

SIEMENS



High-voltage motors SIMOTICS HV and TN series H-compact

Maximum performance, minimum size

siemens.com/h-compact

Answers for industry.

Mighty power packs in the smallest space – The latest generation of high-voltage motors



Space is costly in industry. This is the reason that when designing our SIMOTICS HV/TN series H-compact we consciously focused on achieving small dimensions – without this having a negative impact on performance. Justifiably so, you expect that your drive system reliably performs its task – but without wasting valuable space. We especially focused on these targets to achieve high reliability and small dimensions. The result of our development work is the SIMOTICS HV/TN series H-compact, which admirably fulfills both of these requirements: reliable power and compact design.

Different versions available

SIMOTICS HV/TN series H-compact are available in versions for line operation, for converter operation and in an explosion-protected design.

Horizontal

Standard motors in type of construction IM B3; when requested, you can also obtain other types of construction, for example IM B35.

Vertical

IM V1 with protective roof assembly.
IM V1 without protective roof assembly.

Degrees of protection IP55 and higher.

Cooling type IC411 or IC416.

Perfect cooling for a long lifetime

The leading edge compactness of these motors is achieved by using high-efficiency, dual-circuit cooling systems.



Technology that has proven itself



The SIMOTICS HV/TN series H-compact uses the MICALASTIC® insulation system that has proven itself worldwide for high-rating, high-voltage motors. This means that with the insulation you're getting world-class reliability and service life.

High starting torques

Benefit from the high starting torques – yet another advantage that sets the SIMOTICS HV/TN series H-compact apart. As a consequence, fast starting is guaranteed even for high load torques and moments of inertia. Long locked rotor times provide you with more security for situations where the rotor is blocked externally.

Continuous monitoring

Even the most technically sophisticated motor can be subject to stress and loads in operation for which it was not originally designed. Sensors and monitoring devices can continually record and signal electrical, thermal and mechanical operating data. The motors are equipped as standard with six PT 100 slot resistance thermometers and shock pulse measuring nipples (SPM) for roller bearings.

Well proven MICALASTIC insulation utilizing VPI technology

The Siemens MICALASTIC® insulation system has proven itself over decades around the world in high-rating, high-voltage motors. An important component is the VPI technique (Vacuum Pressure Impregnation) that is harmonized and coordinated with the insulation design. This technique ensures an insulation system almost free of voids, therefore having a favorable partial discharge behavior. A good thermal transition between the winding and laminated core is guaranteed. The long electrical service life is achieved also as a result of the high percentage of mica in the insulation. Together with the high mechanical strength and thermal durability, these factors ensure an extremely long winding service life – even under harsh environmental conditions.

Reliable and rugged

In the low power range, the motors have aluminum die cast rotors. Above this, copper cage windings are used. Both designs permit an outstanding performance to be achieved. The aluminum die cast technology also has an additional advantage regarding the extreme ruggedness as a result of the form-locked connection between the rotor bars and laminated core.

Highest vibration quality

Innovative production processes in conjunction with high precision balancing guarantee the highest vibration quality. As a consequence, the SIMOTICS HV/TN series H-compact not only complies with IEC and NEMA standards, but in most cases even surpasses them.



With the longest service life and highest reliability



Open flange sleeve bearing
with oil ring

For many years now, our motors have stood for the highest quality and ruggedness. When developing our SIMOTICS HV/TN series H-compact we also placed a lot of emphasis on maintaining these high standards. The result: maximum reliability and the longest service life.

Enclosure

For instance, the enclosure and bearing end shields are cast iron and have a smart design. The enclosure is strategically narrowed to optimize the cooling airflow. This is complemented by inner ribs in the area of the stator winding overhang areas as well as box-shaped mounting feet over the complete length – these innovative features give these motors the highest degree of stability and ruggedness. The cast iron enclosure in conjunction with high-quality corrosion protection and paint finish protects the motor for many years against the weather.



Open rolling-contact bearing

Bearings

SIMOTICS HV/TN series H-compact motors are normally equipped with roller bearings. For higher speeds, loads and special operating conditions, when requested, we can also use sleeve bearings. Sleeve bearings have a flange-mounted design and are suitable for clockwise and counter-clockwise rotation without requiring any modifications. Depending on the bearing load, they have an oil ring with natural cooling through radiation and convection – or circulating oil lubrication with oil cooling. The naturally cooled version can be changed over to circulating oil lubrication without any subsequent changes being required.

