

August | 2017



# IMPULSE

Bosch Global Supplier Award 2017

## PARTNERS IN SUCCESS



### LOW VOLTAGE MAIN CATALOGUE

New edition out now –  
a 920-page heavyweight!

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Expanded ordering options

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### CytroPac

Success story for VEM  
and Bosch Rexroth

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The team of the drive systems department



Restructuring

## TRANSRESCH TEAM MERGED INTO SACHSENWERK AS DRIVE SYSTEMS DEPARTMENT

Since 1st June 2017, the former transresch staff are at last fully integrated into VEM Sachsenwerk GmbH. A year after the move from Berlin to Dresden, the legal formalities of the restructuring measure are now completed. As the drive systems department, the team will realise valuable synergy effects in the planning and implementation of complete drive systems for all VEM locations. There are

no relevant changes for the customers, however, and they can rely on the same contacts and project partners as in the past. There is similarly no reason for concern with regard to projects which were originally initiated or commenced with the company transresch. All such projects will continue as agreed, and the existing contacts on the manufacturer side will remain available for future support.



SEC has its headquarters in Wuxi, a city of more than six million inhabitants. Source: Wikipedia

The acquisition by a new Chinese owner will add a new chapter to the innovation success story of VEM. That is the declared joint will of the company SEC, with headquarters in Wuxi in the Eastern Chinese province Jiangsu, and the management of VEM. Irrespective of this transfer of ownership, customers and partners

of VEM can continue to rely on our sophisticated technological know-how and a high vertical range of manufacture, all paired with the internationally acknowledged seal of quality "Made in Germany". Access to the Asian market and the customer support network of SEC are additional benefits for all concerned.

VEM will remain in the possession of the Wang family which realised the purchase. This also ensures that there will be no changes to the flat organisation, fast decision-making and long-term stability of the VEM Group.

Change of ownership

## HALLMARK REMAINS "MADE IN GERMANY"

Customers can continue to rely on VEM and at the same time look forward to new benefits.

Transportation

# STAYING COOL

Traction motors from VEM have passed the new mandatory fire safety test and have been awarded corresponding certification.



The plate with the VEM traction motors from Zwickau. This is how the test would look if actual flames were to be seen.

For Christian Kolbe, this test was a premiere. He has been working as a designer at VEM in Zwickau for over four years, but testing of the behaviour of a traction motor in case of fire has only been mandatory since the DIN EN 45545 standard on fire protection in railway vehicles came into force in April 2016. This standard defines European fire safety demands to be met by all materials used in railway contexts.

When the first major railway customer approached VEM and enquired about certification, there was no beating about the bush. All traction motors manufactured at the VEM factories in Zwickau and Wernigerode – covering the whole range from size 56 to size 180 – were registered for corresponding testing in the laboratories of MPA Dresden.

### 800 °C in the oven

Christian Kolbe and his colleague Andreas Rudolph from Wernigerode themselves travelled to Freiberg in Saxony, where the fire protection competence centre is based. "In Zwickau, we first selected five housing groups," says Christian Kolbe. "These motors were then sawn open and bolted to a plate. Andreas did the same with his motors in Wernigerode." Both designers were then present when the plates were set up in front of ovens in the laboratory hall at MPA. The ovens were heated according to a predefined temperature curve over a period of 35 minutes, culminating in a temperature of 800 °C. Christian Kolbe: "We could even feel the heat from our safe vantage outside the ovens."

Christian Kolbe had no doubts regarding the results, and he was proved right. All traction motors from VEM completed the test successfully and received corresponding certification.



Designer Christian Kolbe preparing the motors for testing



# THE NEW FACE OF VEM

Lars Klatte has been coordinating corporate communications for the VEM Group since February 2017.



Lars Klatte took up the position of corporate communications coordinator for VEM in February 2017. He is a passionate newspaper reader, and mentions electronic music and street art as two of his main leisure time interests.

