OMICRON

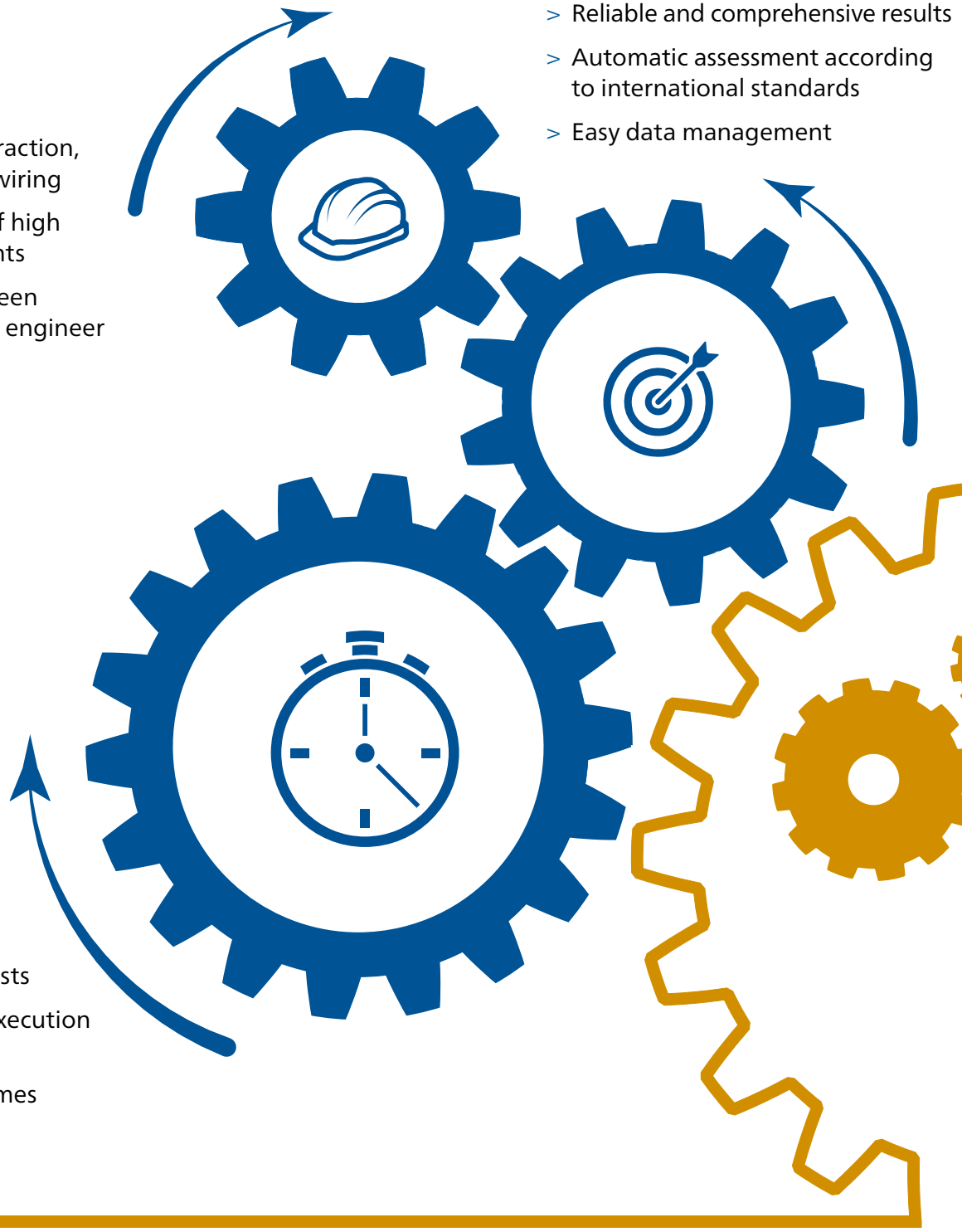
Optimized substation asset testing for maximum efficiency

RESULTS

- Reliable and comprehensive results
- Automatic assessment according to international standards
- Easy data management

SAFETY

- Minimum user interaction, for example, for rewiring
- Controlled usage of high voltages and currents
- Safe distance between test object and test engineer



TIME

- One setup for all tests
- Fast preparation, execution and reporting
- Reduced outage times

THE IDEA BEHIND OPTIMIZED TESTING

Efficiency is the major goal when testing substation assets. The intention is to gather relevant and reliable diagnostic data to be able to make informed maintenance decisions. This must happen in a short time and with reasonable effort while keeping the required outages as limited as possible.

