to a test voltage of 50 kV.

The software offers preconfigured sequences for PI, DAR, high voltage DC, MegaOhm and step voltage testing. In combination with the new fully automatic ramp time determination, handling has been simplified considerably. To configure the test device in the ideal way for special applications, all parameters can also be adjusted individually.

This includes, among others, the following functions:

- Separate current limit values during ramp phase and test phase
- Contact check via minimum current monitoring
- Temperature compensation of the insulation resistance according to IEEE Std 43

> High voltage DC up to 50 kV
> PI | DAR | step voltage
> Up to 500 GΩ (optional up to 1 TΩ)



Insulation resistance test with ramp

As a rule, the ramp time is defined and specified manually for each individual device under test. However, it must be ensured that maximum charging currents are not exceeded.

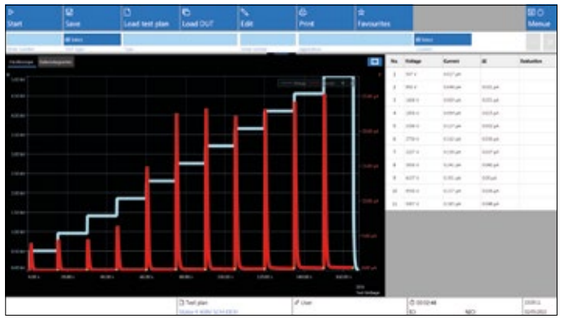
The MTC2 *R7* determines the shortest ramp time using the automatic charging current determination in the initial phase of the ramp function. This feature is included in every device.

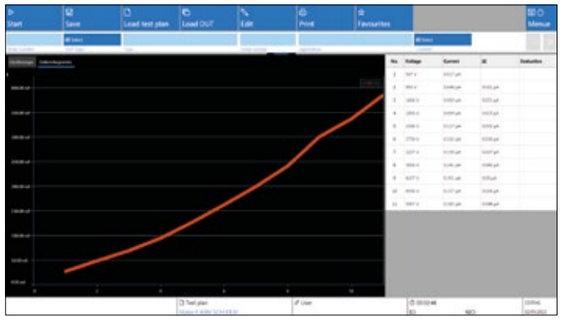
Nevertheless, it is still possible to set custom parameters for the ramp function. To do this, the ramp duration is set and the maximum permissible charging current is set as the evaluation criterion.

- Automatic charging current detection for minimum ramp time
- Adjustable ramp and test time
- Graphical representation of current, voltage and insulation resistance in a diagram
- Discharge after the test is displayed and logged

PI | DAR test

- Logging of the measurement every 60 s
- The first two readings are recorded at an interval of 30 s
- Display of the measurement both in graphical and table form





Step voltage test

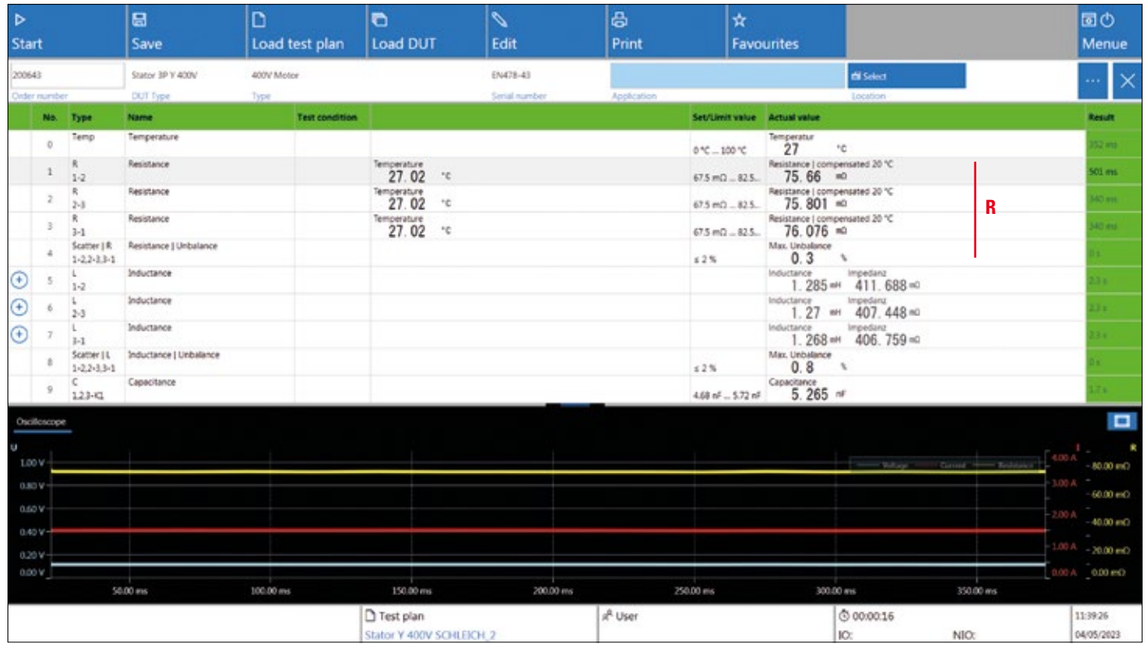
- In combination with PI/DAR test
- Standard-compliant evaluation of the current values at the end of each individual step
- Display of the measurement both in graphical and table form

Insulation resistance test

Model MTC2 *R7*	6 kV/12 kV/15 kV
Test voltage	200 V - max. voltage
Measurement range	100 kΩ - 500 GΩ
Automatic switch-over	Yes

Further information: www.schleich.com/en/product/mtc2-r7-en

The resistance test



High-precision measurements in four-wire technology

From 1 mΩ to 1 MΩ

Fully automatic temperature compensation

Temperature sensor, hygro- and barometer can be connected directly

The MTC2 *R7* comes equipped with the resistance test from the base model onwards. This makes it possible to test phase resistances, temperature sensors (NTCs, PTCs and KTYs) and single coils. It is not necessary to switch the test leads to perform the resistance test. The test is performed immediately and fully automatically via the test leads already connected to the device under test. This is possible thanks to the unique built-in test method switch-over of the MTC2 *R7*.

Room temperature compensation

- Temperature sensor connection directly on the device
- Connectable sensors:
  - Room temperature sensor
  - Object temperature sensor
  - Pyrometer
  - Hygrometer and barometer
- Three independent input signals, each with 0 - 10 V or 4 - 20 mA
- Measuring range 0 - 100 °C (32 - 212 °F)
- Adjustable reference temperature
- Fully automatic compensation of resistance values for copper, aluminum and temperature sensors

Resistance test

Model MTC2 *R7*	6 kV/12 kV/15 kV
Measurement range	1 mΩ - 999 kΩ
Resolution	1 µΩ
Automatic switch-over	Yes

The inductance and capacitance test

Optional extension to the resistance test

The use of a capacitance measuring bridge is a thing of the past. Use the optional measuring bridge integrated in the MTC2 *R7* to measure inductances, impedances and capacitances with high precision.