DE and NDE bearings are designed as floating bearings with a ± 3.5 mm axial play. The motor rotor and the drive train must be axially guided by the driven machine through a coupling that limits the axial play.

Quiet with optimum cooling

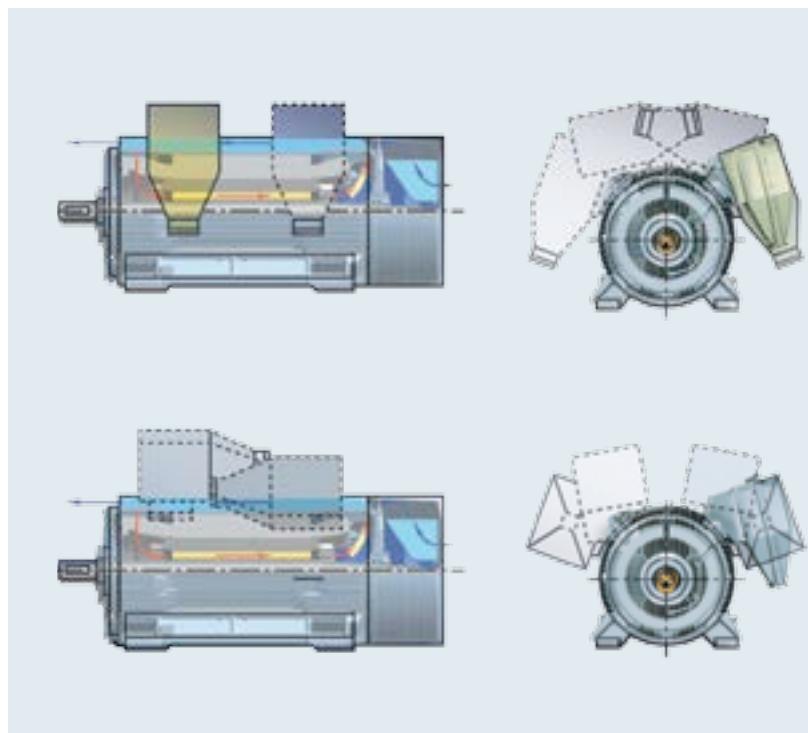
Work safety – always an important issue. The SIMOTICS HV/TN series H-compact is especially quiet. The fan unit and the enclosure have been optimized to achieve better acoustic properties and quieter operation. Experience this yourself. Work safety directives are maintained in most cases without having to apply complex sound dampening measures.

Terminal box

The motors have a very flexible terminal box concept. The terminal box can be mounted at the drive end as well as at the non-drive end – and either at the left or right. Further, the terminal box can be ordered in 4x90° positions, which means that the cable entry position can be selected.

Innovative cooling

SIMOTICS HV/TN series H-compact motors have surface as well as inner cooling. Effective cooling is a decisive factor for high voltage motors as good heat dissipation permits a high power density to be achieved. Another objective is to achieve a uniform temperature level. This reduces the thermal load on the motor components (e.g. winding and bearings), and therefore increases the service life and reliability of your motor.



Mounting position



Sectors and applications

The SIMOTICS HV/TN series H-compact is used in many sectors and applications, always optimally adapted to the prevailing conditions. The first and foremost priority for every motor is that it is absolutely dependable. In other words: The highest degree of availability is always demanded. Based on our extensive know-how, we can offer you a family of three-phase high-voltage motors that sets standards when it comes to reliability and flexibility. This makes it the ideal workhorse to tackle the widest range of applications in the widest range of locations.

Application-specific versions and certifications

Our motors can be used in all industrial areas and sectors as a result of the comprehensive range of options. Versions are available that guarantee ruggedness and a long service life, especially to address extreme climatic and industrial conditions.

This motor series is designed to be used globally, and has a wide range of certificates for specific countries. This is complemented by marine certifications from all of the known marine classification societies and certificates relating to explosion protection.