Lars Klatte (33) may be a native of Zwickau, but it would still be an exaggeration to suggest that his joining the VEM Group was a foregone conclusion. Even so, the links to VEM actually date back much further than his decision to take up a job with the electric motor company in his home town. But more about that later. Media design specialist Lars Klatte has been the face of the VEM Group since mid February 2017. Corporate communications coordinator is the title which goes with the demanding position for which he applied. His task is essentially outward communication on behalf of all companies and locations of the VEM Group in Germany and abroad.

*“Even though the branches are very different, the tasks are basically the same everywhere.”*

There is plenty of work ahead for Lars Klatte, but he is well prepared thanks to the experience gained during an already successful career in a number of very different branches: A lighting manufacturer, housing management, a restaurant group and politics. “Even though the branches are very different, the tasks are basically the same everywhere,” he says. Public relations, marketing, advertising and event organisation – those are the core responsibilities. The opportunity to complete part of his degree studies in England also broadened his world view and language skills. Lars

Klatte emphasises that his most important task lies in promotion of a common, modern corporate image for the VEM locations, as a further means to strengthen the ties between the group members. And he makes no secret of the fact that, as a former competitive athlete, he thrives on challenges and will be tackling his work with drive and enthusiasm, careful consideration and stamina. From management and his experienced colleagues to VEM's proven service providers, he can count on support from all sides.

*“My most important task lies in promotion of a modern corporate image for the VEM locations”*

By the way, Lars Klatte's personal connection to VEM is much older than he believed at first. “As a child, I saw the three letters VEM on notepads and rulers when I visited my grandfather, but that didn't mean anything to me then,” he recalls. When exploring the history of VEM, however, he discovered links to his own family history. It turns out that not only his grandfather, but also his father worked in a former VEM company.

## SIMULATION OF POWER IN THE FIELD

### Tractor test stand at John Deere equipped with VEM frequency converter

VEM transresch GmbH has received a further order for a frequency converter for a new PTO test stand from John Deere GmbH & Co. KG. The abbreviation PTO stands for “power take-off” and describes a mechanical drive shaft serving as an auxiliary output from a gearbox. In the case of an agricultural tractor, this mechanical drive is used to power a variety of attachments, such as rotary harrows, seeders, forage harvesters or balers. In forestry applications, log splitters and wood chippers are examples of equipment which could be driven via the PTO.

The new test stand is used to place defined loads on the tractor engine via the PTO. In addition to static output measurements and cooling system analyses, the test stand is able to simulate dynamic speed/load cycles of the engine which have been recorded in the field. This permits realistic verification of the engine, the engine exhaust and the cooling system.

The simulation commands issued by a higher-level control system must be implemented quickly and precisely. This is achieved with a converter. In this case, the speed of an asynchronous motor with a nominal output of 530 kW is varied in accordance with the details of the simulation.



The acid test: PTO test stand at John Deere. A frequency converter from VEM provides for fast implementation of the control commands issued to the test stand. Photo: Karlheinz Bitsch, John Deere Werke

### Product overview

## NEW MAIN CATALOGUE FOR LOW-VOLTAGE MOTORS

With its 920 pages, the printed catalogue is a real heavyweight. The individual chapters can also be downloaded in electronic form.



A fresh layout, a bound cover and easy to use – the new VEM main catalogue has now been published in German and English language versions. The 16 chapters reflect the entire low voltage product range of the VEM group. This product range has never been as broad as it is today. It covers outputs from 0.06 to 710 kW and is designed to

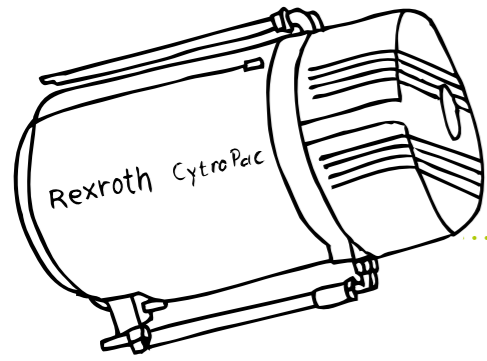
facilitate further expansion. When you browse through the catalogue, you will immediately notice that VEM is well tuned to the wishes of motor users, while at the same time anticipating developments which are just emerging on the horizon.