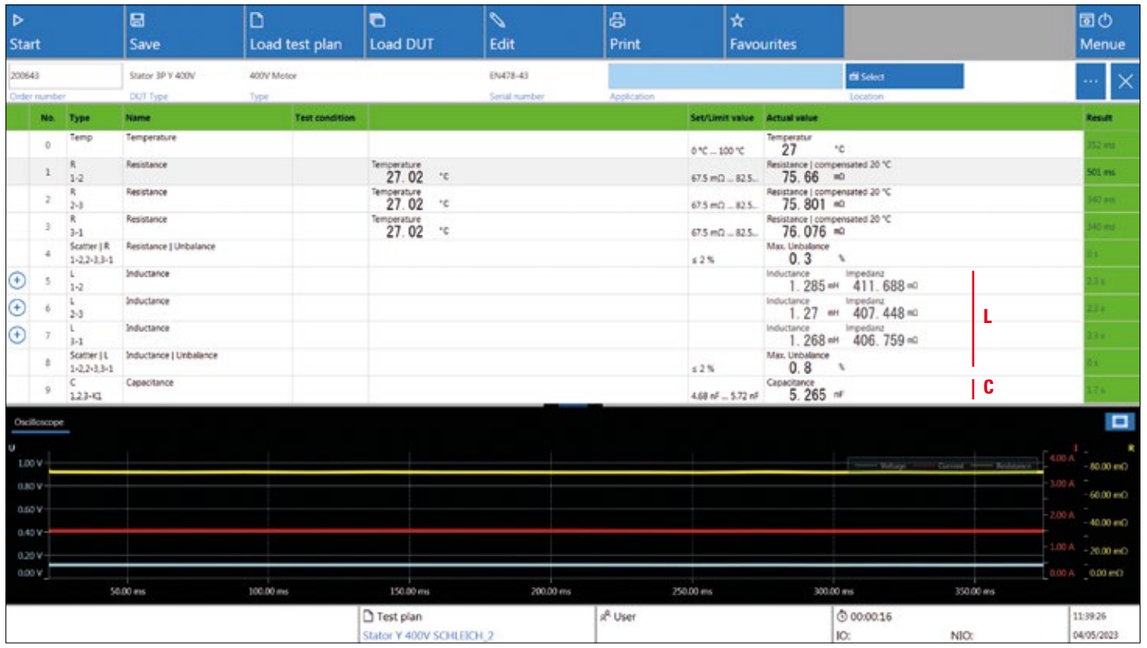
The following evaluation options are available:

- Comparison of the actual value to a specified target value
- Determination of the symmetry (spread) of all three phases

High-precision measurements in four-wire technology

From 0,1 µH to 500 mH

From 1 nF to 100 µF



Inductance and capacitance test

Model MTC2 *R7*	6 kV/12 kV/15 kV Version „RLC“
Measurement range L	1 µH - 500 mH
Resolution L	0,1 µH
Measurement frequency L	50/60 Hz*
Measurement range C	1 nF - 100 µF
Resolution C	0,1 nF
Measurement frequency C	4 kHz*
Automatic switch-over	Yes

* Further measurement frequencies optional

The high voltage test AC

Optional extension

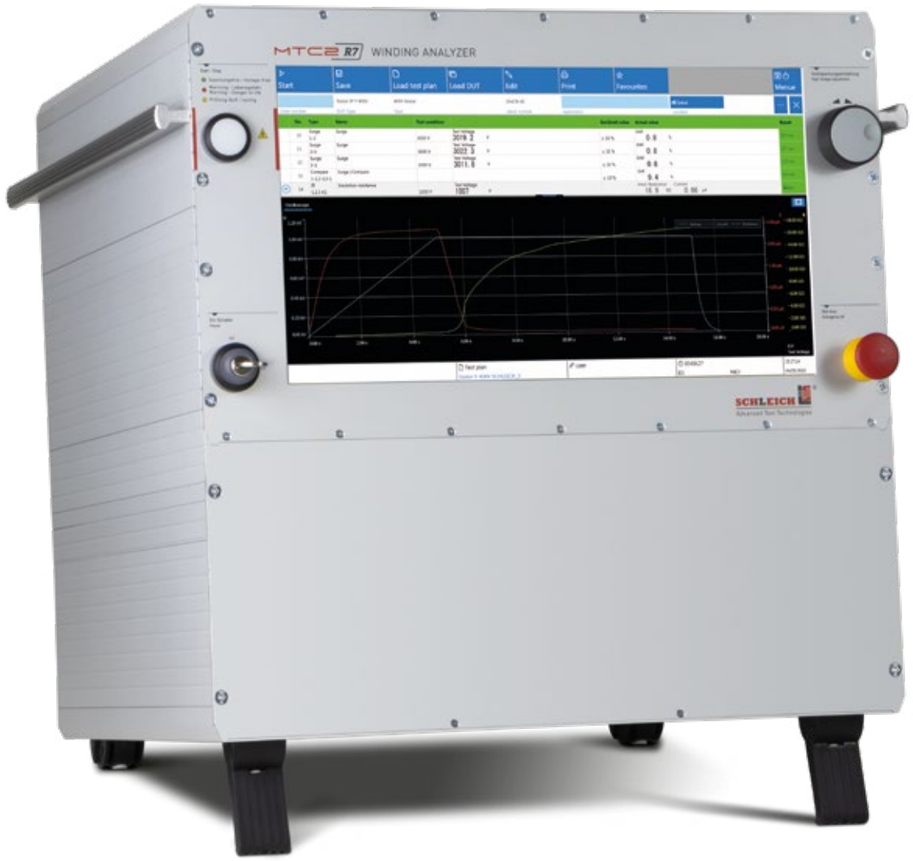
Integration of the high voltage test AC into the MTC2 *R7* with automatic and immediate switch-over to the measurement connections.

Reconnecting the test leads is not necessary. The test is conducted fully automatically via the test leads already connected to the device under test.

This extension is only available in the 19" or desktop version due to the embedding of the high voltage test. The size of the device increases to 10 HU as a result.

High voltage test AC

Test voltage	up to 6 kV
Test current	max. 100 mA
Quick shutdown	adjustable



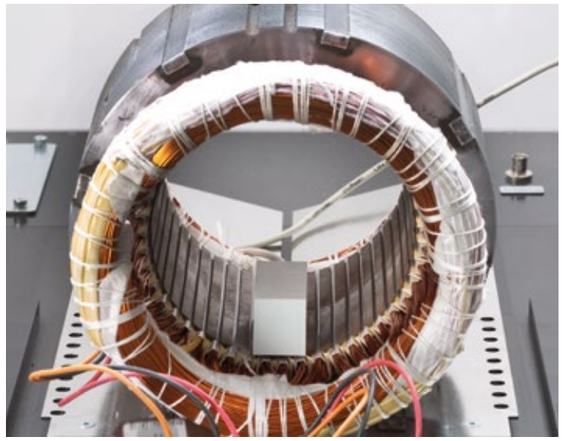
- Standard-compliant high voltage test
- Fully electronically controlled
- 6 kV @ 100 mA, 200 mA I_k

