

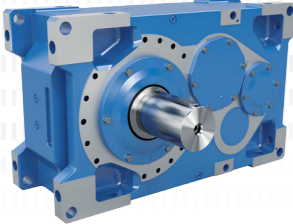
Drive solutions for the crane industry

Industrial Gear Units, Parallel and Right-Angle Gear Units

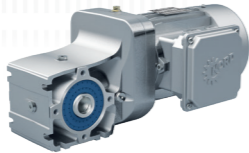


DRIVESYSTEMS

Our Solution. Your Success.



Industrial gear units



Geared motors



Frequency inverters and motor starters

- ▶ Headquarters and technology centre in Bargteheide near Hamburg.
- ▶ Innovative drive solutions for more than 100 branches of industry.
- ▶ 7 production locations with cutting edge technology produce gear units, motors and drive electronics for complete drive systems from a single source.
- ▶ NORD has 48 subsidiaries in 36 countries and further sales partners in more than 50 countries, providing local stocks, assembly centres, technical support and customer service.
- ▶ More than 4,800 employees throughout the world create customised solutions.



Headquarters in Bargteheide



Gear unit production



Inverter production



Motor production



Production and assembly



Motor assembly



Drive solutions for the crane industry

Special drives with integrated brakes and frequency inverter technology for smooth starts and regenerative braking via defined, adjustable ramps are required to enable cranes to pick up loads and set them down gently and precisely. Smooth motion sequences with high positioning accuracy are essential and are often required for parallel movement of the crane and trolley as well as for control and synchronous operation of travelling drives.

Efficient – NORD drive solutions are environmentally friendly and help minimise CO₂ emissions.

- ▶ NORD motors with low inertia are designed for inverter operation and meet the latest international energy requirements
- ▶ Frequency inverters ensure efficient operation, improved process control and optimised motor power
- ▶ Easy to service and maintain: NORD drives reduce standstill times and thus contribute to an increased efficiency and availability of the entire system.

Reliable – It is vital to prevent breakdowns in crane systems. For this reason, reliability is our main focus when developing drive solutions. All of our system components are precisely matched to each other and ensure smooth operation.

- ▶ Gear units with UNICASE housings provide precise positioning of bearings and drive shafts
- ▶ Precisely machined gear wheels with minimum wear are used
- ▶ Exceptionally robust and quiet-running gear unit with particularly long service life
- ▶ FIs protect the drive system electronically and are able to visualise the operating data

Tried and tested – NORD's special solutions for crane systems have proven themselves worldwide.

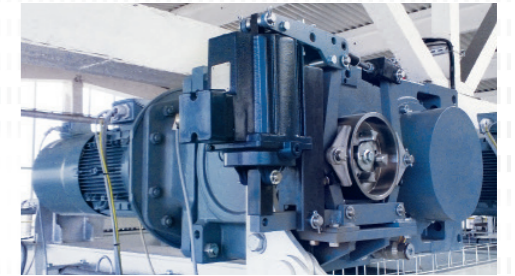
The reasons for this include:

- ▶ The gear units withstand a wide range of ambient conditions. They function both in dusty environments as well as in environments with high humidity, heat and large temperature differences
- ▶ We provide our customers with individual solutions that are tailored to their requirements so that functionality is ensured in all situations



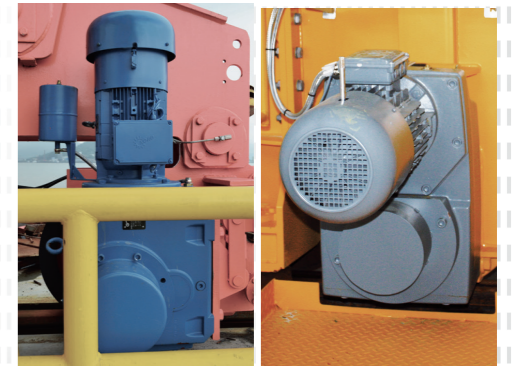
Lifting gear drives

- ▶ Industrial gear units for heavy-duty lifting gears
- ▶ MAXXDRIVE® XD and MAXXDRIVE® G1050 series with output torques of up to 282,000 Nm/2,500,000 lb-in
- ▶ Housing with increased centre distance and in compact design available – according to your requirements
- ▶ Wide range of options including input and output couplings, NEMA/IEC motor adapter and thruster brakes (with console)
- ▶ Modular and flexible design for optimum adaptation to your lifting gear configuration
- ▶ Various solid shaft and hollow shaft designs with different shaft configurations available
- ▶ For smaller lifting gears, NORD's comprehensive geared motor portfolio offers the perfect product for all demands:
 - ▶ Parallel shaft gear unit
 - ▶ Bevel gear unit
 - ▶ Helical gear unit

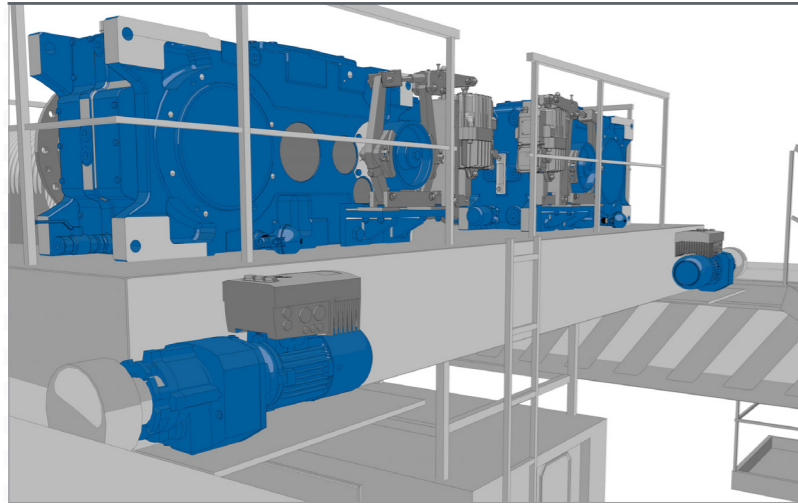


Travelling drives (crane travelling & trolley travelling)