This is the idea behind optimized substation asset testing. Thus, all of our test solutions are optimized regarding:

> SAFETY: Maximize safety for operators, assets and the surrounding environment

> TIME: Lowest possible shutdown times for testing

> RESULTS: Maximum of reliable results for effective maintenance decisions

Minimum outage time with maximum diagnostic output and safety

Power transformer testing
TESTRANO 600

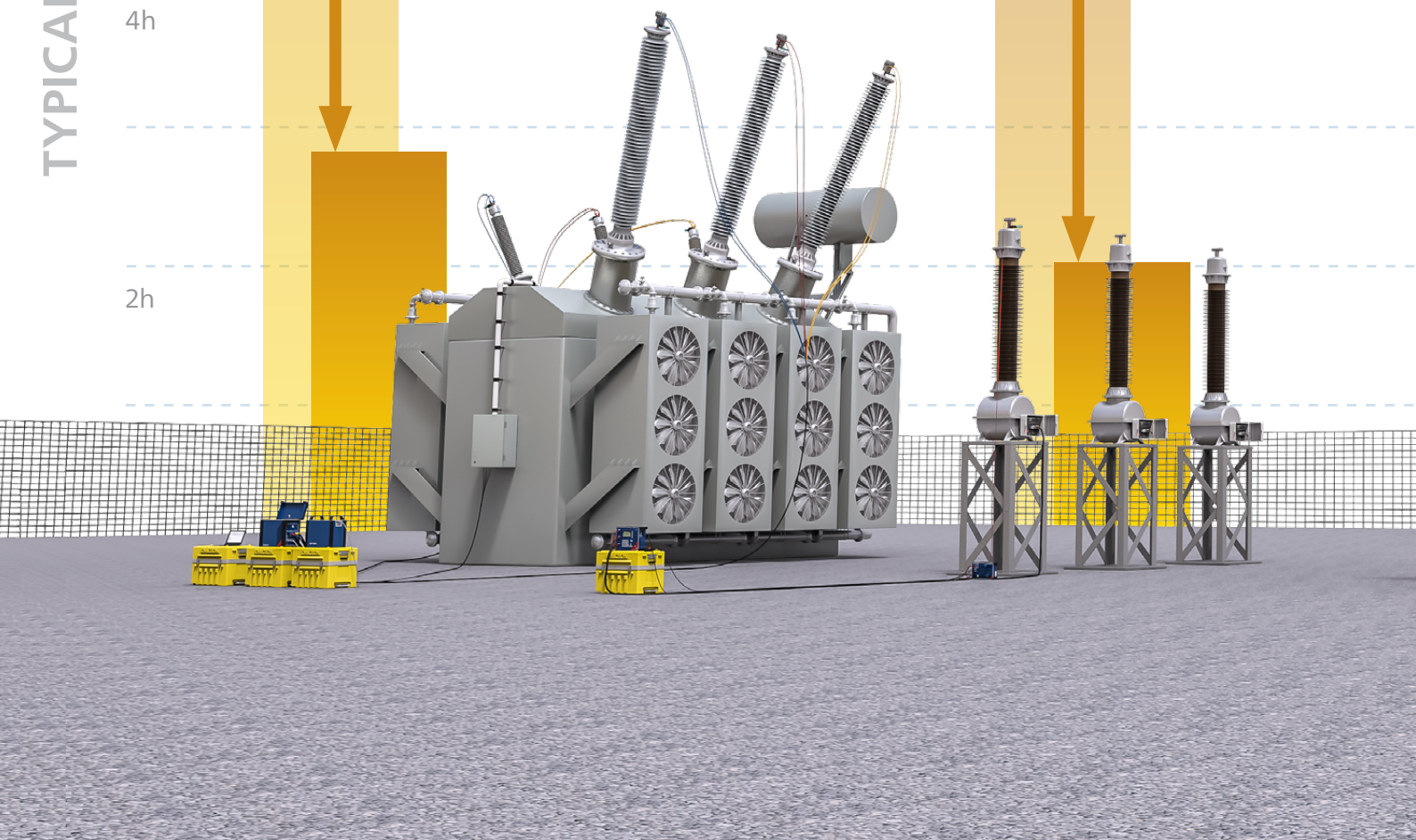
Instrument transform
VOTANO 100

TYPICAL TESTING TIME

8h
6h
4h
2h

Save up to
66 %

Save up to
50 %



er testing
CT Analyzer

Circuit breaker testing
CIBANO 500

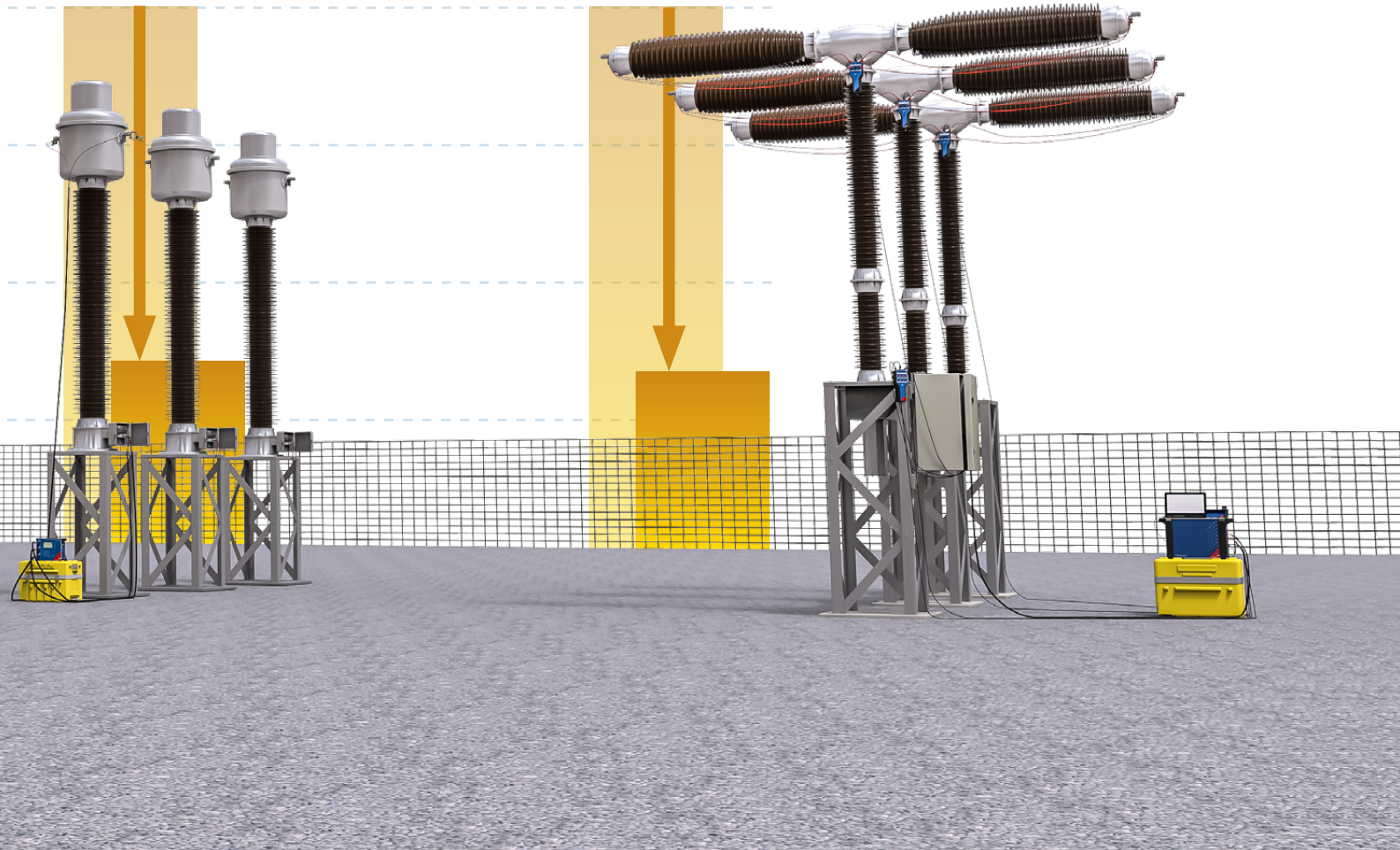
Mimimum outage time for testing

Maximum number of test results due to simultaneous testing

Maximum safety due to minimum rewiring

Save up to
66 %

Save up to
66 %



Optimized testing of power transformers using TESTRANO 600

The challenge during testing

Power transformers are widely considered the most critical components in electrical transmission and distribution networks. Due to the aging of transformer fleets in the field, regular diagnostic testing and condition assessment become increasingly relevant.

Transformer designs can be very complex and, thus, measuring the variety of different parameters can be a time- and cost-intensive job. In order to perform the different diagnostic tests, multiple devices and a frequent change of test leads are required. Individual phase measurements and multiple tap changer positions further increase the testing effort and the outage time.

On average a whole working day needs to be scheduled for the full range of routine tests, usually making it the most time-consuming asset to test in the substation.