Rotary field test

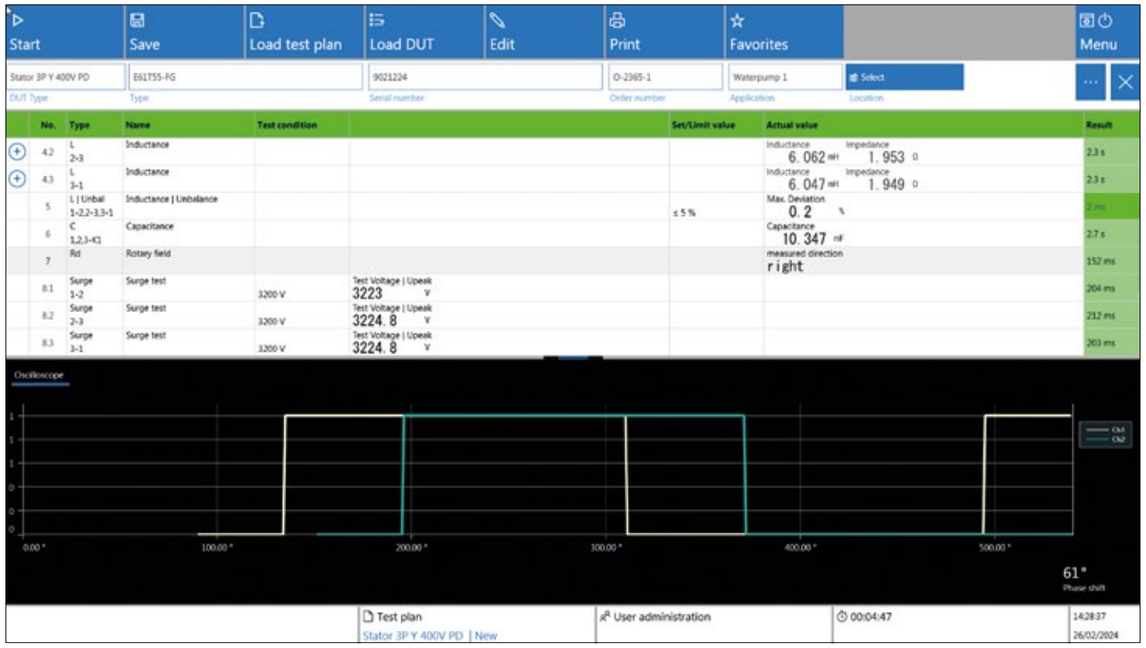
Optional extension

The rotary field test serves to measure and evaluate the rotary field of a stator. The test is performed contactless by means of a rotary field probe, which is inserted into the stator or attached to a DUT holder.

The rotary field is created by a connected current-limited low-voltage rotary field, which simulates the 3-phase supply of the motor. With this test, coil-connection errors in production can be detected before the motor is assembled.



Rotary field probe positioned in a stator



- Contactless rotary field test
- Wear- and maintenance-free
- Short-circuit-proof
- Also suitable for single-phase motors

Further information: www.schleich.com/en/product/mtc2-r7-en

VoltageAnalyzer

Optional extension

UNIQUE TECHNOLOGY MADE BY SCHLEICH

- Precise voltage measurement at winding connections
- Fully automatic switch-over
- Potential-free voltage measurement
- Standard-compliant measurement in accordance with DIN EN 60034-18-41:2021

The VoltageAnalyzer is designed to measure surge voltage signals directly at the motor winding. The frequency response covers the range from DC to very high pulse frequencies in the MHz range. This makes the VoltageAnalyzer the perfect choice for high-precision surge voltage and partial discharge measurements.

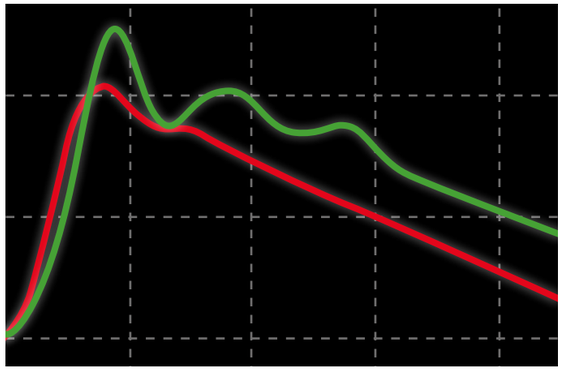
It measures the voltages and voltage peaks directly where they occur. For instance, this could be inside the motor at the motor terminal board or directly at the winding connections.

Voltage measurement during surge voltage and partial discharge

In some cases, the voltage measured internally in the surge tester does not exactly match the voltage at the device under test. The reason for this is that unavoidable line inductances and capacitances between the test leads can change the voltage curve of the surge signal on the path to the device under test. This occurs more intensively the steeper the surge pulse rises.

In order to precisely measure the actual partial discharge inception voltage applied to the motor terminal board during a partial discharge test, for example, measurement via the VoltageAnalyzer directly at the terminal board is required.

In order to inspect a three-phase motor or stator quickly and without the need to reconnect any terminals, the VoltageAnalyzer is equipped with three measurement connections. These are connected directly to the terminals U, V and W of the device under test via the shortest possible measurement leads. The measuring point switch-over between the three measurement connections is fully automatic within the VoltageAnalyzer and synchronous with the surge voltage test.

