



STEEL PRODUCTION

MR SOLUTIONS FOR YOUR
EFFICIENT STEEL PRODUCTION.

THE POWER BEHIND POWER.



CREATING OPTIMAL CONDITIONS FOR EFFICIENT STEEL PRODUCTION.

With an extensive range of products and highly individualized services MR will support you anywhere in the world to optimize your steel production processes.

Performance plus tap changers

Tap changers designed for use in steelworks help minimize downtimes and achieve the best possible furnace capacity. With the VACUTAP® series, Maschinenfabrik Reinhausen (MR) offers innovative on-load tap-changers with low-maintenance vacuum switching technology. The new VACUTAP® VR I HD is not subject to time based maintenance, but can perform 600,000 switching operations between maintenance intervals. The diverter switch insert does not have to be replaced until after 1.2 million switching operations. This means reduced operational costs and the highest possible product quality. Moreover MR is the first and only manufacturer of on-load tap-changers to have the VACUTAP® VV®, VACUTAP® VM® and VACUTAP® VR® tap changers certified according to Directive 94/9/EE (ATEX) (conforms to IEC as well as NEC 505 in North America).

If a conventional oil on-load tap-changer is preferred you can find the best technological solution from a wide range of products in the tried-and-tested OILTAP® series.

Besides on-load tap changers, compatible control and monitoring products ensure safe and highly efficient melting processes.

Accessories for increasing process safety in steelworks

When it comes to accessories for transformers, you will certainly benefit from the many years of experience and extensive expertise of our subsidiary MESSKO. MESSKO® products are designed to perfectly meet special requirements as well as conditions in steelworks. They are extremely resistant to outdoor influences such as dust, dirt and heat, which contributes to longer maintenance intervals and lower operational costs. For example, the maintenance-free, sensor-controlled MESSKO® MTrab® dehydrating



breather reduces the risk of humidity getting into the transformer while, in contrast to conventional dehydrating breathers, the desiccant MESSKO® MTrab® (silica gel) does not have to be replaced.

The new oil analysis sensor MESSKO® MSense® x2.5 with its innovative 2-stage measurement process is an efficient and cost-saving solution to detect the primary early indicators of possible damage in the transformer. It can be mounted directly in the transformer's oil flow via a tank inlet/ valve or retrofitted in an oil-loop using a bypass. After an easy installation the sensor provides highly accurate results for interpretation in order to extend the operating time of equipment to the maximum.

Besides, the MESSKO® COMPACT MT-ST pointer thermometer product line for displaying oil and winding temperatures for process and power transformers stands apart due to its extreme reliability as well as a long service life.

The MESSKO® MPreC® pressure relief device was developed to protect transformers operating under the toughest conditions. The high material quality of the MESSKO® MPreC® additionally makes it very dirt-resistant and leak-proof.

Minimizing downtimes

The worldwide service network of MR gives additional security and is available seven days a week. Maintenance and replacement of on-load tap-changers is handled professionally and quickly by our service experts, if necessary within 24 hours.

We have representatives in almost every country around the world which makes us familiar with country-specific requirements. Your benefit: The transformer is quickly ready for operation again and downtimes are minimized. Long-term experience and extensive expertise in steel operations make us a reliable partner for the safe and smooth operation of steel production plants.

Stabilization of the power supply and reduction of losses

Power quality is essential to facilitate stable and energy efficient steel manufacturing. MR's Power Quality division features innovative solutions for any kind of steel manufacturing and refining processes and any type of furnace, including also reduction and ultra high power furnaces used to finish and refine steel. The product range comprises of both static and dynamic compensation systems, made up of harmonic filters, thyristor controls (TCR) and IGBT compensators (STATCOM).

Our experts develop individual solutions optimized for your application based on network studies and harmonic and load flow measurement analyses of power quality. Moreover, the services provided include assembly, assembly monitoring and worldwide commissioning.

Our power quality systems and solutions provide a stable power supply for your processes and can help increase energy efficiency. As an example, optimized compensation systems stabilize the voltage in the network at the terminal point of the furnace systems. This dramatically shortens melting and batching times, which in turn increases the efficiency of steelworks considerably. Last but not least, compensation systems contribute to environmental protection as they help to reduce CO₂ emissions.