The portfolio of the VEM Group embraces variable-speed electric drive systems with high energy efficiency classifications, as well as special motors and special machines for outputs up to 42 MW. VEM supplies these drives to a multitude of branches. They are found aboard ships, in trams, trains and mining trucks, and in chemical plants and rolling mills. VEM generators produce electricity in hydropower plants and wind farms. There are good reasons why customers turn to VEM,

also – and especially – with unusual requirements. Highly qualified personnel and more than 140 years of experience in electric machine manufacture are decisive factors, as are the close cooperation and intensive discussions with scientific institutions.

You can download individual chapters of the catalogue [here](#).





CytroPac

Engineering I

# INTELLIGENT SOLUTION PACKED INTO THE SMALLEST OF SPACES

The compact CytroPac power unit from Bosch Rexroth, with its integrated VEM motor, its set to revolutionise the machine tool market

Florian Meyer still remembers the phone call he received from Rebecca Lacour in autumn 2015 as if it were yesterday. He already knew her well. After all, the back office manager at VEM motors and the strategic buyer for drive systems at Bosch Rexroth AG had enjoyed a trustful business relationship for many years. "We are developing a completely new hydraulic power unit for machine tools and we need a special motor. Can you build such a motor for us?" was the question asked by Rebecca Lacour. And she even supplied a first suggestion for the design of the required drive. Florian Meyer answered without hesitation: "Of course. Let's see what we can do."

#### Fast solution proposal

The specialists at the VEM location in Zwickau soon determined that the original design idea presented by Bosch Rexroth would not be practicable. But

instead of becoming disheartened, the VEM engineers quickly developed an alternative proposal, before the envisaged contract had even been signed. The Zwickau variant was well received by Bosch Rexroth, and so the VEM designers stepped up their efforts in this direction. Already in early 2016, Florian Meyer was able to present the first prototype. From then on, both sides maintained close contact to coordinate the further project steps. "Bosch Rexroth showed us its new cooling system in Zwickau, and we then developed the entire motor, the flange for the pump, the end shield for the heat pipes and a complete housing to match," Florian Meyer reports.

In the meantime, just a year after presentation of the first prototype, the hydraulic power unit is already to be found on the market in considerable numbers. It has set the machine tool market alight. Some

people are even speaking of a technological revolution which no machine tool will be able to forego in the future. The attractive housing may be small, but it still accommodates frequency converter, motor, pump and sensors. The intelligent hydraulic unit guarantees Industry 4.0 compatibility.

Contemplating their highly successful product, the developers, manufacturer and customer all have every right to lean back in satisfaction for a moment. Florian Meyer's comment: "Everyone can make standard motors. But special motors ... that is something for VEM!"

Trade fair eye-catcher CytroPac:  
The integrated VEM motor is visualised on  
the screen in the background

## Intelligent Hydraulics

Saves Space, Energy and Time







The development team which worked on the new CytroPac unit at VEM motors: Christian Kolbe, Florian Meyer and Sebastian Otto (left to right)

*“Our two product variants are able to cover the whole working range.”*

Engineering II

# IN THREE STEPS TO THE FINAL PRODUCT

Christian Kolbe and Sebastian Otto from VEM motors in Thurm are two of the design engineers whose work flowed into development of the CytroPac hydraulic power unit for Bosch Rexroth.

## Mr. Kolbe, which design features did Bosch Rexroth specify for development of the motor?

The drive was to possess an aluminium housing without terminal box, so that it could be fitted vertically into a plastic cylinder. Further specifications were a cable-free design, forced cooling and a special flange for mounting onto the pump.

