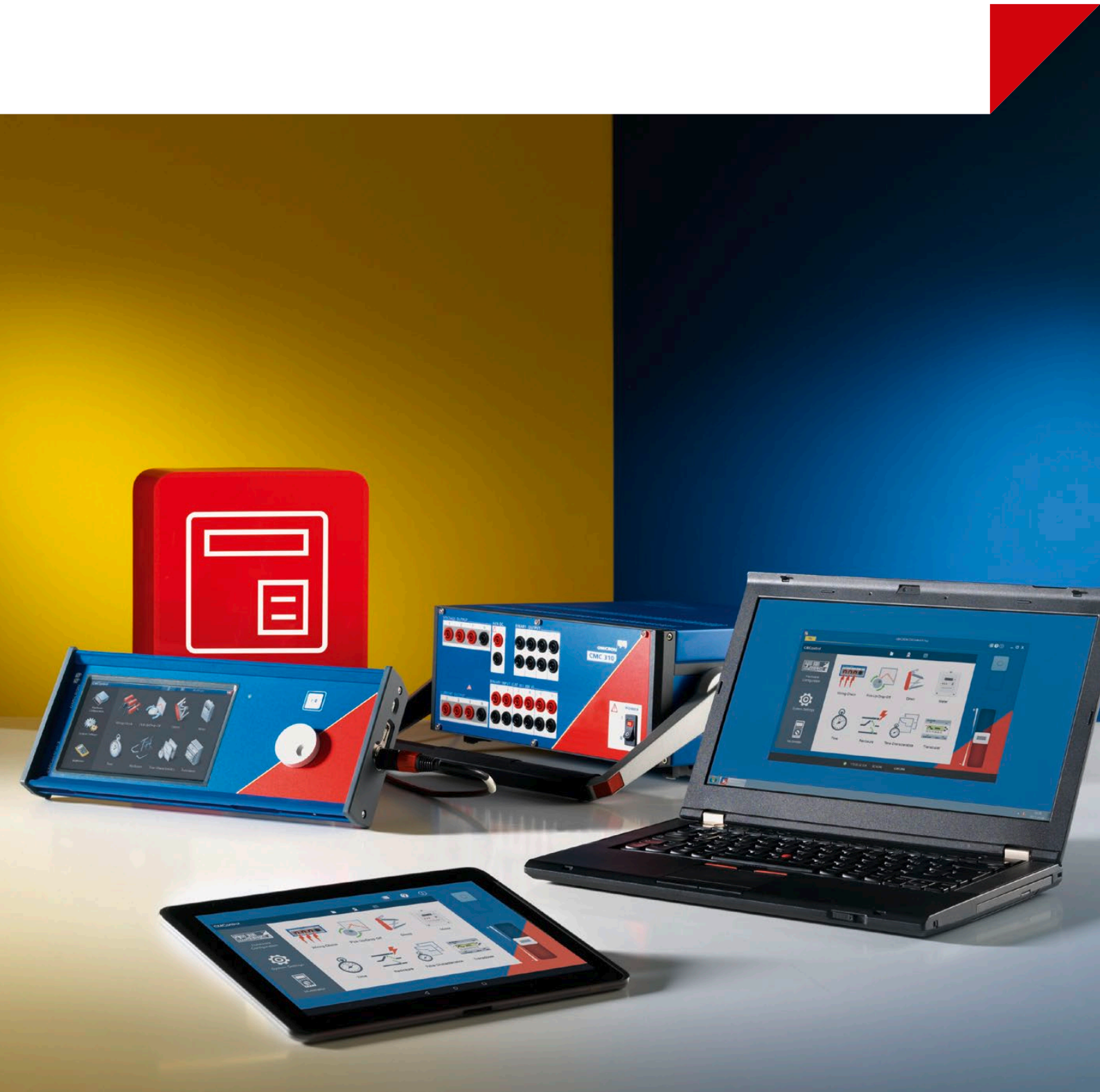
# CMC 310

## Test Set for Basic Three-phase Testing



# Test set for basic three-phase testing

The CMC 310 is specifically designed for basic three-phase testing of protection and measurement devices. It is operated by the CMControl P software with an intuitive user interface and test tools which are optimized for quick manual testing in the field.

The lightweight and compact design makes the CMC 310 particularly suitable for testing distribution and industrial systems.

## Safe and future-proof

The three current and voltage output channels of the CMC 310 are continuously and independently adjustable in amplitude, phase and frequency. All outputs are protected against over-temperature, accidental short-circuits, external high-voltage transient signals and are monitored in case of overload.