By nature, furnace processes lead to significant voltage fluctuation. GRIDCON® SVC and GRIDCON® STATCOM can compensate these effects and ensure that operating equipment in the plant is supplied by a stable voltage, thus protecting them from resonances and aging of main components. Further needs that may arise from the challenging processes during steel manufacturing and refining are reactive power compensation and harmonics cancellation. Filter circuits based on GRIDCON® POCOS® deployed in the medium voltage can for example ensure a power factor close to 1 despite substantial inductive loads. In low voltage networks GRIDCON® PFC as a passive system and the active filter GRIDCON® ACF guarantee reactive power compensation and harmonics cancelling. Finally, when static voltage control at the most energy efficient level for auxiliary processes is a challenge, GRIDCON® Transformer can help. As a voltage regulation distribution transformer it can dynamically adjust the transmission ratio between medium voltage and low voltage to stabilize the supplying low voltage at a defined set point.

Finally, at the spearhead of innovation we can also support steel production processes with a solid-state tap-changer technology for EAF transformers. This solution assumes the voltage control responsibilities of a conventional tap changer and in addition also covers some of the power quality challenges today addressed by additional equipment. Furthermore, savings in operation can be provided by protection of the equipment (e. g. graphite electrodes) from high current peaks.

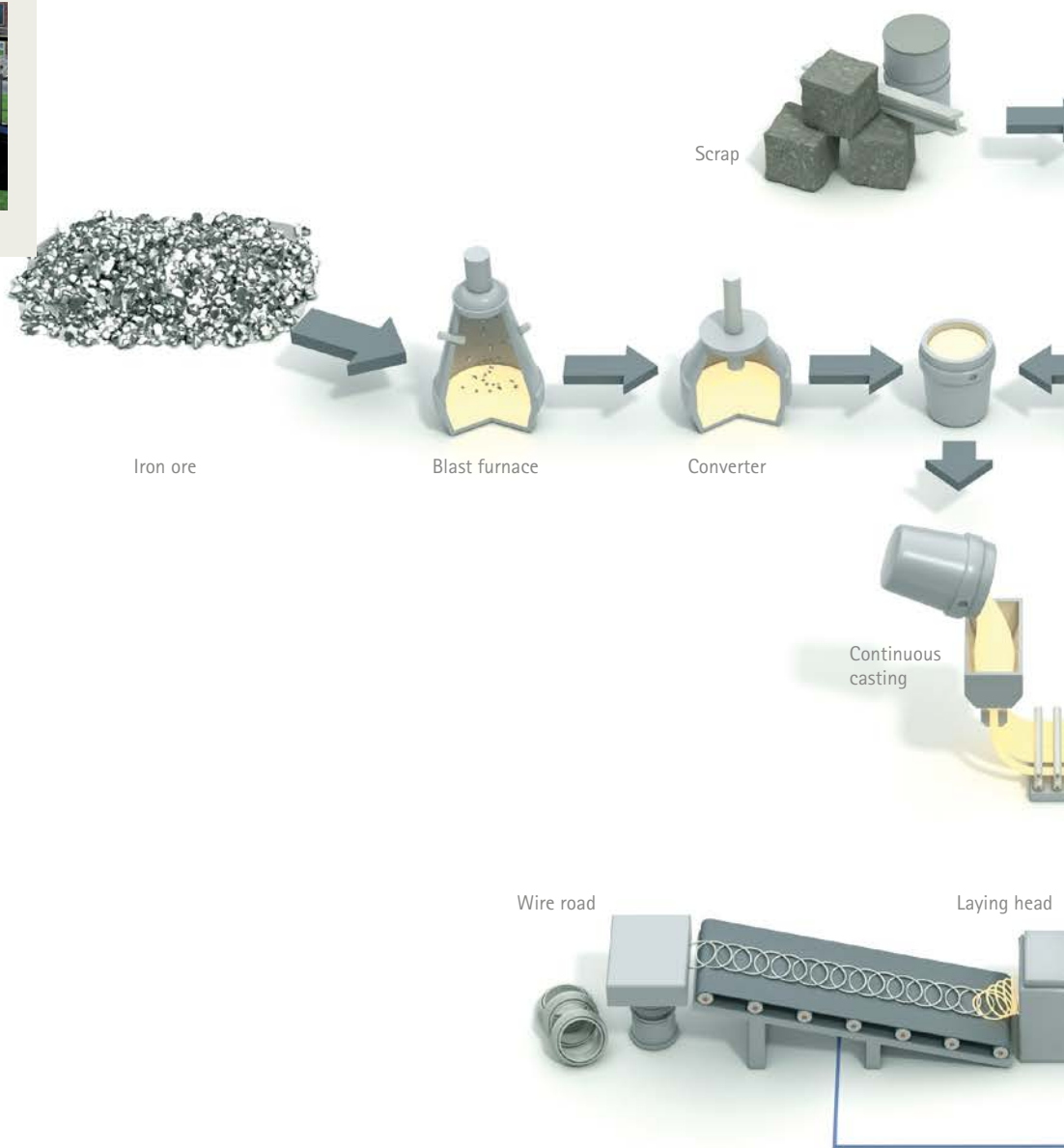
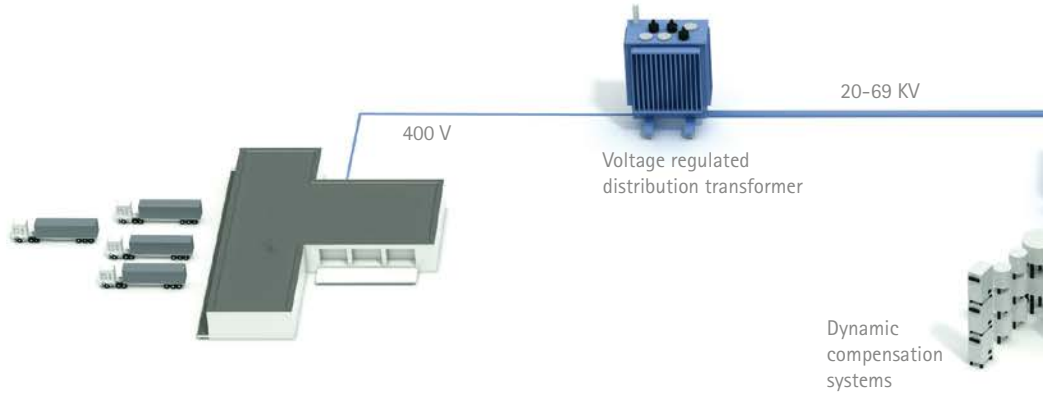


