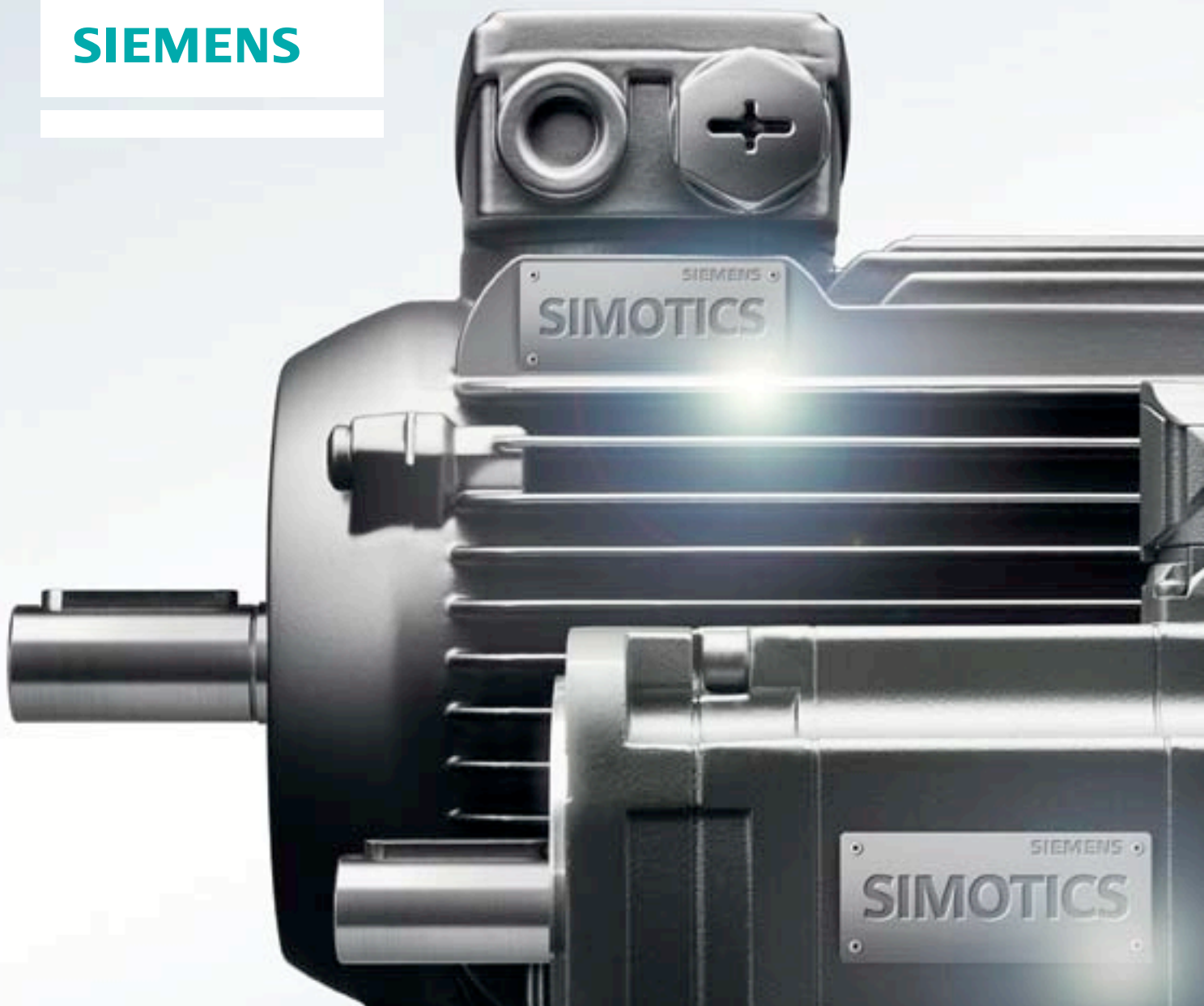


**SIEMENS**



The only thing that we were able  
to improve: the name

The most comprehensive range of motors is now called SIMOTICS

[siemens.com/simotics](http://siemens.com/simotics)

Answers for industry.

*SIMOTICS motors are outstanding when it comes to performance, quality and efficiency.*



## Whatever proves itself of value also deserves a name – SIMOTICS

The history of today's most comprehensive range of motors worldwide started approximately 150 years ago as Werner von Siemens developed the dynamo-electric principle in 1866. This formed the basis for designing powerful electric motors, therefore allowing them to become widely established in industry. Since then, motor development has remained a core business of the company – and Siemens with more than 100 years of experience is still the pacesetter when it comes to innovative motor technology.

