



RENEWABLE ENERGY AND SMART INFRASTRUCTURE

ADVANCED MAGNETIC SOLUTIONS FOR A SMARTER ENERGY FUTURE

INTEGRATING INNOVATION FOR A SMARTER, GREENER TOMORROW

RENEWABLE ENERGY SOURCES such as solar, wind and hydropower are expanding rapidly – and with them the need for infrastructure capable of managing energy intelligently, efficiently and reliably. At the same time, digital technologies are transforming how energy is generated, distributed and consumed.

A SYSTEM PERSPECTIVE ON SUSTAINABILITY

Sustainability is no longer defined by generation alone. It depends on how efficiently energy is converted, monitored, stored and distributed across increasingly complex systems. Smart grids, intelligent transport networks, automated factories and digital infrastructure all rely on precise magnetic performance to ensure stability and efficiency.

VAC supports this transformation with advanced magnetic materials and high-performance compact components with low losses and highest efficiency ensuring reliable long-term operation. By improving efficiency at the core of energy systems, we help turn sustainability targets into measurable performance gains.

WHY VAC?

HOW VAC CAN ENHANCE YOUR SUCCESS

FROM MATERIAL TO FINISHED PRODUCT – ALL FROM A SINGLE SOURCE

AS A FULL-RANGE SUPPLIER OF MAGNETIC SOLUTIONS, VAC combines deep material knowledge with manufacturing expertise. Our vertical integration enables the precise harmonization of every step – from material production to the manufacturing of components and assemblies. This ensures that individual requirements are considered throughout the entire process chain, resulting in solutions that are not only technically optimized, but also reliable in high-volume production.

ENGINEERING EFFICIENCY INTO EVERY DETAIL

Customers benefit from seamless support across material science, process development and final design. This holistic supplier-partner approach helps to maximize performance, reduce cost and scrap, and achieve robust, high-efficiency solutions. With VAC, innovation turns into measurable success – in product performance, lifecycle cost and sustainability impact.