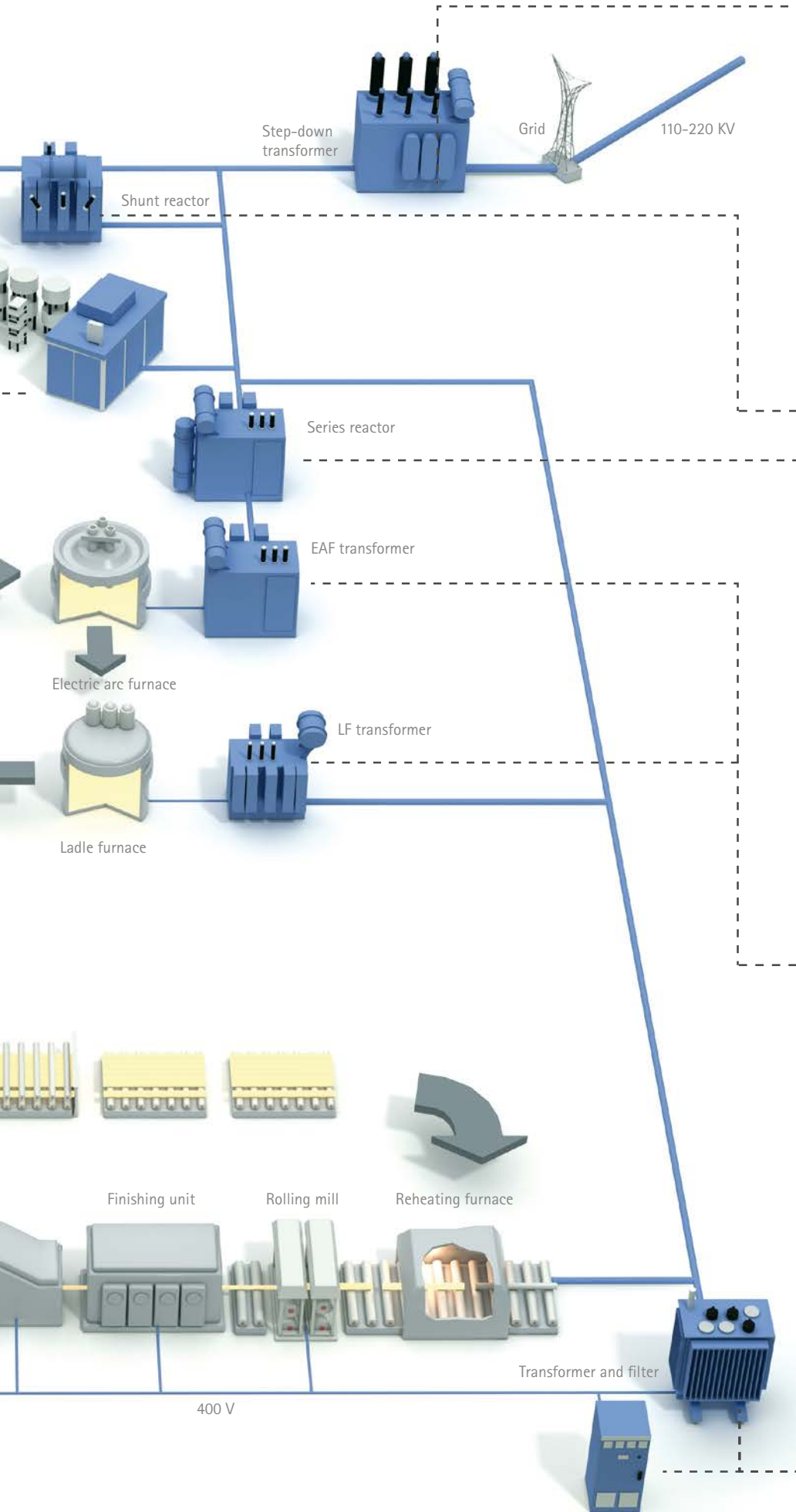
GRIDCON® Transformer system for controllable local grid transformers, with tap changer, motor-drive unit and voltage regulator for office, conveyer, cooling etc.



