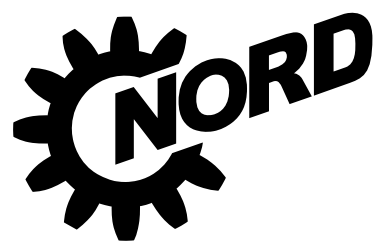


Intelligent Drivesystems, Worldwide Services



EN

**Drive solutions for
stage technology**


DRIVESYSTEMS

Partners in motion

Drive solutions for great events

Stages in community halls, theatres and opera houses require safe, reliable and quiet drive technology. Curtains, podiums, rotating, lifting or sliding stages and stage structures must be brought into the correct position unnoticed by the audience and without endangering the actors and stage hands. For these applications the trend is towards electromechanical drive systems as these are more suitable than relatively complex, high-maintenance hydraulic drives, especially where space is restricted. As compact and cheap alternatives to hydraulic drives, they have proved themselves above all for raising and lowering loads on the stage.

For more than 45 years, NORD DRIVESYSTEMS has been at home in almost every branch of industry where transportation solutions are used for internal logistics. Our drive components and systems are essential wherever things need to be moved, because all movement needs drive - as efficiently and safely as possible. Because of this, we provide the entire spectrum of mechanical, electrical and electronic drive technology from a single source, from motors and gear units to central and decentralised control technology.



Live on stage:

Whisper-quiet technology from NORD DRIVESYSTEMS is used on stages throughout the world, including the Friedrichspalast, Berlin, the Musiktheater, Bielefeld (Germany), the Státní Opera, Prague (Czech Republic), the Alexandrinsky Theatre and the Marinsky II Opera House, St Petersburg (Russia), the National Theatre, Peking (China), the Coex Art Centre, Seoul (Korea) and even in the Opal Theatre on board the cruise ship Oasis, Finland.





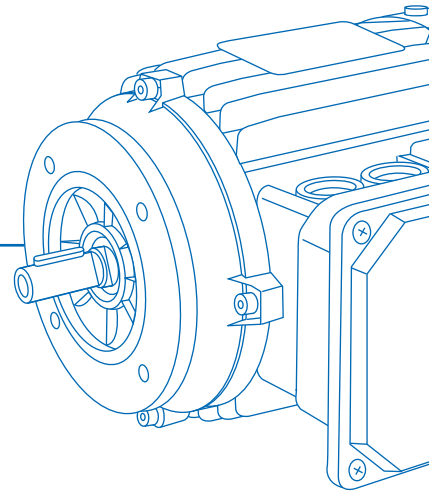
In the spectacular Peking National Theatre, use of especially quiet stage technology equipped with NORD drives ensures that there is no disturbance to the audience's enjoyment.

NORD DRIVESYSTEMS:

- Highest standards of technology and quality
- Comprehensive advice on systems and products
- High availability and rapid service throughout the world



Undisturbed performances



Quiet and reliable

Electromechanical drives from NORD DRIVESYSTEMS are easy to install, use and maintain. They also have exceptionally low noise levels. Thanks to highly responsive frequency inverters, the drive solutions can also be controlled very flexibly, either individually or in groups.

For the specific requirements of stage technology, NORD provides geared motors with maximum torques of up to 200,000 Nm, which can be used in the above- or below-stage machinery of theatres. Gear units for lifts are designed for double the required load and NORD geared motors also fulfil the stringent requirements of DIN 56950 and BGV C1. This ensures the highest possible working safety for people standing in the vicinity of the drive units. All motors are equipped with double brakes, as work goes on continuously under suspended loads such as parts of the stage set or lighting equipment.