THE VAC-ADVANTAGE

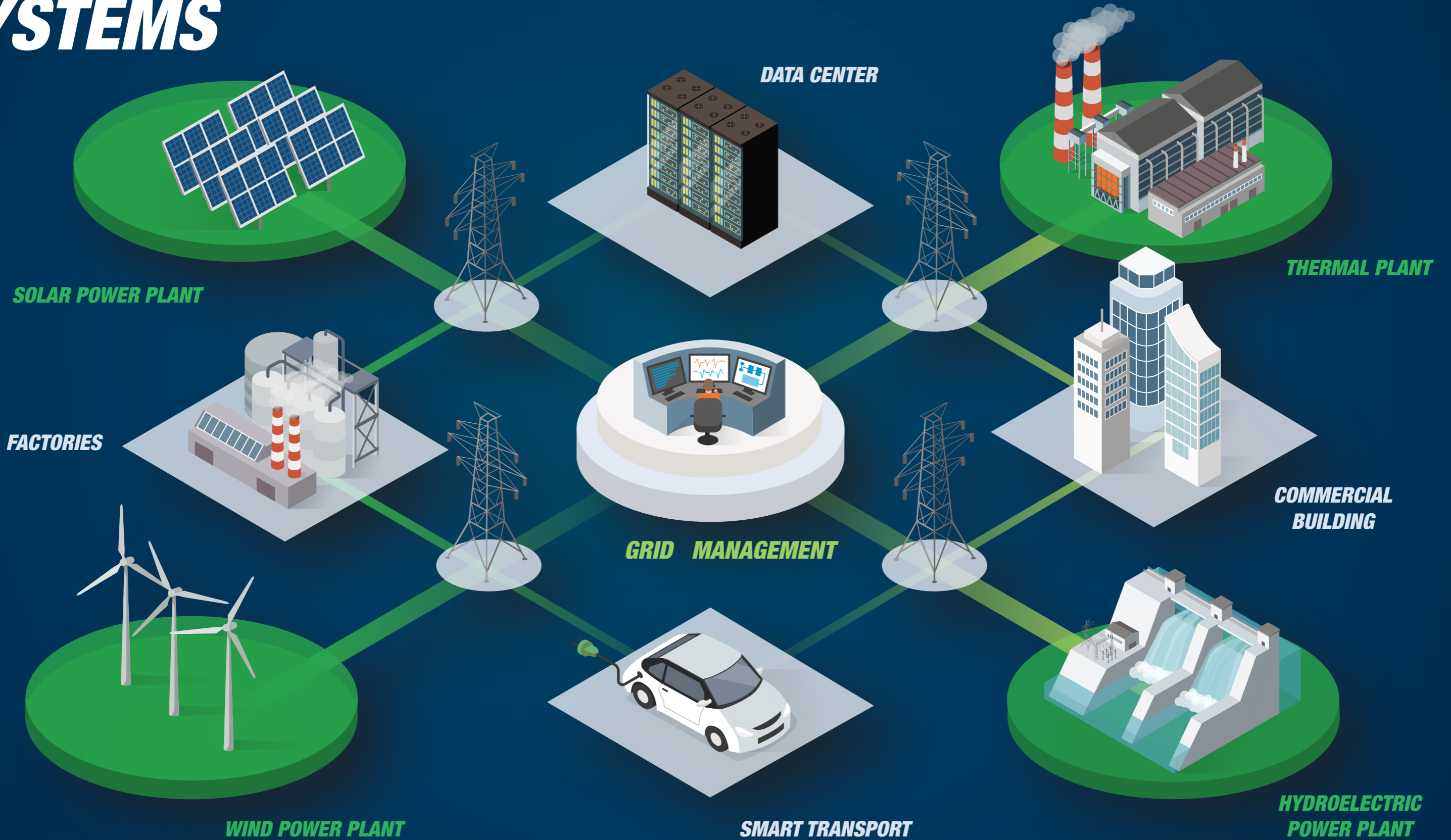
VERTICAL INTEGRATION

Integrated expertise from material science to manufacturing – tailored to maximize performance while reducing cost and scrap.



ENGINEERING SMART ENERGY SYSTEMS

VAC IS YOUR KEY PARTNER FOR SUSTAINABLE AND
RESOURCE-EFFICIENT ENERGY SYSTEMS.





ENERGY GENERATION, DISTRIBUTION AND STORAGE

TURNING SUSTAINABILITY AND EFFICIENCY INTO REAL-WORLD IMPACT

GLOBAL RENEWABLE ELECTRICITY GENERATION is forecast to climb to over 17,000 TWh by the end of this decade – an increase of almost 90% from 2023 (Source: IEA, 2024). This growth is accelerating the demand for efficient power conversion, stable distribution networks and intelligent storage solutions.

ENABLING THE FULL POTENTIAL OF SiC AND GAN

Next-generation hardware developments increasingly rely on SiC/GaN semiconductors, leveraging higher switching frequencies and lower losses. These fast-switching technologies enable higher power density, improved efficiency and more compact system designs – translating

directly into lower energy consumption, reduced system cost and a smaller overall footprint. To unlock these benefits in real applications, magnetic components must deliver low losses, excellent attenuation behavior and reliable performance in compact geometries.

