



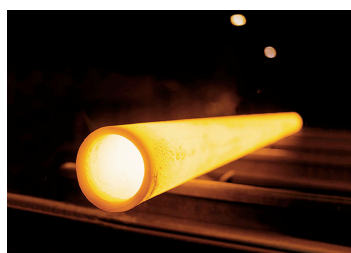
Impulse *online*

■ Tradition

*Modern, innovative and
already 130 years old*

View into the assembly hall at VEM in Dresden. It was here at Sachsenwerk that our electrical engineering story began 130 years ago; in the meantime, the VEM Group is a global market player.

Read more on page 2



■ Tradition

Modern, innovative and already 130 years old

This 6 MW large machine test stand was installed in a new production hall at the VEM location in Dresden in 2011.



The roots of electrical engineering at VEM can be traced back to 1886. It was in that year that work began to establish the original Sachsenwerk factory.

Engineer Ludwig Oskar Kummer pioneered the development of electrical engineering in Niedersiedlitz during the 1880s. The plot of land which he acquired,



The historical motor designed by O. L. Kummer

at that time still before the gates of Dresden, was deemed the

ideal site for the manufacturing of electrical machines. In 1886, and thus exactly 130 years ago, Kummer received important post from the Royal Saxon Trading Standards Office: Building permission for a factory to manufacture equipment and machinery operated by electricity. It was not long before industrial-scale production began to flourish, and the factory can be seen as a cradle of electrical engineering in Europe.

When we view the portfolio of VEM's Dresden location today, we find not only large machines, generators and drive systems, but also a number of motors which uphold the age-old traditions of motors from Sachsenwerk in the most striking manner. Traction motors for trams, for example. Already a century

ago, Sachsenwerk supplied such motors to Allenstein (today Olsztyn/Poland), and history was repeated with further deliveries to the Polish city – in new design, of course – in 2015 (see also page 3). Longstanding experience is a basis for reputation and promotes



A modern pump drive from VEM Sachsenwerk

customer loyalty. No less so than quality, expertise and the readiness to respond flexibly to customer wishes.

The other locations of the VEM

■ HANNOVER FAIR 2016

Electric drives – Essential links in the process chain 4.0

In 2016, the focus of the Hannover Fair and its flagship exhibition "Industrial Automation" is to be placed on the future course of the fourth industrial revolution. The way ahead is the digital networking of all industrial processes.

On our fair stand, you can experience how VEM, as a supplier of complete drive systems, is preparing for the challenges under the motto „ELECTRIC DRIVES FOR EVERY DEMAND“.

Visit us from 25th to 29th April 2016 in Hall 14, Stand H 10.

Group also score with decades of experience in their respective fields. The manufacturing of electric motors in the region around Zwickau, for example, dates back almost 110 years; it was in 1908 that brothers Kurt and Alfred Stephan set up the electrical workshop which later evolved into VEM motors Thurm. In Wernigerode, the first electric motors were produced in 1947. The company will thus be celebrating its 70th anniversary next year. The history of the VEM company Keulahütte GmbH in Krauschwitz must be counted in centuries rather than decades. Today, it is a modern, high-performance supplier of the most diverse cast products. But with traditions stretching back more than 500 years, it is at the same time one of the oldest iron foundries in Germany.

■ Transport engineering

In Olsztyn number one since 100 years



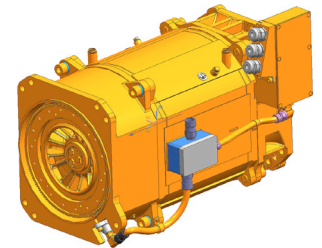
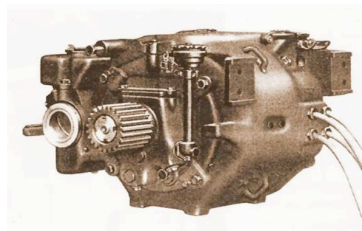
Trams in the Polish city of Olsztyn were first equipped with Sachsenwerk traction motors over a century ago. Today, history is repeating itself.

They were no doubt much louder, but their design was in keeping with street scenes in the early 20th century and they gave reliable service: Trams in what was then the German city of Allenstein, today Olsztyn in the north-east of modern-day Poland. Already when the first line was opened at the end of 1907, the cars were driven by DC traction motors from

Sachsenwerk in Dresden. Tram services were discontinued in favour of buses in 1965. Since last year, however, they have experienced a renaissance with the development of a new route network.