Today, in industrial plants and systems around the world, many millions of Siemens motors are ensuring motion and efficient operation. In all sectors, applications and performance classes. Starting with energy-efficient low-voltage motors through motion control motors with a high dynamic performance up to DC motors and powerful high-voltage motors. Through ongoing and persistent innovation, Siemens has always been able to prove its competence when it comes to electric motors. For instance, just recently with the development of a high-speed, high-voltage motor with up to 15,000 rpm in the Megawatt range. Or the presentation of the new motors for motion control main drives in the power range from 2.8 up to 1340 kW. As a result of employing a completely new modular system, these motors can be flexibly and optimally adapted to each and every application. These are just two examples of motors, which constantly prove

themselves in use and are convincing through their quality, efficiency and compactness. For all of the motors, the only thing that was missing up until now was a name that reflected their outstanding performance. Now they have it: SIMOTICS.

### *SIMOTICS stands for:*

- 125 years of experience in building electric motors
- The most comprehensive range of motors worldwide
- Optimum solutions in all sectors, regions and performance classes
- Innovative motor technologies with the highest quality and reliability
- Highest dynamic performance, precision and efficiency – but still extremely compact
- Essential part of the integrated drive train
- A global network of competence and worldwide service 24/7



### A clearly structured portfolio

The complete SIMOTICS product portfolio is transparently structured according to application-related criteria, to make it easy for users to select the optimum motor. Whether you are looking for a low-voltage induction motor or a motor for motion control applications – you will find your optimum motor. Even if it involves a high-voltage motor with a power rating above 100 MW.

The bandwidth extends from efficient induction motors for pumps, fans and compressors through precise motion control motors with a high dynamic performance for positioning tasks and motion control in handling applications as well as production and machine tools. The portfolio also includes DC motors and powerful high-voltage motors, for example, for ships, rolling mills, ore mills or for large pumps and compressors in the oil and gas sector. We can offer you the optimum motor no matter what you have to move.

### Always a strong performance

What makes all SIMOTICS motors stand apart is their quality. They are rugged, reliable, have a high dynamic performance and outstanding precision. As a consequence, they can ensure the required performance in each and every process and perform precisely as they should. As a result of their compact design, they can be simply integrated into plants and systems in a space-saving fashion. But there is more to come: as a result of their convincing energy efficiency, they play an effective role in reducing your operating costs and protecting our environment.

### A tightly meshed global network of competence and service

SIMOTICS not only offers a level of experience that has been developed over approximately 150 years, but also the know-how of hundreds of engineers, who are continually working around the globe to optimize innovative motor technologies. In intensive exchange of knowledge between one another and in close collaboration with universities and technical colleges, they form a network of competence that is continually growing, as it utilizes synergies and takes advantage of new ideas.

This know-how and this global presence form the basis for the unique closeness to the various sectors and an understanding of the regional requirements. This is clearly reflected in precisely the motor configuration that you require for your particular application. As a result of this presence, our specialists are available to respond to any questions about motors that you might have – at any time, no matter where you are in the world. As a consequence, with SIMOTICS, you profit from a global service network, which optimizes response times and minimizes downtimes as it is always reachable.

### The integrated drive train to perfection

SIMOTICS is perfectly harmonized to the other Siemens product families. Together with the seamless and integrated family of SINAMICS drives and SIRIUS – the complete range of industrial switchgear – as part of the integrated drive train, SIMOTICS can be seamlessly integrated into automation solutions based on the SIMATIC, SIMOTION and SINUMERIK control systems.


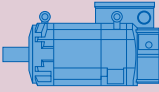


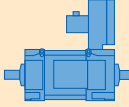
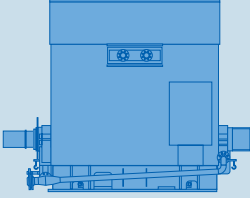
# The complete range for all applications

SIMO

Low-voltage motors for line and converter operation						
	General Purpose	Severe Duty	Trans-Standard	Definite Purpose	Explosion-Protected	High Torque
	GP	SD	TN	DP	XP	HT
						
Power	IEC: 0.09 ... 45 kW NEMA: 1 ... 200 HP	IEC: 0.75 ... 315 kW NEMA: 1 ... 400 HP	200 ... 3,500 kW	0,09 ... 1.250 kW	IEC: 0.12 ... 1000 kW NEMA: 1 ... 300 HP	150 ... 2.100kW
Torque	IEC: 0.61 ... 292 Nm NEMA: 2 ... 883 lb-ft	IEC: 5 ... 2022 Nm NEMA: 1.5 ... 1776 lb-ft	800 ... 22,500 Nm	0,61... 8.500 Nm	IEC: 0.61 ... 8090 Nm NEMA: 1.5 ... 1187 lb-ft	6.000 ... 42.000 Nm
Speed	750 ... 3600 min <sup>-1</sup>	750...3600 min <sup>-1</sup>	750 ... 5,000 min <sup>-1</sup>	750 ... 3.600 min <sup>-1</sup>	750 ... 3600 min <sup>-1</sup>	0 ... 800 min <sup>-1</sup>
Applications	Pumps, fans, compressors, with specific requirements relating to low weight and the highest efficiency	Pumps, fans, compressors, marine applications, offshore, mixers, crushers, extruders, rolling mills with special requirements regarding the ruggedness, especially in the chemical and petrochemical industries	Pumps, fans, compressors, mixers, extruders in the chemical and petrochemical industry, paper machines, mining, cement, steel industry, marine applications	Special motors, for example transport and working roller tables, ventilating tunnels, parking garages, shopping malls, port cranes, container terminals	For general industrial applications with special requirements relating to explosion protection, e.g. in the process industry	Gearless motors with high torques for paper machines, slow-running pumps, crushers, shears for steel, bow thrusters, winches or main drives for marine applications