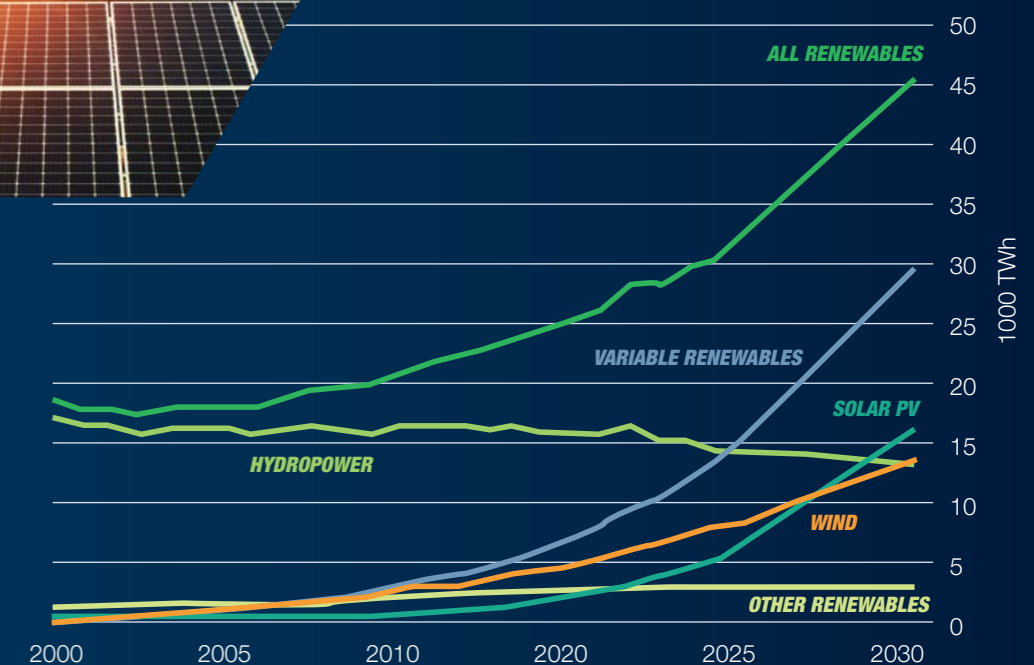
VAC's high-performance components and bespoke solutions help you realize the full potential of SiC-based systems, enabling reliable operation, simplified integration and long-term competitiveness in fast-evolving markets. Our portfolio supports key functions across renewable generation, distribution and storage – from EMI performance and conversion efficiency to precise sensing and protection.



GLOBAL RENEWABLE ELECTRICITY GENERATION

is forecast to climb to over 17 000 terawatt-hours (TWh) by the end of this decade, an increase of almost 90 % from 2023. This would be enough to meet the combined power demand of China and the United States in 2030.

Source: International Energy Agency (IEA), 2024



ENERGY GENERATION, DISTRIBUTION AND STORAGE

SOLUTIONS THAT DRIVE PERFORMANCE

COMMON MODE CHOKES & NANOCRYSTALLINE CORES (VITROPERM®)

Superior EMI solutions based on nanocrystalline VITROPERM materials delivering highest attenuation performance in extremely compact designs. Ideal for high-frequency SiC/GaN power electronics and dense converter architectures.

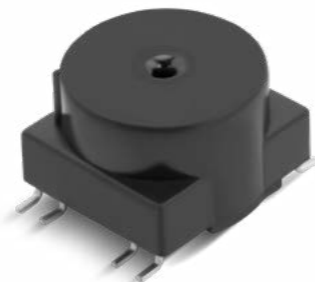


MAGNET ASSEMBLIES FOR WIND AND HYDRO ENERGY

Customized high-performance magnet assemblies enabling efficient torque generation, compact generator designs and long-term operational reliability in wind turbines and hydroelectric systems.

NEXT-GENERATION GATE DRIVE TRANSFORMERS

High-efficiency gate drive transformers optimized for modern high-speed switching applications. Reduced volume, improved switching performance and enhanced overall system efficiency.