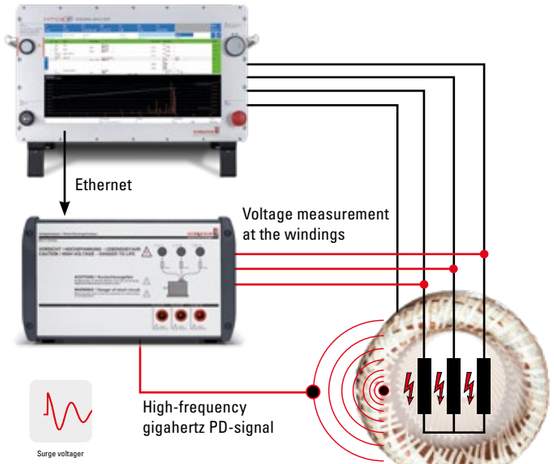


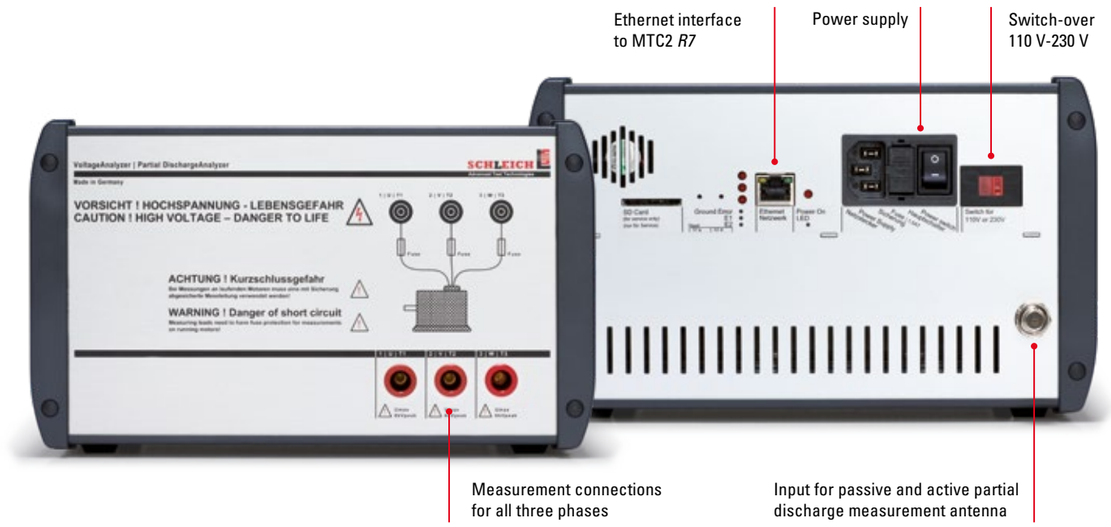
The green curve shows the voltage signals measured with the VoltageAnalyzer

- measured directly at the motor terminals
- accurate peak and peak-to-peak voltage measurement

The red curve shows the voltage signals measured without the VoltageAnalyzer

- signal waveform is not measured at the motor terminals
- high damping of the overshoot signal





Further information: www.schleich.com/en/product/mtc2-r7-en

SCHLEICH Advanced Test Technologies

Armature booster

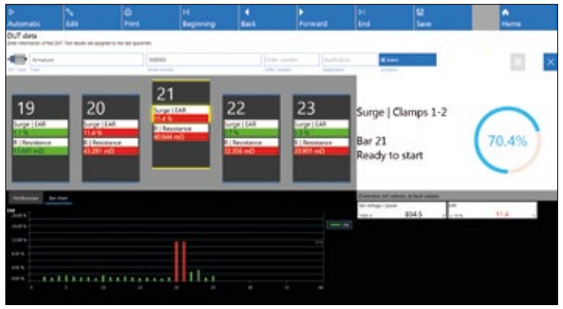
Optional extension

For armature testing, an additional armature booster is available for the MTC2 *R7* test devices. It is needed for testing larger, low-inductance DC armatures. The armature booster increases the surge current by a factor of 10 to find short circuits and insulation faults between the bars.

The armature booster is connected to the measurement leads of the MTC2 *R7*. Two solid test probes with built-in start button are available for the operator at the output of the booster. In addition, a built-in warning light indicates whether the probes are voltage-free. An acoustic signal indicates whether the test is GO or NOGO.

The test is performed using two test probes with which the bars are contacted (bar method). The test can be performed directly between bar and bar or, for example, between ¼ of the commutator. The test is started via the start button in the test probe.

The test is evaluated at the end of the fully automatic test sequence, which guides the operator through the measurement. Alternatively, testing can also be performed manually, without a fixed test step sequence. With both methods, the MTC2 *R7* compares the surge curve with a previously stored reference during the measurement. This allows the user to directly fix any faults and repeat the test at these points. Alternatively, the measurement can be saved at this point and repeated after the repair.



Booster-Pack

Model MTC2 *R7*	6 kV | 12 kV | 15 kV
Output current	>2000 A possible
Output voltage	≤1500 V
Four-wire technology	no
Pluggable	yes
Part number	4023227

Collector test probes

Probes for armature test booster

Article number	4023713

Hand adapter armature contacting

Adjustable width	2.5-22 mm
Collector diameter	100-700 mm
Article number	4023373

Further information: www.schleich.com/en/product/mtc2-r7-en

The software concept

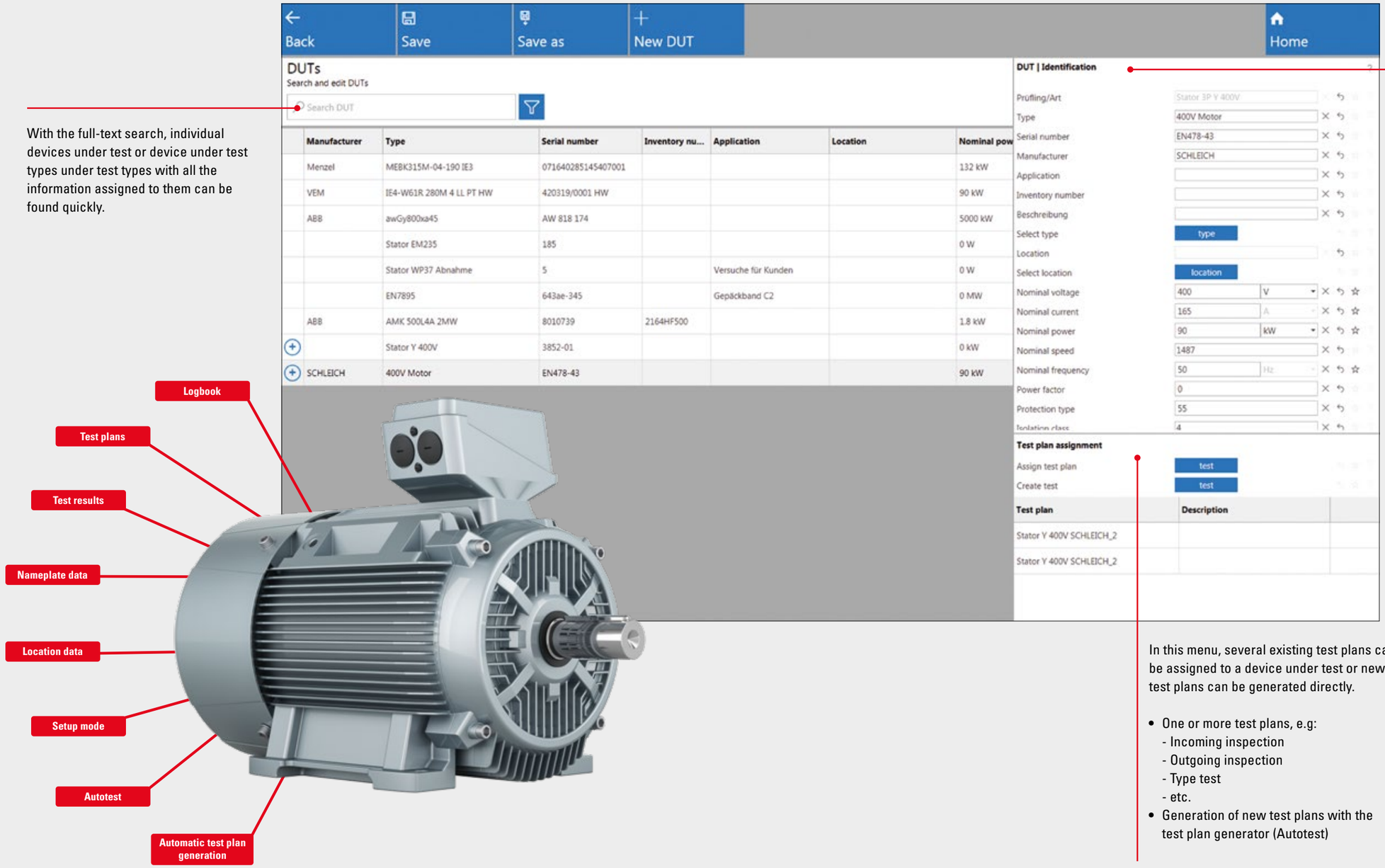
It's all about the device under test

The user interface has been completely redesigned and is based on the latest .NET technology. The MTC2 *R7* features modern and clear visualizations that enable intuitive operation.

