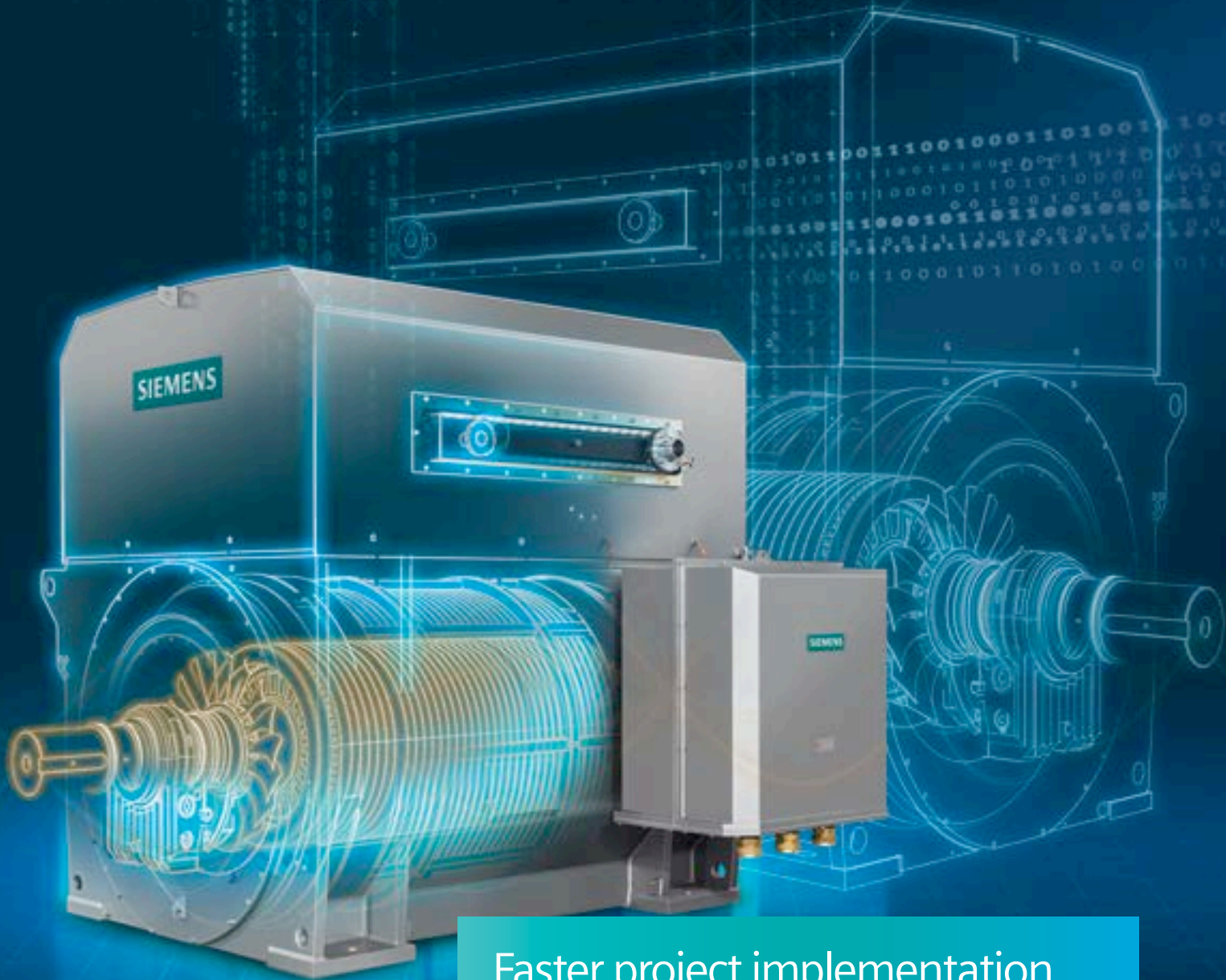


SIEMENS

Ingenuity for life



Faster project implementation.
Earlier return on invest.