DC supply:
0 ... 264 V

Voltage outputs:
3 x 300 V or 1 x 600 V


Current outputs:
3 x 32 A / 3 x 430 VA or
1 x 64 A / 1 x 870 VA

## Connectivity options

The CMC 310 is designed to work with OMICRON's CMControl P. Users can control the test set using either a Windows PC, Android tablet or a dedicated front panel control device and connect via Ethernet/USB cable or Wi-Fi (through the optional mini wireless USB adapter).

## Upgrade to CMC 353

If advanced testing is required, a CMC 310 can be upgraded to a CMC 353 at any time which then can be operated by the PC based software Test Universe and RelaySimTest.

## Organize your tests

For centralized planning, tracking and managing of all engineering, testing and maintenance activities in the power industry, the ADMO software ensures that the workflows of asset and operations managers, testers, and protection engineers are structured and coordinated. Key data will be kept up-to-date and available to all employees at all times.


4 x binary outputs

6 x binary inputs (dry/wet)

13.3 kg / 29.3 lbs
343 x 145 x 390 mm / 13.5 x 5.7 x 15.4 in

### Your benefits

- Easy manual testing using dedicated test tools and intuitive user interface
- Portable and lightweight testing solution
- Reduced testing effort, increased productivity
- Highly reliable and economic solution

**www.omicronenergy.com/CMC310**

# CMC 310 control options

*"Ideal solution for fast and easy manual testing with low initial effort"*

## Manual settings-based testing with CMControl

CMControl P is specially designed for the quick manual testing of protection and measurement devices.

Due to its intuitive user interface setting up tests is easy and convenient. Output values are adjusted manually while the included test tools with integrated fault models guarantee quick tests and reliable results. The innovative user guidance offers easy operation even without special training.

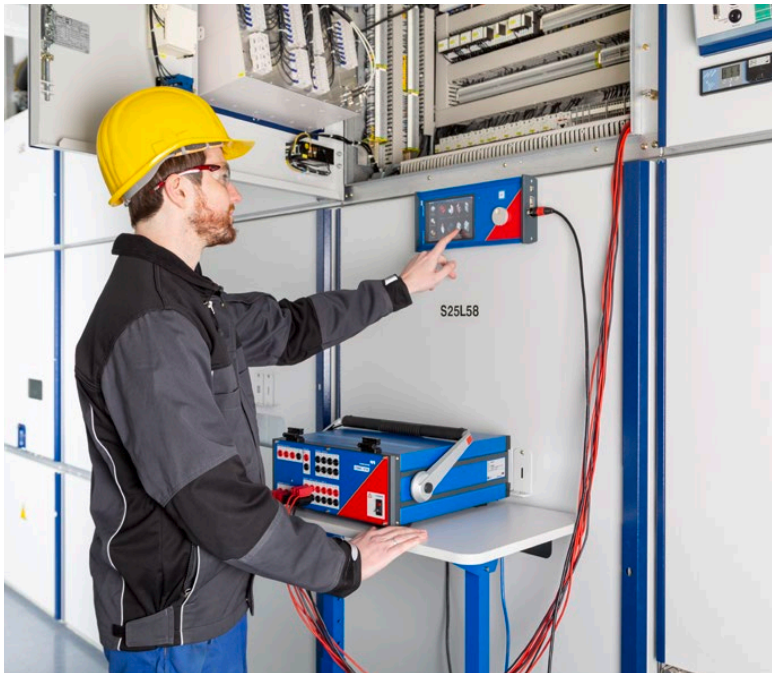
CMControl P is available as an App for Windows PC or Android tablets and as a dedicated front panel control device.

### CMControl P App

The CMControl P App runs on a standard Windows PC or Android tablet to control your CMC test set. A dedicated mini wireless USB adapter enables wireless control of CMC test sets.

#### Benefits

- Works with standard Windows and Android devices
- No cables required through Wi-Fi connection
- Flexible handheld operation
- High versatility with Windows PC
- Integrated user manual
- Save and display test results on device




## CMControl P front panel control

The CMControl P front panel control is a specially designed control option for CMC test sets even under rough conditions. It offers instant availability for quick manual testing.