The DUT database provides an optimum insight into every device under test created. In addition to an overview of the individual assigned parameters such as manufacturer, serial number and type, all test results are displayed as well.

New, modern .NET software
Windows 11® operating system
Storage of all signal sequences

With the full-text search, individual devices under test or device under test types under test types with all the information assigned to them can be found quickly.



The software can be used to store any number of devices under test or device under test types. Further information can now be assigned to these:

- Nameplate information
- Images of the nameplate or device under test
- Location information
- Logbook entries to document any kind of information
- Test results
  …

In this menu, several existing test plans can be assigned to a device under test or new test plans can be generated directly.

- One or more test plans, e.g:
  - Incoming inspection
  - Outgoing inspection
  - Type test
  - etc.
- Generation of new test plans with the test plan generator (Autotest)

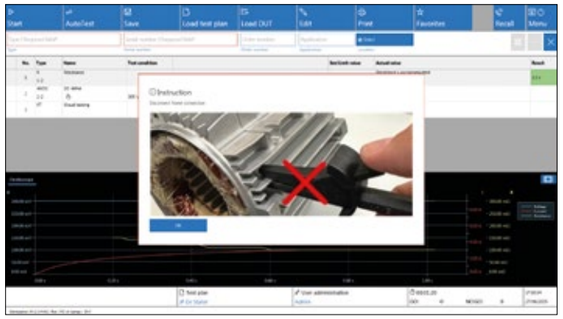
Further information: www.schleich.com/en/product/mtc2-r7-en

The software features

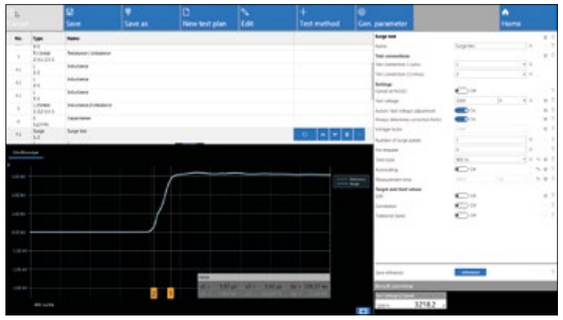
Visual inspection and worker guidance

Visual inspection test steps can be used in a variety of ways, for example to run non-electrical tests or to prompt operators to perform actions outside of the test sequence.

Examples:
- Checking that a device under test is in perfect visual condition
- Instructions for further handling after tests
- Checking that all accessories are included
- Preparing for the next test sequence:
  Tidying up/preparing the test station
- etc.



Measurement function



The oscilloscope feature is at its best. For each measurement, current, voltage and resistance curves are displayed not only as numerical values but also in the form of an oscillogram, if possible.

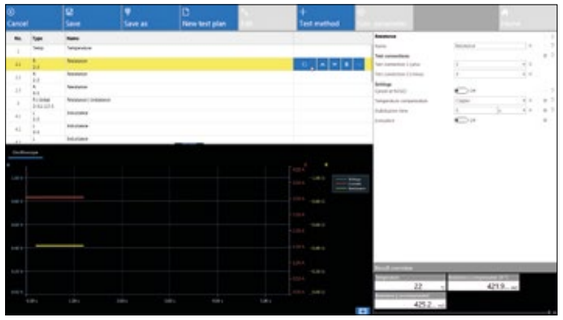
The „Measurement" function can be used to place cursors at any point in the diagram in order to determine amplitudes, resistance values and times in the selected range

This allows for very precise determination of a resistance value at a specific point in time. It is also easy to determine the rise time of a surge voltage.

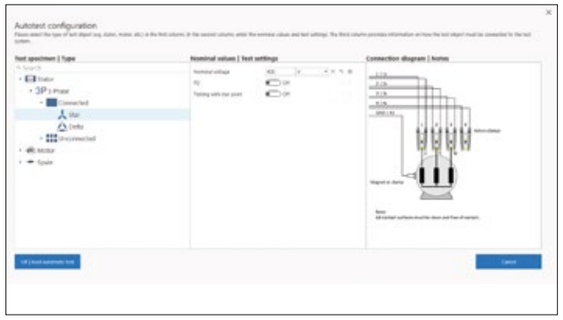
Setup mode

Test steps can be started at any time during the creation of the test plan. This enables the precise configuration of each test step.

Example:
The times for the ramp functions can be easily determined and transferred directly to the test step. Switching from test plan editing to test mode is a thing of the past.



Autotest



For the automatic test plan creation, only data that can be taken from the type plate needs to be entered into the software as well as the test methods required for the test.

The MTC2 *R7* then automatically calculates the test target values for the test methods, taking into account the current standards. The calculation* is based on over 70 years of SCHLEICH experience in testing winding goods.

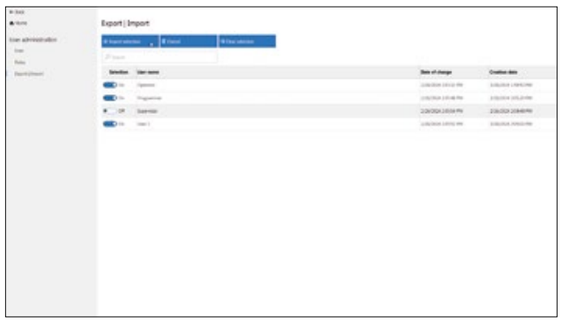
Making everyday testing easier. With SCHLEICH's know-how it is possible.

* Calculation of the test voltage without guarantee!

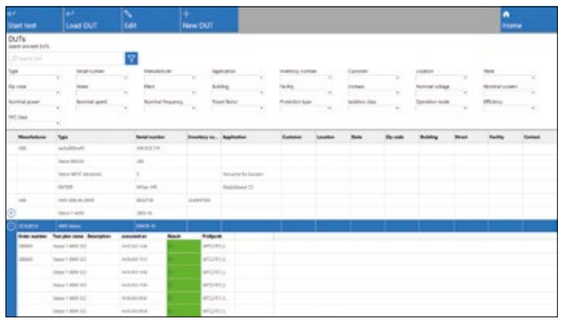
User management

Custom „user roles" can be assigned for each operator in user management. These user roles can be used to assign user rights from a central control point, e.g. for administrators or users who are allowed to change set values or only perform predefined test sequences. Operators are required to log in with their password.

Thanks to the Windows 11® operating system, almost any kind of input is supported: From keyboard to screen input, scanner or RFID – everything is possible.