SIMOTICS HV M shaft height 450 to 800:
the modular motor concept up to 19 MW

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Value added in plant engineering: modular SIMOTICS HV M high-voltage motors – consistent from shaft height 450 up to 800

When it comes to plant construction, fast project execution and the highest degree of availability in operation are crucial factors. SIMOTICS HV M addresses both of these factors: Maximum reliability under extreme conditions as well as preventive service concepts employing cloud-based status data analysis ensure the high degree of availability. The fast, smooth project execution is based on short delivery times, user-friendly and efficient engineering tools, the highest degree of flexibility and simple integration into plants and systems as a result of the extremely low dimensions and weights referred to the particular power rating.

This is complemented by low operating costs based on minimum maintenance costs and high efficiency. SIMOTICS HV M motors are available in 2-, 4-, 6-, 8-, 10- and 12-pole versions (additional pole numbers available on request); they cover a speed control range up to 4800 rpm. The power spectrum of the series extends up to 19 MW at 50 Hz – and up to 21 MW at 60 Hz. As a consequence, users profit from the advantages of this modular high-voltage motor concept over a wide power range.





SIMOTICS HV M is at home in the following industries

- Oil & Gas
- Petrochemical & Chemical
- Steel
- Marine
- Cement
- Fiber
- Water/wastewater
- Power generation
- Mining

Typical applications are pumps, fans, compressors, mixers, mills, conveyor belts, rolling mills, ship drives.

The advantages at a glance

- Short delivery period and high delivery reliability
- Very reliable, even under extreme conditions
- Long service life with low maintenance costs
- High efficiency of up to 98 %
- Flexibly and precisely adaptable to a wide range of applications
- High power density due to low envelope dimensions and weight
- Simple selection and configuration with standard engineering tools
- Perfectly harmonized for operation with SINAMICS medium-voltage converters
- Motor dimension drawings and 3D motor data are available from the PLM software (Product Lifecycle Management) – or on request





Quickly delivered – straightforward engineering

The standardized production and testing processes for SIMOTICS HV M motors now also apply to rated powers from 0.5 up to 19 MW. This means that short delivery times as well as precise on-time delivery are also ensured. These motors with the corresponding high power ratings are now also integrated in standard engineering tools such as DT configurator (DTC). This simplifies selection and configuration.

Furthermore, the 3D motor data generated during the product design phase with Siemens PLM software (NX, Teamcenter) can be used for planning and modernizing of plants. This significantly shortens overall project execution times – and therefore plants are commissioned with earlier profit and faster return on invest.

Low weight and low noise – with higher plant availability

On the mechanical design side, the optimized enclosure offers many advantages – depending on the application and power rating, it is made of cast iron or steel *: The low weight simplifies transport and integration into

plants and systems – and in many cases, the low-noise design avoids costs for additional noise-reducing measures. Further, the higher motor stiffness increases the reliability, even under extreme conditions – and therefore plant and system availability. SIMOTICS HV M sets itself apart as a result of its outstanding vibration quality over the complete speed control range (up to 4800 rpm). Last but not least, the modular concept reduces downtimes as spare part stocking is significantly simplified.

For an even higher plant or system availability, SIMOTICS HV M motors can be optionally equipped with condition monitoring systems, permitting status data to be analyzed in the cloud. This provides valuable information for data-supported service concepts, which are able to identify even the smallest irregularities in the drive train at an early phase and resolve them during routine service work – long before any damage is incurred.

* for SH 630-800 steel is standard, for SH 450-560 on request

Flexible platform concept allows motors to be tailored to specific sectors

Plenty of options allow SIMOTICS HV M motors to be always precisely adapted to address individual sector-specific applications. So even complex requirements can be easily complied with, but still maintaining maximum quality and reliability.

Oil and gas industry

If the target applications involve pumps and compressors in the oil and gas domain, SIMOTICS HV M motors are available with special coating systems to protect against very humid, saliferous or chemically aggressive ambient atmospheres, for example also in compliance with Norsok specifications. In hazardous areas, versions in type of protection Ex ec (Zone 2) or Ex pxb (Zone 1) ensure a maximum degree of safety. A low temperature design for temperatures down to $-50\text{ }^{\circ}\text{C}$ is available for projects in arctic environments. Also available: designs that fully comply with the API standard and the associated high requirements regarding vibration quality frequently specified in the oil and gas industry.