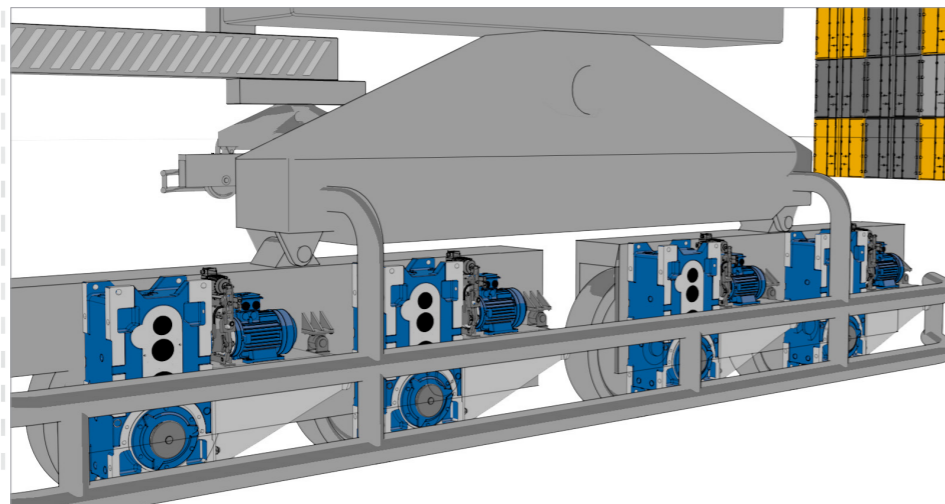
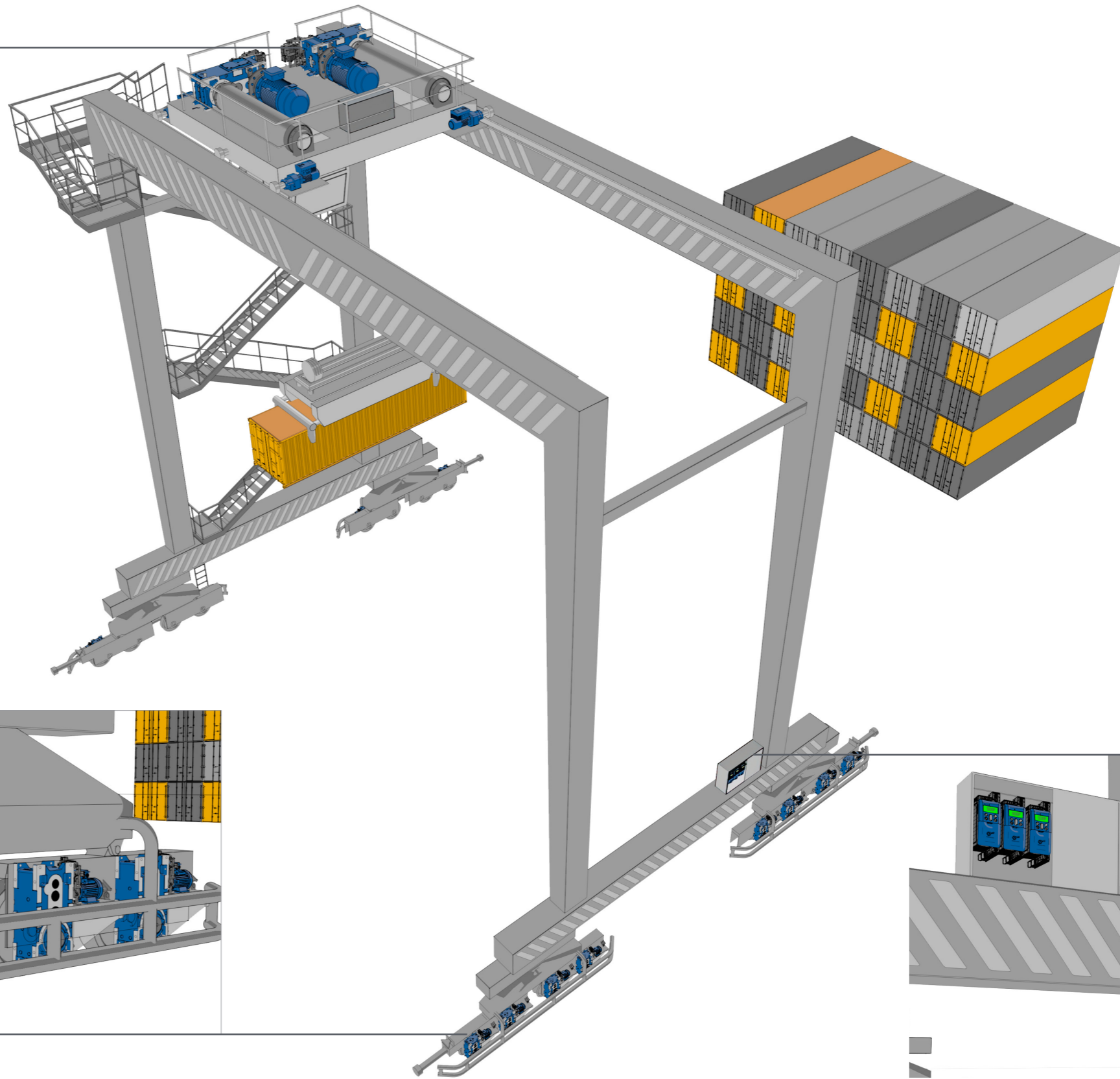
- ▶ Comprehensive portfolio of NORD gear units for all assembly and torque requirements
 - ▶ Parallel shaft gear unit
 - ▶ Bevel gear unit
 - ▶ Helical gear unit
- ▶ Reliable, maintenance-friendly UNICASE housing
- ▶ Premium Efficiency motors according to international standards
- ▶ Motor options
 - ▶ Encoder
 - ▶ External ventilation (IC416)
 - ▶ Brake
- ▶ Painting and sealing systems for harsh environmental conditions
- ▶ Frequency inverter for control cabinet installation and decentralised motor integration
 - ▶ Precise vector regulation with high overload capability
 - ▶ Closed-loop performance and master-follower synchronisation
 - ▶ S-ramp acceleration and deceleration for smooth motion sequences