>17,000 TWh

**RENEWABLE ELECTRICITY GENERATION
PROJECTED BY 2030**

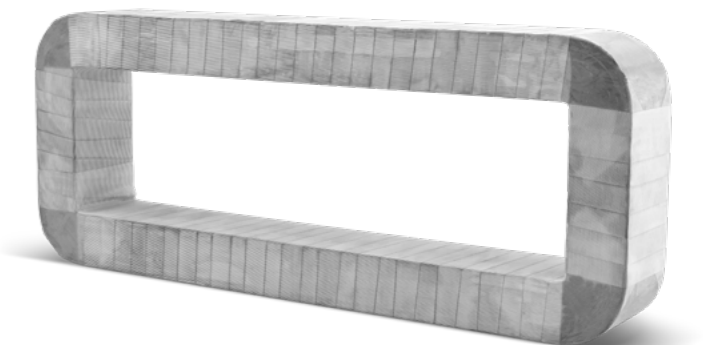


HIGH-PRECISION CURRENT SENSORS & DIFFERENTIAL CURRENT SENSORS

Accurate, cost-efficient current measurement from a few milliamps up to more than 1,000 A. Designed for reliable monitoring, protection and control in renewable energy systems and power conversion units.

NANOCRYSTALLINE CORES FOR SOLID-STATE TRANSFORMERS

Energy-efficient and compact alternatives to conventional 50 Hz transformer technology. Enable high power density, reduced core losses and ultra-low acoustic noise emissions below 65 dB.





+600 M.

OVER 600 MILLION VAC-BASED
CURRENT TRANSFORMERS
INSTALLED WORLDWIDE

SMART GRID

INTELLIGENT POWER NETWORKS FOR A RELIABLE ENERGY SUPPLY

The smart grid represents the next stage of energy supply: an intelligent electricity network that seamlessly connects generation, storage and consumption in real time. Its purpose is to make power supply more efficient, reliable and stable – particularly when integrating renewable energy sources such as solar and wind.





SMART GRID

ADVANCED MEASUREMENT AND PROTECTION SOLUTIONS

TO ENSURE THIS LEVEL OF PERFORMANCE, smart grid infrastructures depend on highly accurate measurement, robust protection concepts and scalable component solutions that support large-scale deployment. VAC supports smart grid developments with advanced current transformer technology and magnetic solutions engineered for precision, linearity and long-term reliability.

More than 600 million current transformers (CTs) based on VAC technology have already been installed worldwide by our customers. Extensive testing and a zero-defect mindset ensure outstanding quality, while a secure supply chain with manufacturing locations in Europe and Asia provides stability for global programs.

High linearity enables precise calibration of smart energy meters. A wide temperature range ensures reliable performance under demanding environmental conditions. In electric charging infrastructure, VAC current transformers enable compact and highly accurate current measurement for

metering and billing applications. Automated high-volume production is supported by pick-and-place compatible designs – including solutions with integrated primary wires that reduce assembly complexity.

PROTECTION AND MONITORING ACROSS THE NETWORK

Beyond metering, VAC cores and differential current transformers play a critical role in grid safety and monitoring. They are used in residual current devices, substations and distribution systems to reliably detect leakage currents, fault currents and insulation failures. Their high sensitivity and stability support dependable protection across industrial, public and private electrical distribution grids.

Customized solutions allow customers to differentiate their products – whether through smallest possible build sizes or peak performance in terms of accuracy, linearity and reliability, depending on the application requirements.



CURRENT TRANSFORMERS (CTs)

High-precision current transformers for accurate metering and billing applications in smart grid and electric charging infrastructure. Designed for high linearity, wide temperature range and reliable long-term performance.

CORES AND CTs FOR RCDS

Magnetic cores for monitoring and protection in residual current devices. Reliable detection of leakage currents and insulation failures ensures grid safety and operational stability.





SMART MOBILITY

EFFICIENT AND RELIABLE SOLUTIONS FOR MODERN TRANSPORTATION SYSTEMS

Smart mobility demands energy-efficient, compact and reliable systems - from power conversion and charging infrastructure to onboard monitoring and protection.

AS TRANSPORT NETWORKS become increasingly connected and energy-aware, the performance of power electronics and measurement technology directly influences efficiency, safety and operational cost.