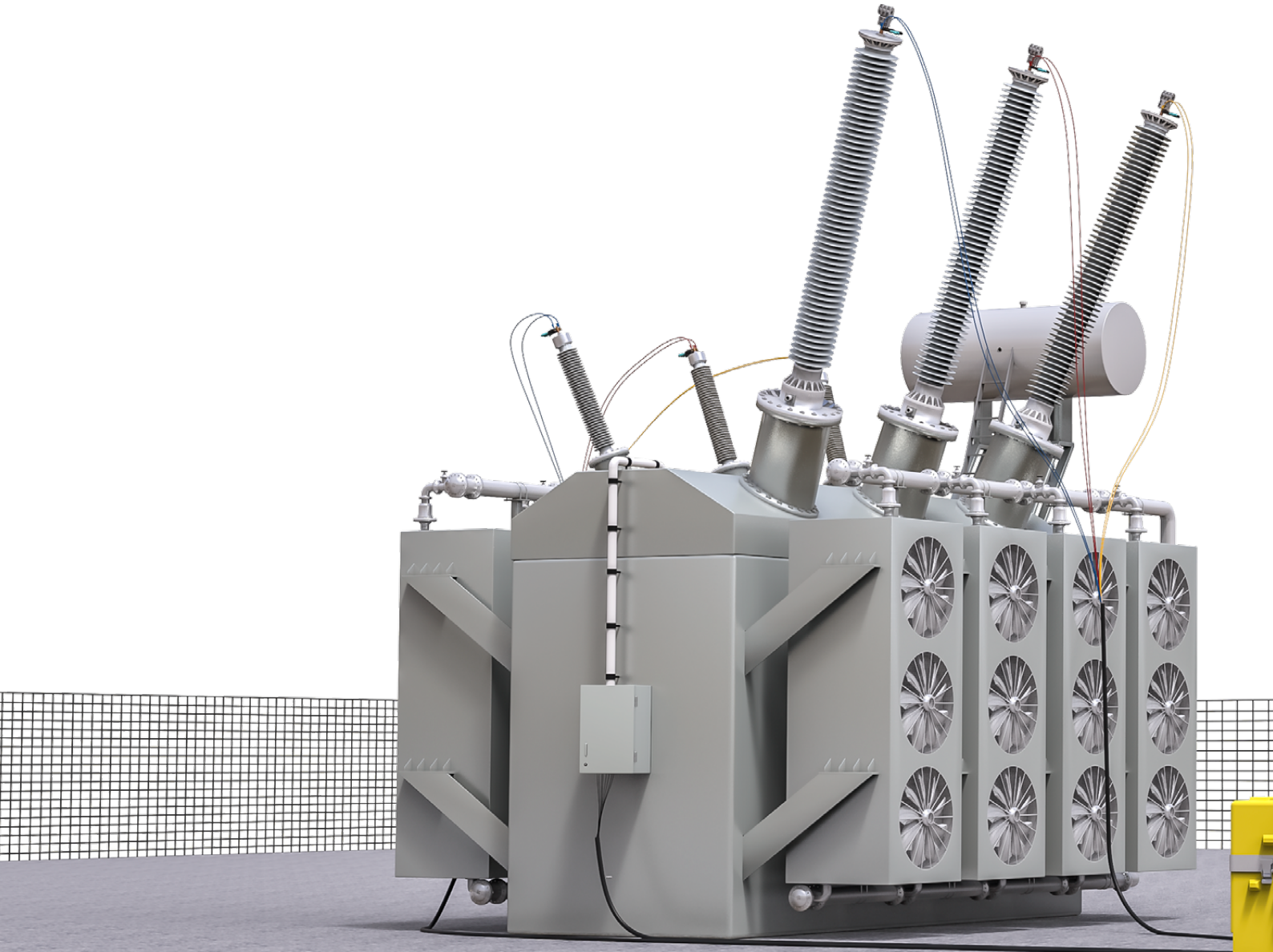
Our solution

TESTRANO 600 is a highly portable, three-phase test system, providing all common electrical tests on power transformers.

Its three powerful amplifiers keep the testing time to a minimum while delivering the highest measurement accuracy on the market. Intelligent algorithms ensure fully automated testing on all three phases simultaneously, making TESTRANO 600 three times faster than single-phase devices.

The simple connection concept enables its users to perform multiple tests using the same test setup. This not only reduces the rewiring effort but also further reduces overall testing time and increases the safety for the operator.

After the test is done, the results can be automatically assessed according to international standards or user defined limits, and can be stored in the comprehensive Primary Test Manager™ (PTM) database for future reference.



Our scope

With our TESTRANO 600 you can perform wide range of standard tests:

- Transformer turns ratio
- Exciting current
- DC winding resistance
- Dynamic resistance
- Short-circuit impedance / leakage reactance
- Frequency response of stray losses (FRSL)
- Demagnetization
- Power/dissipation factor (with CP TD12/15)

- One, simple test setup for all common diagnostic tests
- Simultaneous injection
- Easy to transport due to its low weight (20 kg / 44 lbs)

- One database with all asset and test data
- Automatic execution of a series of tests
- Automatic result assessment according to applicable standards

- Intuitive connection, for example, using color-coded cables
- Fewer trips up and down the transformer
- Fast and reliable core demagnetization

Optimized testing of instrument transformers using CT Analyzer and

The challenge during testing

Regular testing and calibration of instrument transformers, that are current and voltage transformers, is important to ensure correct operation of protection, accurate metering and billing as well as overall safety.

Conventional solutions require complex on-site tests, or the test object to be completely disassembled and transported to a test laboratory.

Depending on the test method and required scope, high test currents and voltages are applied, which significantly affects the handling and safety during test execution.

In order to fully test according to applicable standards, all cores, windings and taps need to be tested. The amount of transformer types and designs require a considerable effort in terms of test preparation and execution, for example, for asset specification and re-connection.

The test time itself can easily take up to a few hours, for example, when different measuring points at nominal frequency 50/60 Hz have to be tested.

Our solution

In order to counteract these challenges during testing, we have developed the CT Analyzer and VOTANO 100.

Both solutions use model-based approaches for testing current and voltage transformers. During testing, all relevant parameters of the transformer's equivalent circuit are determined. Subsequently, the electrical functionality and all relevant performance parameters, as per applicable standards, can be tested with high accuracy and within minutes.

The switching matrix reduces the connection effort to a minimum: With CT Analyzer up to six taps and with VOTANO 100 up to 5 windings can be tested simultaneously and without rewiring.

The required test voltage is a maximum 120 V using CT Analyzer, and 4 kV using VOTANO 100. The additional voltage booster VBO 2 ensures safe distance during testing.

VOTANO 100

Our scope

With the CT Analyzer and VOTANO 100 you can perform various measurements, such as:

- Ratio
- Phase displacement
- Ratio error
- Burden
- Polarity
- Excitation characteristics
- CT/VT accuracy at different burden and current/voltage conditions
- CT/VT class assessments according to the specific standard requirements
- Transient performance parameters

- Minimum rewiring effort and testing time
- Easy test preparation in advance
- Flexible on-site usage due to its low weight (15 kg / 33 lbs)

- Highly accurate results
- High reproducibility of test results
- Automated result assessment

- Guided workflow during test execution
- Low testing currents and voltages using CT Analyzer
- Separation between high-voltage and safe area using VOTANO 100

Optimized testing of circuit breakers using CIBANO 500

The challenge during testing

Circuit breakers protect all subsequent equipment by interrupting for example, during normal operation or in the event of a system fault in the grid.