# TICS

Motors for motion control				DC motors	High-voltage motors
Servo	Main	Linear	Torque	Direct current	High voltage
S	M	L	T	DC	HV
					
0.05 ... 34.2 kW	2.8 ... 1340 kW	1.29 ... 81.9 kW	1.7 ... 380 kW	up to 1610 kW	200 ... 100,000 kW
0.08 ... 125 Nm	13 ... 12,435 Nm	66,3 ... 10,375 N	22 ... 7,000 Nm	up to 44,500 Nm	1290 ... 25,000,000 Nm
up to 10,000 rpm	up to 40,000 min <sup>-1</sup>	up to 1,280 m/min	up to 1800 rpm	up to 3600 rpm	9 ... 15,000 min <sup>-1</sup>
High-speed and high precision applications, e.g. handling systems, wood, glass, ceramic and stone processing, packaging and plastics and textiles machines, machine tools	High precision, high-speed rotary axes, e.g. main drives in presses, printing machines, roller drives and winders in foil machines and other converting applications, main spindle drives in machine tools	Applications with the highest requirements regarding dynamic performance and precision for linear motion, e.g. machining centers, turning, grinding, laser machining, handling and in the machine tool area	Rotary axis applications with the highest requirements regarding position and force, e.g. extruders, winders, roller drives, rotary axes in machine tools, indexing tables, tool magazines	Motors for drive applications in all industrial areas and in the infrastructure	Medium- and high-voltage drive applications including pumps, fans, compressors, extruders, mills, crushers, conveyor belts, refiners, open-cast mining excavators, main drives for ships, main rolling mill drives

# High efficiency up to 1250 kW – SIMOTICS low-voltage motors

Every drive application is different – which is reflected in our solutions. SIMOTICS low-voltage induction motors cover a wide application range up to 1250 kW. As standard and special versions, they form the basis for powering most industrial applications. The high-efficiency motors are available in graduated efficiency classes according to current legislation and standards for a positive energy balance. They are produced using the latest environmentally friendly technologies and are so cost-effective that generally they have a payback time of two years or less.

## Light and compact – SIMOTICS GP

With their light, compact aluminum frame, SIMOTICS General Purpose motors are predestined for pump, fan and compressor applications as well as for cranes. With their high efficiency, they play a significant role in noticeably reducing operating costs and achieving a significantly optimized eco-balance.

## Master extreme conditions – SIMOTICS SD

The compact SIMOTICS Severe Duty motors have a rugged cast-iron frame, which allows them to master harsh or demanding conditions. They stand up to the dust and vibration typical for crushers and mixers as well as aggressive atmospheres in the petrochemical industry.

SIMOTICS GP and SD motors with increased output power can be used where space is especially restricted – also for retrofits. These motors allow power ratings with efficiency class IE2 to be achieved in the next smaller shaft height.

## Versatile with a long service life – SIMOTICS TN

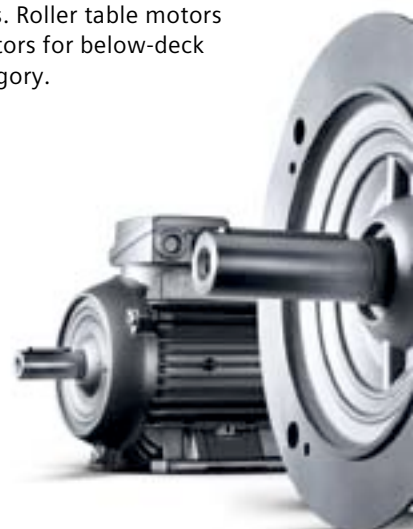
Our trans-standard motors have been designed for use under harsh conditions. They have rugged cast-iron bearing shields and frames, a high degree of corrosion protection, the winding insulation system and an aluminum die-cast squirrel-cage rotor to ensure an outstanding service life. They are ideal for applications with power ratings above 200 kW, for example, in the chemical, oil and gas, cement, mining, steel and marine sectors.

## With explosion protection – SIMOTICS XP

Outstanding service life and extremely safe – this sums up our explosion-protected SIMOTICS XP motors. They have been specifically developed for applications in the chemical and petrochemical industry as well as gas plants – and have proven themselves hundreds of times over in applications around the globe. They offer maximum safety for man, machine and the environment.

## For special sectors – SIMOTICS DP

SIMOTICS Definite Purpose motors are available for quite specific requirements. These include smoke extraction motors for use in public buildings or crane motors to withstand the harsh conditions that prevail in crane operation under extreme weather conditions. Roller table motors for rolling mills as well as ship motors for below-deck applications also fall into this category.