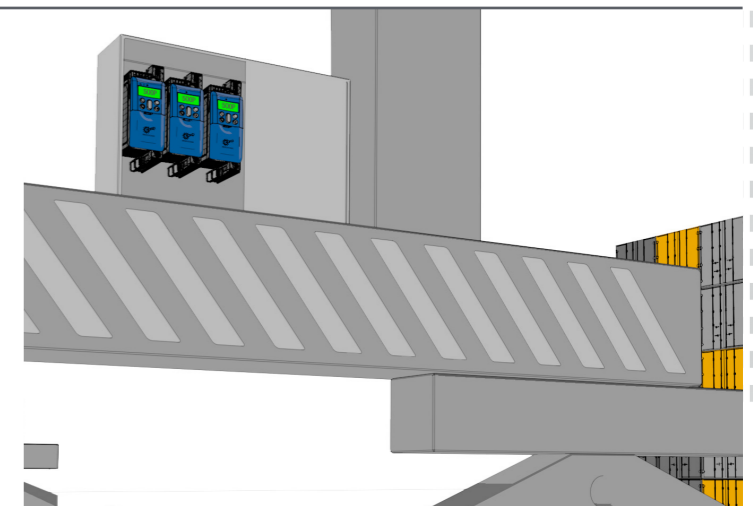
Drive solutions for the crane industry



Lifting gear drives and trolley drives



Travelling drives



Decentralised control cabinet with NORDAC PRO 500P

Drive solutions for the crane industry

The new MAXXDRIVE® XD & MAXXDRIVE® XJ series complete NORD's well-proven MAXXDRIVE® industrial gear units range specifically for lifting gear applications.

Options

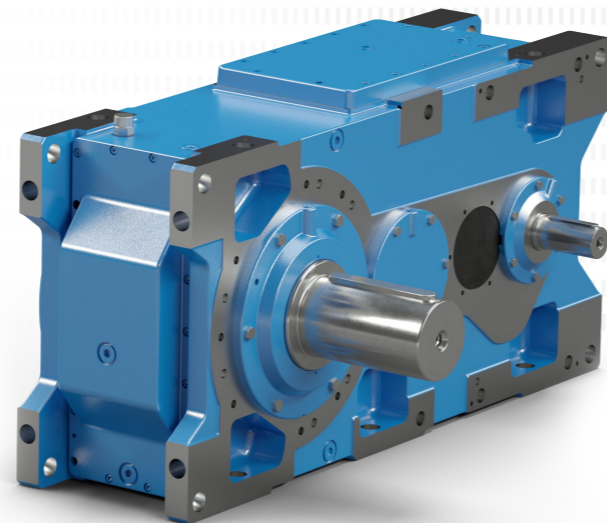
- ▶ Foot-mounting and shaft-mounting (with torque arm) possible
- ▶ Input shaft: Solid input shaft with key groove (single or double extension)
- ▶ NEMA/IEC motor adapter and elastic input couplings available
- ▶ Thruster brake (with brake console) and input flange for flange-mounted brakes available
- ▶ Output shafts: solid shaft with key groove(s), double solid shaft with key groove(s), splined solid shaft DIN5480, keyed hollow shaft, splined hollow shaft DIN5480, hollow shaft with shrink disc
- ▶ Output coupling optionally available: e.g. barrel type (for direct connection to the rope drum)
- ▶ Cast-iron housing optionally available
- ▶ Additional options from our standardised modular system: Oil heater, PT100, Taconite seals, monitoring devices and sensors

Design features

- ▶ Rigid one-piece UNICASE™ housing (GJL)
- ▶ Inspection cover on the top of the gear unit
- ▶ FEA-optimised housing for overhanging loads (especially downward forces)
- ▶ Calculation and design of all components according to the current international standards
- ▶ Stable nominal torques across the entire ratio range

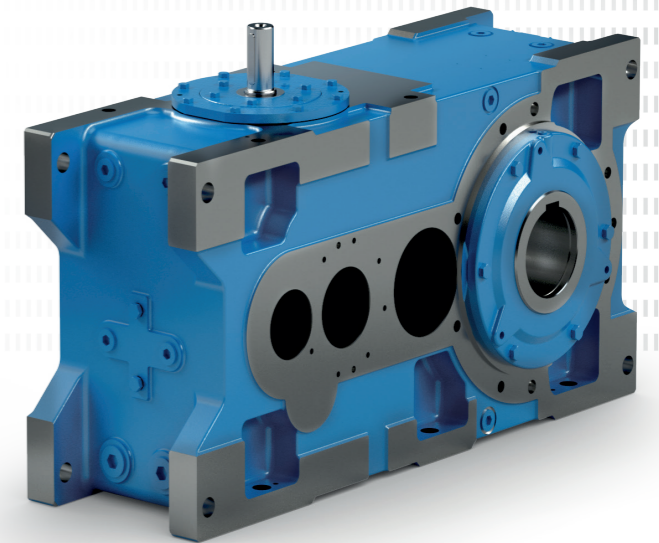
MAXXDRIVE® XD

Gear unit	i_{nom}	$M_{2,max.}$ [Nm]	$M_{2,max.}$ [lb-in]
SK 2221 / SK 2321 / SK 2421	5.6 - 355	6,800	60,200
SK 5321 / SK 5421	28.0 - 355	15,000	132,800
SK 6321 / SK 6421	31.5 - 400	20,000	177,100
SK 7321 / SK 7421	28.0 - 355	25,000	221,300
SK 8321 / SK 8421	31.5 - 400	30,000	265,600
SK 9321 / SK 9421	28.0 - 355	43,000	380,600
SK 10321 / SK 10421	31.5 - 400	50,000	442,600
SK 11321 / SK 11421	22.4 - 355	76,900	680,600
SK 12321 / SK 12421	22.4 - 355	112,800	998,400
SK 15321 / SK 15421	22.4 - 355	282,000	2,496,000