Reversely, any malfunction of circuit breakers could result in failures with both extensive physical and economic impact.

Due to the complex design of circuit breakers, a wide range of possible mechanical and electrical faults can occur. Various diagnostic tests, therefore, have to be performed. This typically leads to an immense and time-consuming rewiring effort when using conventional test solutions.

Another critical aspect is the power supply during testing. Normally the station battery is used, resulting in a volatile test voltage and reduced test reliability.

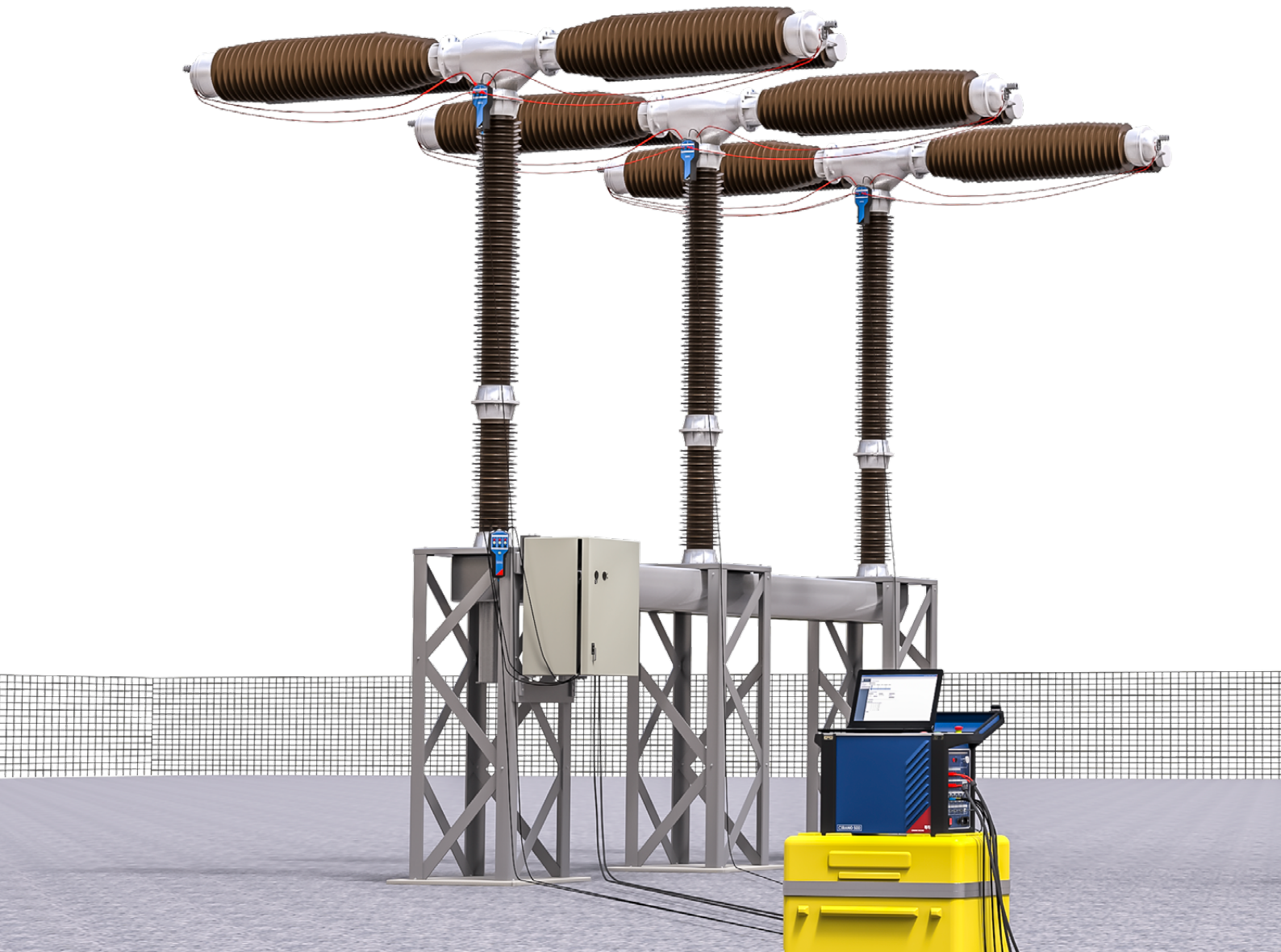
Our solution

CIBANO 500 revolutionizes testing of medium and high-voltage circuit breakers by supporting all common tests with one device.

In addition, just a single test setup can be used to perform all those tests. By using the optional accessories, the connection effort can further be reduced. Thus, up to 66 % of the total testing time can be saved compared to conventional solutions .

Both the integrated power supply of CIBANO 500 and the possibility to perform tests with both circuit breaker sides grounded, increase safety and reliability during testing.

The included Primary Test Manger™ (PTM) software minimizes the risk of error and maximizes the efficiency, for example, due to automatic assessment and easy reporting.