Today's visitors to Olsztyn can travel the city aboard a fleet of modern low-floor trams. A total of 15 new trams were supplied by manufacturer Solaris by the end of 2015. They are each

driven with DKCBZ 0210-4D 120 kW traction motors from Sachsenwerk. In this way, more than 100 years after the original deliveries, proven drives from the VEM location in Dresden have found their way back to the Warmian-Masurian capital – this time as an example from the comprehensive range of products which VEM has tailored to the demands of modern rail-borne vehicles and the transport branch as a whole.



A traction motor of the kind which Sachsenwerk supplied to Allenstein 100 years ago (centre). The trams in present-day Olsztyn (left) also operate with modern traction motors from VEM in Dresden (right).

■ Engineering

Improved annealing process



Test installation of the Carbojet® gas control panels for setting of the nitrogen and hydrogen flow rates

New heat treatment technology brings valuable benefits for VEM in Wernigerode

At VEM in Wernigerode, electrical steel sheet is annealed in a roller hearth furnace with a throughput capacity of 2.5 tonnes per hour. Especially where Si-alloyed electrical strip steels are used, the tempering process was often found to be rather problematic. Not least for that reason, it was decided to seek significant improvement of the annealing process with the aid of the Linde

CARBOJET® technology. The technology is based on high-speed gas injection. It optimises the flow characteristics of the injected gases and provides for more complete mass transfer in the furnace.

The results are beneficial for both the customer and the manufacturer. The new technology not only improves the tempering process and thus the quality of the annealed sheet. The reduced energy and material consumption also eases the impact on the environment.



Preparations for an arc flashover test at the German High-Power Test Laboratory (IPH)

■ Research & development

VEM generators for GeCoLab test stand

Leibniz University in Hannover installs a megawatt-class universal test stand to aid research and development

The GeCoLab large-scale test stand is a government-funded project of the Institute of Drive Systems and Power Electronics (IAL) at the Leibniz University in Hannover. The test stand was officially inaugurated on 11th January 2016.

As supplier of the two generators, the VEM location in Dresden has contributed significantly to the success of the project. In addition to a double-fed asynchronous generator of the type typically incorporated into wind turbines, a permanent-magnet synchronous machine was developed

specifically for the test stand. In response to customer wishes, the latter was also fitted with a multitude of sensors on both the stator and rotor.

The new test stand offers diverse possibilities for analytical experiments and will enable the scientists at IAL to study the frequently neglected interactions between generators and converters. With an output rating of up to 1.5 MW, it covers a wide range of relevant applications, for example testing on 1:10 scale models for the off-shore sector. Further key research topics include grid-supporting strategies for wind turbines and generator diagnosis systems, e.g. early fault detection or the origins of bearing currents.

■ Engineering

Short-circuit-proof, arc-resistant and shatterproof

New VEM cable terminal passes testing

A new cable terminal for electric machines has been developed, manufactured and tested successfully by VEM. The test institute IPH Berlin, too, has confirmed that the new solution is not only short-circuit-proof, but also arc-resistant and shatterproof. Designed for a rated voltage of 11 kV and a nominal current of 400 A, it complements the cable terminal with enhanced short-circuit strength for 11 kV and 1600 A which VEM already presented in 2013.

The benefits of the new terminal: It further raises the safety of machines in operation, and reduces the risk of accident or damage to the machine in case of a supply network fault. In this way, VEM is now able to satisfy customer demands for increased short-circuit strength and arc resistance at the cable terminal for smaller machines with outputs from 315 kW. That is especially relevant, for example, with regard to the use of machines with lower outputs in power generating plants.



The megawatt-class universal test stand with PM and slipping machines from VEM



Photo call for the service conference participants in front of the "Haus der VEM" in Dresden. As initiator of the event, customer service manager Anett Arndt (front centre) was responsible for organisation of the two-day get-together.

■ VEM worldwide

Service partners get to know VEM better

Two-day conference for representatives from the German-speaking region at VEM in Dresden

Getting to know each other, exchanging of experiences and discussion of the latest technical developments – those were the aims of a VEM service conference at the end of February 2016. Some 20 sales partners from Germany, Austria and Switzerland attended the two-day meeting in Dresden. Given that VEM reorganised its network of contract partners in 2015, a team get-together was

a point high on the agenda for all concerned. It provided a framework for introductions, and enabled VEM to present the offers with which it supports the work of its partner companies both online and locally in their respective regions. The participants also learned a great deal about the individual VEM locations; the visit naturally included an extended tour of the Sachsenwerk factory. It is planned to repeat such conferences on an annual basis. The focus will then be placed above all on technical issues and developments.

