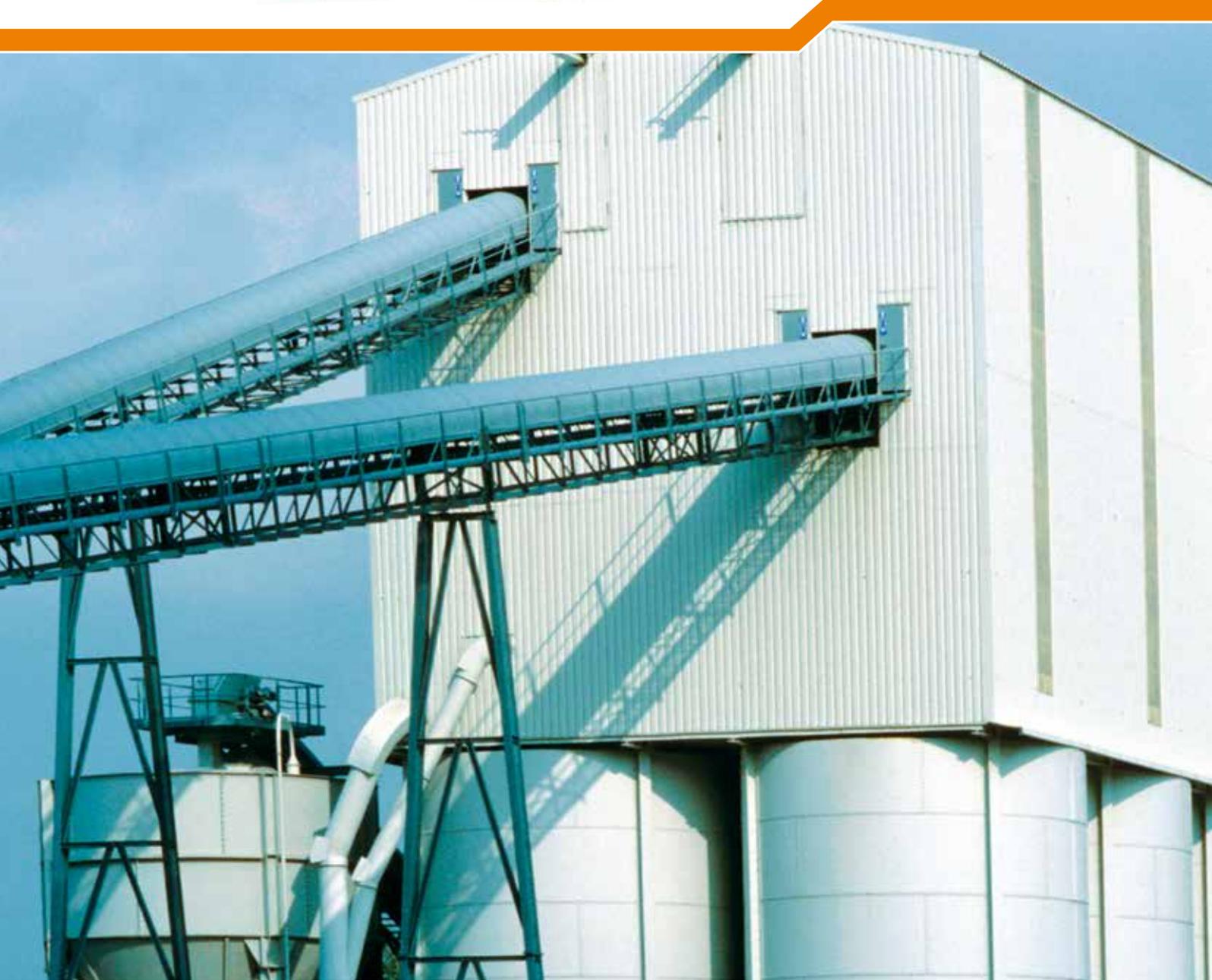


Intelligent Drivesystems, Worldwide Services



®

**Industrial gear units
for conveyor belts and
bucket elevators**

NORD
DRIVESYSTEMS

Partners in motion

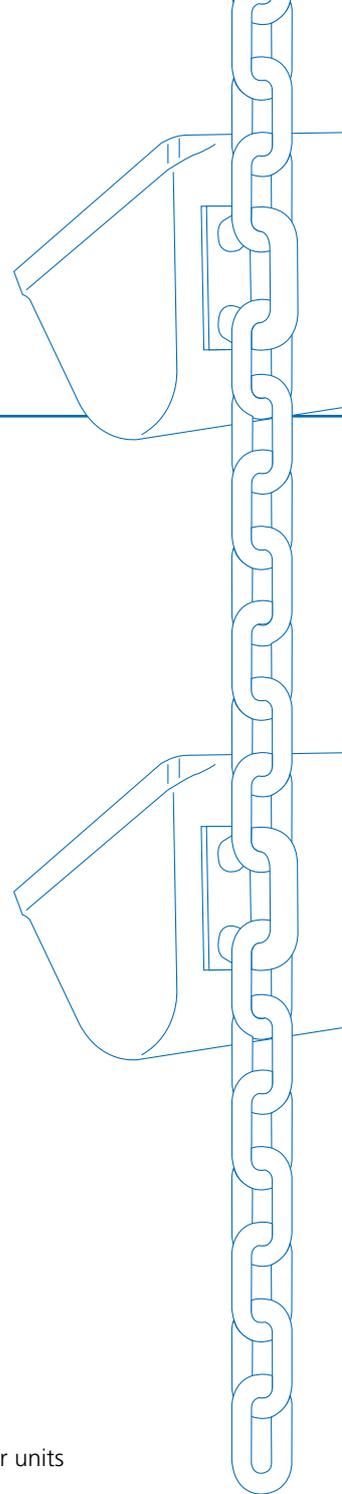
Heavy duty gear units for conveyor belts and bucket elevators