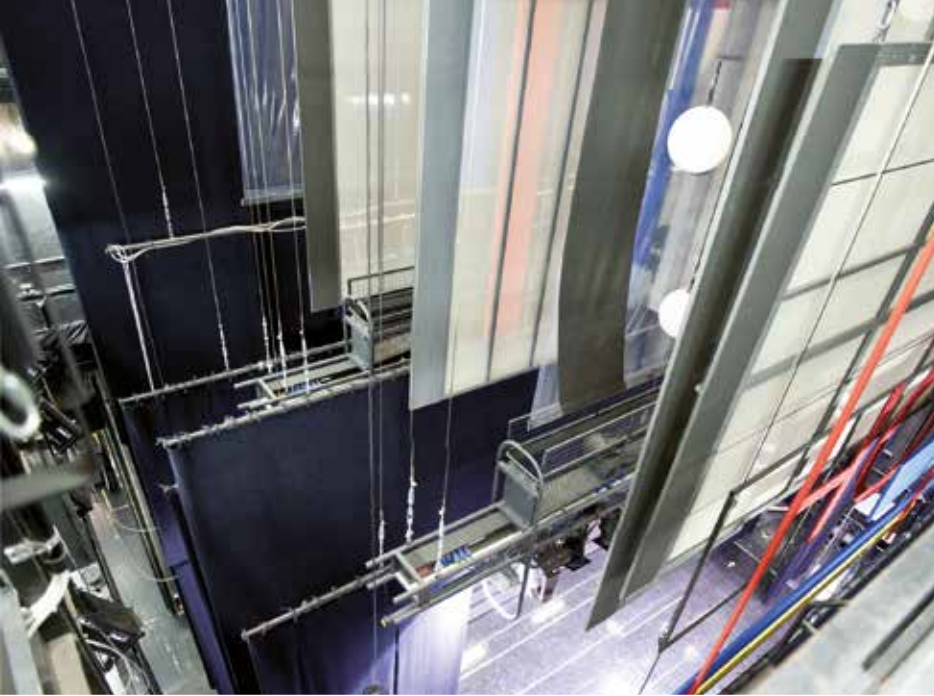
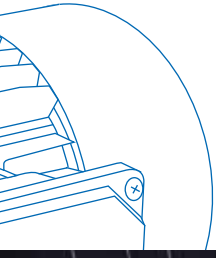
Musiktheater Bielefeld

At the end of the theatre season 2003/2004 the theatre, which was built in 1901, was completely refurbished and reopened in September 2006. The stage technology now uses NORD geared motors.



Opera houses in Moscow (left) and Peking also rely on NORD drive technology.





In the Bielefeld Musiktheater, a multitude of parallel, helical and bevel gear motors from NORD ensure smooth and quiet running behind the scenes. In the first row of the auditorium, the noise level of the motors is less than 35 db(A).

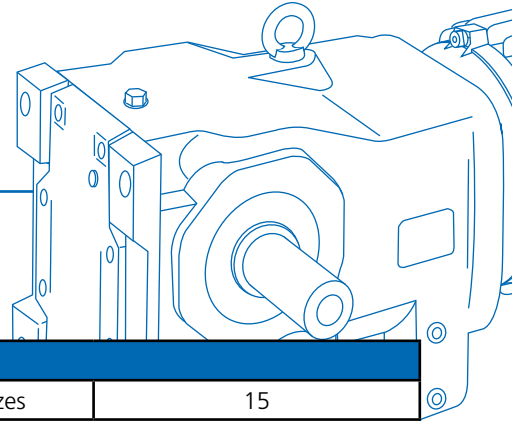
The modular design of NORD drive solutions allows many possible versions. These primarily concern the design and location of drive units, to cater for the individual space situation of different stages.



The selection of the right components for the optimisation of internal processes is decisive for the efficiency and safety of your transportation systems. High quality products, innovative technology and the world-wide presence of NORD guarantee a high level of customer satisfaction.



Efficient UNICASE drive units



Parallel shaft gear units

<ul style="list-style-type: none"> ✓ Shaft mounted, foot or flange-mounted ✓ Hollow or solid shaft ✓ Compact design ✓ UNICASE 	Sizes	15
	kW	0,12 – 200
	Nm	65 – 90.000
	i	4,03 : 1 – 6.616,79 : 1

Bevel gear units

<ul style="list-style-type: none"> ✓ Up to 95 % efficiency ✓ Shaft mounted, foot or flange-mounted ✓ Hollow or solid shaft ✓ UNICASE 	Sizes	11
	kW	0,12 – 200
	Nm	180 – 50.000
	i	8,04 : 1 – 13.432,68 : 1