These motors are used in the following sectors, for instance:

Oil and gas, petrochemical, chemical, mining, water/wastewater, marine, cement, steel industry, energy generation

Typical applications include:

Pumps, compressors, fans/blowers, extruders, mixers/crushers, conveyor belt systems

Harmonized system solutions for variable-speed operation

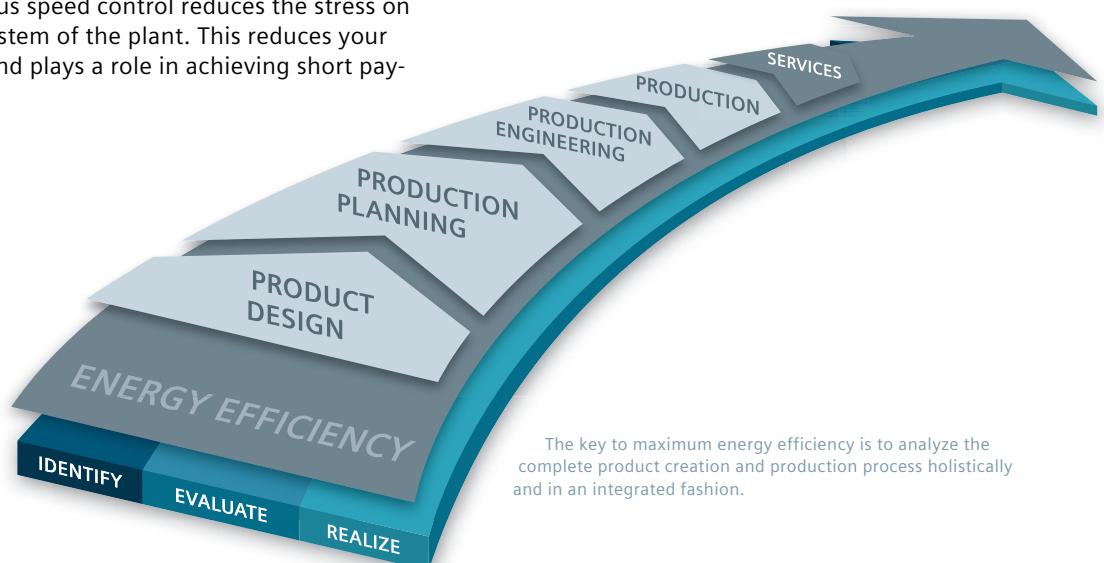
Drive systems with the highest degree of availability and efficiency can be achieved by combining SIMOTICS HV/TN series H-compact motors with converters from the following families: SINAMICS Perfect Harmony for medium voltage as well as SINAMICS for medium and low voltage.

Lower energy consumption

When using converters, energy consumption can be slashed by 60% – and in extreme cases even up to 70% – by being able to flexibly adapt the drive power to the demand of the plant or system. This is because pumps, fans and compressors can be frequently operated in the partial load range. This is the reason when using fixed-speed drives, material transport must be reduced, for instance using a throttle valve. As a consequence, without even having the advantage of flexible variable speed-operation, a large percentage of the drive power remains unused – and just who can afford this these days?

More precise processes have a short payback time

In many cases, converter operation allows processes to be more precisely controlled. Soft starting and stopping as a result of continuous speed control reduces the stress on the mechanical system of the plant. This reduces your operating costs, and plays a role in achieving short pay-back times.



The key to maximum energy efficiency is to analyze the complete product creation and production process holistically and in an integrated fashion.