### Benefits

- Dedicated and rugged CMC accessory
- Touch screen display with outstanding readability
- Output values easily adjustable using the precision control wheel
- Flexible handling and convenient working positions
- Magnetic rear makes the device attachable to steel surfaces
- Save test results on a USB memory stick

# Upgrade to CMC 353

Your requirements may change in the future. To ensure a high level of flexibility and future-proofing (for example, IEC 61850 testing capabilities), we offer the possibility to upgrade the CMC 310 to a CMC 353 test set.

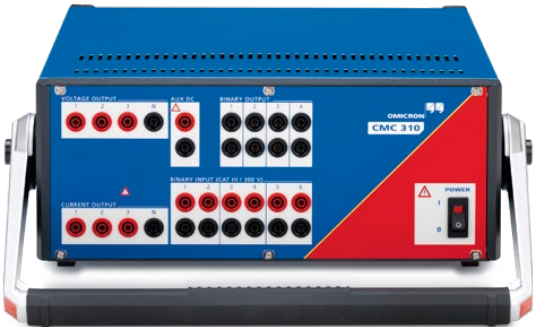
Besides additional hardware related features, the upgraded test set also enables the use of our PC based control options Test Universe and RelaySimTest for advanced settings-based and system-based testing:

**Test Universe**

> High degree of automation and standardization for fully automated testing
> Customized test plans (PTL) to simplify frequent and recurring testing
> Wide range of application-optimized and function specific test modules for a greater depth of testing

**RelaySimTest**

> Innovative testing approach to verify the whole protection system for an unmatched testing quality
> Easy test setup for simplified testing of complex scenarios such as end-to-end tests
> Logic and scheme testing with outstanding troubleshooting capabilities




CMC 310


## Additional hardware features:

> Generator combination socket:
easy connection of 3 x V and 3 x I
> 4th voltage output
up to 4 x 300 V or 2 x 600 V
> 6 low level outputs
12 low level outputs (LLO-2 option)
> 4 additional binary inputs


CMC 353

# CMC 310 accessories

The following accessories are included with the CMC 310 standard delivery but can also be ordered separately.

| | Description | Order No. |
|---|---|---|
|  | > Country-specific power cord 3 m / 9.8 ft | |
| | > Ethernet patch cable 1.5 m / 4.9 ft | E1664300 |
| | > USB connection cable 2 m / 6.6 ft | B1021101 |
| | > Leads with 4 mm safety plugs (6 x red, 6 x black) 2 m / 6.6 ft | P0006168 |
| | > Flexible terminal adapters (12 x black) | E0439201 |
| | > Flexible test lead adapters with retractable sleeve (6 x red, 6 x black) | P0006167 |
| | > Grounding cable with battery clamp and M6 cable lug 6 m / 19.7 ft | B0349701 |
| | > Soft bag (for CMC 310 without CMControl P) | E0659401 |

## Optional accessories[1]

| | Description | Order No. |
|---|---|---|
|  | CMC wiring accessory package<br>For connecting test objects to CMC test sets, consisting of:<br>> 12 flexible test lead adapters for connections to narrow terminals<br>> 12 flexible test lead adapters with retractable sleeve for connections to non-safety sockets<br>> 4 flexible jumpers for paralleling current outputs or shorting neutrals of binary inputs<br>> 8 crocodile clips for contacting pins or screw bolts<br>> 12 flexible terminal adapters for screw-type terminals<br>> 20 cable lug adapters for M4 (0.15 in) screws<br>> 10 cable lug adapters for M5 (0.2 in) screws<br>> 10 cable ties 150 mm / 5.9 in long<br>> 1 accessory bag | B1764601 |
|  | Mini wireless USB adapter<br>For wireless control of the CMC 310 with the CMControl P App.[2] | E1636800 |
|  | Transport case<br>Heavy-duty transport case with wheels and extendable handle. | B0679500 |
|  | ARC 256x<br>For testing arc flash protection systems, the ARC 256x simulates an arc flash by means of a xenon flash tube. | P0006279 |
|  | CMTAC 1<br>For installations without battery arrangements, where binary signals use AC voltage. CMTAC 1 converts the AC signals to DC to connect to the binary inputs of a CMC test set. | P0006278 |
|  | CPOL 2 polarity checker<br>For checking a series of terminals for correct wiring. The signal can be injected into the primary side of a CT. Thus, the correct polarity of CT wiring can be included in the test. | P0006331 |

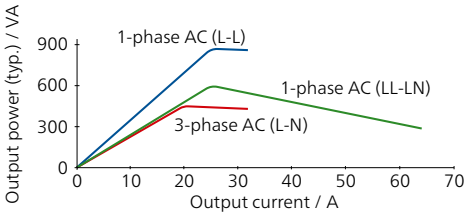
[1] Non-exhaustive list. For the complete list please visit our website: www.omicronenergy.com/cmc310
[2] Requires a CMC test set with NET-2 interface board.
Wi-Fi is subjected to technical and legal constraints. For more information please contact your local OMICRON office or sales partner.