MAXXDRIVE® XJ

Gear unit	i_{nom}	$M_{2,max.}$ [Nm]	$M_{2,max.}$ [lb-in]
SK 5418	18 - 100	15,000	132,800
SK 6418	20 - 112	20,000	177,100
SK 7418	18 - 100	26,500	234,600
SK 8418	20 - 112	31,490	278,700
SK 9418	18 - 100	42,990	380,500
SK 10418	20 - 112	52,300	462,900
SK 11418	12.5 - 71	75,000	663,800
SK 12418	12.5 - 71	107,000	947,000
SK 15418	12.5 - 71	220,000	1,947,100



Drive solutions for:

- ▶ Bridge cranes
- ▶ Wall mounted cranes
- ▶ Portal cranes
- ▶ Travelling cranes
- ▶ Building cranes
- ▶ Jib cranes
- ▶ Floating cranes
- ▶ Container cranes
- ▶ Harbour cranes and
- ▶ Many other types of crane

NORD DRIVESYSTEMS provides:

- ▶ Extensive knowledge of applications and technical support
- ▶ Complete drive solutions from a single source
- ▶ Strong global presence and service
- ▶ Experience from the installation of thousands of drive units in the crane industry
- ▶ Wide range of products with high quality standards
- ▶ Great reliability, economy and service life
- ▶ Recognised product quality compliant with international standards

Drive solutions for the crane industry

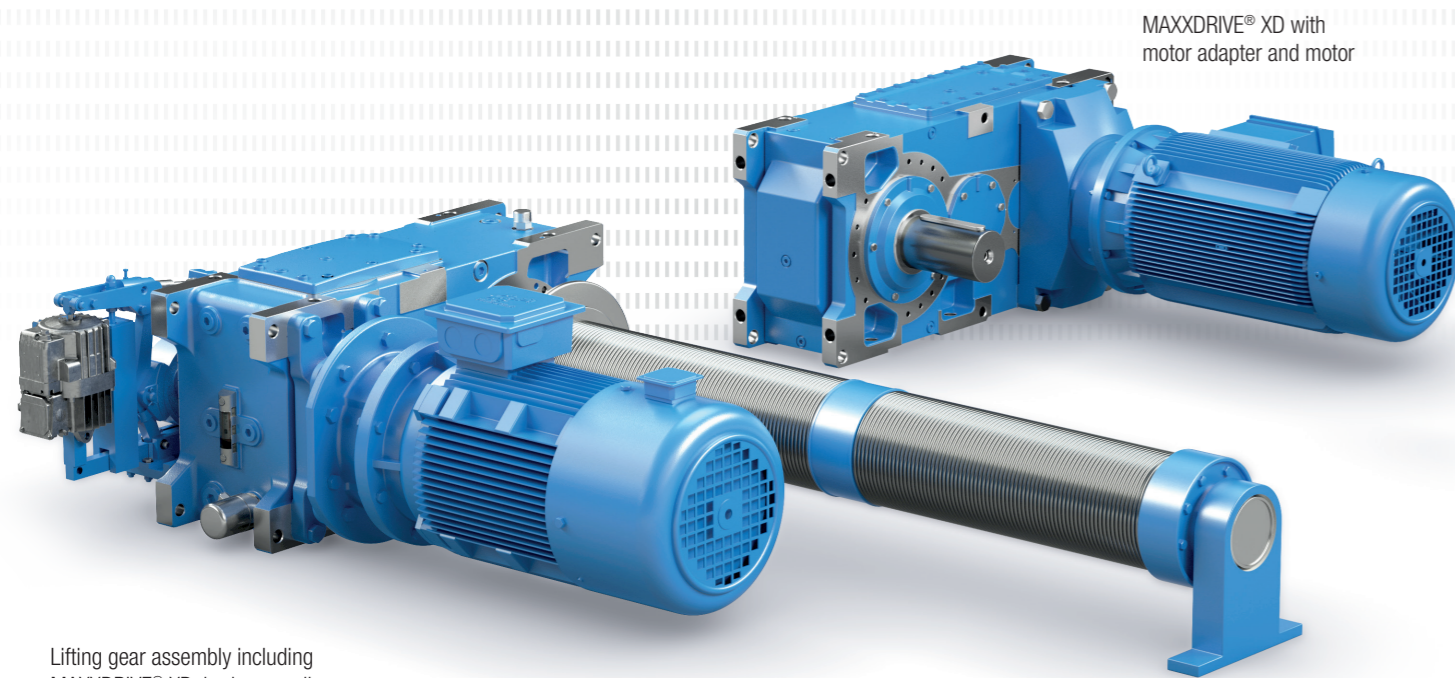
MAXXDRIVE® XD

- ▶ Average increase of centre distance by +35% compared to our compact G1050 series
 - ▶ Maximum space for the U-shaped arrangement of motor and cable drum on the same gear unit side
- ▶ Oversized gear units due to geometric restrictions are a thing of the past:
 - ▶ The new MAXXDRIVE® XD series enables a reduction of the drive weight of up to 60%
- ▶ Precise drive dimensioning is the prerequisite for a cost-optimised crane design:
 - ▶ Reduction of moving masses (lower energy consumption)
 - ▶ Material savings in the steel structure of the lifting trolley
- ▶ Selection in accordance with FEM/DIN EN 13001
- ▶ Identical housing dimensions and centre distance for 3-stage and 4-stage reduction
 - ▶ Standardisation and variant reduction of the lifting gear design
- ▶ Drive solutions that are tailored to the customer's requirements with short delivery times
- ▶ Long service life, low maintenance
- ▶ NORD can supply all drives such as travelling drives from a single source