NORD industrial gear units for conveyor and bulk materials handling applications have been developed according to the tried-and-tested UNICASE principle. With all the available options and modules, it is very easy to configure especially compact solutions for both conveyor belt and bucket elevator drive units. For example, identical gear unit rockers, frames and modules are available for both of these applications. This standardisation guarantees quality, reduces the number of components, simplifies inventory and ensures rapid availability to our customers.

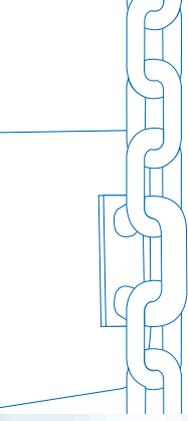
Since 1965, NORD DRIVESYSTEMS has been at home in almost every branch of industry where transportation solutions are used for internal logistics. Our drive components and systems are essential wherever things need to be moved, because all movement needs drive - as efficiently and safely as possible. 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.

Basic information

- 3-stage bevel gear units
- Power ratings
37 kW to 1000 kW
- Gear ratios
 $i=16$ to $i=71$ (max. 300)
- Drive torques
13 kNm to 242 kNm
- UNICASE design



DRIVESYSTEMS



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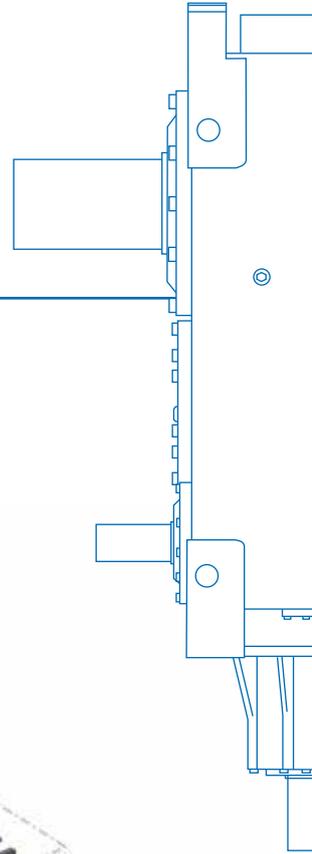
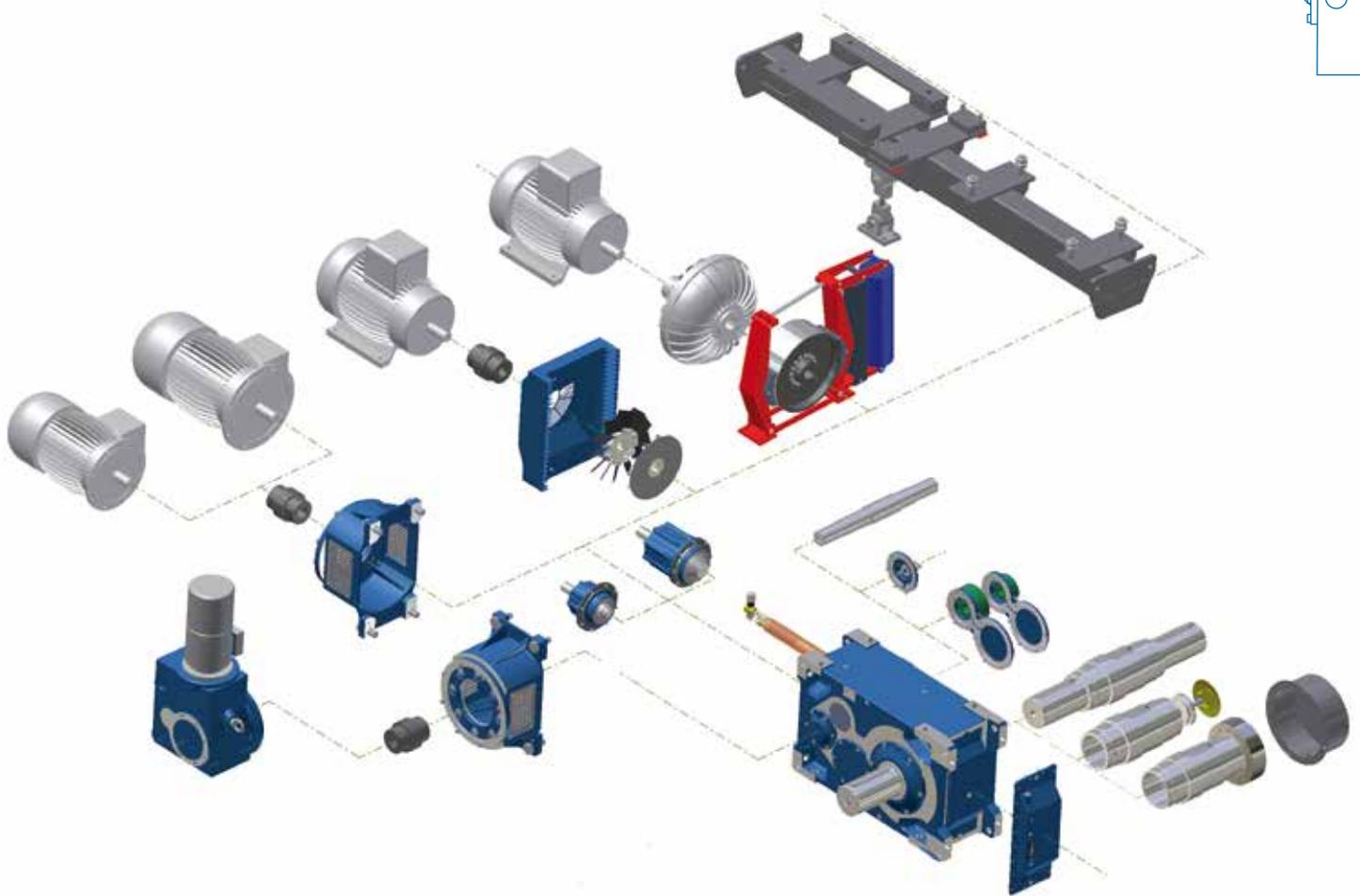
- Highest standards of technology and quality
- Comprehensive advice on systems and products
- High availability and rapid service throughout the world