Our scope

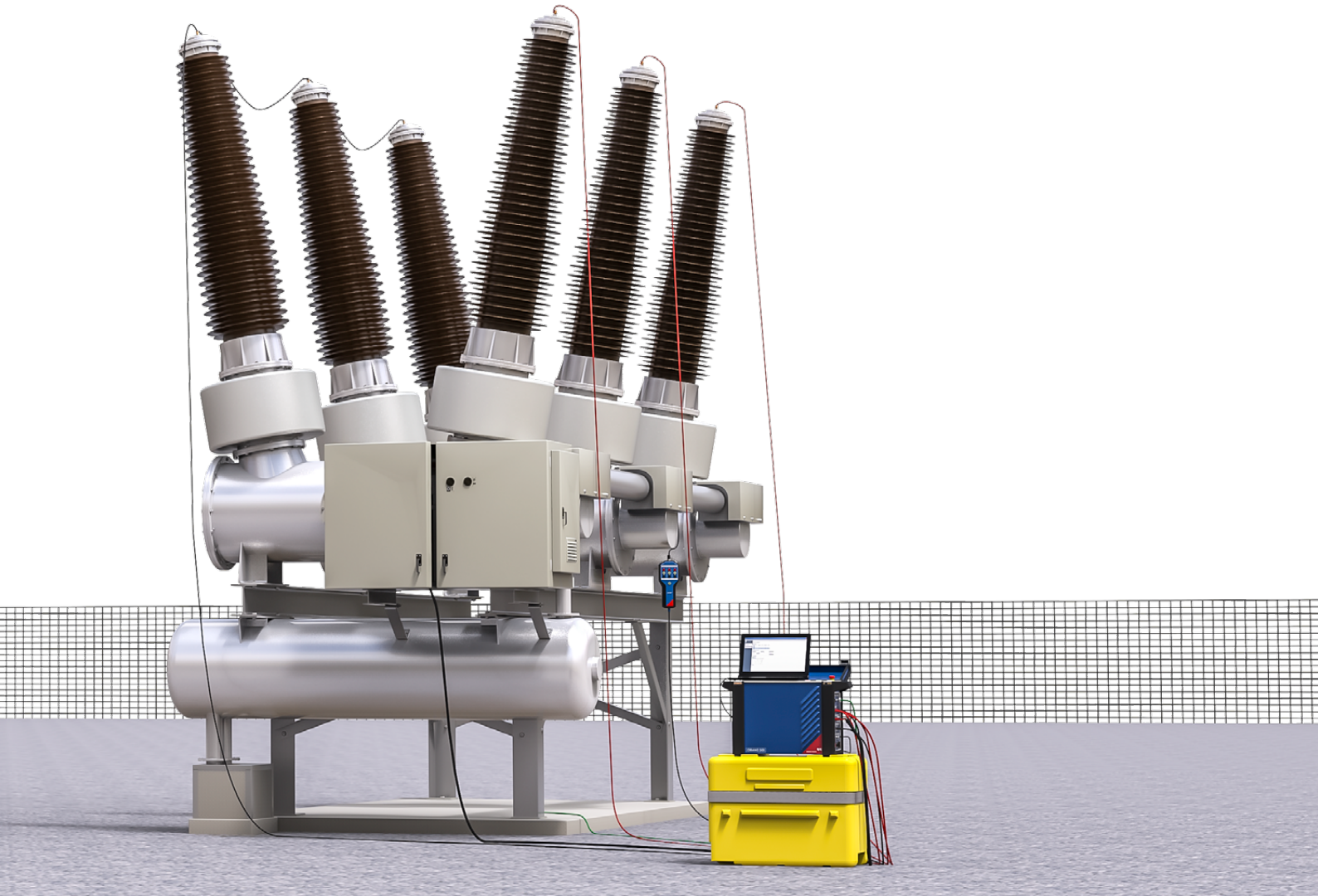
With our CIBANO 500 you can perform various tests:

- Timing tests for main contacts, auxiliary contacts and pre-insertion resistor contacts
- Static and dynamic contact resistance
- Motion test
- Coil and motor current test
- Under-voltage condition
- Minimum pick-up test

- One device and one setup for all tests
- Automatic test execution
- Easy to transport due to its low weight (20 kg / 44 lbs)

- Short wires for high accuracy
- Synchronous timing test of all main and auxiliary contacts
- Constant power output guarantees reproducible test results

- Both sides grounded circuit breaker
- No station battery needed
- Fewer trips up and down the circuit breaker



One software for substation asset testing and data management: Pri

The Primary Test Manager™ (PTM) is the ideal software tool for the diagnostic testing and condition assessment of your substation assets:

> Easy data management
> Fast and safe test execution
> Reliable results analysis and assessment
> Customized reporting

Easy data management

PTM provides a well-structured database for managing all related asset data to get a comprehensive overview of your asset's condition.