# Overview of technical specifications[1]

## CMC 310

### Current amplifier

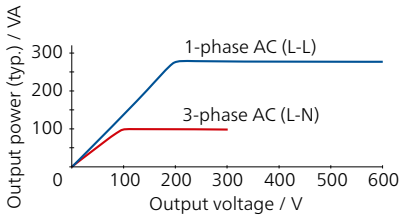
| | | |
|---|---|---|
| Setting range | 3-phase AC (L-N) | 3 x 0 ... 32 A |
| | 1-phase AC (L-L) | 1 x 0 ... 32 A |
| | 1-phase AC (LL-LN) | 1 x 0 ... 64 A |
| | DC (LL-LN) | 1 x 0 ... 64 A |
| Power | 3-phase AC (L-N) | 3 x 430 VA typ. at 25 A<br>3 x 250 W guar. at 20 A |
| | 1-phase AC (L-L) | 1 x 870 VA typ. at 25 A<br>1 x 530 W guar. at 20 A |
| | 1-phase AC ((LL-LN) | 1 x 500 VA typ. at 40 A<br>1 x 350 W guar. at 40 A |




| | |
|---|---|
| Accuracy | Error < 0.05 % rd.[2] + 0.02 % rg.[2] typ.<br>Error < 0.15 % rd. + 0.05 % rg. guar. |
| Distortion (THD+N)[3] | < 0.05 % typ., < 0.15 % guar. |
| Resolution | 1 mA |
| Max. compliance voltage (L-N)/(L-L) | 35 Vpk / 70 Vpk |

### Voltage amplifier

| | | |
|---|---|---|
| Setting range | 3-phase AC (L-N) | 3 x 0 ... 300 V |
| | 1-phase AC (L-L) | 1 x 0 ... 600 V |
| | DC (L-N) | 3 x 0 ... ±300 V |
| Power | 3-phase AC (L-N) | 3 x 100 VA typ. at 100 ... 300 V<br>3 x 85 VA guar. at 85 ... 300 V |
| | 1-phase AC (L-L) | 1 x 275 VA typ. at 200 ... 600 V<br>1 x 250 VA guar. at 200 ... 600 V |




| | |
|---|---|
| Accuracy (at 0 ... 300 V) | Error < 0.03 % rd.[2] + 0.01 % rg.[2] typ.<br>Error < 0.08 % rd. + 0.02 % rg. guar. |
| Distortion (THD+N)[3] | 0.015 % typ., < 0.05 % guar. |
| Resolution | 5 mV / 10 mV in range 150 V / 300 V |
| Ranges | 150 V / 300 V |

### Amplifiers, general

| | | |
|---|---|---|
| Frequency | Range sine signals[4] | 10 ... 599 Hz |
| | Resolution | < 5 µHz |
| Phase | Resolution | 0.001° |
| | Error at 50 / 60 Hz | Voltage: 0.02° typ., < 0.1° guar.<br>Current: 0.05° typ., < 0.2° guar. |

[1] The full technical specifications are available on request. All data specified are guaranteed, except where indicated otherwise. OMICRON guarantees the specified data for one year after factory calibration, within 23 °C ±5 °C / 73 °F ±10 °F in the frequency range from 10 to 100 Hz and after a warm-up phase > 25 minutes

[2] rd. = reading, rg. = range

[3] THD+N: Values at 50/60 Hz, 20 kHz measurement bandwidth

[4] For current outputs amplitude derating at > 380 Hz

## Auxiliary DC supply

| | |
|---|---|
| Voltage ranges, max. current | 0 ... 264 VDC, 0.2 A<br>0 ... 132 VDC, 0.4 A<br>0 ... 66 VDC, 0.8 A |

## Binary inputs

| | |
|---|---|
| Number | 6 |
| Trigger criteria | Toggling of potential-free contacts or DC voltage compared to threshold voltage |
| Ranges | 20 V / 300 V |
| Sample rate | 10 kHz (resolution 100 µs) |

## Binary outputs

| | |
|---|---|
| Type | 4 relay<br>4 transistor |
| Relay breaking capacity | Imax: 8 A / Pmax: 2000 VA at 300 VAC<br>Imax: 8 A / Pmax: 50 W at 300 VDC |