COMPACT PERFORMANCE FOR CHARGING INFRASTRUCTURE

VAC current transformers enable precise metering and billing in electric charging infrastructure. Their compact design, wide temperature range and high linearity ensure reliable measurement under dynamic load conditions. Pick-and-place compatible solutions with integrated primary wires support automated high-volume manufacturing and scalable deployment.

mental conditions, VAC solutions help ensure reliable performance and long-term operational stability.

By combining deep materials expertise with scalable manufacturing capabilities, VAC supports mobility systems that deliver efficiency improvements where they matter most – in real-world operation.



STABLE OPERATION IN HIGH-FREQUENCY ENVIRONMENTS

Magnetic components for modern power electronics support efficient energy conversion in high-frequency switching systems. Designed for compact architectures and demanding environ-

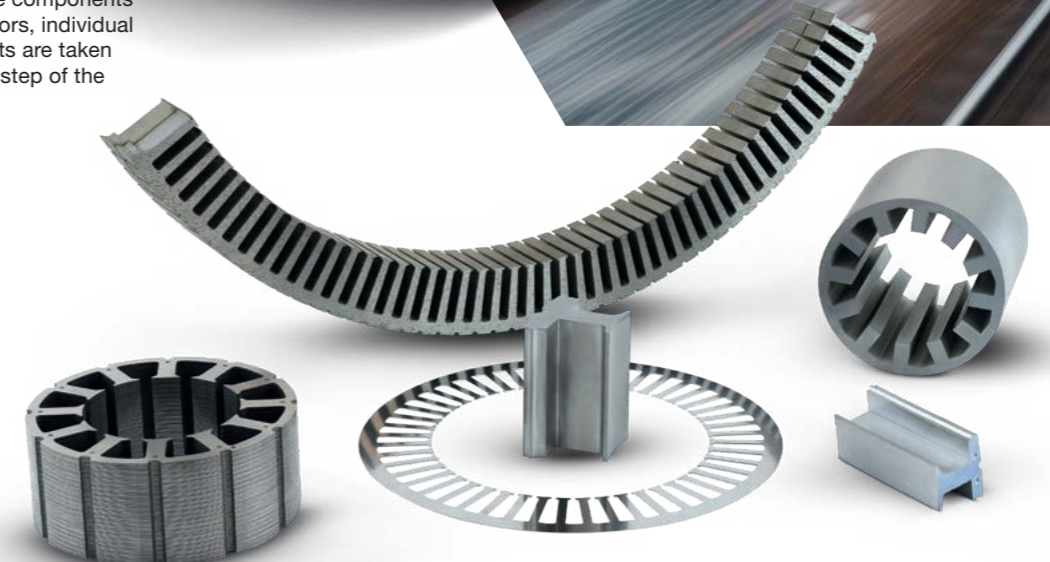
SUPERIOR EMI SOLUTIONS BASED ON VITROPERM

delivering highest attenuation performance, especially for the HF range in extremely compact designs. VACOCOIL is most suitable for high current/high power applications with load currents above 50 A.

COBALT-IRON LAMINATION STACKS TO IMPROVE ELECTRIC MOTOR PERFORMANCE

VAC CoFe alloys meet the requirements of the market. For their respective applications, each of them bring the same property: optimum performance capability.

Since VAC controls every step from material production and manufacturing of parts to the assembly of complete components such as rotors or stators, individual customer requirements are taken into account in every step of the process.



FACTORY AUTOMATION

DRIVING EFFICIENT AND SUSTAINABLE PRODUCTION

Factory automation is a key driver for efficient and sustainable production processes.

SENSOR TECHNOLOGY, ROBOTICS AND INTELLIGENT CONTROL SYSTEMS allow industrial processes to be monitored and optimized with high precision. Automated systems ensure consistent product quality, reduce downtime and increase productivity. At the same time, digital technologies such as IoT and data analytics make manufacturing environments more adaptive – improving performance while reducing unnecessary energy consumption.