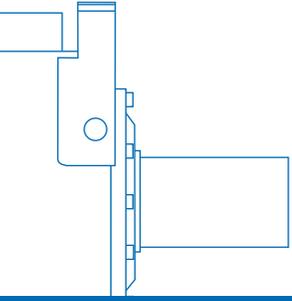
Further application areas for NORD Industrial gear units

- Transport of materials (Belt, plate, bucket, worm, chain conveyors etc.)
- Stacking conveyors and loaders
- Mining industry
- Paper Industry
- Woodworking industry
- Agitators
- Steel industry
- Sugar industry
- Waste water treatment
- Pumps
- Chemical Industry
- Cranes and lifting gear



System overview for conveyor belts and bucket elevators

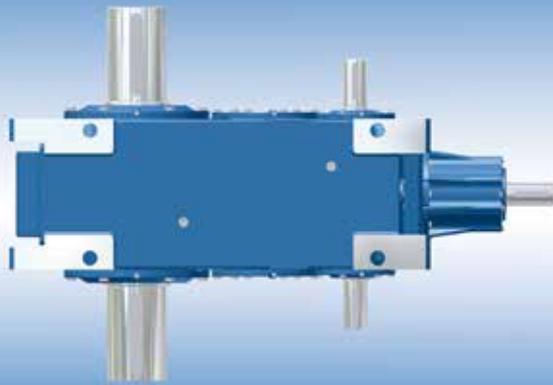




Measuring devices and sensors

The following measuring devices are available as options:

- Inspection glass
- Oil level glass
- Dip-stick
- Pt 100 (Temperature)
- Temperature sensor, PTC resistor
- Temperature monitor, Bimetal switch
- Particle counter (oil)
- Water content (oil)
- Electrical contamination indicator for oil filter
- Optical contamination indicator for oil filter
- SPM-nipple (vibrations)
- Bearing condition monitor with evaluation unit
- Pressure monitoring (oil circulation)
- Incremental encoder
- Special requirements on request



Sealing systems

The following features are available as options:

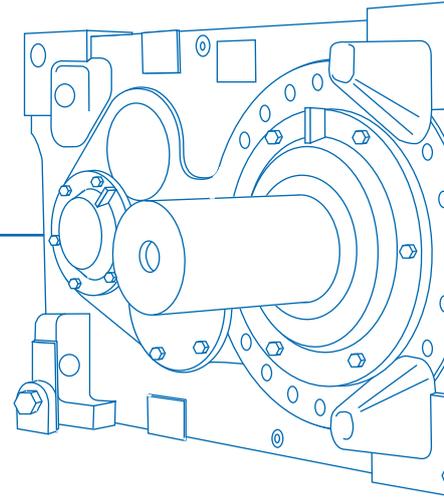
- Single NBR/FKM seals
- Double NBR/FKM seals
- Dust protection seals
- Taconite seals (labyrinth seals which can be re-lubricated)
- Gamma ring seals, dust protection
- NORD dust seals

