



Impulse *online*

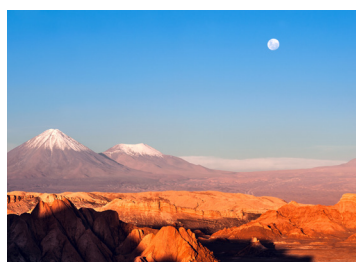


■ Transportation

Hybrid rail vehicle with new concept

The hybrid rail vehicle EcoTrain incorporates numerous innovations, also from VEM. It will be running regular services for the Erzgebirgsbahn network in the hilly south-west of Saxony, Germany.

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■ Transportation

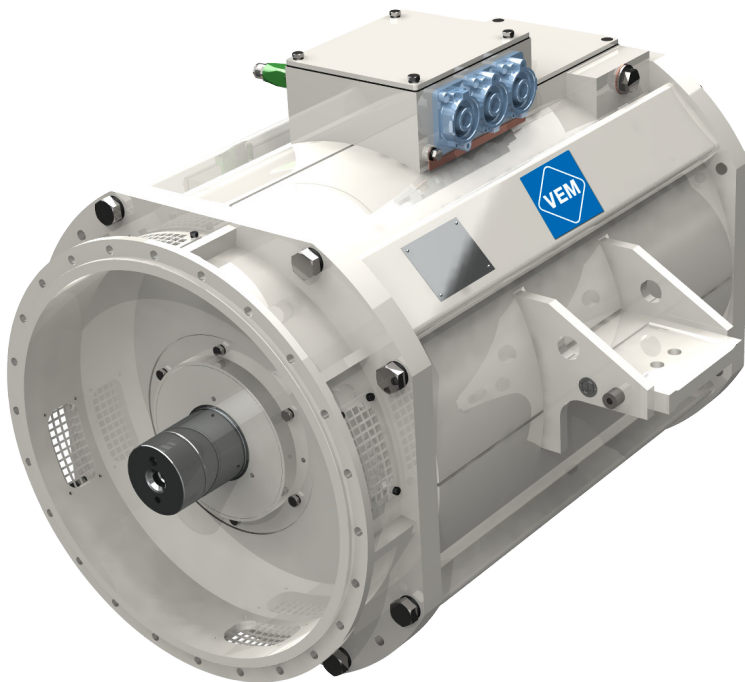
Innovative drive components for the EcoTrain

The EcoTrain is to make its debut among the hills and valleys of the German state of Saxony. According to the German Railways (DB), this modern hybrid rail vehicle will add to the economic and environmental efficiency of local passenger services on non-electrified routes.

The train concept incorporates innovative drive components from VEM. Sachsenwerk supplied important components for the hybrid drive system. One completely new development is the water-jacketed permanent-magnet generator for ultimate efficiency in thermal class 200. The drives are built around compact geared motors and can thus also be viewed as product innovations.

The EcoTrain embodies a whole new approach to railway engineering: A modular technology platform on a diesel-electric, serial hybrid basis. Depending on the position of the train, the optimum energy split between diesel and electric drive can be calculated and set automatically. The system controls not only the traction units, but also the auxiliary consumers.

The project outcome is a quiet, environment-friendly solution with a reduced carbon footprint. Supported by funding from the Saxon government, this new development from DB's industrial and research partners will help to make local rail transport more attractive in the future.



The permanent-magnet traction generator for the EcoTrain is a new development from the VEM location in Dresden.

■ Engineering

Transnorm motors up to $U_N = 6.6$ kV for potentially explosive environments

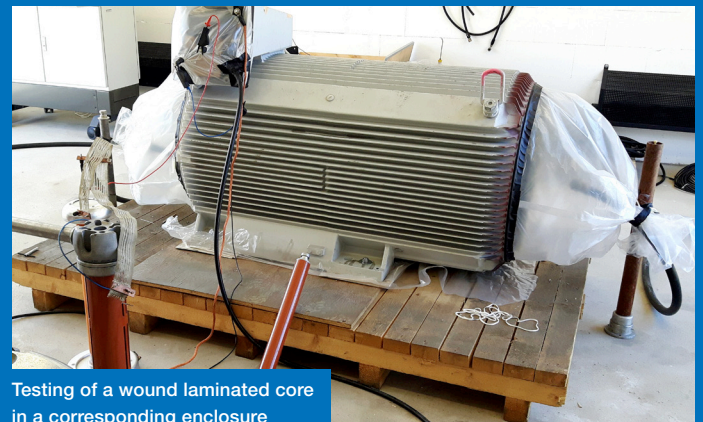
EU type examination certificates in accordance with directive 2014/34/EU have been granted for transnorm motors with a new, more compact winding for voltages up to $U_N = 6.6$ kV:

- IIBExU15ATEX1179 for type W52R 350... U_N : max. 6.6 kV; rated output: max. 280 kW
- IBExU15ATEX1180 for type W52R 400... U_N : max. 6.6 kV; rated output: max. 475 kW
- IBExU15ATEX1181 for type W52R 450... U_N : max. 6.6 kV; rated output: max. 670 kW

Markings:

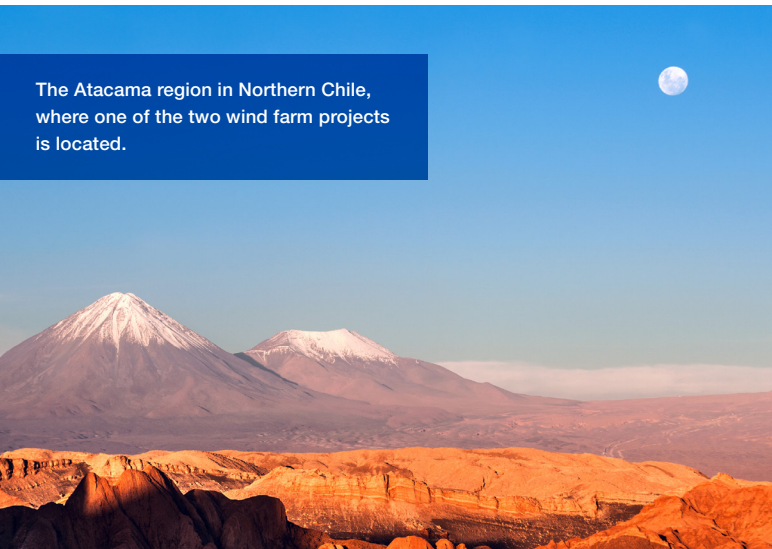
- ⊕ II 2G Ex e IIC T1/T2, T3 or T4 Gb, and
- ⊕ II 2D Ex tb IIIC T125°C or TX Db

The essential prerequisite for Ex e or Ex n motors for voltages $U_N > 1$ kV is a winding design which does not lead to ignition of an explosive gas-air mixture during certain high voltage tests.



Testing of a wound laminated core in a corresponding enclosure

For the purpose of such testing, the new and more compact winding required for transnorm motors for voltages (U_N) up to 6.6 kV was enclosed in a surface-cooled housing. All openings were closed with plastic sheeting (see photo). The enclosed space with the winding was then filled with a highly explosive mixture of 20% hydrogen and 80% air. Subsequently, an AC voltage of 1.5 times the nominal voltage (9.9 kV/3 min) was applied to each of the individual phases, followed by a lightning impulse voltage with a peak value of 16.2 kV. No ignitions were detected during any of these tests, which were performed in accordance with IEC EN DIN 60079-7 and IEC EN DIN 60079-15 by the German National Metrology Institute (PTB) in Braunschweig. The availability of the new winding allows the VEM companies in Dresden and Wernigerode to offer more efficient explosion-protected motors not only for Zones 1 and 2 (gas), but also for Zones 21 and 22 (dust).



■ Renewable energy

Wind turbines for Chile

VEM is supplying 93 generators with outputs of 3.0 and 3.4 MW to wind turbine manufacturer Servion. Incorporated into two wind farm projects with an overall capacity of 300 MW, they will in future be providing clean energy to a total of 196,000 households in the Atacama region of Northern Chile and the Los La region in the south of the country. The first generators will already be sent on their way to Chile from the factory in Dresden at the end of August. Subsequently, up to 4 generators are to be called up for the wind farm projects each week. The whole order will then have been completed by February 2017. As part of the aforementioned project, the generators from VEM's Dresden location will bring Chile closer to its goal of raising the contribution of renewable energies from currently 4 per cent to 20 per cent by 2025.

A link to all wind energy documents can be followed [here](#).