PRECISION MONITORING FOR INDUSTRIAL DRIVES

VAC contributes with high-precision, cost-efficient current sensors and differential current sensors covering ranges from a few milliamps up to more than 1,000 A. These solutions enable reliable monitoring and safe operation of drives, servo motors and automated production systems.

STABLE OPERATION IN HIGH-DENSITY ELECTRONICS

Industrial drives benefit from superior EMI solutions such as common mode chokes and

nanocrystalline VITROPERM® cores, supporting stable performance in compact and high-density electronic environments.

Cores for residual current circuit breakers (RCCBs) further enhance safety by enabling reliable fault detection and protection in industrial and commercial applications.

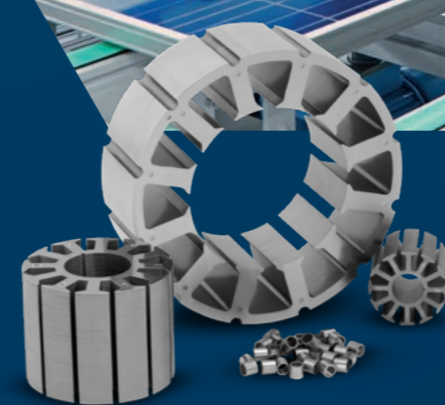
DID YOU KNOW?

- All world-leading manufacturers of robots use VAC components – benefiting from high density, long lifetime and robust performance.
- Nearly every household and factory uses VAC products – for example in RCCBs or photovoltaic systems.
- A majority of servo motors for conveyor belts are controlled by our current sensors.



100%

USED BY ALL LEADING ROBOT MANUFACTURERS WORLDWIDE



SOFT MAGNETIC NICKEL-IRON ALLOYS

offer cost efficient solutions for resolvers, high precision current and position sensors, as well as for low-loss motor applications.



SUPERIOR EMI SOLUTIONS BASED ON VITROPERM

delivering highest attenuation performance, especially for the HF range in extremely compact designs. VACOCOIL is most suitable for high current/high power applications with load currents above 50 A.



HIGH-PRECISION CURRENT SENSORS

Accurate, cost-efficient current measurement from a few milliamps up to more than 1,000 A. Designed for reliable monitoring, protection and control in power conversion units.

SUSTAINABILITY, HEALTH AND SAFETY

RESPONSIBLE OPERATIONS WORLDWIDE

At VAC, responsibility goes beyond product performance. It is embedded in our environmental footprint, our operational standards and the protection of our people.



ENVIRONMENTAL RESPONSIBILITY

We are committed to continuously reducing our environmental footprint across all global operations. This includes increasing the use of renewable energy, reducing water consumption and minimizing waste through optimized production processes.

Two of our five manufacturing sites already operate entirely on renewable energy – an important milestone in our transition toward more sustainable production.

Energy efficiency initiatives, recycling programs and resource optimization projects are integral parts of our operational strategy and contribute to measurable environmental improvements year after year.