Temperature management

The following features are available:

- Axial fan
- External oil / air cooler
- Heater cartridges

NORD industrial gear units



Perfect for horizontal and vertical use

Conveyor belt systems

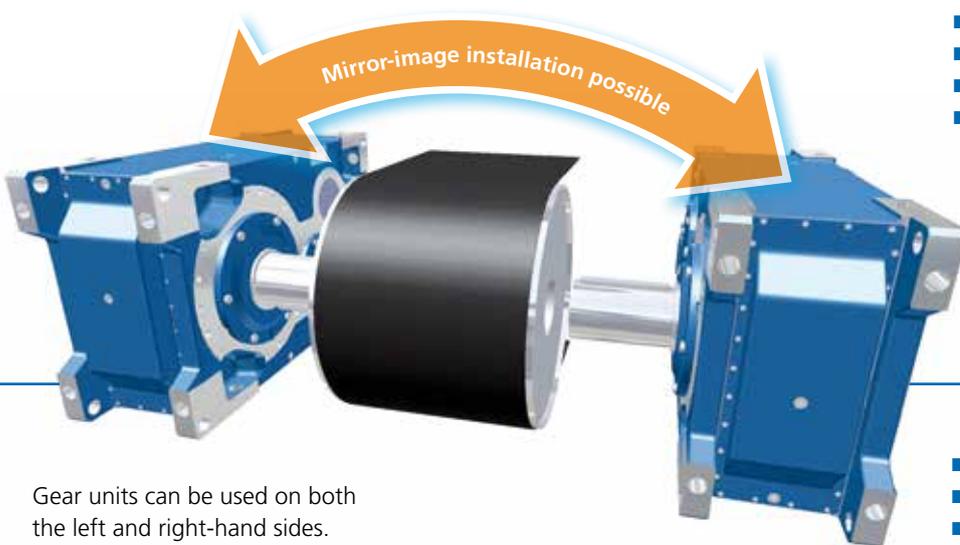
For fast or slow-running conveyor systems with short or long distances for the transportation of sand, gravel, coal, ore or cement - NORD industrial gear units meet every challenge. NORD plans and supplies safe, low maintenance drive components for the entire drive chain - electric motors, rockers, couplings, brakes, back stops and Taconite seals along with heating and/or cooling.

- Belt drive applications from 37 kW to 1000 kW
- 3 stage parallel bevel gear units / $i=16$ to $i=71$
- Drive torque 13 kNm up to 242 kNm

Bucket elevators

NORD industrial gear units are the first choice for chain or bucket elevators of almost every height and speed. Geared motors with frequency inverters are used for small bucket elevators, and 3-stage parallel bevel gear units for greater power requirements. Because of the mass to be transported, gentle start-up via a fluid coupling is required, while the back stop prevents the bucket elevator from running backwards. Speed monitoring on the housing and the freewheeling coupling are integrated as standard.

- Bucket elevator applications from 15 kW to 250 kW
- Drive torque 10 kNm up to 130 kNm
- 3 stage parallel bevel gear units / $i=25$ to $i=56$
- Single or double drive units
- With back stop
- Freewheel coupling
- Speed monitor

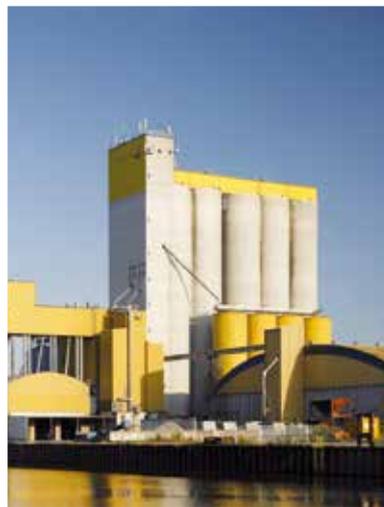
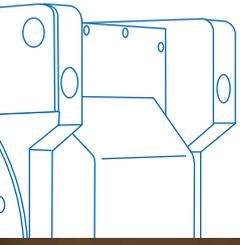


Gear units can be used on both the left and right-hand sides.

- Symmetrical design
- Standard B14 flange on the output side
- Six possible installation orientations
- Mirror-image installation possible
- Same housing size and installation dimensions for all gear ratios (2 and 3 stage)