Designed for versatility

MAXXDRIVE® XD industrial gear units can be used for a variety of applications in the heavy industry such as:

- ▶ Lifting gear drives
- ▶ Travelling drives
- ▶ Trolley drives
- ▶ Jib crane drives
- ▶ Swivel drives



MAXXDRIVE® XD with motor adapter and motor

Lifting gear assembly including MAXXDRIVE® XD, brake, coupling, rope drum, and motor

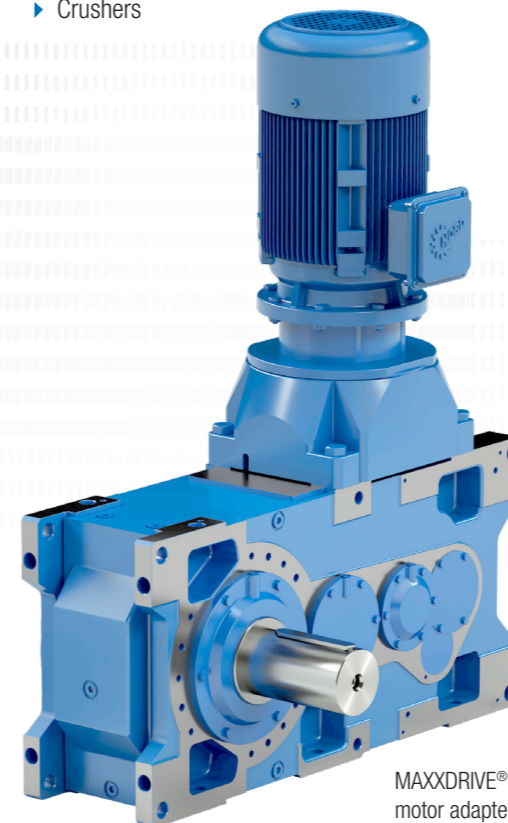
MAXXDRIVE® XJ

- ▶ Special and space-saving "J-arrangement" for travelling drives and crushing plants with large centre distance
- ▶ Suitable for all drive arrangements with narrow installation space due to surrounding peripherals
- ▶ Ratios identical to the 3-stage MAXXDRIVE® XC right-angle gear units
- ▶ Synchronisation via belt drive possible
- ▶ Drive solutions that are tailored to the customer's requirements with short delivery times
- ▶ Long service life, low maintenance
- ▶ NORD can supply all drives, such as travelling drives, from a single source

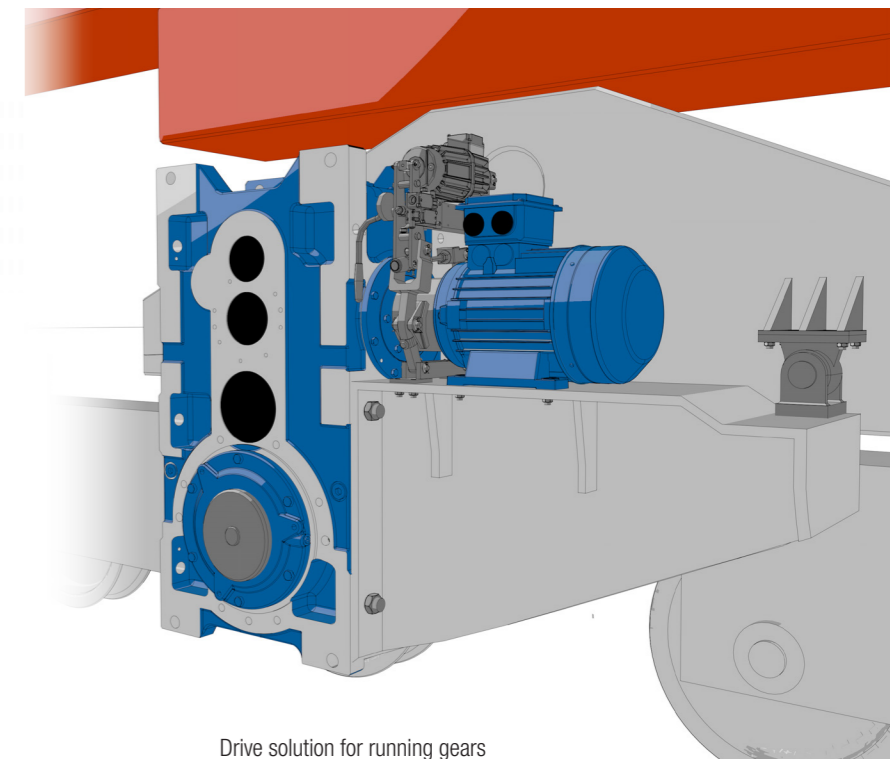
Designed for versatility

MAXXDRIVE®XJ industrial gear units can be used for a variety of applications in the heavy industry such as:

- ▶ Travelling drives
- ▶ Trolley drives
- ▶ Crushers



MAXXDRIVE® XJ with motor adapter and motor



Drive solution for running gears including MAXXDRIVE® XJ, brake, coupling and motor