■ High voltage

New generator series for medium-speed diesel and gas motors

A new series of medium-speed three-phase high-voltage generators in salient-pole design has been developed at VEM in Dresden.

They have been engineered for outputs up to 21 MW at voltage levels 6 kV and 11 kV in 50 Hz and 60 Hz systems, and are already being supplied to customers worldwide. Fields of application for such synchronous generators include not only permanent installations on land, but also offshore use and installations aboard ships and oil platforms. The generators serve to provide continuous power supplies in stand-alone or grid-parallel situations, and are equally suitable for emergency power supplies and peak load operation. They are used successfully together with diesel or gas motors, as well as water, gas or steam turbines.

The development has been fuelled by decades of experience gained in the manufacturing of high-voltage machines at the VEM location in Dresden, paired with the latest know-how in electromagnetic and mechanical design, unrivalled expertise in high-voltage insulation, innovative cooling technologies, digital control systems and cost-efficient manufacturing methods. Key properties of the new series are the modular and compact design, high levels of efficiency, quiet operation, grid-stabilising characteristics, a long service life, simple installation and commissioning, and low maintenance requirements.

Overview of generator series

Shaft heights	900 to 1120 mm
Number of poles	8 to 12 poles (other pole counts upon request)
Protection rating	IP 23 or IP 44
Type of cooling	IC 0 A1 or IC 8 A1 W7

Basic version

Output range 1	2650 to 21000 kW
Voltage	6.3 (6.6) and 10.5 (11.0) kV
Frequency	50 or 60 Hz
Power factor cos phi	0.8
Thermal class	155 (F), utilisation to 155 (F)
Output range 2	500 to 18000 kW
Voltage	6.3 (6.6) and 10.5 (11.0) kV
Frequency	50 or 60 Hz
Power factor cos phi	0.8
Thermal class	155 (F), utilisation to 130 (B)



■ 15th Technical Conference

Challenging topics and exciting presentations

Our long-awaited jubilee event is now just around the corner. The 15th Technical Conference is to be held in Wernigerode on 18th and 19th October 2016.

**This year's motto is:
"Industry 4.0 – What does that mean
for drive technology?"**

We want to explore the implications of Industry 4.0 in the field of drive technologies. How must products be designed and constructed in the future? Which changes must companies accommodate when planning their production processes? Equally important topics on the agenda will concern the development of three-phase machines and electric drive systems, new drive technologies and new fields of application.

An overview of all planned presentations can be found [here](#).

Plenary lecture

Prof. Armin Willingmann, Ministry of Economy, Science and Digitalisation of the State of Sachsen-Anhalt

Cascade drives – Overview of the technical possibilities, as well as benefits and disadvantages of the different variants

Dr.-Ing. Henri Arnold, VEM transresch GmbH

Advanced electrothermal design, optimisation processes and virtual prototyping for electric machines in drive engineering

Ing. Giuseppe Zanolchi, Spin Applicazioni Magnetiche S. r. l.

Monitoring as a means to analyse the influences of operating parameters on bearing currents

Dipl.-Ing. Yves Gemeinder, TU Darmstadt, Institute of Electrical Energy Conversion

Industry 4.0 – A challenge for manufacturing and services

Prof. Michael Schenk, Fraunhofer Institute for Factory Operation and Automation (IFF) Magdeburg

Comparison of cast and bar-type copper rotors with a corresponding aluminium rotor in terms of efficiency

Dr.-Ing. Christian Lehrmann, PTB Braunschweig

Look forward to these topics

Status as per 22.07.2016

Industry 4.0 and other buzzwords in technical communication

Dipl.-Ing. Stefan Fassbinder, German Copper Institute

Boosting energy efficiency with PMSM technology

Dipl.-Ing. Markus Kutny, Bauer Gear Motor GmbH

The future is smart

Dipl.-Ing. Michael Burghardt, Danfoss GmbH

High-torque synchronous reluctance machines designed for electric traction

Prof. Wilfried Hofmann,
Dipl.-Ing. Stephan Günther, TU Dresden,
Institute of Electrical Power Engineering,
Chair of Electrical Machines and Drives

Industry 4.0 = Increased availability through predictive maintenance

Dipl.-Ing. Martin Ehlich, Lenze SE

E-drives as intelligent information sources for Industry 4.0

Prof. Axel Mertens, Leibniz University Hannover

Industry 4.0 – Hype, revolution or evolution comprising many individual steps?