Smart definition of assets, locations and jobs

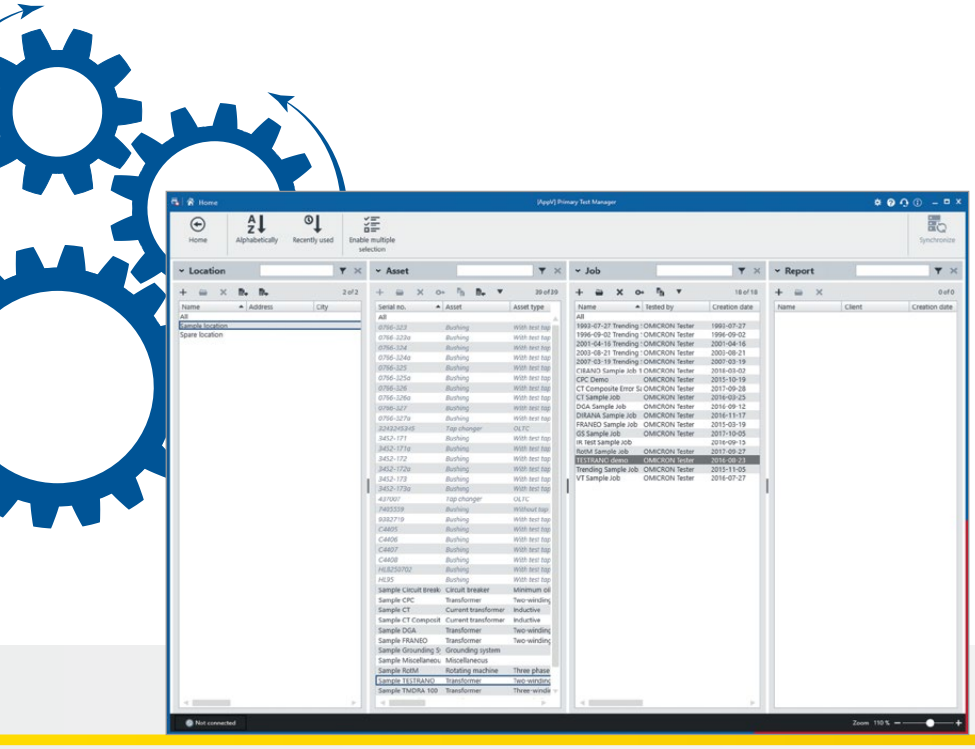
You can define and manage assets, locations and jobs in an easy and fast way. For example, PTM indicates mandatory and recommended parameters based on the common data on the nameplates.

Enhanced import and export functions

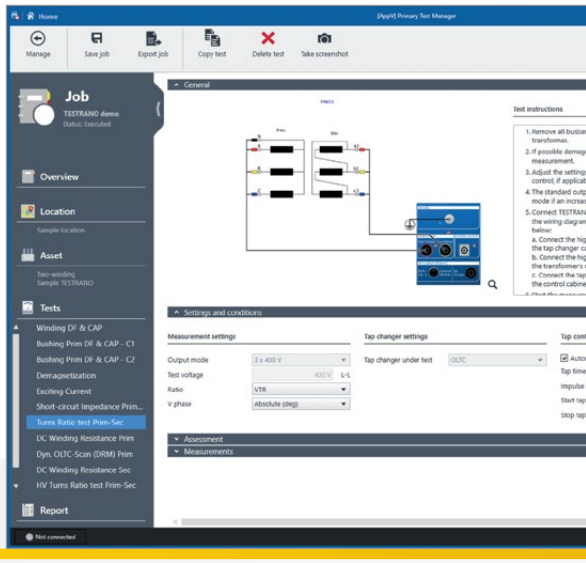
Data about locations or assets can be imported from other systems, such as ERP, maintenance or asset management systems. In addition, PTM supports the import of test results, which were generated by third party test sets, for example, dissolved gas analysis results.

Data synchronization and back-up

During on-site testing, data is often generated by multiple testing teams. With the 'PTM DataSync' module, you can synchronize all data to a central database hosted on premises or in the cloud.



Easy management of location, asset and test data due to a structured database, search and filter functions, and automatic data synchronization.



PTM supports you in the best possible way during execution of diagnostic tests via wiring diagrams and asset-specific test plans.

mary Test Manager™

Fast and safe execution of diagnostic tests

PTM enables you to control and operate the connected test set directly from a computer.

Customized test plans

Test plans can be created in advance to enable efficient measurements. You can use the automatic generated test plans which are based on the specified nameplate values, adapt them to your needs and create your own individual, asset-specific test plan templates.

Guided workflow

PTM guides you step by step through the entire test procedure in order to make testing faster, easier and safer. For example, wiring diagrams display the correct test setup, minimizing the likelihood of measurement errors.

Powerful result assessment and reporting

Results are automatically stored and organized in the database on your PC for further analysis and reporting.