## You presented a total of three prototypes to Bosch Rexroth. How did they differ?

There were actually many successive steps to the process. The original plan was to realise the cooling with four heatpipes, but over the course of the development we decided to provide a larger number of these space-

saving cooling elements. The first prototype was designed for a single operating point, but the later ones then featured two different winding configurations to accommodate several operating points. In the final model, we increased the output and created two different windings with an identical outward appearance. I would also like to mention the fact that we ordered new casting patterns for the D- and ND side end shields. Finally, we chose a cable design with axial routing through the ND-side end shield.

## How would you sum up the design phase and result with regard to this VEM special motor?

Our two product variants are able to cover the whole working range specified in the

project description. Their dimensions are identical and thus matched to the same installation space. With a newly developed aluminium housing profile, special cast end shields and an innovative cooling variant, we were able to implement the customer's wishes in optimum manner. It must also be emphasised that the customer's satisfaction with our services is at the same time a product of the close cooperation and flawless communication between VEM and Bosch Rexroth.



# CYTROPAC IS A MINOR REVOLUTION IN HYDRAULICS FOR MACHINE TOOL- ENGINEERING

Engineering III



CytroPac

Our interview partners Rebecca Lacour and Andreas Günder with the newly developed hydraulic power unit.

Rebecca Lacour, strategic buyer for electric drives for the business unit Industrial Hydraulics, and project manager Andreas Günder were the contact partners for VEM at Bosch Rexroth. They kindly provided us with further insights into this partnership.

**Just a few days ago, VEM was awarded the Bosch Global Supplier Award in the category "Innovation". The corresponding nomination had been submitted by Bosch Rexroth. Could you tell us why you favoured VEM receiving this award?**

**Rebecca Lacour:** It was the convincing support demonstrated in adapting a standard asynchronous motor such that it can cover several outputs with a single motor size. At the same time, the special demands of our compact CytroPac unit meant that we needed a motor with an innovative cooling system and special windings. Everything had to be matched to our requirements in frequency-controlled operation. But not only that: The design was

also to give due consideration to the aim of a reduced number of variants.

**Do you remember your first contact with VEM?**

**Rebecca Lacour:** That was in mid-2012, when we discussed my participation at the VEM Technical Conference. Later that year, I did indeed attend the conference for the first time. The two days provided a deep insight into the world of electric motors and was a great opportunity to expand my knowledge in the field.

**Andreas Günder:** During the innovation phase, we were looking for a motor manufacturer who would be prepared to develop new solutions as part of a joint project. Already during my first telephone conversa-

tions with the sales department, VEM captured my attention with technical ideas and its enthusiasm to tread new paths. All the different technical departments were very soon sitting around the table, and we discussed possible solutions very openly. With a new cooling system, for example, there was a certain risk that it might not function the way we wanted. But during our many meetings, we quickly sensed the good cooperation between the sales and design departments at VEM. As two of our most important contacts, I would here like to mention not only Florian Meyer from sales, but especially also Sylvia Blankenhagen, the head of design at VEM motors Thurm.



Bosch Global Supplier Award 2017

# PARTNERS IN SUCCESS



Group photo with award winners from 11 different countries at the presentation ceremony for the Bosch Global Supplier Awards 2017. Roland Zänger, head of low voltage sales at VEM, is standing in the back row (6th from the right).

➤ **With CytroPac, you have implemented a revolutionary idea. What made you choose VEM as a partner?**

**Rebecca Lacour:** Bosch Rexroth does not manufacture three-phase asynchronous motors itself. This meant that we needed a partner with the ability to manufacture a special motor with high dynamic response, taking into account our very particular demands with regard to the electrical design. And that all within a very short delivery time. With its know-how in the calculation of electrical systems, a high proportion of in-house manufacturing and the flexibility of a mid-size company, VEM was able to supply the required prototypes unusually quickly.