Options

Input version		XD	XJ
W	Solid input shaft	●	●
W2	Additional input shaft	●	●
W3	Additional input shaft	–	●
W4	Additional input shaft	–	–
IEC	IEC motor adapter	●	●
NEMA	NEMA motor adapter	●	●
WG	First-stage gear unit	●	On request
MT	Motor mount	●	●
MC	Motor bracket	On request	●

Output shaft

V	Solid shaft with key	●	●
EV	Splined solid shaft DIN5480	On request	
VB	Solid shaft with two keys	●	●
L	Double solid shaft with key	●	●
A	Hollow shaft with key	●	●
AS	Hollow shaft with shrink disc	●	●
AM	Solid shaft with GRIPMAXX™	○	○
EA	Splined hollow shaft DIN5480	●	●
B	Fixing element	●	●
H	Cover	●	●
H66	IP66 cover	On request	

Lubrication & thermal options

OT	Oil tank	●	●
SOT	SAFOMI adapter	○	○
LC	Pressure lubrication (bearings)	On request	
LCX	Pressure lubrication (bearings and gearing)	On request	
OSG	Oil inspection glass	●	●
OST	Oil level indicator	●	●
PS	Oil dip-stick	●	●
MG	Magnetic drain screw	●	●
BV	Drain tap	●	●

Lubrication & thermal options		XD	XJ
FAN	Fan	●	○
FAN2	Two fans	On request	–
EFAN	Electrical fan	On request	
CS1	External oil-water cooler	●	●
CS2	External oil-air cooler	●	●
CC/CC2	Cooling coil	●	●
OH	Oil heater	●	●
LTS	Long-term storage	●	●

Seal options

TAC	Taconite seal	●	●
DRY	TRUE DRYWELL	On request	

Vent

FV	Metal filter	●	●
EV	Cellulose filter	●	●
DB	Desiccant breather	●	●
DR	Pressure vent / AUTOVENT™	○	○

Housing design

GJS	Nodular cast iron	●	●
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Bearing design

VL	Reinforced bearing	○	○
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Output version

F	Output flange (threaded hole)	●	●
FK	Output flange (through hole)	○	○
VL2/KL2	Extended bearing spacing	On request	
VL3/KL3	Extended bearing spacing with DRYWELL	On request	
VL4/KL4	Extended bearing spacing with TRUE DRYWELL	On request	
VL6/KL6	Extended bearing spacing with TRUE DRYWELL	On request	
VL5	Axial bearing	On request	

Surface treatment		XD	XJ
NSD	Painting	●	●

Further options

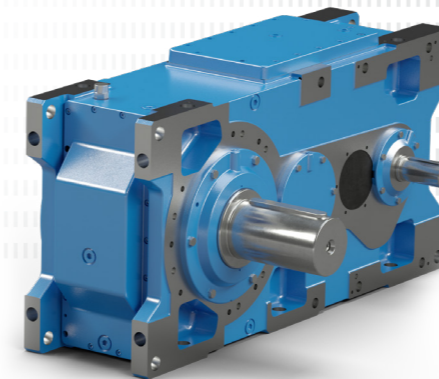
D/ED	Torque arm / elastic torque arm	●	●
R	Back stop	●	●
WX	Auxiliary drive	●	●
F1	Input flange	●	○

● Available ○ Available with restrictions – Not available
Further information on the options can be found in the G1050 catalogue.

Monitoring & maintenance		XD	XJ
PT100	PT100	●	●
EP	Endurance Package	On request	

Additional components

–	Input coupling	●	●
–	Output coupling	●	●
–	Brakes	●	●
BC	Brake console	●	On request
MS	Motor swing base	–	–
MF	Motor base frame	On request	–



MAXXDRIVE® XD parallel gear unit

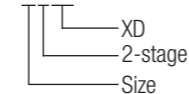
XD = Extended centre distance
(Extended centre distance)

Size: 2 / 5 / 6 / 7 / 8 / 9 / 10 / 11 / 12 / 15

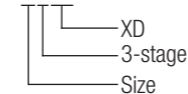
Torque: 6.8 - 282 kNm

Power: 2.5 - 2.300 kW

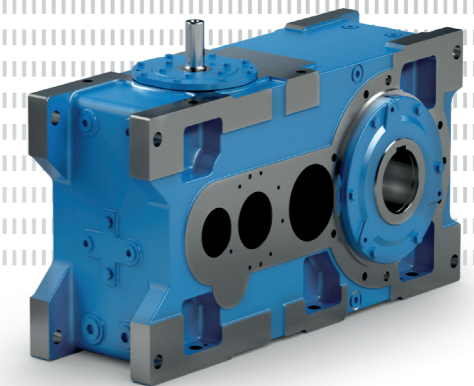
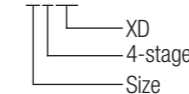
SK_221



SK_321



SK_421



MAXXDRIVE® XJ right-angle gear unit

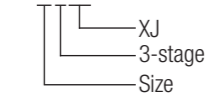
XJ = Extended J-mount
(Extended J-mount)