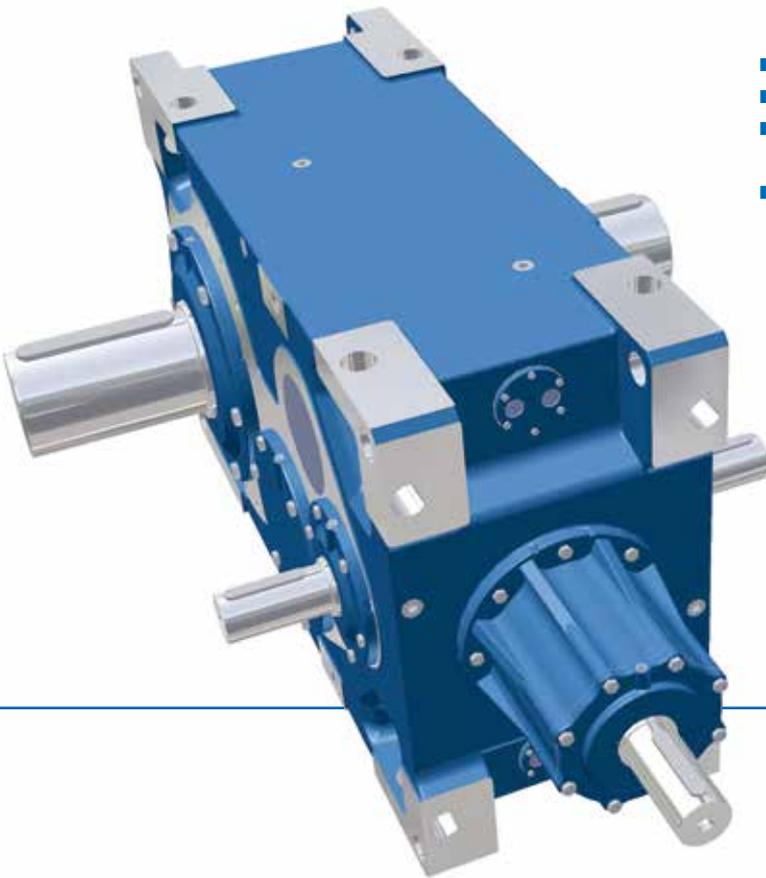


DRIVESYSTEMS



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.

Advantages of NORD UNICASE industrial gear units



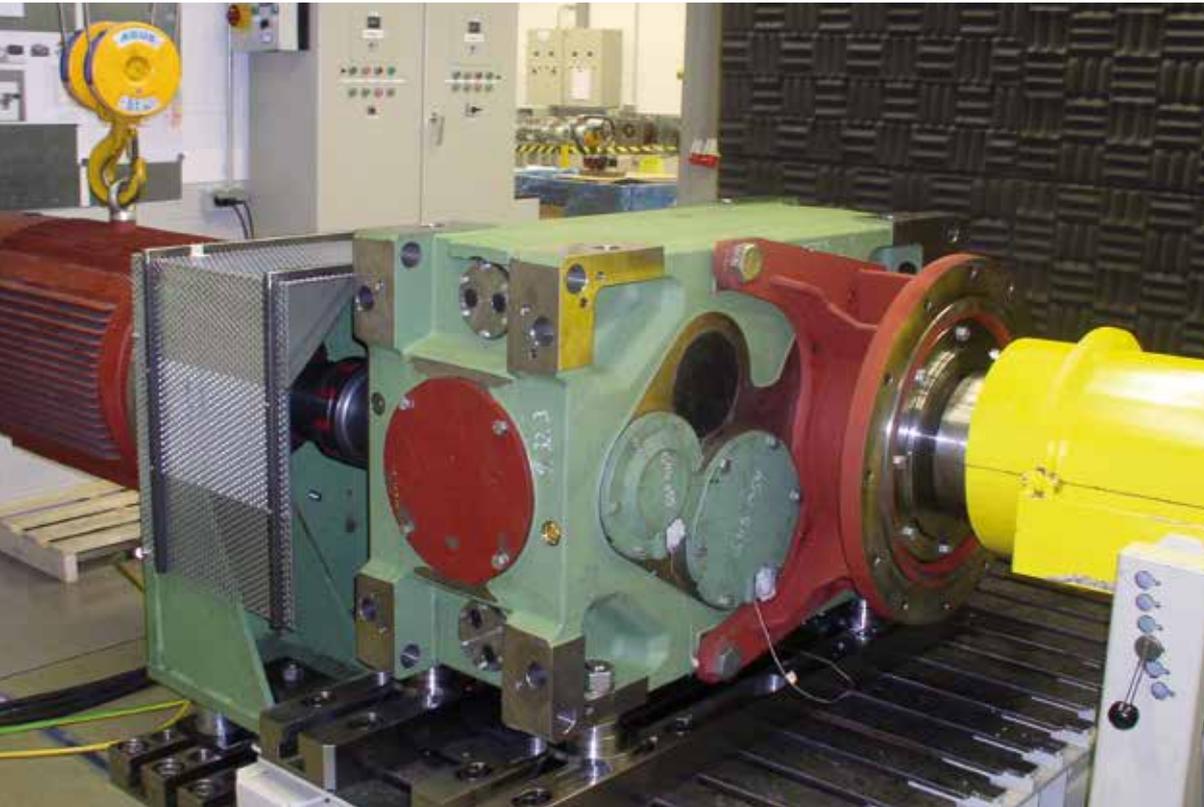
- Higher manufacturing precision thanks to FEM optimised, distortion free housing
- Higher power density
- Lower weight than with split case gear units, thus reduced weight for swing base units
- Longer bearing life than with jointed case gear units
- Simply re-lubricated labyrinth seal (Taconite)
- Noise-optimised bevel gears (HPG/Wiener)
- Optimal axial fan
- Greater reliability due to the use of synthetic oils; lower maintenance due to longer oil life
- Modular structure
- Optional flange pump attachment (bearing oil supply) with longitudinal inclination $>5^\circ$ / transverse inclination $>3^\circ$
- Symmetrical construction - with double-drive conveyor belt systems, the drives can be changed over without conversion.
- 2 and 3 stage gear units have identical housing and shaft centre dimensions, allowing subsequent gear ratio modification in the same housing.
- Addition of a second oil cooler possible
- Optional torque-limiting back stop (double drive units)
- All prerequisites for mounting additional modules to the housing as standard (e.g. heater cartridges)
- Components held in stock for fast delivery times