Helical Worm Gearboxes

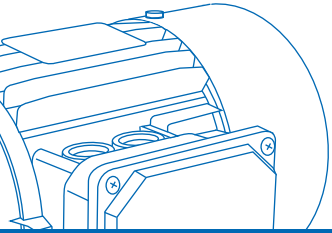
<ul style="list-style-type: none"> ✓ Shaft mounted, foot or flange-mounted ✓ Hollow or solid shaft ✓ UNICASE 	Sizes	6
	kW	0,12 – 15
	Nm	46 – 3.090
	i	4,40 : 1 – 7.095,12 : 1

Industrial Gear Units

<ul style="list-style-type: none"> ✓ Parallel shaft and bevel gear versions ✓ UNICASE design ✓ Temperature management ✓ Wide selection of sensor options ✓ Wide selection of sealing options 	Sizes	8
	kW	2,2 – 1.000
	kNm	25/30/40/50/70/101/141/242
	i	5,54 : 1 – 1.600,00 : 1



DRIVESYSTEMS



The UNICASE concept

A closed housing manufactured from a single block combines all the elements of the gear unit.

NORD is the only manufacturer which produces modular industrial gear units with an output torque of 242,000 Nm in a one-piece UNICASE housing.

- A single housing which integrates all gearbox components
- Complete machining in one step
- High output torque capabilities
- High axial and radial loads
- Great reliability
- Long service life
- Quiet running



NORD UNICASE design since 1981

In the 1980s NORD DRIVESYSTEMS engineers developed the most important innovation in gear unit construction: The UNICASE concept, which unites all gear unit elements in a single closed housing. This innovative concept rapidly became established and is now standard.



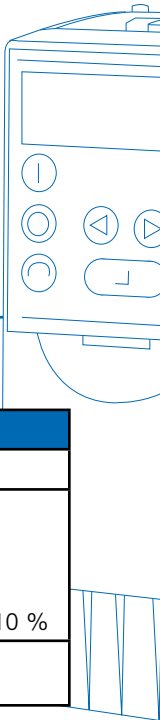
Special low-noise drive units

- Power optimised motor - no cooling required
- Theatre brake
- Synthetic oil filling (VG 680)

Customised solutions






Frequency inverters and accessories



SK 500E		
<ul style="list-style-type: none"> ✓ Compact design ✓ Energy saving function ✓ Performance grading according to application (e. g. "Posicon" positioning control) ✓ Push-on modules for control and communication (field bus) ✓ Ethernet-based BUS systems 	Sizes	11
	U(V)	1 - 110 ... 120 ±10 % 1/3 - 200 ... 240 ±10 % 3 - 200 ... 240 ±10 % 3 - 380 ... 480 -20 % / +10 %
	P(kW)	0,25 – 160

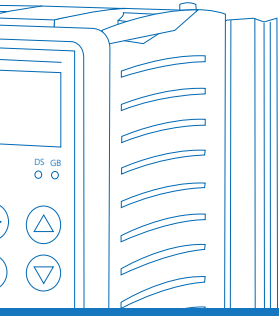


SK 200E		
<ul style="list-style-type: none"> ✓ "Safe stop" as per EN 954-1 ✓ Commissioning via integrated DIP switches and potentiometer possible ✓ Energy saving function ✓ Ethernet-based BUS systems ✓ Performance grading according to application ✓ Decentralised modules combined as a system ✓ Integrated "Posicon" positioning control ✓ On board AS interface 	Sizes	4
	U(V)	1 - 100 ... 120 ±10 % 1 - 200 ... 240 ±10 % 3 - 200 ... 240 ±10 % 3 - 380 ... 500 -20 % / +10 %
	P(kW)	0,25 – 22

Brake technology	Encoder, feedback systems	Option: double shaft sealing rings + shaft material
<ul style="list-style-type: none"> ✓ Electromagnetic spring-loaded brakes ✓ Working or holding brakes ✓ Double brake ✓ IP66 brakes ✓ Rust protection ✓ Dust protection ✓ Air-gap wear monitoring with MIK ✓ Noise-optimised brakes 	<ul style="list-style-type: none"> ✓ Incremental encoders TTL / HTL / sin-cos ✓ Absolute encoders single or multiturn, combined encoders ✓ Sensor bearings ✓ Inductive sensors 	<ul style="list-style-type: none"> ✓ Optimum sealing ✓ Long life seals ✓ Clean gearbox oil ✓ Rust-proof shafts
		



DRIVESYSTEMS



Specialists for innovative stage technology

NORD DRIVESYSTEMS offers intelligent and cost-effective drive solutions with graded equipment versions, which perfectly cater for the requirements of stage technology with regard to power range, supply voltage and size.