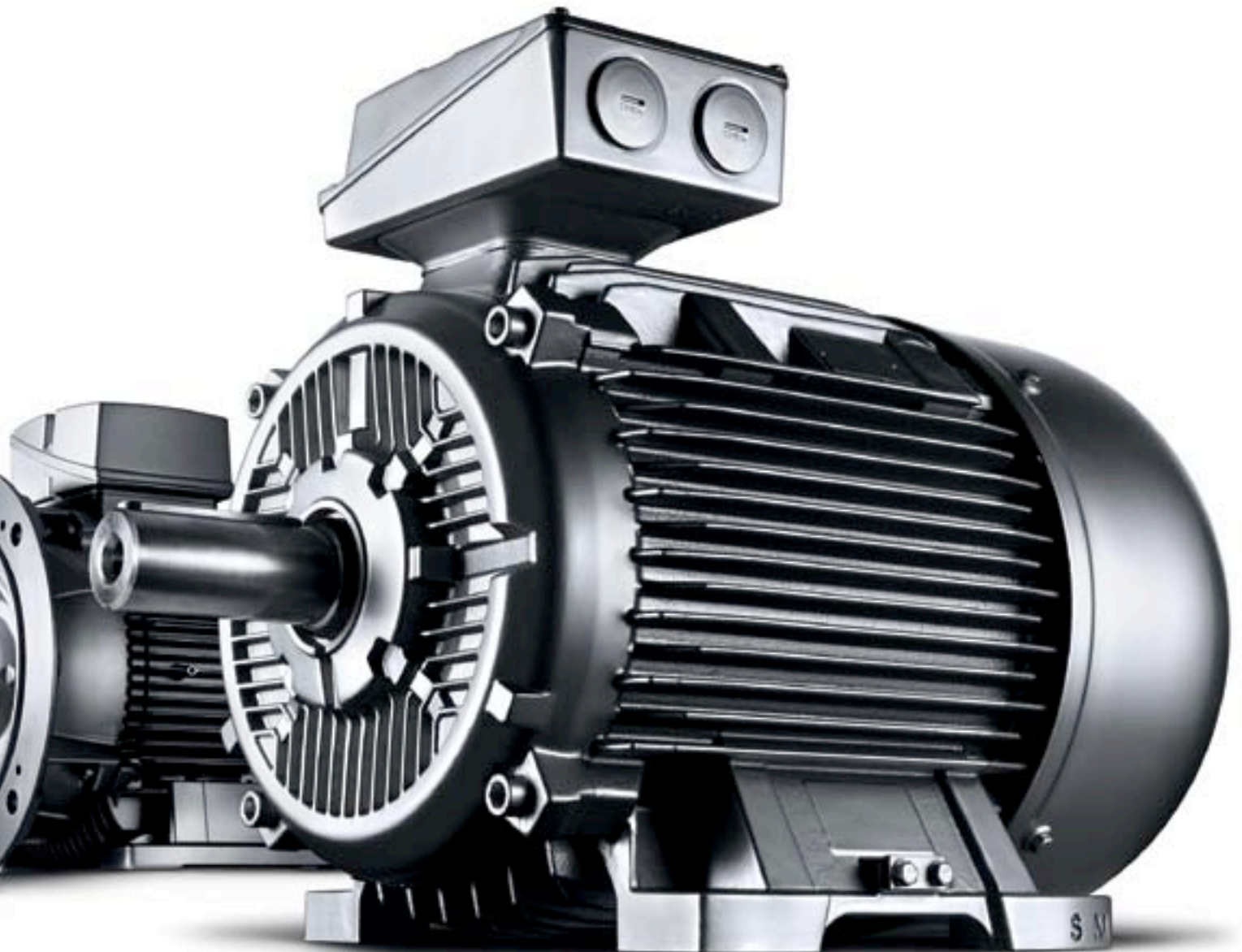


### High torques without gearbox - SIMOTICS HT

SIMOTICS HT is at home in all applications that require a very powerful drive without gearbox, also at low speeds. This permanent-magnet synchronous motor is the powerful low-noise solution for paper machine applications, such as presses or roller drives, in the steel industry, e.g. shears and edgers, in ships, such as bow thrusters, winches or main drives, or in mining/cement, e.g. crushers. In these applications, it clearly and convincingly leverages its advantages regarding efficiency, reliability, operating costs as well as size and weight when compared to conventional drive systems.

### *Ideal for standard and special applications:*

- SIMOTICS GP – light standard motors for general drive tasks
- SIMOTICS SD – rugged, compact motors for use under adverse conditions
- SIMOTICS TN – trans-standard motors up to 1250 kW, with an especially long service life for applications operating under harsh, demanding conditions
- SIMOTICS XP – explosion-protected motors that offer maximum safety for man and machine
- SIMOTICS DP – sector-specific motors for special requirements
- SIMOTICS HT - gearless torque motor for applications demanding high torques



# Dynamic and precise with SIMOTICS motion control motors

No matter whether servo or main, torque or linear motors – no other manufacturer around the world offers such a wide range of motors for motion control tasks. Perfectly harmonized for converter operation with SINAMICS, the overall portfolio is convincing as a result of the compactness, precision and dynamics.