The full-text search



All results can be found again quickly at any time using the information previously entered. The built-in full-text search feature simplifies and accelerates the retrieval of results.

Barcode scanning
CSV export
Raw data export
Blackbox test

The test protocol

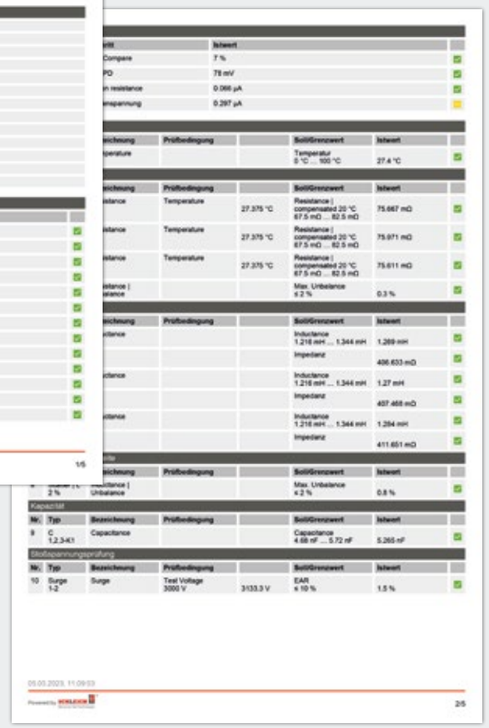

Your Logo

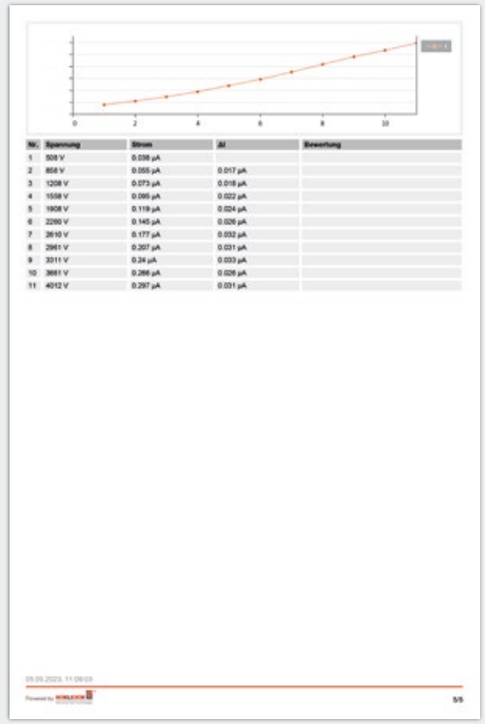
Sample Company Ltd
Sample Street 89
12345 Sample City

PRÜFPROTOKOLL

Customizable section with your company logo and address

The title page with customizable section, the general data of the device under test and the overview of the measurement results. On the following pages, the detailed measurement results of the individual test steps are depicted.





- Direct printing on a Windows® compatible printer
- Creation of a PDF or optional CSV file
- Reporting in accordance with IEC 61934

All test results can either be exported directly after the test or at a later time using the modern standard protocol.

The protocol language can be selected individually before creating the protocol. Default languages include German, English, Chinese, Czech, Danish, Dutch, French, Hungarian, Italian, Polish, Portuguese, Slovenian, Spanish, Swedish.

Protocol options

- **Paper printout**

  Any Windows® 11 compatible printer can be connected to the MTC2 *R7*. As is standard in Windows®, only one click on the print icon is required and all test results are automatically printed.

- **Generating a PDF file**

  The MTC2 *R7* can generate a PDF file that can be stored on a USB drive, the internal hard disk or on any network directory. Storing on the USB drive is done automatically into the root directory. No "copy and paste" in Windows® is required.

- **Creating a CSV file (optional)**

  Optionally, the MTC2 *R7* can also generate a CSV file after a test sequence. The file can be stored on any network directory. The data to be transferred to the CSV file are customizable and can be adapted to your requirements.

The MTC2 *R7* in a network

Test plans and test results can be stored locally or alternatively on a central server. This guarantees a high level of security for your data as well as optimized data sharing between different test systems.

The MTC2 *R7* is perfectly suited to operate in all network infrastructures, including its standard version. It offers the ideal platform for collecting, managing, analyzing and distributing information.

You can decide for yourself whether the data is stored on external cloud storage or on an internal company server.

Tried and tested popular technologies from Microsoft® serve as the foundation for the database.

Microsoft SQL Server

Microsoft SQL Server Express

mongoDB.

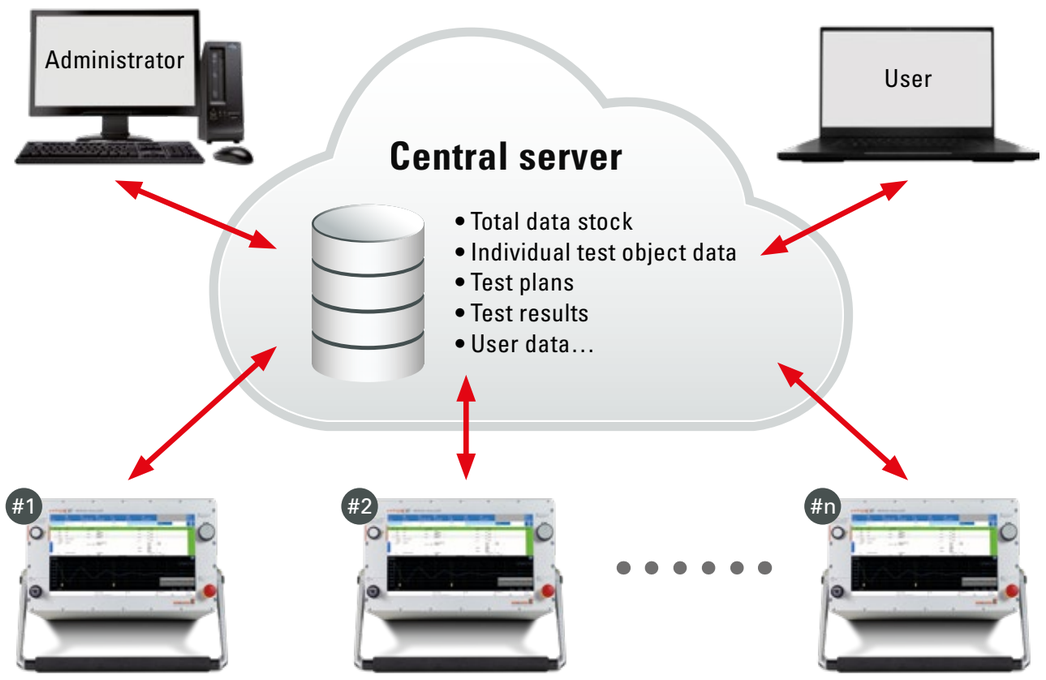
- Central storage of the test plans and results
- Local editing of test plans and evaluation of test results on the MTC2 *R7* or on workstations
- Operation in global networks
- Optimized for remote maintenance

Automatic data synchronization

All device under test data, test plans, test results, and user information can be efficiently synchronized across multiple test devices. This ensures that every test device or desktop workstation is always up to date without the need to exchange data via an additional data carrier.