■ Relocation

Moving closer together

The team of VEM transresch will be commencing work in Dresden from 1st April

Synergies in the planning and realisation of drive systems are the prime objective of the pending relocation of VEM trans-

resch. The engineering offices will be moving from their original base in Berlin to VEM's Sachsenwerk site in Dresden. "Since the acquisition of transresch in 2011, VEM has been able to reposition itself as a supplier of complete drive sys-

tems," says VEM managing director Dr. Torsten Kuntze by way of explanation. "It is thus a logical next step to provide for everyone to work together at a common location, and we expect this to deliver valuable new impetus in the future."

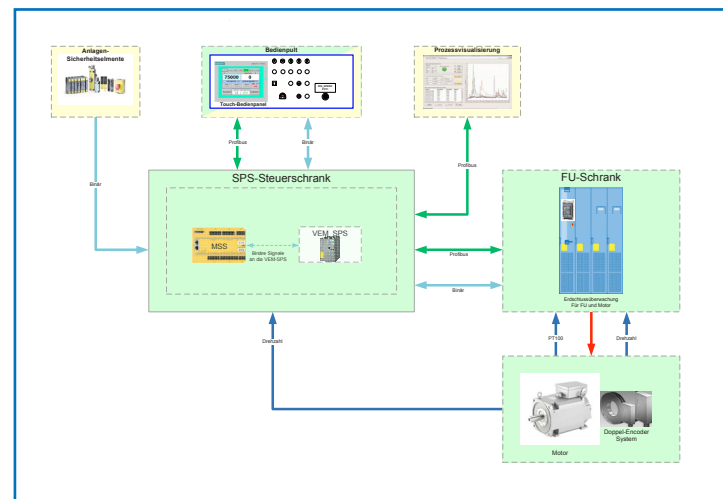
■ Drive systems

VEMoDRIVE for balancing and spin-testing machines

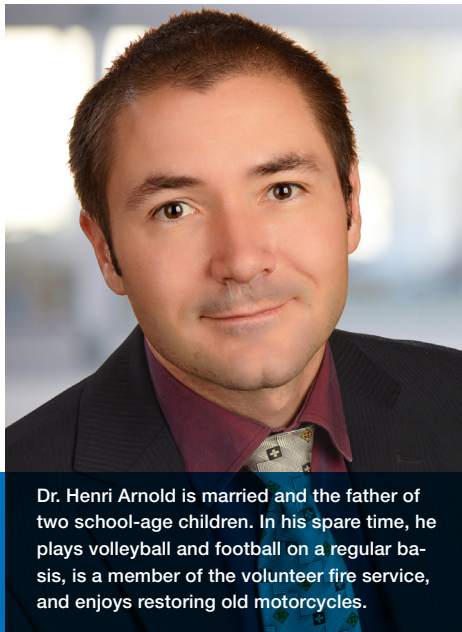
Safety and control configuration can be adapted to customer wishes with only minimal engineering costs

What do turbines, rotors, compressors and car wheel rims have in common? They must all be balanced. To enable the compensation of dynamic unbalances for turbines and turbochargers, VEM transresch GmbH has supplied a high-quality modular control system for integration into high-speed balancing and spin-testing machines to a renowned German manufacturer. The VEMoDRIVE drive system, which has already been com-

missioned in conjunction with a spin-testing machine, runs at 75,000 rpm. It comprises a 4Q converter for 400 V/1000 A, a modular control cabinet with PLC and safety systems, a water-cooled three-phase asynchronous motor with an output of 500 kW and a local control box. The high demands placed on the safety functions of the VEMoDRIVE drive system for performance level "d" were realised with PILZ safety devices. The modular design of both the safety and control systems permits adaptation to customer-specific wishes with only minimal engineering costs.



Topology of balancing and spin-testing machines test stand



■ People

New responsibilities for Dr. Henri Arnold

With effect from 1st March 2016, Dr. Henri Arnold (39) has taken up the post of technical manager for electric drive systems at VEM transresch, allowing longstanding predecessor Wolfgang Schramm to enter his well-earned retirement.

Henri Arnold studied mechanical engineering at the Freiberg University of Technology and joined VEM in Dresden after obtaining a doctorate from the department of electric machines in 2007. He subsequently worked in the office responsible for electromagnetic

calculations at Sachsenwerk for nine years. In his new function, the first task for Henri Arnold will be to manage the relocation of VEM transresch from Berlin to Dresden. A further focus of his work will be to promote customer awareness for VEM as a full-range supplier of complete drive systems. As a graduate engineer with a good standing in the academic world, he also plans to strengthen VEM's scientific lead through even closer contact to the universities, and in this way to remain one step ahead of the market.