Dipl.-Ing. Udo Marmann, SEW-EURODRIVE GmbH & Co. KG

Industry 4.0 in drive technology – The digital twin in development, manufacturing and operation

Dipl.-Ing. Christof Gebhardt, CADFEM GmbH

Paint sprayer Uwe Grunert lends a motor its final appearance in the VEM standard tone RAL 7031.



■ Company portrait

Positive finishes

Mankiewicz Gebr. & Co. has been supplying coating systems to companies of the VEM Group for the past 25 years. Sachsenwerk is the latest location to switch to the Hamburg-based paint specialists.

Strong marketing claims and real quality must not necessarily coincide. But when a company has already been a favoured partner of the VEM Group for more than 25 years, there are likely to be good reasons. "The quality and properties of our paints help to ensure the maximum efficiency of our customers' coating processes," is one promise expressed by tradition-steeped paint manufacturer Mankiewicz Gebr. & Co.

VEM location Wernigerode

Dr. Elke Panzer, head of the VEM laboratory in Wernigerode, can confirm the truth of this promise. It was back in 1990 that VEM motors first used the fast-drying ALEXIT 432 system from Mankiewicz. Via an intermediate step in 2005, the location later switched to the new water-based system SEEVENAX 312-40 at the end of 2007.

This two-component coating system continues to prove its value today. "Our satisfaction with Mankiewicz is also a result of the company's perfect service," says Elke Panzer. "Customer complaints or operational disturbances are practically unknown. And if a customer does happen to contact us with a question about paints which we are unable

to answer ourselves, we can be sure of a reply in next to no time. Whenever we need advice or assistance, a Mankiewicz representative simply calls in."

VEM location Zwickau

The VEM location in Zwickau has also been working with Mankiewicz for more than 20 years. Each time the relevant legislation is tightened, VEM motors Thurm upgrades its painting line accordingly. In 2012, the process was converted to use two-component water-based paints.



■ Our partner

Mankiewicz Gebr. & Co.

- The Hamburg-based company supplies solvent- and water-based paints for use in industrial series manufacturing.
- These paints are used in the most varied branches of industry, with a special focus on the automobile and aviation sectors.
- The workforce comprises over 1,200 employees at various locations worldwide.
- The family-run company has its roots in a business founded in 1895 to produce high-quality coach paints according to original English formulae.

▶▶ Later, in response to increasing customer demands, the factory also invested in an additional painting and drying plant in 2014. “Special motors which require several paint layers as a basis for enhanced corrosion protection can be identified by way of an electronic code when they are sent to the coating plant,” says VEM works engineer Kevin Lein. “That ensures that they receive the necessary number of paint layers to build up the specified minimum coating thickness and thus to meet the corresponding quality standards.”

VEM location Dresden

At the VEM location in Dresden, the process of conversion to the Mankiewicz system ALEXIT 402-08 is almost complete. Corrosion protection specialist Heiko Dartsch has been looking after the switch from a previous 4-layer technology to the new

3-layer system. This change has simplified working processes enormously. Furthermore, the motors can already be packed for shipping after a few hours of drying at room temperature. Heiko Dartsch mentions the positive experience of his VEM colleagues as a major factor behind Sachsenwerk’s decision: “Wernigerode and Zwickau have been working with Mankiewicz for a long, long time, and they have had no problems over all those years.”

High corrosion protection, fast drying, reduced solvent use, significantly increased productivity and improved ecological compatibility are benefits typical for the use of Mankiewicz paint systems. The experts from all three VEM locations are unanimous in that assessment.

www.mankiewicz.com



VEM motors on their way to the drying tunnel after painting



A man with diverse hobbies: Jörg Schützhold enjoys rock-climbing in the Saxon Switzerland, besides playing beach volleyball and the piano.

