PRODUCTS AND SOLUTIONS FOR A SMOOTH POWER SUPPLY.
MR – A RELIABLE PARTNER. GUARANTEED.

We at MR have been writing our success story for more than 140 years. As the inventor of the tap changer, we have always set the applicable technical standards. Our unique knowledge of customers’ needs makes us experts in flexible and tailored transformer solutions for the entire industry.

Load-flow regulation. Stable voltage management.

Our company is active in power engineering and consists of Maschinenfabrik Reinhausen GmbH (MR) as well as 36 subsidiaries and 6 affiliated companies around the world. Our core business is power transformer regulation. This is accomplished above all with the aid of on-load tap-changers, which adapt the transmission ratio of the primary to secondary winding to changing load ratios and, together with additional, innovative products and services, ensure an interruption-free power supply. Through increasing integration of renewable energies into the power network, regulation also has an ever-increasing importance at the distribution network for which we also offer innovative system solutions. We round off our network regulation offering with the conceptual design of systems for reactive power compensation and accompanying services, such as network analysis and calculation.

Other successful areas of activity include the winding of fiberglass-reinforced plastic tubes, the processing of plastic cylinders and the manufacture of composite hollow insulators.

The future of energy supply: We’re working on it.

Currently, over 50% of global electricity flows through our products. As an innovative company with decades of experience in voltage regulation, we can be found wherever power is flowing. Every single day, we work on solutions to make the global energy supply even better and more reliable. This applies to our product solutions just as much as to our extensive range of services and project expertise. We develop solutions together with our customers – the manufacturers of high-voltage devices and systems, utility providers and energy-intensive large-scale industrial companies.
WHEN IT MATTERS. WE ARE THERE FOR YOU, WHEREVER YOU ARE.

Our responsibility doesn’t end when the product is delivered. We offer reliable customer support throughout the lifetime of the product, even if that’s 50 years or more. Even after this time, we provide our customers with the maintenance and all the spare parts they need. And we do this anywhere in the world at any time.

All you need for a long transformer life

The operating lives of high-power transformers are increasing all the time. Therefore we are continuously developing our portfolio of asset management solutions. We offer an extensive range of services for a long transformer life. This starts with complete installation and commissioning of the most important additional components.

Regular diagnoses and status analyses on transformers can prevent disruptions and expensive downtimes. And this is what our experts specialize in. Modern measurement methods extend the usual diagnosis procedure and enable a more accurate status assessment of various transformer components. And don’t forget our monitoring systems to monitor the dynamic switching behavior of all operating statuses. In real time.

We undertake maintenance and repairs professionally and to the highest standards. Of course, this also includes providing spare parts and accessories. We also offer a range of retrofit and modernization solutions. From upgrades to complex replacement concepts, we offer a wide range of options for efficiently extending transformer service life.

Through specific advice based on local requirements, we work with our customers to produce tailored maintenance concepts.

We also train customers in how to correctly operate and maintain our products in our ultra-modern training centers and at their own premises around the globe. For further information, please visit www.reinhausen.com/service
VACUTAP®. LEADING TECHNOLOGY.  
COST REDUCTIONS.

In the more than 80 years in which we have been developing and manufacturing on-load tap-changers, we have again and again extended the limits of what is feasible. For example, with VACUTAP® vacuum switching technology which we fit into both high-speed resistor-type tap-changers as well as reactor-type tap-changers.
VACUTAP® RMV II on-load tap-changer
(reactor-type tap-changer)

- Maintenance-free up to 500,000 tap-change operations with no time component
- Quick switching times
- Internal oil heating system for use in arctic conditions
- UVT-LTX use as a retrofit solution for Westinghouse UVT on-load tap-changers

For further information about the VACUTAP® series VACUTAP® VV, VM, VR, VT, AVT and RMV, please visit www.reinhausen.com/oltc

ECOTAP VPD on-load tap-changer
(high-speed resistor-type tap-changer)

The ECOTAP VPD enables the regulation of distribution network transformers (Verteilnetztransformatoren). It does this by relying on the MR vacuum switching technology which has proven itself in tens of thousands of applications. ECOTAP VPD is not only maintenance free and particularly reliable, it can also be used in any transformer regardless of manufacturer. The new MR on-load tap-changer is so compact that it does not alter a transformer’s dimensions. This makes ECOTAP VPD the first choice for the regulation of public distribution networks and for industrial, wind-park and photovoltaic applications.