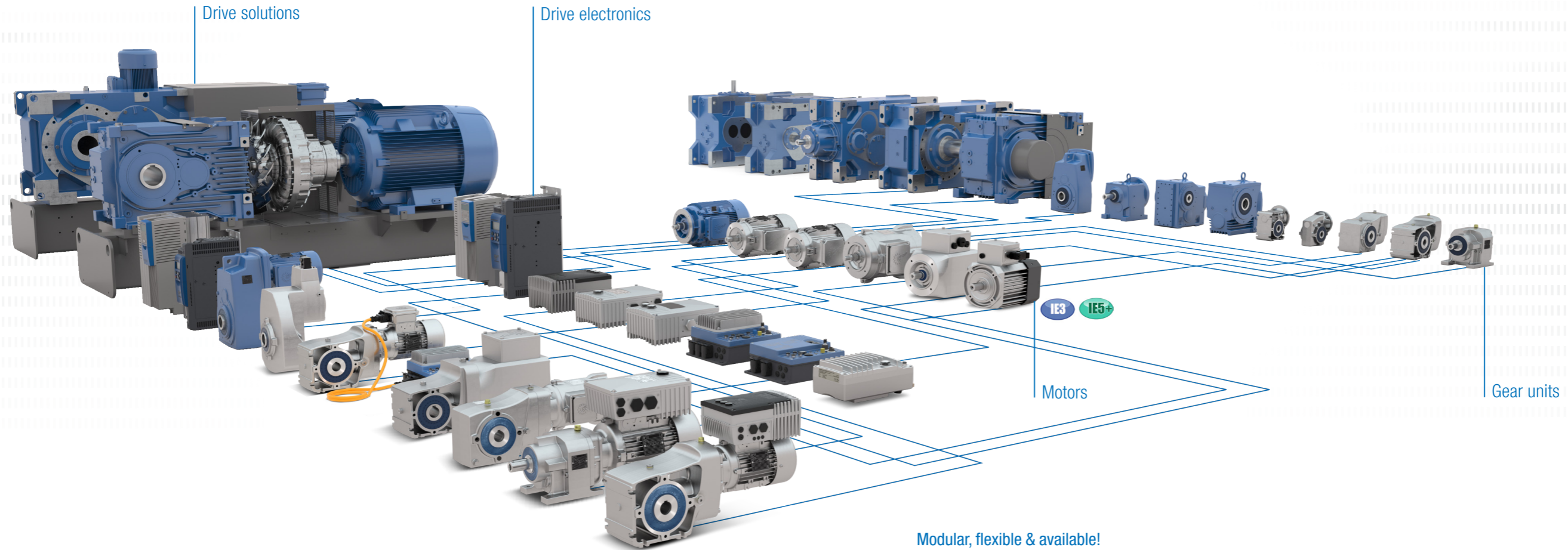
Size: 5 / 6 / 7 / 8 / 9 / 10 / 11 / 12 / 15

Torque: 15 - 220 kNm

Power: 5.5 - 1.800 kW

SK_418





Modular, flexible & available!

An optimum and individual drive solution can be created using the modular NORD system consisting of the gear unit, motor and drive electronics. Each of the variants combine: the highest product quality, short planning and assembly times, high delivery availability, and a good price/performance ratio.



Reliable gear units with one-piece UNICASE housing can cater for any load.

- ▶ High power density
- ▶ Long service life



Powerful motors up to IE4 keep drive systems in motion in all operating situations.

- ▶ Designed in compliance with international standards
- ▶ High overload capacity
- ▶ Energy-efficient



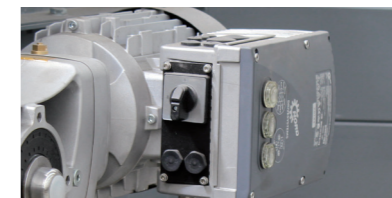
Intelligent drive electronics provide exactly the control options which you need.

- ▶ Scalable functions
- ▶ Full field bus connection facilities
- ▶ Wide power range
- ▶ PLC integrated at no extra cost



Extensive communication options enable access to drives from all levels to enable a wide variety of setting options.

- ▶ All common bus systems
- ▶ Quick and simple commissioning with plug-in control box or using NORDCON software
- ▶ Convenient hand held console for local operation
- ▶ Optionally with intralogistics options



Switches and keys are located directly on the drives and enable direct starting and stopping as well as mode switching.

- ▶ Mains switch
- ▶ Selector switch for local or remote control
- ▶ Start/Stop and Forward/Reverse switch
- ▶ Energy-efficient



All interfaces are designed for ease of use. Drives can be easily configured and installed.

- ▶ Simple Plug-and-Play with all common connection plugs
- ▶ Plug-in supply cable and motor output
- ▶ Plug-in sensors and encoders
- ▶ Pre-assembled cables
- ▶ PLC integrated at no extra cost

UNICASE helical in-line gear units (Catalogue G1000)



- ✓ Foot or flange mounted
- ✓ Long life, low-maintenance
- ✓ Optimum sealing
- ✓ UNICASE housing

Sizes: 11
 Power: 0.12 - 160 kW
 Torque: 10 - 26,000 Nm
 Speed ratio: 1.35 - 14,340.31:1

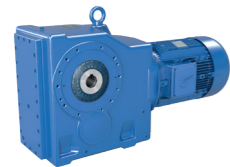
UNICASE parallel shaft gear units (Catalogue G1000)



- ✓ Foot, flange or face mounted
- ✓ Hollow or solid shaft
- ✓ Compact design
- ✓ UNICASE housing

Sizes: 15
 Power: 0.12 - 200 kW
 Torque: 110 - 100,000 Nm
 Speed ratio: 4.03 - 15,685.03:1

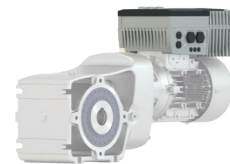
UNICASE bevel gear units (Catalogue G1000)



- ✓ Foot, flange or face mounted
- ✓ Hollow or solid shaft
- ✓ UNICASE housing

Sizes: 11
 Power: 0.12 - 200 kW
 Torque: 180 - 50,000 Nm
 Speed ratio: 8.04 - 13,432.68:1

NORDAC FLEX SK 200E frequency inverters (Catalogue E3000)



- ✓ Energy-saving functions
- ✓ Integrated POSICON positioning control
- ✓ Integrated PLC

Sizes: 4
 Voltage: 1~ 110 - 120 V, 1~ 200 - 240 V, 3~ 200 - 240 V, 3~ 380 - 500 V
 Power: 0.25 - 22 kW

NORDAC PRO SK 500E frequency inverters (Catalogue E3000)