## High dynamic performance and extremely compact – SIMOTICS S

Whether for positioning in pick-and-place applications, for cyclic drives in packaging machines or for path control in handling equipment and machine tools: Our permanent-magnet SIMOTICS servomotors are the first choice wherever high-speed and precise motion sequences are required. Depending on the application, they are available with different integrated encoders – from basic resolvers up to high-resolution absolute encoders. SIMOTICS S Motors are also available with gear units.

## Precise rotation up to 40,000 rpm – SIMOTICS M

SIMOTICS M are main motors for applications where the primary focus is on the continuous and precise rotary motion of axes. They are predestined as main drives for presses, as roll drives in printing and paper machines as well as textile and plastics machines. Further, they are used as winder drives – and are also employed in machine tool spindles and cranes. With a power range extending from 2.8 up to 1340 kW, they cover almost every application.

## Highest precision for rotary axes – SIMOTICS T

SIMOTICS torque motors are optimized for high torques at low rated speeds. With their high precision, dynamic performance and their low wear, they are convincing as built-in motors for rotary cycle machines, indexing tables as well as swiveling and rotary axes, for example, for machine tools. The same also applies to complete torque motors, which are also used as roll and winding drive in converting applications.

## Higher dynamics across the board – SIMOTICS L

SIMOTICS linear motors are the ideal solution if linear motion is to be executed with the maximum dynamic performance and precision. The reason: elasticities, backlash and friction effects as well as natural vibration in the drive train are avoided to a large extent. The reason for this is that when using linear motors, mechanical transmission elements – such as ballscrews, couplings and belts – are eliminated. This simplifies the machine design and reduces wear.

## Individual solutions for special applications

Sometimes there is no way around application specific solutions. We can offer you these: Based on many years of experience, together with our customers, we design and implement application specific motor solutions – perfectly tailored to your requirements regarding both design and performance. Not only this, you profit from the high level of integration in our converter and control environment.