The UNICASE concept

A closed housing made from a single block combines all the elements of the gear unit. NORD DRIVESYSTEMS produces helical, parallel shaft, bevel gear and worm gear units and is the only manufacturer in the world which produces UNICASE industrial gear units up to 242,000 Nm as UNICASE.

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



NORD industrial gear unit on the test bed at the Bargteheide Technology Centre.

Overview of available versions for conveyor belt and bucket elevator drives

Abbreviations	Meaning /Description	Output version	Options for output	Drive versions	Additional options	Size			
						SK 11..07	SK 12..07	SK 13..07	SK 15..07
A	Hollow shaft	X				√	√	√	√
AS	Hollow shaft with shrink disc	X				√	√	√	√
B	Fixing element for hollow shaft		X			√	√	√	√
CC	Cooling coil				X	√	√	√	√
CS	Cooling system				X	√	√	√	√
EA	Splines according to DIN 5480	X				√	√	√	√
FAN	Fan				X	√	√	√	√
D	Torque support		X			√	√	√	√
ED	Elastic torque support		X			√	√	√	√
H	Cover as a touch guard		X	X		√	√	√	√
MO	Additional monitoring elements ¹⁾				X	√	√	√	√
MSB	Motor rocker with brake				X	√	√	√	√
MSK	Motor rocker with elastic coupling				X	√	√	√	√
MST	Motor rocker with fluid coupling				X	√	√	√	√
MSTB	Motor rocker with fluid coupling and brake				X	√	√	√	√
OH	Oil heater				X	√	√	√	√
R	Back stop			X		√	√	√	√
V	Solid shaft	X				√	√	√	√

1) on request



DRIVESYSTEMS

Explanation

In order to determine the correct gear unit and suitable rocker for the NORD UNICASE gear unit, the technical data for the drive unit and the machine to be driven must be known. The machine factor (depending on the running time under load - see NORD Industrial Catalogue G1050) for conveyor belt and bucket elevator gear units serves to determine the selection of the gear unit torque and must be smaller than that listed in the table. From the selection of the rocker version and the installed motor, the correct rocker size can be obtained from the rocker table (M)

Gear unit size	Rated torque in kNm for $n_{mot}=1500 \text{ min}^{-1}$ and $f_B=1,0$													
	Nominal ratio i_N													
	16	18	20	22.4	25	28	31.5	35.5	40	45	50	56	63	71
11407	47	49	50	52	53	56	50	52	53	56	50	52	53	56
12407	81	84	85	89	90	95	85	89	90	95	85	89	90	95
13407	106	110	113	117	120	126	113	117	120	126	113	117	120	126
15407	159	162	168	171	180	183	168	171	180	183	168	171	180	183