- ✓ Stand-alone operation
- ✓ 4 parameter sets
- ✓ Sensorless current vector control (ISD control)
- ✓ Integrated PLC

Sizes: 11
 Voltage: 1~ 110 - 120 V, 1~ 200 - 240 V, 3~ 200 - 240 V, 3~ 380 - 480 V
 Power: 0.25 - 160 kW

Motors (Catalogue M7000)



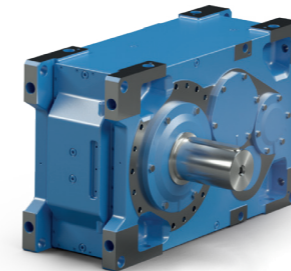
- ✓ IE3 motors from 0.12 kW (Size 63)
- ✓ IE4 synchron- and asynchronous motors



International energy efficiency standards

- ▶ EU: IE1 – IE4 as per IEC 60034-30
- ▶ US: ee labeling as per EISA 2014 (Dept. of Energy)
- ▶ CA: CSA energy verified as per EER 2010
- ▶ CN: CEL as per GB 18613
- ▶ KR: KEL as per REELS 2010
- ▶ BR: Alto Rendimento as per Decreto nº 4.508
- ▶ AU: MEPS as per AS/NZS 1359.5

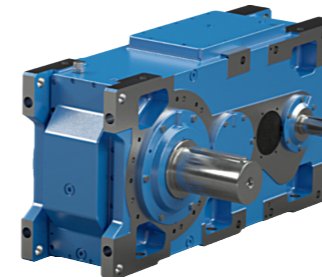
MAXXDRIVE® industrial gear units (Catalogue G1050)



- ✓ Parallel and angled gear units
- ✓ High precision axis alignment
- ✓ Long life, low-maintenance
- ✓ UNICASE housing

Sizes: 11
 Power: 1.5 - 6,000 kW
 Torque: 15,000 - 282,000 Nm
 Speed ratio: 5.54 - 30,000:1

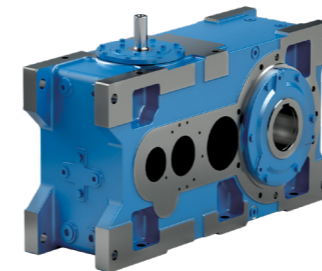
MAXXDRIVE® XD parallel gear units (Flyer S1056)



- ✓ 3- and 4-stage
- ✓ Housing with increased centre distance
- ✓ Inspection cover
- ✓ Housing optimised for downward radial loads
- ✓ Ideal for lifting equipment

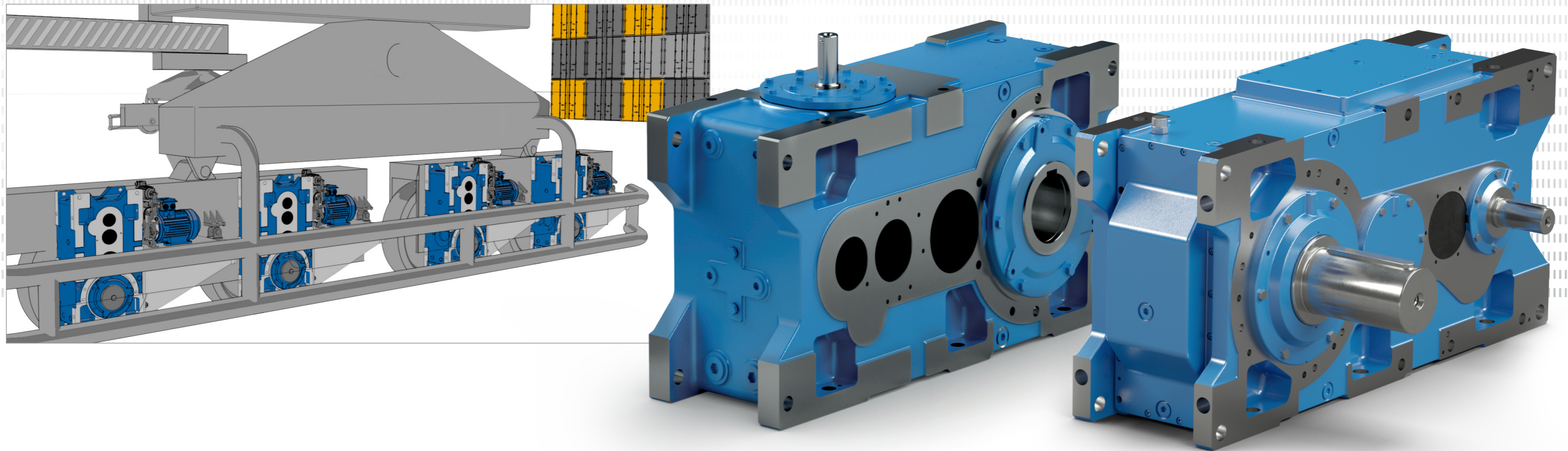
Size: 10
 Power: 2.5 - 2.300 kW
 Torque: 6.800 - 282.000 Nm
 Ratio: 5,6 - 355:1

MAXXDRIVE® XJ right-angle gear unit (Flyer S1056)



- ✓ 3-stage
- ✓ New input shaft position "J-Mount"
- ✓ Horizontal and vertical installation positions
- ✓ Modular
- ✓ Flexible

Size: 9
 Power: 5,5 – 1.800 kW
 Torque: 15.000 - 220.000 Nm
 Ratio: 12,5 - 112:1



Crane cargo: NORD drive solutions

The solution for your crane application. Everything from a single source.

- ▶ Properly dimensioned drive systems from running gears to lifting gears
- ▶ Powerful gear units, efficient motors and scalable drive electronics
- ▶ Robust, sustainable and safely designed according to global industry standards



DRIVESYSTEMS

Our Solution. Your Success.

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