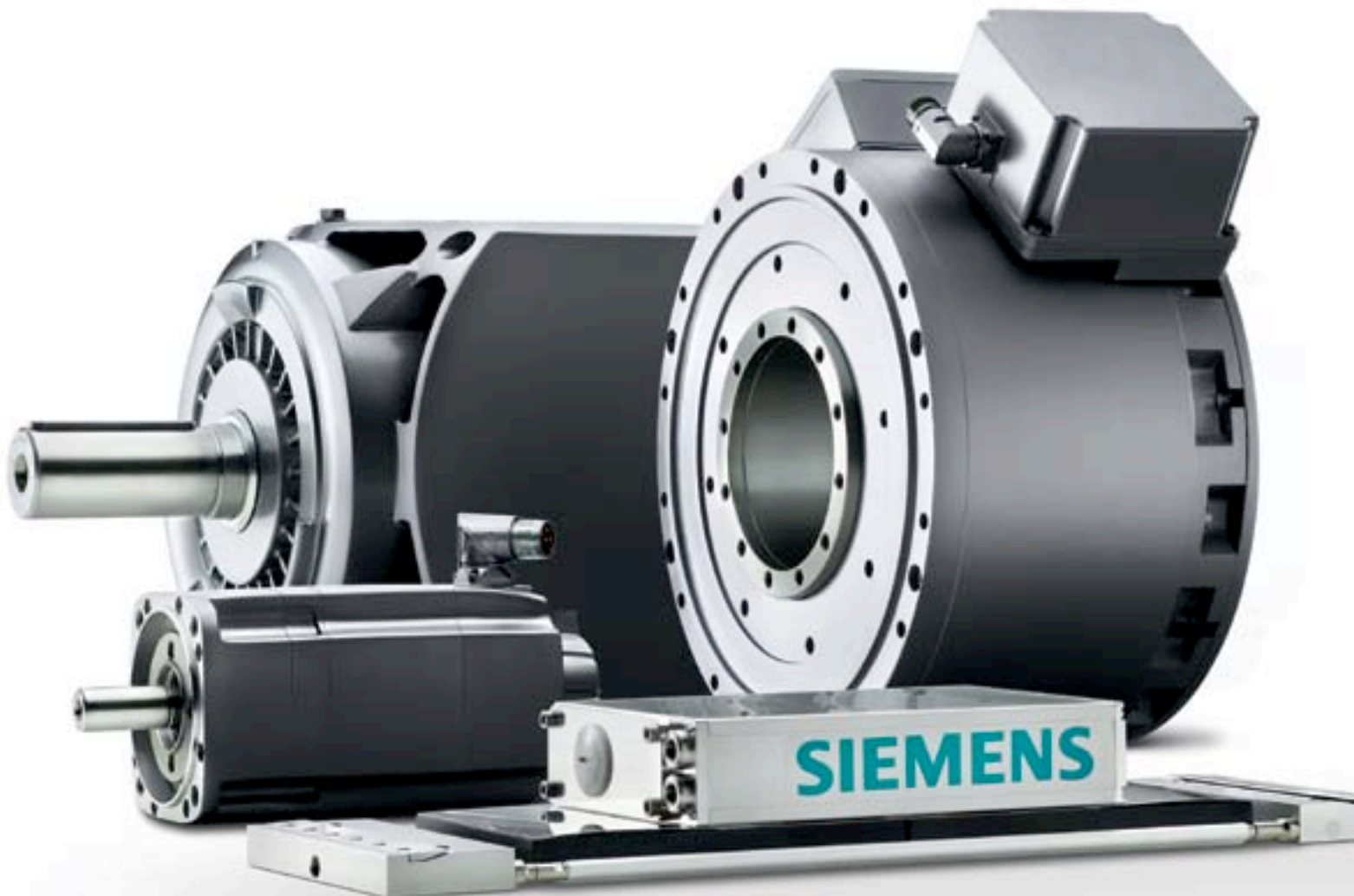


**Optimum system solutions that are harmonized with one another**

SIMOTICS motors are optimally harmonized and coordinated to the family of SINAMICS drives. Based on standard components that are available worldwide, you can obtain motion control solutions that precisely meet your demands and also reflect state-of-the-art technology in all power and performance classes. Electronic rating plates and the DRIVE-CLiQ interface used to connect the motors ensure fast commissioning and smooth operation. State-of-the-art safety concepts can be simply implemented based on integrated encoders with redundant encoder tracks as well as safety functions integrated in the drive. As a consequence, additional external safety components are not required. Prefabricated MOTION-CONNECT signal and power cables guarantee simple and fault-free connection between all of the components.

***Ideal for motion control applications:***

- SIMOTICS S – servomotors for high dynamic and precise positioning and exact motion control – also available with planetary and angled gear-boxes
- SIMOTICS M – main motors for precise and smooth running of rotary axes and main drives
- SIMOTICS T – torque motors for gearless direct drive of rotary axes
- SIMOTICS L – linear motors for the highest dynamic performance and precision for linear motion
- Solutions for specific applications, for example, motors for servo pumps



# From the pioneers of DC drive technology – SIMOTICS DC

Siemens built the first DC motor over 130 years ago, which made it the pioneer for DC drive technology. We still assume this role today. All around the globe, in countless plants and applications, our motors prove themselves in daily use. This is because DC drive technology is reliable, favorably priced and convincing when it comes to operator friendliness and operating characteristics, and just as before, DC drive technology is the solution of choice in many areas of industry and infrastructure. This is the reason why we are still building and marketing this drive technology and continuing to consequentially develop it.

## High degree of reliability for disturbance-free operation

Rugged, low maintenance and with a long service life, our DC motors have been designed for maximum operational reliability. The high mechanical stiffness of the enclosure, bearing shields and shafts ensures a unique level of smooth running and vibration quality. This reduces the load on the motor and extends its lifetime.

The bearings have an especially long service life, which is also true for the commutators and brush holders that all DC motors have in common. The brushes themselves are manufactured out of specially coordinated, low-wear materials, which extend the press lifetimes and rule out brush arcing. Further, the high-quality Durignit 2000® insulating system plays a decisive role in achieving the long service life. This is because it allows motors to be operated under extreme ambient conditions – whether in hot and humid tropical climates or in aggressive industrial environments.

## Optimum operating characteristics

The operating characteristics of our DC motors ensure the highest processing accuracy of machines, therefore guaranteeing the highest and consistent quality of end products. The smooth operating behavior is a decisive issue here, and is achieved by minimizing vibration and torque ripple. Further, the high rate of current change allows a high dynamic performance to be achieved, which in turn provides maximum precision.

## Pleasantly quiet

When it comes to noise, we left nothing to chance for our DC motors. Examples include the special main pole shape and the optimized separately driven fan. These mechanical and electrical design features as well as optimum fan design guarantee an extremely low noise level. This is especially beneficial for the operating personnel and reduces the costs for noise-damping measures on site.

## Always the optimum DC motor

Our DC motors seamlessly address a power range extending from 31.5 kW up to 1610 kW. Self-ventilated, forced-ventilated with or without fan. The modular structure of our portfolio allows all combinations. Our DC motors are available in IP23, IP54 and IP55 degrees of protection for use under harsh ambient conditions. A wide range of options allows the motor to be optimally adapted to the specific project.

*The ideal partner for our  
SINAMICS DCM converters for  
low investment costs and high  
availability in the widest range  
of applications as:*

- Extruders for the plastics industry
- Hoisting and travel gear drives for cranes
- Rolling mill drives and winders
- Rotary kilns for cement factories
- Drives for wire-drawing machines
- Press drives
- Drives for lifts and cable railways
- Paper machine drives



# Maximum efficiency and reliability – SIMOTICS high-voltage motors

Whether synchronous or induction motor, slow-speed rotor or high-speed direct drive, standard motor, customized or sector solution – SIMOTICS high-voltage motors cover all application areas up into the Megawatt class.