## Power supply

| | |
|---|---|
| Nominal input voltage | 100 ... 240 VAC, 1-phase (50/60 Hz) |

## Environmental conditions

| | |
|---|---|
| Operation temperature [1] | 0 ... +50 °C / +32 ... +122 °F |
| Storage temperature | -25 ... +70 °C / -13 ... +158 °F |
| Humidity range | Relative humidity 5 ... 95 %, non-condensing |

## Equipment reliability

### Electromagnetic interference (EMI)

| | |
|---|---|
| International / Europe | IEC/EN 61326-1, IEC/EN 61000-6-4,<br>IEC/EN 61000-3-2/3,<br>CISPR 32 (Class A)/EN 55032 (Class A) |
| North America | 47 CFR 15 Subpart B (Class A) of FCC |

### Electromagnetic susceptibility (EMS)

| | |
|---|---|
| International / Europe | IEC/EN 61326-1, IEC/EN 61000-6-2/5,<br>IEC/EN 61000-4-2/3/4/5/6/8/11/16/18 |

### Safety

| | |
|---|---|
| International / Europe | IEC/EN 61010-1, IEC/EN 61010-2-030 |
| North America | UL 61010-1, UL 61010-2-030,<br>CAN/CSA-C22.2 No. 61010-1,<br>CAN/CSA-C22.2 No. 61010-2-030 |

### Mechanical tests

| | |
|---|---|
| Vibration | IEC 60068-2-6 |
| Shock | IEC 60068-2-27 |

## Miscellaneous

| | |
|---|---|
| Weight | 13.1 kg / 28.9 lbs |
| Dimensions (W x H x D, without handle) | 343 x 145 x 390 mm / 13.5 x 5.7 x 15.4 in |
| PC connection | 2 PoE (Power over Ethernet) ports<br>USB Type-B port (PC)<br>USB Type-A port (optional Wi-Fi adapter for wireless control) |

## Certifications

Developed and manufactured under an ISO 9001 registered system

[1] For an operational temperature above +30 °C /+86 °F a duty cycle of down to 50 % may apply

# We create customer value through ...

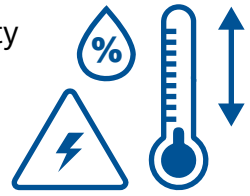
## Quality

You can rely on the highest safety and security standards


Superior reliability with up to

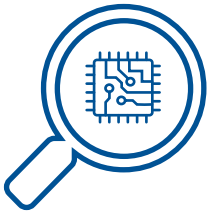
72

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

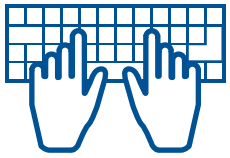
## Innovation


... 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

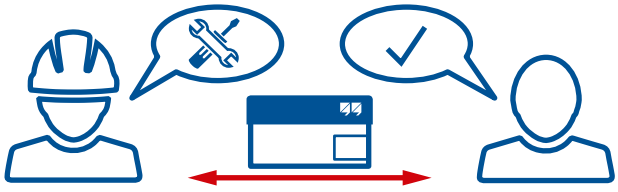
70%

testing time through templates, and automation

## Support


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

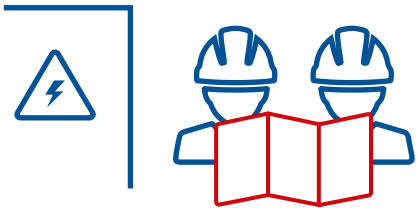
More than

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



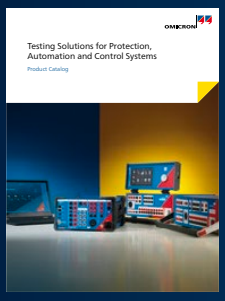
Extensive expertise in consulting, testing and diagnostics

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.

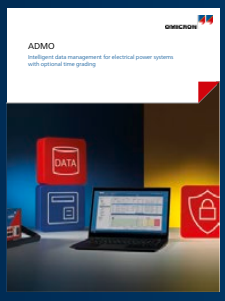
Within the OMICRON group, we research and develop innovative technologies for all fields in electric power systems. When it comes to electrical testing for medium- and high-voltage equipment, protection testing, digital substation testing solutions, and cybersecurity solutions, customers all over the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

The following publications provide further information on the solutions described in this brochure:




Product catalog




ADMO

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

www.omicronenergy.com



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