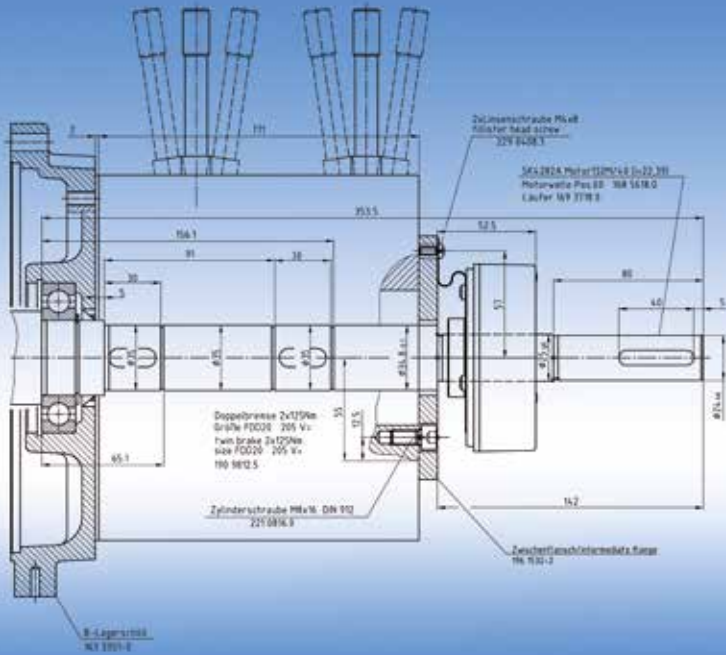
SK 200E

SK 200E inverters are available with almost the same functions as the SK 500E models. The spectrum of applications ranges from simple drive functions to complex positioning control.



SK 500E

With the SK 500E series of frequency inverters, NORD offers intelligent and cost-effective drive solutions with scalable equipment options, which are all fully compatible with regard to motor performance range, supply voltage and sizes.



Intelligent drive systems from a single source

NORD DRIVESYSTEMS drive solutions are based on the principle of the function pyramid: Motors, control units and gears are just as much components as our extensive range of system modules such as planning, project management, installation and service.

NORD produces helical, parallel shaft, bevel gear and worm gear units and is the only manufacturer in the world which produces industrial gear units up to 242 kNm as UNICASE versions. The benefits for our customers include extreme reliability and sealing, safe handling of even the largest output torques, high axial and radial load bearing, quiet running and low maintenance and exceptionally long operating life. With its own gear and motor production facilities, NORD offers its customers complete, sophisticated system solutions with the very highest levels of economy and efficiency.



DRIVESYSTEMS



Left: NORD DRIVESYSTEMS headquarters in Bargteheide, from top: Production plant in Gadebusch, Glinde, Aurich (all in Germany) motor factory in San Giovanni, (Italy, production facility in Waunakee (USA), production in Suzhou (China)

www.nord.com



Always near you throughout the world

For globalisation, we rely on local roots. We have set up a network of assembly factories and service facilities in 35 of the most important industrialised countries, so that local planning advice, high availability of the required drive technology and rapid local service make NORD a flexible and dependable partner for drive systems throughout the world.

- Close to customers thanks to 35 subsidiaries and more than 30 agencies throughout the world
- High availability and rapid service thanks to local presence
- Certification: ISO 9001, UL, CSA, GHOST-R, CCC and ATEX
- Everything from one source, from planning to commissioning
- You can find further up-to-the-minute data and facts about NORD DRIVESYSTEMS under www.nord.com





www.nord.com/locator

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