## A quasi-standard range for almost all applications

Our range of high-voltage motors addresses all of the usual voltage classes up to 13.8 kV. The range of power rating starts at approximately 200 kW and extends up to 30 Megawatt for induction motors – and even up to over 100 Megawatt for synchronous motors. Most drive applications can be optimally addressed using the wide range of quasi-standard high-voltage motors. Up to 3000 kW, the motors are generally fin cooled, with a modular cooling system, open-circuit-ventilated or equipped with air-to-air or air-to-water heat exchangers.

## Number one regarding compactness, reliability and efficiency

No matter whether fin-cooled or with a modular cooling concept – our high-voltage motors set standards when it comes to envelope dimensions and weight referred to the power rating; this is also true at the highest power levels. And with efficiencies often of 98% and more, they are certainly efficient and at the same time extremely reliable. The reasons include insulation systems such as Micalastic®, which has proven itself over many years and which secures a long winding service life, as well as the uniform cooling of the complete motor and the long bearing life-times. Our high-voltage motors are generally built in conformance with IEC – and for the North American market, to ANEMA. Versions to comply with standards such as API can be simply implemented.

## Customized motors for the highest power ratings

For applications that require a motor design that deviates from the standard, Siemens can offer customized and special sector-specific SIMOTICS motors. These have proven themselves in the widest range of applications. The following examples provide strong evidence of this performance:

- Main rolling mill drives, which as a result of their extremely smooth running properties and dynamic performance, play a role in achieving maximum product quality – even for power ratings of 12 MW, for example
- Gearless ring motors for ore mills with power ratings of up to 30 MW reliably operate even under the toughest of conditions – for example in the Chilean Andes at an altitude of over 3000 m
- Motors integrated in cable drums for mine hoists and open-cast mining excavators
- Main drives for large freighters and cruise ships
- Powerful, high-speed synchronous motors for gas liquefaction plants with ratings of 65 MW and more
- High-speed direct induction motor drives with speeds of up to 15,000 rpm at 4 MW and 6000 rpm at 30 MW – employing a unique rotor technology

*Ideal for applications that demand the highest power and performance, such as:*

- Compressors for pumping and transporting natural gas
- Liquid gas compressors that require power ratings of up to 100 MW
- Large oil pumps
- Main pumps in the water and chemical industries
- Boiler feed pumps in power stations
- Platform drives
- Main propulsion drives for freighters, tankers and cruise ships, extruders, kneaders and mixers in the megawatt range, ore mills and stone crushes, bucket wheel and dragline excavators in open-cast mining, conveyor belt systems with high transport capacities, blowers (e.g. for blast furnaces, which blow several 100,000 cubic meters of air), air separation plants, refineries and main rolling mill drives





# Intelligent tools to select, engineer and configure drive systems

Our tools support you in all life cycle phases of your drive solution – from calculating the payback time of energy-efficient motors, through selecting, dimensioning and configuring products and drive systems, including comprehensive documentation, up to ordering.

## Quickly determine what really pays off – with SinaSave

The SinaSave tool can provide you with answers to questions such as “What is the payback time when investing in a more efficient motor?”, “How high is the cost-saving potential when using variable-speed drives?”, “Does it make sense to change over to direct drives?”. Based on individual operating characteristics as well as system-specific parameters, SinaSave calculates and compares the energy requirement of various drive products and systems. Furthermore, SinaSave tells you the payback time when investing in an energy-efficient drive solution. Based on the investment and operating costs as well as the energy-saving potential, the tool determines the expected payback time. It also provides fast and straightforward help for decision-making when it comes to financially assessing the investment in energy-efficient products. SinaSave is available at [www.siemens.com/sinasave](http://www.siemens.com/sinasave)