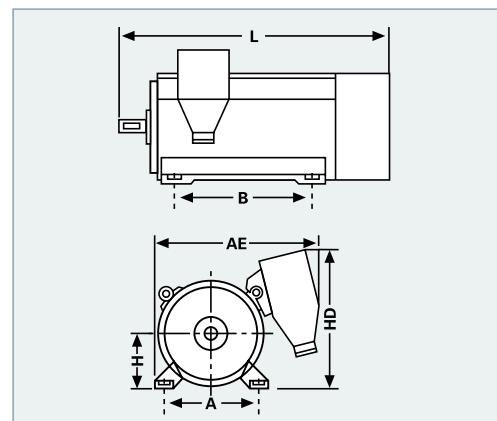
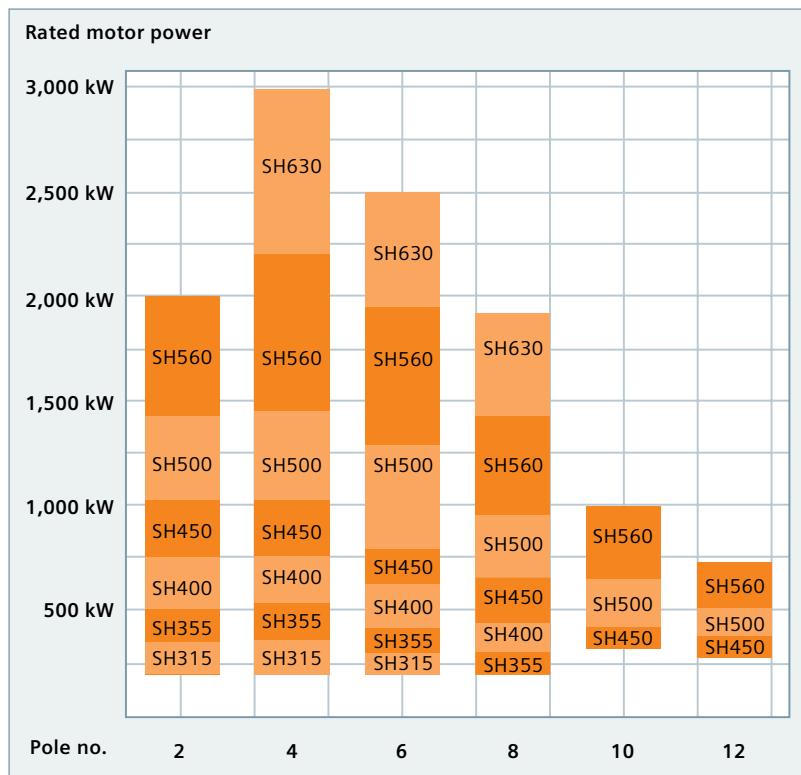
H-compact

Technical data and dimensions

We can provide you with a wide range of finely-scaled types. Our motors are available for rated voltages from 2 to 11 kV (as low-voltage system, also 690 V) – and rated frequencies of 50 or 60 Hz.

Pole numbers 2 to 12, as well as versions in types of protection Ex n (non sparking), Ex e (increased safety) and Ex p (pressurized) are available as standard.

	1LA4 self ventilated	1PQ4 force ventilated	1LH4 water jacket cooled
Voltage	690V–11 kV	690V–6.6 kV	690V–4.16 kV
Frequency	50/60 Hz		
Number of poles	2–12	2–8	4–8
Operating mode	Line operation	Converter operation	Converter operation
Shaft height	315/355/400/450/ 500/560/630	450/500/560/630	500
Type of construction	IM B3, IM B35, IM V1		
Degree of protection/cooling method	IP 55/IC 411	IP 55/IC 416	IP 55/IC 71W
Enclosure	Gray cast iron	Gray cast iron	Steel
Rotor cage	Aluminum/copper	Aluminum/copper	Copper
Explosion protection	Ex n, Ex e, Ex p	–	–



Maximum dimensions in mm for versions with roller bearings for 6 kV						
B	900	1,000	1,120	1,250	1,320	1,400
A	610	686	750	850	950	1,060
L	1,785	1,925	2,090	2,390	2,525	2,775
AE	1,075	1,155	1,255	1,340	1,440	1,560
HD	860	930	1,010	1,100	1,200	1,310
H	310	355	400	450	500	560

Service & Support

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Services for industry are becoming a decisive success factor in the competitive environment, irrespective of whether in the production or process industry. This is as a result of the high cost pressure, increasing energy prices and increasingly stringent environmental regulations.



Siemens can support you worldwide with product, system and application-related services over the complete lifecycle of your plant or system. From planning and development through operation up to modernization, you profit from these services, also from extensive technological and project knowledge and the sector competence of Siemens experts. This means that downtimes can be reduced – and the use of valuable resources optimized. This results in higher productivity, flexibility and efficiency with lower overall costs.

You have access to our service & support at any time, assisting you in all areas of Siemens drive technology. Based on our global network of workshops, we can reduce downtimes caused by failures to an absolute minimum. We are represented in more than 100 countries as your reliable local partner, providing you with support over the complete lifecycle of your plants and machines.

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