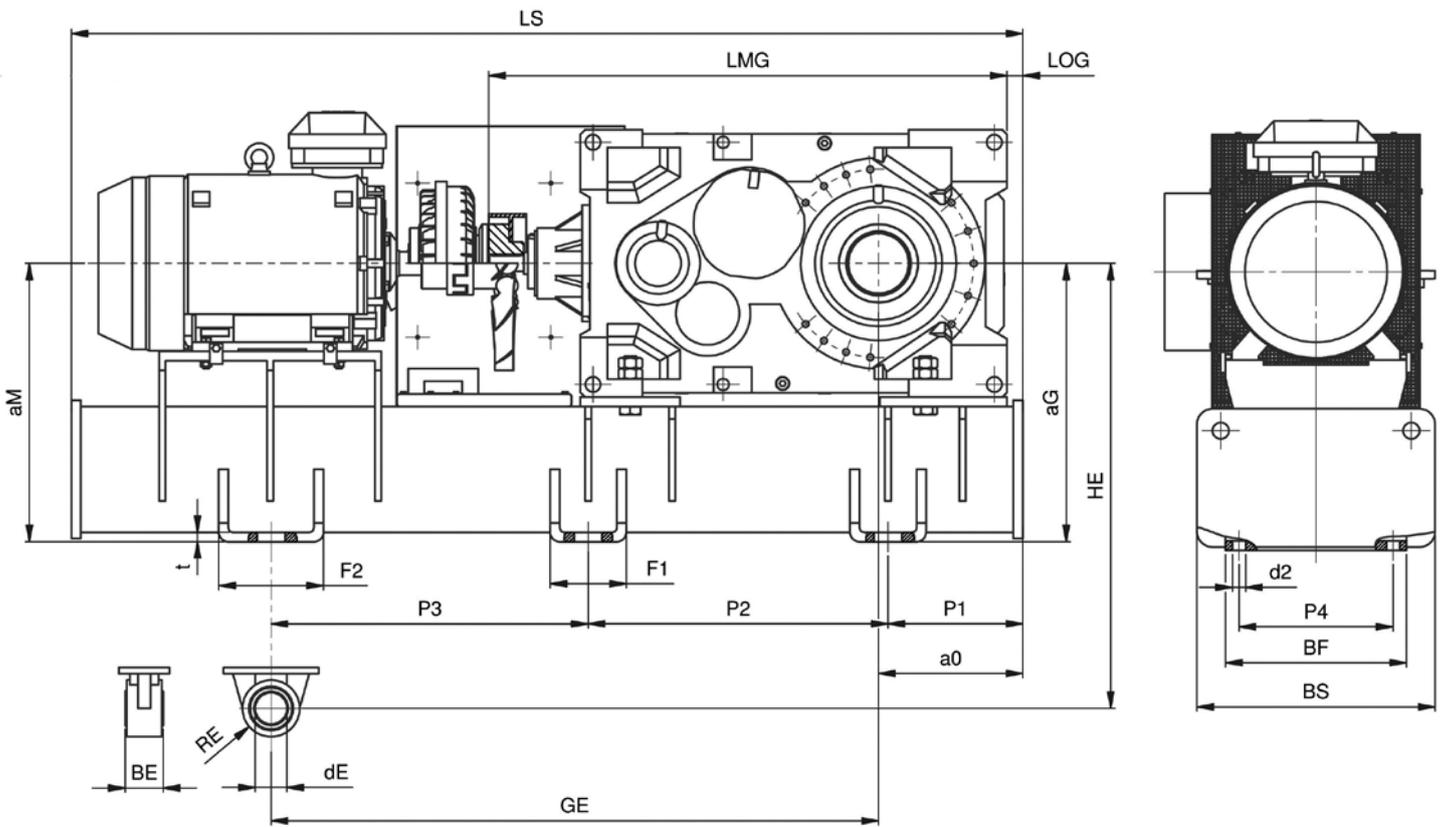
A thermal examination of the drive units is generally necessary

Rocker versions

- MSK Motor rocker with elastic coupling
- MSB Motor rocker with elastic coupling and drum brake
- MST Motor rocker with elastic fluid coupling
- MSTB Motor rocker with elastic fluid coupling and drum brake

Gear unit size	Rocker version	IEC three-phase motor $n_{mot}=1500 \text{ min}^{-1}$													
		in kW													
		30	37	45	55	75	90	110	132	160	200	250	315	355	400
11407	MSK		MS07	MS07	MS07	MS07	MS07	MS07	MS09	MS09	MS09	MS09	MS11		
	MSB		MS07	MS07	MS07	MS07	MS07	MS07	MS09	MS09	MS09	MS09	MS11		
	MST		MS07	MS07	MS07	MS07	MS07	MS09	MS09	MS09	MS09	MS11	MS11	MS11	MS11
	MSTB		MS07	MS07	MS07	MS07	MS07	MS09	MS09	MS09	MS09	MS11	MS11	MS11	MS11
12407	MSK		MS08	MS08	MS10	MS10	MS10	MS10	MS10	MS12	MS12	MS12	MS12	MS14	MS14
	MSB		MS08	MS08	MS10	MS10	MS10	MS10	MS10	MS12	MS12	MS12	MS12	MS14	MS14
	MST		MS10	MS10	MS10	MS10	MS10	MS10	MS12	MS12	MS12	MS12	MS12	MS14	MS14
	MSTB		MS10	MS10	MS10	MS10	MS10	MS10	MS12	MS12	MS12	MS12	MS12	MS14	MS14
13407	MSK				MS10	MS12	MS12	MS12	MS12	MS12	MS14	MS14	MS14	MS16	MS16
	MSB				MS10	MS12	MS12	MS12	MS12	MS12	MS14	MS14	MS14	MS16	MS16
	MST				MS12	MS12	MS12	MS12	MS12	MS14	MS14	MS14	MS14	MS16	MS16
	MSTB				MS12	MS12	MS12	MS12	MS12	MS14	MS14	MS14	MS14	MS16	MS16
15407	MSK				MS15	MS15	MS15	MS15	MS17	MS17	MS17	MS17	MS17	MS18	MS18
	MSB				MS15	MS15	MS15	MS15	MS17	MS17	MS17	MS17	MS17	MS18	MS18
	MST				MS15	MS15	MS15	MS17	MS17	MS17	MS17	MS17	MS17	MS18	MS18
	MSTB				MS15	MS15	MS15	MS17	MS17	MS17	MS17	MS17	MS17	MS18	MS18