The workstation software provides you with a comprehensive overview of all test results at all times. Test plans can be conveniently edited from your office workstation.

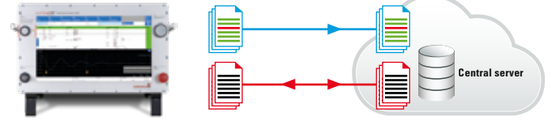
Use the extensive configuration options to specify which data, user accesses, and results are intended for which test system and which are not.



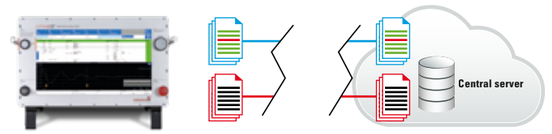
Offline operation | Network failure

The software allows the test device to be operated even without a network connection. This ensures continuous testing. This is necessary, for example, in the event of a network failure or when working outdoors.

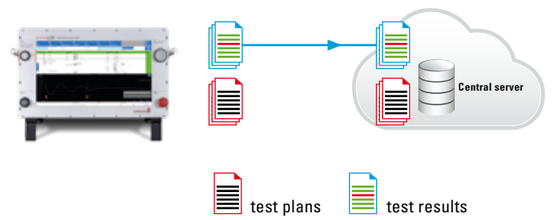
❶ Each test device automatically saves local copies of the latest server test plan database so that it can continue to operate in the event of an eventual network failure.



❷ In the event of a network failure, the local test plans are used and the test results are stored locally on the test device.



❸ After the network connection is re-established, the test device automatically transfers the test results back to the server ensuring that the server database is up to date again.



Product overview

6 kV, 12 kV and 15 kV

	Housing type ❶	Housing type ❷	Housing type ❸	Housing type ❹	Housing type ❺	Housing type ❻	Housing type ❼	Housing type ❽	Housing type ❾
									
	All-round housing | 6 HE	Workshop housing | 6 HE	19" rack mount housing 6 HE	19" rack mount housing 10 HE	19"rack mount housing 14 HE	Table-top housing | 6 HE carrying handles on side	Table-top housing | 10 HE carrying handles on side	Table-top housing | 14 HE carrying handles on side	Hardcase housing

	6 kV			12 kV			15 kV		
	MTC *R7* 6 kV | R	MTC *R7* 6 kV | RLC	MTC *R7* 6 kV | RLC | HVAC	MTC *R7* 12 kV | R	MTC *R7* 12 kV | RLC	MTC *R7* 12 kV | RLC | HVAC	MTC *R7* 15 kV | R	MTC *R7* 15 kV | RLC	MTC *R7* 15 kV | RLC | HVAC
Standard housing type	❶	❶	❼	❶	❶	❼	❶	❶	❼
Optional housing type	❷ | ❸ | ❻ | ❾	❷ | ❸ | ❻ | ❾	❹ | ❾	❷ | ❸ | ❻ | ❾	❷ | ❸ | ❻ | ❾	❹ | ❾	❷ | ❸ | ❻ | ❾	❷ | ❸ | ❻ | ❾	❹ | ❾
Winding connections	4	4	4	4	4	4	4	4	4
4 additional winding connections	○ Housing type ❹ or ❼	○ Housing type ❹ or ❼	○ Housing type ❺ or ❽	○ Housing type ❹ or ❼	○ Housing type ❹ or ❼	○ Housing type ❺ or ❽	○ Housing type ❹ or ❼	○ Housing type ❹ or ❼	○ Housing type ❺ or ❽
Ground connection	1	1	1	1	1	1	1	1	1
Surge voltage | 100 nF	●	●	●	●	●	●	●	●	●
Surge capacitance | 200 nF	○	○	○	○	○	○	○	○	○
Partial discharge with surge voltage	○	○	○	○	○	○	○	○	○
Resistance	●	●	●	●	●	●	●	●	●
Insulation resistance | PI/DAR	●	●	●	●	●	●	●	●	●
Step voltage	●	●	●	●	●	●	●	●	●
High voltage DC	●	●	●	●	●	●	●	●	●
High voltage AC 6 kV | 100 mA	–	–	●	–	–	●	–	–	●
Inductance	–	●	●	–	●	●	–	●	●
Capacitance	–	●	●	–	●	●	–	●	●
Sense of rotation	○	○	○	○	○	○	○	○	○
Visual inspection	●	●	●	●	●	●	●	●	●
External accessories									
Armature booster ready	●	●	●	●	●	●	●	●	●
VoltageAnalyzer ready	●	●	●	●	●	●	●	●	●

● Standard model
○ Optional at extra costs
– Not available

R: Resistance
RLC: Resistance \| Inductance \| Capacitance
HVAC: High voltage AC

Product overview

30 kV, 40 kV and 50 kV

Heavy-duty mobile cabinet

	30 kV	40 kV	50 kV
	MTC *R7* 30 kV | RLC	MTC *R7* 40 kV | RLC	MTC *R7* 50 kV | RLC
Winding connections	2	2	2
3rd Winding connection	○	○	○
Ground connection	1	1	1
Measuring connections pluggable	○	○	–
Surge voltage | 100 nF	●	●	●
Surge capacitance | 200 nF	–	–	–
Partial discharge with surge voltage	○	○	○
Resistance	●	●	●
Insulation resistance | PI/DAR	●	●	●
Step voltage	●	●	●
High voltage DC	●	●	●
High voltage AC 6 kV | 100 mA	–	–	–
Inductance	●	●	●
Capacitance	●	●	●
Sense of rotation	○	○	○
Visual inspection	●	●	●

● Standard model
○ Optional at extra costs
– Not available

RLC: Resistance | Inductance | Capacitance

Accessories

Kelvin tong | sturdy design

Sturdy 4-wire Kelvin tongs for high-precision resistance tests.
The standard measuring leads can be plugged
on the Kelvin tongs.

Type	small	medium	large
Opening width	10 mm/0.4 inch	20 mm/0.8 inch	33 mm/1.3 inch
Pressure intensity	20 N	30 N	100 N
4-wire-technology	yes	yes	yes
Measuring lead pluggable	yes	yes	yes
Dimensions (L x H x W)	13 x 37 x 90 mm	20 x 63 x 168 mm	25 x 107 x 253 mm
Article number	4023184	4023122	4023109

Motor terminal plug

The motor terminal plugs enable quick contacting of 6-, 8- or 9-pole motor terminal boards. The individual types are designed to match the motor-side connection threads from M4 to M10. Different versions are available for each type due to the different distances between the threaded bolts.