**How was the cooperation with VEM realised?**

**Andreas Günder:** There was very intensive communication with both the sales team and the various technical departments. We discussed calculations, simulated models and sought realistic feasibility assessments. To enable optimum integration into our system, the standard motor had to be modified significantly, including a 30% reduction in size. We could hardly wait to receive the first test results. After all, CytroPac represents a minor revolution in hydraulic systems for machine tool engineering. If any adaptation had been necessary at this point, the changes to components dependent on specific tooling would have resulted in delays of up to

nine months. That would have been very negative for the overall project schedule. We were thus all the more pleased with the excellent results from the first tests.

**But CytroPac is not the only project to have emerged from the longstanding relationship between our two companies.**

**Rebecca Lacour:** We have already completed numerous successful projects with the VEM locations in Zwickau and Wernigerode. Special mention can be given to the fields of transportation – specifically railway engineering – or wind energy. Special applications such as oil-immersed motors for lock-gate applications also enable VEM to stand out above other manufacturers.



CytroPac

Innovation hands-on:  
The hydraulic power unit CytroPac



# NEW OPTION FOR ONLINE ORDERS

Access the  
online store  
here.

VEM has expanded its online store. As a motor in the combination II2G/II2D can be used in Zone 1 or Zone 21, depending on individual circumstances, the customer now only needs to order a single motor variant from the online store. In the past, motors were only stocked with the classification ExII2G Exe IIC T3 Gb. Motors can be supplied ex

stock within 24 hours after receipt of the order in Germany. The combined explosion protection rating covers both ExII2G Exe IIC T3 Gb (Zone 1) and ExII2D Extb IIIC T125 °C Db (Zone 21) in accordance with the standards EN 60079-0:2012, EN 60079-7:2007 and EN 60079-31:2009 as applicable at the time of application.



Motor with combined explosion protection rating, as it can be ordered in standard colour FS01 RAL 7031 from the VEM online store

P (kW)	No. of poles	50 Hz	Shaft height	Type of protection	Construction types	Colour
0.18 to 3.3	2-pole	Wide voltage	63 to 112	IP 65	IM B3 and IM B5	FS01 7031
0.18 to 3.6	4-pole	63 to 112	IP 65	IP 65	IM B3 and IM B5	FS01 7031

## There are various benefits for customers thanks to the significantly larger number of IBExU-approved motors:

- Wide voltage approvals (type-dependent)
- Ambient temperatures up to 65 °C possible (type-dependent)
- 50/60 Hz approvals available (type-dependent)
- Marking with energy efficiency class IE.- possible
- Reduced stock requirements for customers, as only one motor in the combination II2G/II2D must be held for both Zone 1 and Zone 21
- All type-examination certificates are available in German and English

## DRIVES FOR HYDRAULIC UNIT WITH CHINA ENERGY LABEL



The China Energy Label



These VEM drives (photo above) are designed for use in hydraulic units in a steel plant. They are the first motors from the VEM factory in Wernigerode to be assigned a China Energy Label. This label is a further marketing argument for the plant manufacturer who has chosen VEM drives for this project.

## IP 23 PROTECTION EXTENDS PRODUCT RANGE

VEM recently extended its product range to include motors of energy efficiency class IE3 with open-circuit air cooling and type of protection IP 23. These compact drives with very high outputs are suitable above all for installation in closed rooms. The motors draw in cold ambient air with an internal fan and dissipate their heat load to the air passing through the housing. They are designed with type of cooling IC 01.

Motors with IP 23 protection are the preferred choice for pumps, fans and compressors, but are also used in crane and elevator systems. They are offered in sizes 160 to 355 in both 2-/4-pole and 6 pole versions. As the next step, VEM will be adding motors with energy efficiency classification Super Premium Efficiency IE4 to the product portfolio. You can read more about these new motors in the next issue of "Impulse".

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