Rocker dimensions for NORD industrial gear units



Rocker dimensions

Gear units	i	Rocker	LS	LMG	LOG	BS	P1	P2	P3	P4	F1	F2	BF	t	d2	aG	aM	(aO)	GE	HE	dE	BE	RE
SK11407	(16 – 45)	MS07	2650	1564	70	720	250	800	590	560	220	330	660	30	36	695	695	440	1200	855	100	120	80
SK11407	(16 – 45)	MS09	2920	1564	70	720	250	800	590	560	220	330	660	30	36	695	695	440	1200	855	100	120	80
SK11407	(16 – 45)	MS11	3190	1564	70	720	250	800	590	560	220	330	660	30	36	695	695	440	1200	855	100	120	80
SK11407	(50 – 71)	MS07	2650	1564	70	720	250	800	590	560	220	330	660	30	36	695	695	440	1200	855	100	120	80
SK11407	(50 – 71)	MS09	2920	1564	70	720	250	800	590	560	220	330	660	30	36	695	695	440	1200	855	100	120	80
SK11407	(50 – 71)	MS11	3190	1564	70	720	250	800	590	560	220	330	660	30	36	695	695	440	1200	855	100	120	80
SK12407	(16 – 45)	MS14	3460	1782	130	620	300	900	935	485	240	450	570	30	42	885	885	535	1600	1065	110	180	90
SK12407	(16 – 45)	MS08	2650	1782	130	620	300	900	935	485	240	450	570	30	42	885	885	535	1600	1065	110	180	90
SK12407	(16 – 45)	MS10	2920	1782	130	620	300	900	935	485	240	450	570	30	42	885	885	535	1600	1065	110	180	90
SK12407	(16 – 45)	MS12	3190	1782	130	620	300	900	935	485	240	450	570	30	42	885	885	535	1600	1065	110	180	90
SK12407	(50 – 71)	MS14	3460	1782	130	620	300	900	935	485	240	450	570	30	42	885	885	535	1600	1065	110	180	90
SK12407	(50 – 71)	MS08	2650	1782	130	620	300	900	935	485	240	450	570	30	42	885	885	535	1600	1065	110	180	90
SK12407	(50 – 71)	MS10	2920	1782	130	620	300	900	935	485	240	450	570	30	42	885	885	535	1600	1065	110	180	90
SK12407	(50 – 71)	MS12	3190	1782	130	620	300	900	935	485	240	450	570	30	42	885	885	535	1600	1065	110	180	90
SK13407	(16 – 45)	MS14	3460	1997	60	620	300	900	935	485	240	450	570	30	42	985	985	535	1600	1115	110	180	90
SK13407	(16 – 45)	MS16	3730	1997	60	620	300	900	935	485	240	450	570	30	42	985	985	535	1600	1115	110	180	90
SK13407	(16 – 45)	MS10	2920	1997	60	620	300	900	935	485	240	450	570	30	42	985	985	535	1600	1115	110	180	90
SK13407	(16 – 45)	MS12	3190	1997	60	620	300	900	935	485	240	450	570	30	42	985	985	535	1600	1115	110	180	90
SK13407	(50 – 71)	MS14	3460	1997	60	620	300	900	935	485	240	450	570	30	42	985	985	535	1600	1115	110	180	90
SK13407	(50 – 71)	MS16	3730	1997	60	620	300	900	935	485	240	450	570	30	42	985	985	535	1600	1115	110	180	90
SK13407	(50 – 71)	MS10	2920	1997	60	620	300	900	935	485	240	450	570	30	42	985	985	535	1600	1115	110	180	90
SK13407	(50 – 71)	MS12	3190	1997	60	620	300	900	935	485	240	450	570	30	42	985	985	535	1600	1115	110	180	90
SK15407	(16 – 45)	MS15	3460	2332	60	720	400	1050	855	570	380	570	670	40	48	1030	1030	605	1700	1230	124	230	100
SK15407	(16 – 45)	MS17	3730	2332	60	720	400	1050	855	570	380	570	670	40	48	1030	1030	605	1700	1230	124	230	100
SK15407	(16 – 45)	MS18	4000	2332	60	720	400	1050	855	570	380	570	670	40	48	1030	1030	605	1700	1230	124	230	100
SK15407	(50 – 71)	MS15	3460	2332	60	720	400	1050	855	570	380	570	670	40	48	1030	1030	605	1700	1230	124	230	100
SK15407	(50 – 71)	MS17	3730	2332	60	720	400	1050	855	570	380	570	670	40	48	1030	1030	605	1700	1230	124	230	100
SK15407	(50 – 71)	MS18	4000	2332	60	720	400	1050	855	570	380	570	670	40	48	1030	1030	605	1700	1230	124	230	100

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.





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)



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





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