■ Introducing

Move across from research

Jörg Schützhold joins the team at VEM transresch

Interdisciplinary approaches placing a focus on functions rather than components – that is an apt characterisation of the study course in mechatronics at the Dresden University of Technology. For Dresden-born Jörg Schützhold, with his pronounced interest in mathematics, physics and all things technical, there could be no better subject. He received his engineering degree in 2010, and followed this up with a further five years of research as a scientific assistant at the university. One of his most important projects was the elaboration of

selection criteria for energy-efficient electric drive technologies together with relevant industry partners. With this experience, Jörg Schützhold decided that the time had come to move across from research into practice. His first preference was a locally based medium-sized company which would allow a certain freedom for creative ideas, without becoming tied up in bureaucracy. The application submitted to VEM transresch was successful, and he has now been contributing his expertise to the further development of VEMoDRIVE drive systems since

mid-April 2016. It is the declared aim of VEM to become a one-stop supplier for all drive types and sizes. There is thus plenty of opportunity for Jörg Schützhold to apply the know-how accumulated during his research work. His summary after the first few weeks: “It’s great to be involved in so many different aspects, to see that my input and my organisational talents are appreciated, and to be able to move things.” And the fact that four young colleagues have joined the team at VEM transresch recently is definitely a very promising signal.

■ Drive systems

VEM transresch now in Dresden

The actual move was already accomplished at the end of March, and all the prerequisites are now in place to achieve the proclaimed goals. We are talking about VEM transresch GmbH, and specifically the decision to transfer its offices from Berlin to the Sachsenwerk site in Dresden. “The move is not simply a change of location,” says Dr. Henri Arnold, technical manager for electric drive systems. “More importantly, it achieves synergies for the whole VEM Group in respect of the planning and realisation of drive systems.”

The closer proximity of all involved colleagues is at the same time further substantiation of VEM’s corporate philosophy. “We remain focussed on enabling our customers to order complete drive systems, and not simply on supplying individual motors or machines,” as Henri Arnold explains. He is convinced that one of the key prerequisites has been the recruitment of four young colleagues: “They are contributing a wealth of fundamental know-how and personal commitment, and are already well integrated into the team.”





Managing Director
Marc Rosekrans

■ VEM worldwide

Rosekrans Group named as new agent for the USA

With effect from May 2016, the company Rosekrans Group LLC has been appointed sales agent for high- and low-voltage drives and complete drive solutions from VEM in the USA and Canada. Contact person at the company headquarters in Loganville/Georgia is managing director Marc Rosekrans.

■ Eligibility test

Successful pre-qualification for GE

The VEM location in Dresden passed a pre-qualification audit by Nuovo Pignone (General Electric) in May.

Completion of this programme is a pre-requisite for the eligibility to tender for GE projects in the Middle East, Saudi Arabia and China. The core business of Nuovo Pignone relates to compressors and turbines for the petrochemical industry. The pre-qualification for

deliveries and services is a contract-independent audit of the performance documentation which must be furnished by all potential suppliers under tendering and contract regulations. That also applies without restriction outside the independent union.

The VEM companies make use of this pre-qualification to boost their success on the market.

Compliance Certification of DoE as series approval for low-voltage motors

Several series of VEM low-voltage motors have been granted approval in the form of Compliance Certification from the US Department of Energy.

■ **Premium Efficiency series**

IE3-W41R, IE3-WE1R; 5.0 to 200.0 hp (3.7 to 150.0 kW), and particularly in connection with project business

In a letter dated 16th June 2016, the DoE confirmed that the following motor series comply with the current EISA regulations:

■ **Light-duty roller table motors of the series**

IE3-A41R; 6.0 to 177 hp (4.5 to 132.0 kW), in 2-, 4- and 6-pole versions.

■ VEM fair calendar 2016

We look forward to seeing you

SMM Hamburg
Modern electric drive technology for shipbuilding
6th to 9th September
Visit VEM in Hall B6, Stand B6.130

Innotrans Berlin
Modern traction drives for transportation
20th to 23rd September
Visit VEM in Hall 18, Stand 312

WindEnergy Hamburg
Efficient generators and auxiliary drives for wind turbines
27th to 30th September 2016
Visit VEM in Hall B6, Stand B6.152

T.I.I.E. Teheran International Industry Exhibition
Modern drive technology for all branches of industry
5th to 8th October
Visit VEM on the German joint stand

SPS IPC DRIVES Nürnberg
Variable-speed drives for industrial applications
22nd to 24th November
Visit VEM in Hall 3, Stand 268

Approval under the Compliance Certification of DoE was preceded by approval in accordance with CSA C 390-10 for Canada. Customers will find corresponding references on the motor rating plates and in the documentation.

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