Rolling mills

Versions of SIMOTICS HV M – especially for rolling mills – achieve rated torques of up to 120 kNm. They completely satisfy all of the requirements of this application as a result of the high overload capability and a wide field weakening range.

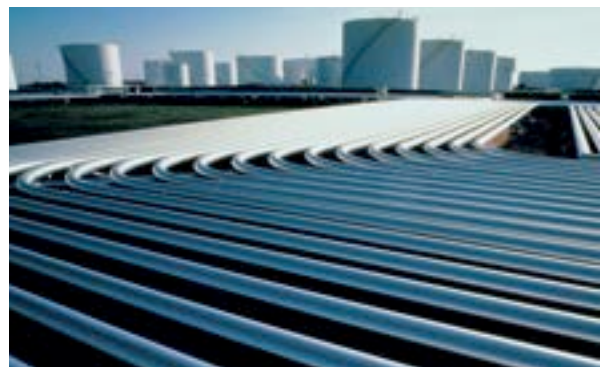


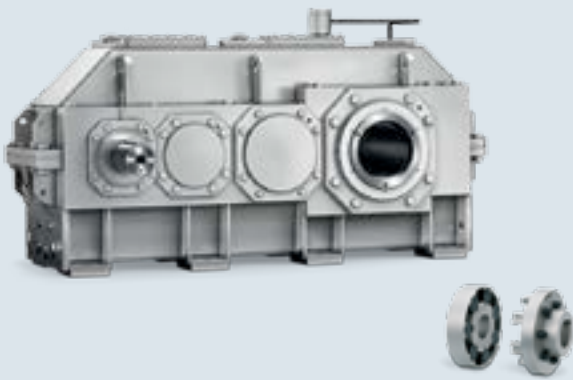
Marine

The lightweight and space-saving design is especially optimized for the marine versions of the SIMOTICS HV M. The quiet, low-vibration operation enhances the level of comfort on board of vessels. Special coating systems protect against corrosion caused by aggressive, saliferous marine environment. Self-evident the specifications of leading marine classification societies are fully complied with.

Power generation

In the domain of power generation, SIMOTICS HV M motors are predestined for powerful pumps and fans in power utilities, for example cooling pumps, boiler feed pumps, district heating system pumps, forced draft and induced draft fans.





Perfect interaction – within the context of integrated drive systems

For variable-speed applications where high energy saving potential and precise process control is necessary, SIMOTICS HVM in shaft height 450 to 800 in conjunction with SINAMICS medium-voltage converters create optimally harmonized and integrated drive systems. The same is true for low-voltage versions of SIMOTICS HV M, which operate perfectly with SINAMICS low-voltage drive systems. Depending on the particular application, different versions of the SINAMICS family provide the optimum system partner:

- For pumps and compressors in the oil and gas industry, SINAMICS PERFECT HARMONY medium-voltage converters are used with an extremely motor-friendly and highly available cell topology – depending on the particular requirement in the plug-and-play GH180 version with integrated transformer or in the flexible, versatile GH150 version with separate transformer. On the low-voltage side, SINAMICS G130/G150, SINAMICS G180 and SINAMICS S120 are the ideal partners.
- SINAMICS SM150 converters – with their high dynamic performance and energy recovery capability – are used in rolling mill applications with high requirements regarding

dynamic response, precision and overload capability. In a multi-motor line-up, these converters allow power to be exchanged via a common DC busbar.

- SINAMICS GM150, SINAMICS PERFECT HARMONY GH150 and SINAMICS SM120 CM are the recommended system partners for the marine sector for low-voltage SINAMICS G130/G150 or SINAMICS S120 in the Cabinet Modules and Liquid Cooled Marine Chassis versions.
- Irrespective of which converter is actually used: For SIMOTICS HV M, currents, voltages and winding design are adapted to the specifics of the relevant SINAMICS device in order to achieve an overall system with the highest efficiency and reliability. As complete integrated drive systems from a single source, this can be complemented by a FLENDER coupling and – depending on the application – possibly by a FLENDER gearbox.