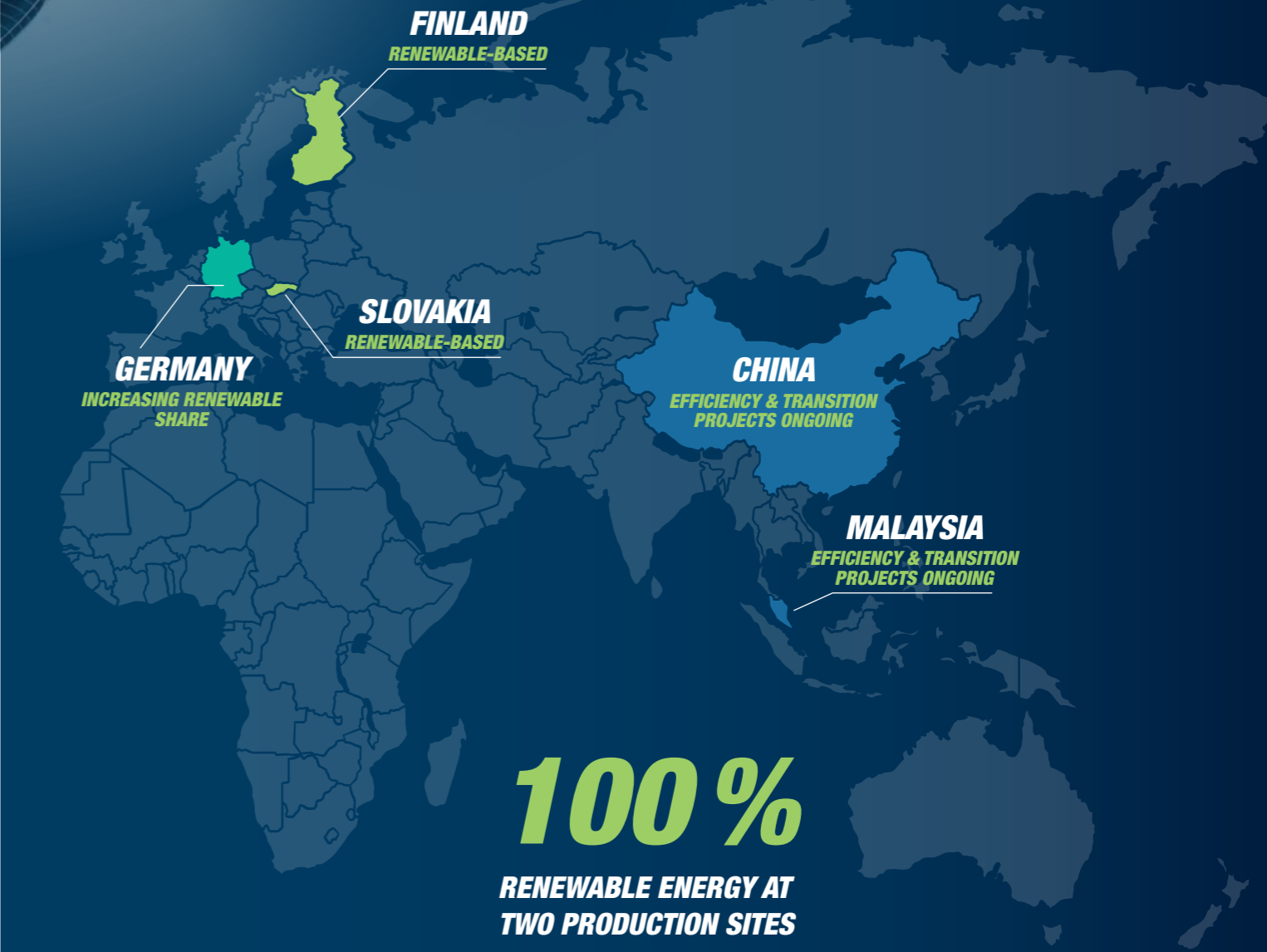
HEALTH & SAFETY – PROTECTING OUR PEOPLE

The safety of our employees, customers and partners has the highest priority at VAC. Structured safety standards, preventive measures and continuous improvement initiatives strengthen workplace safety across all locations.

VAC is committed to a zero-incident culture, as demonstrated by a consistently declining incident rate that remains well below the industry average of ~4. A high volume of near-miss reporting each year demonstrates our proactive safety culture, enabling risks to be identified and mitigated early.

Dedicated medical teams at our facilities ensure employees have access to up-to-date medical information and professional care, reinforcing our commitment to long-term well-being.

EXPANDING RENEWABLE ENERGY ACROSS OUR GLOBAL OPERATIONS



100%
RENEWABLE ENERGY AT
TWO PRODUCTION SITES

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