MESSKO® SMART-VT thermometers are used for taking temperature measurements at distribution transformers.

The modular hardware and software platform of the GRIDCON® SVC improves the power supply system by flicker control and reactive power optimization.





Transformer with tap changer, voltage regulator, monitoring. E.g.:



VACUTAP® VM®
up to 300,000 tap-change operations without any maintenance



TAPCON®, TAPGUARD®
for monitoring and automatic voltage regulation

Reactor with tap changer, monitoring. E.g.:



VACUTAP® VM®, VACUTAP® VV®
up to 300,000 tap-change operations without any maintenance



TAPCON®, TAPGUARD®
for monitoring and automatic voltage regulation

Transformer with tap changer, voltage regulator, monitoring. E.g.:



VACUTAP® VM®, VACUTAP® VV®
up to 300,000 tap-change operations without any maintenance



VACUTAP® VR I HD
up to 600,000 tap-change operations without any maintenance

GRIDCON® Transformer and GRIDCON® ACF for stable network quality



400 V

Maschinenfabrik Reinhausen GmbH

Falkensteinstrasse 8
93059 Regensburg, Germany

Phone: +49 941 4090-0

Fax: +49 941 4090-7001

E-mail: info@reinhausen.com

www.reinhausen.com

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.

AF2393032/01 EN – Steel Production –

F0269801 – 07/15 – uw –

©Maschinenfabrik Reinhausen GmbH 2015

THE POWER BEHIND POWER.