For further information about the ECOTAP VPD, please visit www.reinhausen.com/oltc
### TECHNICAL DATA

#### OFF-CIRCUIT TAP-CHANGERS

<table>
<thead>
<tr>
<th>Model</th>
<th>1 phase</th>
<th>2 phase</th>
<th>3 phase</th>
<th>1 phase</th>
<th>2 phase</th>
<th>3 phase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. rated through-current</td>
<td>350 A</td>
<td>650 A</td>
<td>600 A</td>
<td>300 A</td>
<td>400 A</td>
<td>600 A</td>
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<tr>
<td>1 phase</td>
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<td>2,500 A</td>
<td>1,300 A</td>
<td>1,500 A</td>
<td>1,300 A</td>
<td>600 A</td>
</tr>
<tr>
<td>2 phase</td>
<td>2,500 A</td>
<td>2,500 A</td>
<td>1,300 A</td>
<td>1,500 A</td>
<td>1,300 A</td>
<td>600 A</td>
</tr>
<tr>
<td>3 phase</td>
<td>2,500 A</td>
<td>2,500 A</td>
<td>1,300 A</td>
<td>1,500 A</td>
<td>1,300 A</td>
<td>600 A</td>
</tr>
</tbody>
</table>

#### VACUTAP® (vacuum switching technology)

<table>
<thead>
<tr>
<th>Model</th>
<th>1 phase</th>
<th>2 phase</th>
<th>3 phase</th>
<th>1 phase</th>
<th>2 phase</th>
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<td>1,500 A</td>
<td>1,300 A</td>
<td>600 A</td>
</tr>
<tr>
<td>2 phase</td>
<td>2,500 A</td>
<td>2,500 A</td>
<td>1,300 A</td>
<td>1,500 A</td>
<td>1,300 A</td>
<td>600 A</td>
</tr>
<tr>
<td>3 phase</td>
<td>2,500 A</td>
<td>2,500 A</td>
<td>1,300 A</td>
<td>1,500 A</td>
<td>1,300 A</td>
<td>600 A</td>
</tr>
</tbody>
</table>

#### OILTAP® (conventional switching technology)

<table>
<thead>
<tr>
<th>Model</th>
<th>1 phase</th>
<th>2 phase</th>
<th>3 phase</th>
<th>1 phase</th>
<th>2 phase</th>
<th>3 phase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. rated through-current</td>
<td>350 A</td>
<td>650 A</td>
<td>600 A</td>
<td>300 A</td>
<td>400 A</td>
<td>600 A</td>
</tr>
<tr>
<td>1 phase</td>
<td>2,500 A</td>
<td>2,500 A</td>
<td>1,300 A</td>
<td>1,500 A</td>
<td>1,300 A</td>
<td>600 A</td>
</tr>
<tr>
<td>2 phase</td>
<td>2,500 A</td>
<td>2,500 A</td>
<td>1,300 A</td>
<td>1,500 A</td>
<td>1,300 A</td>
<td>600 A</td>
</tr>
<tr>
<td>3 phase</td>
<td>2,500 A</td>
<td>2,500 A</td>
<td>1,300 A</td>
<td>1,500 A</td>
<td>1,300 A</td>
<td>600 A</td>
</tr>
</tbody>
</table>

#### Operating positions

<table>
<thead>
<tr>
<th>Without change-over selector</th>
<th>With change-over selector</th>
<th>With multiple coarse change-over selector</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 max.</td>
<td>14 max.</td>
<td>18 max.</td>
</tr>
<tr>
<td>17 max.</td>
<td>31 max.</td>
<td>107 max.</td>
</tr>
</tbody>
</table>

#### Max. step capacity

<table>
<thead>
<tr>
<th>1 phase</th>
<th>2 phase</th>
<th>3 phase</th>
</tr>
</thead>
<tbody>
<tr>
<td>525 kVA</td>
<td>1,000 kVA</td>
<td>3,500 kVA</td>
</tr>
<tr>
<td>3,500 kVA</td>
<td>12,000 kVA</td>
<td>3,500 kVA</td>
</tr>
<tr>
<td>700 kVA</td>
<td>2,500 kVA</td>
<td>7,000 kVA</td>
</tr>
<tr>
<td>1,625 kVA</td>
<td>6,000 kVA</td>
<td>12,000 kVA</td>
</tr>
<tr>
<td>750 kVA</td>
<td>2,500 kVA</td>
<td>7,000 kVA</td>
</tr>
<tr>
<td>1,625 kVA</td>
<td>6,000 kVA</td>
<td>12,000 kVA</td>
</tr>
<tr>
<td>40 kVA</td>
<td>145 kVA</td>
<td>405 kVA</td>
</tr>
<tr>
<td>72.5 kVA</td>
<td>300 kVA</td>
<td>72.5 kVA</td>
</tr>
<tr>
<td>72.5 kVA</td>
<td>300 kVA</td>
<td>72.5 kVA</td>
</tr>
<tr>
<td>36 kVA</td>
<td>72.5 kVA</td>
<td>72.5 kVA</td>
</tr>
<tr>
<td>36 kVA</td>
<td>72.5 kVA</td>
<td>72.5 kVA</td>
</tr>
</tbody>
</table>

### Additional Information

1) on request
2) with forced current splitting
3) double the number of windings needed
We continue to offer the well-known OILTAP® product line with conventional switching technology as an alternative to the VACUTAP® series. There is an OILTAP® on-load tap-changer for virtually every network application. There are well over 100,000 of these products providing reliable service worldwide.

**OILTAP® on-load tap-changer**

Our OILTAP® on-load tap-changers have an almost legendary reputation with energy suppliers and industrial customers around the world. This reputation is enjoyed in all areas of application. Network or generator operation, electric arc furnaces, HVDC, electrolysis, inverters, phase shifters and auto transformers.