Horizontal Integration

You can increase the availability of your plant or application – up to **99%***

*e.g. in conveyor applications

Vertical Integration

With the TIA Portal, you can reduce your engineering time – by up to **30%**

Lifecycle Integration

Thanks to Integrated Drive Systems, you can reduce your maintenance costs – by up to **15%**

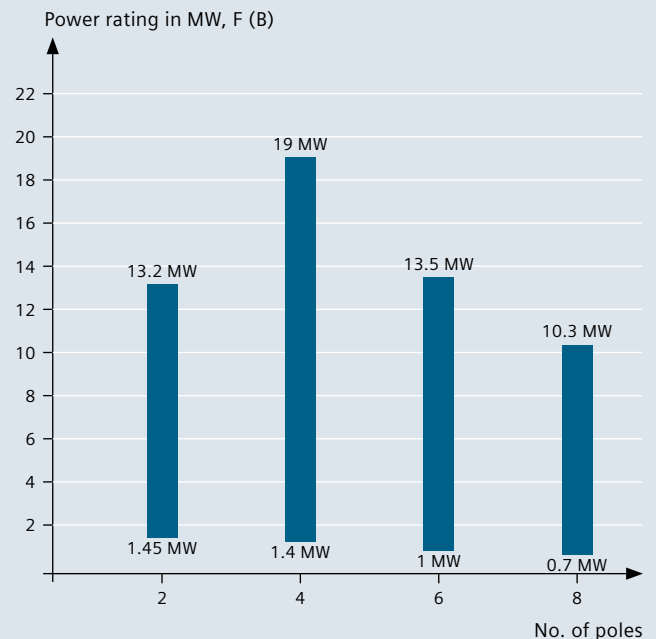
Technical data

overview SIMOTICS HV M

The features at a glance

- Power: 0.5 up to 19 MW at 50 Hz, up to 21 MW at 60 Hz
- Voltage classes: 380 V ... 13.8 kV
- Frequency: 50/60 Hz
- Number of poles: 2, 4, 6, 8, 10 and 12 poles*
- Motor type: squirrel-cage induction motor
- Type of construction: IM B3 and IM V1
- Degree of protection: IP23, IP55, IP56 non heavy sea
- Cooling type: IC 81W, IC 86 W, IC 01, IC 611, IC 616, IC 666
- Insulation class, stator windings: Thermal class 155 (F), utilized to 130 (B)
- Explosion protection: Ex pxb/Ex ec (IEC, EN)
- Efficiency: up to 98 % according to IEC 60034-2-1
- Shaft height: 450 to 800 mm
- Bearings: sleeve bearings, roller bearings
- Rotor material: copper
- Enclosure: steel or cast iron
- Standards: IEC, EN, ship classification societies
- Speed: up to 4800 rpm⁻¹
- Insulation: MICALASTIC VPI insulating system

Insulation thermal class 155 (F),
utilized to 130 (B)
Power range for 6 kV, 50 Hz, IC 81W



Typical configurations for the target application

Application / sector	Suitable medium-voltage converter	No. of poles	Services	Typical properties
Compressor drives in the oil and gas sector	SINAMICS PERFECT HARMONY GH150 and SINAMICS PERFECT HARMONY GH180	2, 4	up to 13.2 MW (2-pole) up to 19 MW (4-pole)	Ex pxb, Ex ec, safe area, IC 611, IC 616, IC 81W, IC 86W, IC 666
Rolling mill drives in the steel sector	SINAMICS SM150	6	up to 120 kNm	High overload capability, for constant torque applications, IC 81W, IC 86W, IC 666
Main propulsion and thrusters for marine applications	SINAMICS GM150, SINAMICS PERFECT HARMONY GH150 and SINAMICS SM120 CM	8	up to 10.3 MW	Ship classification societies IC81 W, IC 86W

* other pole numbers on request

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