## Reliably find what you are really looking for with the DT Configurator

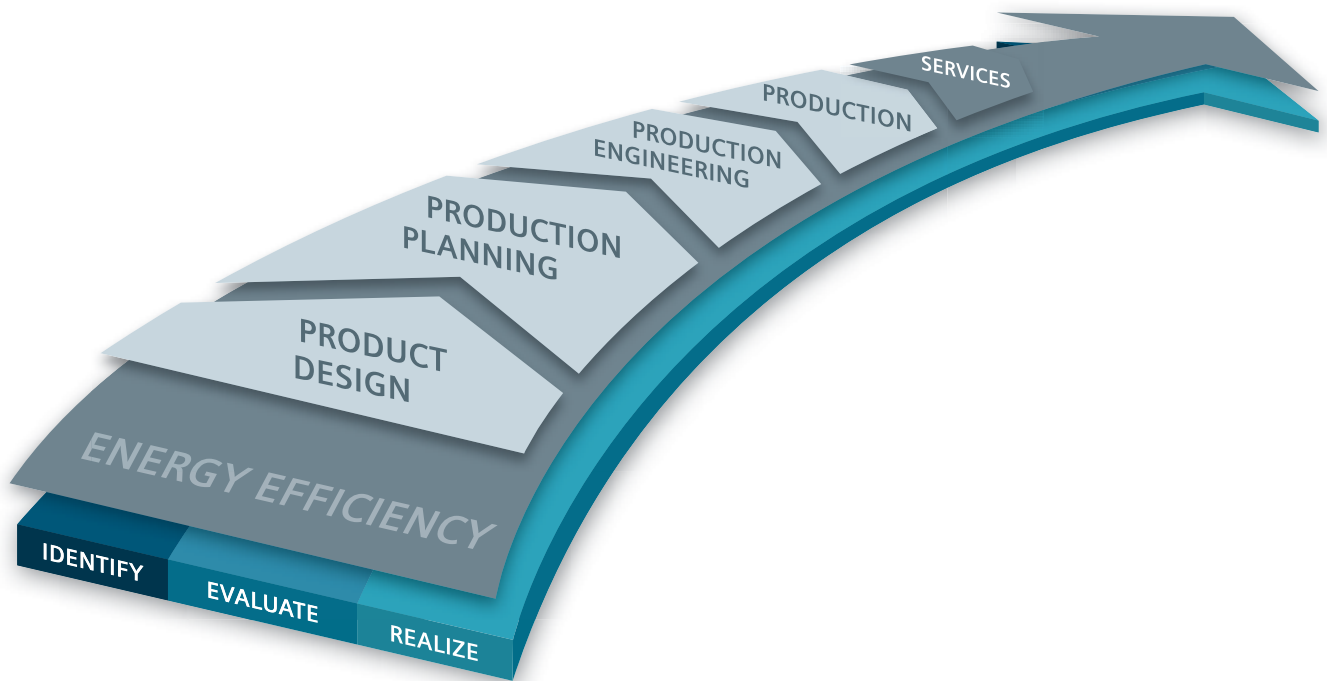
For the many motors and options, the “DT Configurator” is the tool that supports you when selecting the optimum motor for your application. Configuration is convenient and fast using focused navigation with selection menus or by directly selecting a product by entering the ordering number. Comprehensive documentation, starting from the data sheet, operating instructions up to 2D/3D dimension drawings and certificates can also be created. The selected products can be immediately ordered by exporting a parts lists to the shopping cart of the Mall. Also for retrofits, the correct motor is found – even if the previously used motor has an efficiency class that can no longer be supplied as a result of the new efficiency legislation. More information on this topic is available at [www.siemens.com/dt-configurator](http://www.siemens.com/dt-configurator)

## Simply engineer your drive application using SIZER for Siemens Drives

The engineering software SIZER for Siemens Drives decisively simplifies the engineering of all the components required for your drive application. Starting from your application, the program supports you step by step when defining the mechanical system, when selecting and dimensioning frequency converters, motors, gearboxes and additional system components. It also helps you configure the open-loop/closed-loop control system. Here, in addition to the engineering results, such as characteristics, technical data, layout drawings and dimension drawings, SIZER also provides calculations regarding performance and the load-dependent energy requirement. First-time users of the tool can take a guided tour and browse numerous help functions as well as comprehensive physical and technical background knowledge. Simply try it out. You can get to know more at [www.siemens.com/sizer](http://www.siemens.com/sizer)

## Flexible, customized and user-friendly – SIZER WEB ENGINEERING

With the web-based drive engineering tool, you can quickly find the solution for your particular drive application: Menu-prompted workflows specifically guide you when you are selecting and dimensioning products and drive systems – including accessories. Via an integrated query function, SIZER WEB ENGINEERING can also provide you with customized special solutions for applications that cannot be addressed using “Standard Products”, i.e. where the focus is on flexibility and a customized solution. In addition to low-voltage products, you can also engineer high-voltage motors, medium-voltage systems and DC inverters. Comprehensive documentation such as data sheets, starting calculations, dimension drawings, quotation documentation – to name just a few – are a fixed component of this tool. The result: customized solutions for your drive tasks. You can access this tool at [www.siemens.com/sizer-we](http://www.siemens.com/sizer-we)



### Energy efficiency in the future

In machine and plant construction, energy efficiency is a topic that is becoming increasingly more important: on the one hand, because energy is becoming an essential and increasing cost factor for manufacturing industries – and on the other hand, because at the domestic and international level, increasingly more stringent standards and legislation must be complied with. We can offer you everything that is required for a focused energy management:

Products and systems that play a decisive role in significantly reducing operating costs, and at the same time reducing the stress on our climate and environment. As a continuous process, our well-conceived concept ensures continuous reduction of the energy requirement. Our energy management is based on the phases identify, evaluate and realize. We offer the perfect solutions for each one of these phases.

Contact person close to you:  
[www.siemens.com/automation/partner](http://www.siemens.com/automation/partner)

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Subject to change without prior notice 03/13  
Order No.: E20001-A10-M118-V2-7600  
DISPO 21510  
GM.XXXMO.52302 WS 03133.  
Printed in Germany  
© Siemens AG 2013

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