For further information about the OILTAP® series: OILTAP® V, MS, M, RM, R, G, please visit www.reinhausen.com/oltc

**OF 100 oil filter unit**

When using OILTAP® on-load tap-changers under adverse conditions, we recommend our OF 100 oil filter unit which cleans and dries the oil in the tap changer and can therefore greatly extend its maintenance intervals.

For further information about the OF 100 oil filter unit, please visit www.reinhausen.com/OF100

**DEETAP® off-circuit tap-changer**

Off-circuit tap-changers are used for setting the voltage of oil-immersed transformers. In contrast to on-load tap-changers, the required winding taps must be set with the transformer completely switched off.

For further information about our DEETAP® DU off-circuit tap-changers, please visit www.reinhausen.com/deetap
Measuring, controlling, regulating and monitoring – the drives of the TAPMOTION® series and the TAPCON® voltage regulators provide all these functions in one unbeatable combination. Whether for standard regulation tasks or complex requirements with individual adaptations – we have the optimum solution. What’s more, our TAPGUARD® and TRAFOGUARD® monitoring systems monitor the most important operating statuses of the transformer and its components. Naturally, these devices can easily communicate with all common control system protocols.

TAPMOTION® AND TAPCON®.
SUPERLATIVE COMMUNICATION.

TAPMOTION® drives
The motor-drive units of the TAPMOTION® series are used to reliably drive on-load tap-changers and off-circuit tap-changers in regulating transformers. They embody decades of practical experience and our know-how as market leader and are equipped with high-end communication functions.

For further information about drives in the TAPMOTION® ED, DD, DD-S and TD series and accessories, please visit www.reinhausen.com/tapmotion

TAPCON® voltage regulator
We have the appropriate voltage regulator both for standard regulation tasks as well as for complex applications requiring individual solutions. We provide various housing shapes for the different installation situations encountered in the substation. A range of extensive communication solutions guarantees exceedingly high flexibility during utilization and easy handling at the same time.

For further information about the TAPCON® voltage regulators, please visit www.reinhausen.com/tapcon

Monitoring systems TRAFOGUARD® / TAPGUARD®
As the world market leader in tap changers, we also offer an innovative monitoring system for our products called TAPGUARD®. And if you want to be able to control the most important functions of your transformer at any time, TRAFOGUARD® is the practical solution.

For more information about the TAPGUARD® monitoring systems and TRAFOGUARD®, please visit www.reinhausen.com/monitoring
Increasing the meshing of networks and the need for greater availability and reliability from the equipment used in the network make continuous status monitoring and assessment indispensable. Our monitoring solutions and the integrated visualization options allow us to give you a particularly low-cost, practical way of simplifying asset management and operational management.

ISM® SOLUTIONS AND TESSA®
MORE THAN JUST MONITORING.

Our TRAFOGUARD® provides you with an overview of all relevant operating data for your transformers, such as workload level or tap changer condition. This allows you to conveniently monitor the operating state at all times without limiting your options in regard to function and operating location. The TRAFOGUARD® can be integrated into motor-drives and control cabinets and the module can also be used to retrofit all TAPMOTION® ED drive units that have been delivered to date.

All it takes is a few hours to upgrade your TAPMOTION® motor-drive unit with additional intelligence and adapt it to your individual requirements. Via the integrated web browser, you can call up a visualization of the recorded values simply and from any location without the need for additional software. ISM® Technology is the basis for a comprehensive monitoring system for your transformers and TESSA® visualization solutions make all connected transformers visible. Coupled with our extensive evaluation software, this makes monitoring your fleet of transformers and directly accessing your local monitoring devices extremely simple.

Comprehensive ISM® and TESSA® service:
- Situation appraisal
- Advice
- Development and implementation of solutions
- Engineering design
- Commissioning
- Support

Further information regarding our ISM® (Integrated Smart Module) monitoring system, fleet monitoring and TESSA® visualization solutions can be found at www.reinhausen.com/monitoring
MESSKO®. COMPONENTS & SENSORS.
FOR ALL TRANSFORMER NEEDS.

The specialists in our Messko division offer technical expertise, quality and reliability in regard to transformer solutions. Pressure relief devices, zero-maintenance dehydrating breathers and thermometers give transformer manufacturers, energy supply companies and industry the peace of mind they need. This division is also our center of competence for sensors.

Special products from the Messko range

- MESSKO® MPreC® Pressure relief device for transformers
- MESSKO® MSafe® The Buchholz relay from Messko
- MESSKO® MTraB® Zero-maintenance dehydrating breather – twice as reliable and highly effective
- MESSKO® BeTech Oil and winding thermometer with BeTech bellows technology
- MESSKO® PrimeLab® Oil analyses for maximum operational reliability

For further information, please visit www.reinhausen.com/messko
Follow us on social media.

Please note:
The data in our publications may differ from the data of the devices delivered. We reserve the right to make changes without notice.

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