Dr. Henri Arnold is married and the father of two school-age children. In his spare time, he plays volleyball and football on a regular basis, is a member of the volunteer fire service, and enjoys restoring old motorcycles.

■ Steel and rolling mills

A well-rounded affair

VEM portfolio for iron and steel mills

Roller table motors in sizes 56 – 400

Standard and transnorm motors to DIN/IEC with light-duty, heavy-duty and geared roller table motors

Special machines in sizes 355 – 630

Transnorm motors to IEC as three-phase asynchronous motors with squirrel-cage rotor

Special machines from size 710

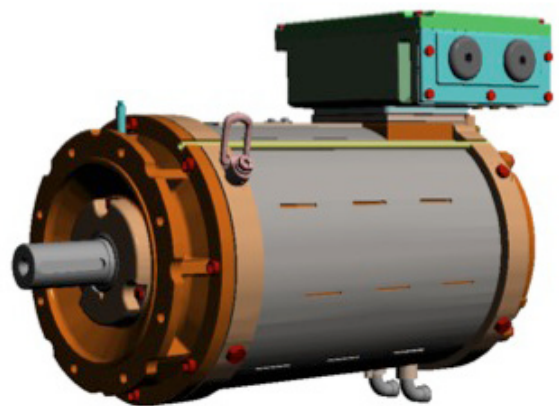
Three-phase synchronous and asynchronous motors

Seamless tube plant in US state of Louisiana equipped with low-voltage motors from VEM

The new hot-rolling mill is operated by the company Benteler Steel/Tube in Shreveport, Louisiana. VEM supplied motors for several sections of the plant. The special, size 280 motors with water-jacket cooling for the extracting and 3-roll stretch-reducing blocks enabled VEM to demonstrate how seemingly contradictory customer wishes can be reconciled. The project specifications called for a motor which was mechanically compact with a small diameter, but at the same time delivered a high torque over a wide speed range. The final solution was a

motor with water-jacket cooling (IC31W). With its welded-steel stator housing and extended IMB5 flange in ductile cast iron, it meets all the mechanical and electrical requirements.

Ever since successful commissioning at the beginning of 2015, the VEM motors have held their promise unconditionally even in this tough operating environment.



3D model of a three-phase motor with water-jacket cooling



The symposium at which VEM was able to present its broad product portfolio to Iranian partners was held at the Ministry of Water in Teheran.

■ VEM international

Closer contact

VEM sales managers join longstanding partner VEM Pars at a symposium in Teheran

A symposium organised specifically for VEM by the Iranian Ministry of Water attracted some 500 participants to Teheran in January 2016. Sales management representatives from VEM joined longstanding Iranian partner VEM Pars to present the whole product portfolio of the VEM group, for example high and low-voltage machines, drive systems, and also various foundry products from

Keulahütte Krauschwitz. The attendees, among them government representatives, planners, engineers and plant operators, displayed considerable interest. That was probably also reward for the fact that VEM had maintained a presence and continued to supply drive solutions even during the difficult years. The good contacts stem back to the pioneering work of Jürgen Sander, the former managing director of VEM motors.

The business relationship with Iranian partner VEM Pars was founded in 1994.

The company's activities to date have concentrated on low-voltage motors, sales and local manufacturing. VEM Dresden has been successful in the country with practically the whole spectrum of large machine components for the cement, oil, gas and steel industries. To better familiarise themselves with the whole VEM product portfolio, Pars staff visited VEM in Dresden and Wernigerode for a three-week course of training in March. Specialists from VEM have also been working in the local office in Teheran since the beginning of 2016.

■ Motors for Mali

„Fekola“ gold mine receives raw mill drives

VEM is supplying two slipring motors for a gold mine in the West African republic of Mali. The drives with a shaft height of 900 mm are to be incorporated into a raw mill. The VEM specialists in Dresden are cooperating closely with Siemens as the project contractor. The Danish com-

pany FLSmidth is responsible for installation of the key process technologies. The Fekola mine will be going into operation at the beginning of 2017 and is expected to produce around 7,500 kg gold each year. Mali is the third-largest gold producer in Africa.

Herausgeber

VEM Holding GmbH
Pirnaer Landstraße 176, 01257 Dresden
Tel.: +49 351 208-0
Fax: +49 351 208-1028
www.vem-group.com

Verantwortlich

VEM Sachsenwerk GmbH
Sabine Michel
Leiterin Unternehmenskommunikation
sabine.michel@vem-group.com

Gestaltung

Kommunikation Schnell GmbH, Dresden
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An- und Abmeldung

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