Assessment according to standards and customized limits

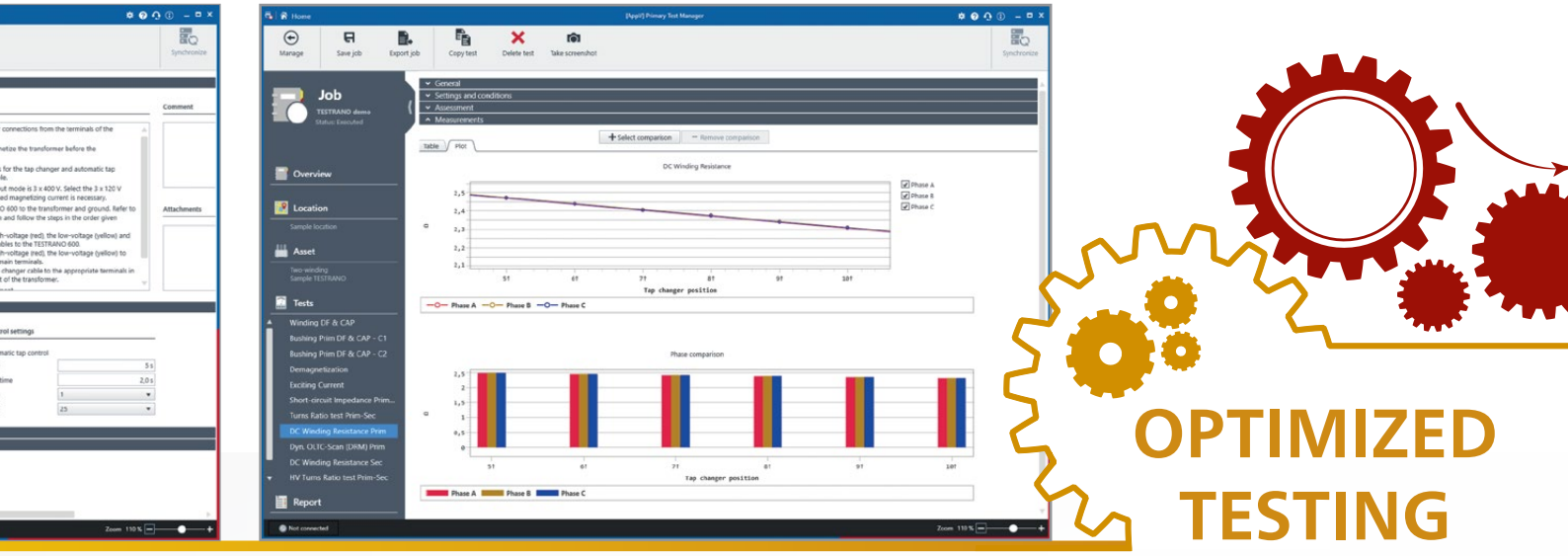
Each test can be automatically assessed according to international standards and guidelines, or based on your individual limit values.

Comparison tools for detailed analysis

The measurement result can be visualized in tables and plots for easy review and assessment. Additionally, they can be compared with previous results and historical trends, allowing further in-depth analysis.

Customized reports

PTM generates reports automatically including all asset-related information and performed tests. This gives you a comprehensive overview of the test object, test results and assessment. You can also adapt test reports easily, provide comments on every test, or attach photos and other test results.



For a comprehensive analysis, PTM offers automatic result assessment and comparison as well as customized reporting.

We create customer value through ...

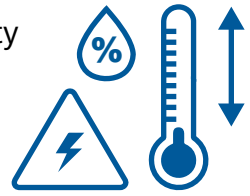
Quality

You can rely on the highest safety and security standards

Superior reliability with up to

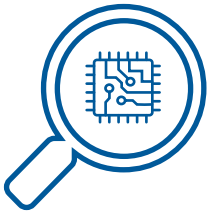
72

hours burn-in tests before delivery



100%

routine testing for all test set components



ISO 9001
TÜV & EMAS
ISO 14001
OHSAS 18001

Compliance with international standards

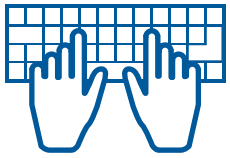
Innovation

... a product portfolio tailored to my needs

More than

200

developers keep our solutions up-to-date



More than

15%

of our annual sales is reinvested in research and development

Save up to

70%

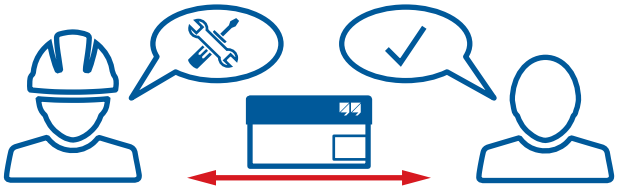
testing time through templates, and automation

Support

24/7

Professional technical support at any time

Loaner devices help to reduce downtime



Cost-effective and straight-forward repair and calibration

offices worldwide for local contact and support

Knowledge

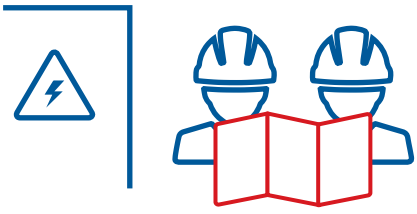
More than

300

Academy and numerous hands-on trainings per year

Frequently OMICRON hosted user meetings, seminars and conferences

to thousands of technical papers and application notes



Extensive expertise in consulting, testing and diagnostics

OMICRON is an international company that works passionately on ideas for making electric power systems safe and reliable. Our pioneering solutions are designed to meet our industry's current and future challenges. We always go the extra mile to empower our customers: we react to their needs, provide extraordinary local support, and share our expertise.

Within the OMICRON group, we research and develop innovative technologies for all fields in electric power systems. When it comes to electrical testing for medium- and high-voltage equipment, protection testing, digital substation testing solutions, and cybersecurity solutions, customers all over the world trust in the accuracy, speed, and quality of our user-friendly solutions.

Founded in 1984, OMICRON draws on their decades of profound expertise in the field of electric power engineering. A dedicated team of more than 900 employees provides solutions with 24/7 support at 25 locations worldwide and serves customers in more than 160 countries.

For more information, additional literature, and detailed contact information of our worldwide offices please visit our website.

www.omicronenergy.com

L4231