You can find further information on our website:
www.schleich.com/en/product/motor-terminal-plugs-en

Foot-switch to start the test

Lead length	Article number
2 m	4010611
5 m	40104706
10 m	40104707

Two-hand start

Lead length	2 m
Article number	4023716

Emergency stop

Lead length	Article number
2 m	40106085
5 m	40106086
10 m	40106087

Rotary field probes

	Article number
Static rotary field probe for micromotors	4007215
Static rotary field probe, medium housing	4007207
Static rotary field probe, large housing	4000305

Connection cables	Article number
4-pole, length 0.5 m	4000261
4-pole, length 1 m	40001929
4-pole, length 2 m	40002081
4-pole, length 3 m	40001930
4-pole, length 4 m	40003541

Warning and Result lights

The LED warning light indicates the following conditions:
Green= high voltage switched off
Red= high voltage switched on

Indications	red/green
Lead length	1.8 m/5.9 ft
Article number	40004858

The LED result light indicates the following conditions:
Green= test GO
Red= test NOGO

Indications	red/green
Lead length	1.8 m/5.9 ft
Article number	40004861

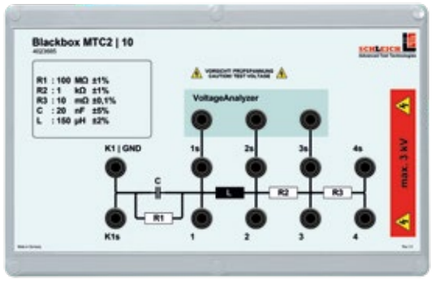
PD coupler

Separate PD coupler for measuring partial discharge signals on motors

Article number	40001669

Accessories

Test dummy | Blackbox



Daily verification of the test device using a black box to simulate „GO/NO GO" conditions gives you the safety of knowing that your test device is operating perfectly and that you are delivering products that have been tested properly. Our black boxes can be used as set value dummies or GO/NO GO test dummies.

Set value test dummy for simulation of tests
When the test device is checked with this black box, it measures the set value of the respective test method within a very tight ± tolerance. If the test result is out of the tolerance limits, a fault is present.

Article number	4023685

PD-free Blackbox

This blackbox serves to verify that the test system is free of partial discharge and is equipped with connections for the MTC2 R7. The PD-free blackbox is resistant to partial discharge up to a voltage of 6 kV.

Article number	40003448

PD simulator

Generates partial discharges for testing partial discharge measurement systems

Article number	40004751

VoltageAnalyzer

The VoltageAnalyzer is used to measure surge test signals directly at the motor winding. The frequency response covers the range from DC to very high pulse frequencies in the MHz range. This makes the VoltageAnalyzer ideal for high-precision surge test and partial discharge measurements.

Article number	403400

Twin-Sense Kelvin tong

Small Kelvin test tong with separate sense connection for the VoltageAnalyzer.

Article number	40004705

Interfaces and fieldbus

- Remote control of the tester via e.g. a PLC
- Read-out of test results
- Transfer of order data

Ethernet TCP/IP · PROFINET · EtherCAT · PROFIBUS · WLAN | Bluetooth *

The indicated logos are registered trademarks of the respective companies. | * optional

	Article number
Ethernet TCP/IP	40031850
ProfiNet	4023656
EtherCAT	4023657
ProfiBus	4023658
WLAN/Bluetooth	40004840

Connection extension to 8 winding connections

Test voltage	max. 6 or 15 KV
Surge current	max. 2000 A
4-wire-technology	yes
Article number 6 kV	4023646
Article number 15 kV	4023647

UPS

The uninterruptible power supply enables the built-in PC to be shut down in a controlled manner after a power failure.

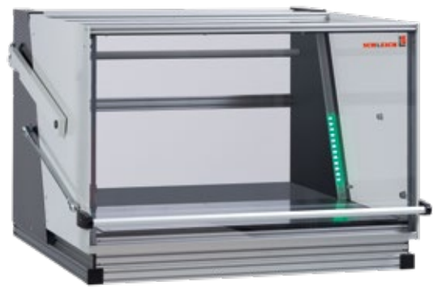
Article number	4023771

Accessories

Test cover model 13 *R2L*

Overall dimensions (W x D x H)	620 x 782 x 515 mm
Inside dimensions (W x D x H)	458 x 600 x 350 mm
Integrated result lights	optional
Test voltage at surge test	max. 16 kV
Test voltage	max. 12 kV AC/16 kV DC
Safety	CAT IV
Article number 6 kV AC/8 kV DC	40005553
Article number 12 kV AC/16 kV DC	40005689

Test cover model 10



Overall dimensions (W x D x H)	946 x 837 x 625 mm
Inside dimensions (W x D x H)	800 x 800/730 x 505 mm
Integrated result lights	2 pcs. (1 x GO/1 x NO GO)
Test voltage	max. 8 kV AC
Safety	CAT IV
Article number	400281

Rolling tables

Overall dimensions (Wx D x H)	700 x 870 x 1010 mm	700 x 870 x 1010 mm
Drawer	no	yes
Additional shelf	no	yes
Base plate	no	yes
Casters	yes	yes
Caster diameter	120 mm	120 mm
Push handle	yes	yes
Article number	124.982.0	124.981.0

〉Note: The rolling tables can also be customized according to your specifications.

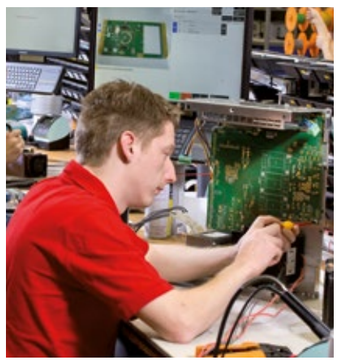
Transport case

- Solid outdoor case
- Ideal for wind turbines, military, on-site service in the field etc.

Model MTC2 *R7*	6 kV/12 kV/15 kV
Casters	yes
Shock absorber	yes
Color	black
Weight (tare)	20.5 kg/45,19 lbs
Dimensions (W x D x H)	700 x 850 x 450 mm
Article number	4023762

Another word for “Made in Germany”:

SCHLEICH



Comprehensive 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 150 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 their ideas and suggestions for improvement they are all part of the innovation process.

Further information: www.schleich.com/en/product/mtc2-r7-en

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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 via remote maintenance.

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Sales and Service Centers

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Advanced Test Technologies

Expect more!

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 70 years ago, is present in over 40 markets all around the globe.

Test devices for electric motors and windings

MotorAnalyzer3
Universal tester for electric motors and windings

MTC2 *R7*
Multi-purpose winding testers

VoltageAnalyzer
Accurate surge measurement directly at the winding

EncoderAnalyzer
For testing encoders

Dynamic-MotorAnalyzer
Online Monitoring of electric motors

MTC3
Multi-purpose winding testers for motor production

GLP3-M
Multi-purpose motor testers

Thermal-bonding machines, impregnation and resistive-heating systems

Test covers, test cabins and protection devices
Personal protection against dangerous test voltages

Motor terminal plugs
Contact electric motors quickly

Electrical safety- and function testers

Handheld
Mobile multi-purpose testers

GLP1-g
Safety, function and high-voltage testers

GLP2-BASIC
Safety, function and high-voltage testers

GLP2-MODULAR
Safety, function and high-voltage testers

GLP3
Multi-purpose Windows®-testers

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