

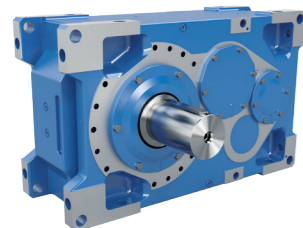
# Drive solutions for wastewater treatment

Complete drive solutions from a single source

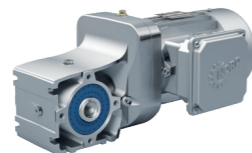


**DRIVESYSTEMS**

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

Motor production

Gear unit production

Production and assembly

Inverter production

Motor assembly

**We support you**

With years of experience in the wastewater industry, NORD DRIVESYSTEMS creates economical applications that meet all current requirements and prepare you for future system upgrades.

**Design**

- ▶ myNORD
- ▶ Reduced number of variants
- ▶ Project design / optimization
- ▶ Drive system design
- ▶ Application solutions
- ▶ Green solutions
- ▶ CAD drawings

**Commissioning**

- ▶ Plug-and-Play
- ▶ Support
- ▶ Training
- ▶ Documentation
- ▶ Smart commissioning

**Service**

- ▶ Predictive Maintenance (PLC function)
- ▶ Spare parts, express shipping
- ▶ Global presence
- ▶ 24/7/365 support

## Aeration

NORD drive systems keep brush and surface aeration systems performing to effectively deliver oxygen into wastewater within municipal lagoons.

## Pumps

NORD gear units optimize pump efficiency and prevent backups, keeping systems throughout the plant running smoothly to move water from one process to the next.

## Clarifiers

NORD drive systems allow both small- and large-volume water clarifying applications to efficiently separate solid and liquids.

## Sludge Thickening

Variable frequency drive technology combines with gearmotors on sludge thickening machines to optimize the speed of the paddles in tanks, efficiently increasing the solid concentration and decreasing the free water.

## Screens

Screening is the first step in wastewater processing and is crucial to plant performance. Mechanical cleaning screens automated by NORD gearmotors produce lower labor costs and improve flow conditions and screening capture.

## Screw Pumps

Powerful drive systems are needed to pump heavily contaminated liquids that often have solid particulate. NORD gear units provide all of the torque required with seals and surface protection options to ensure longevity.



NORD DRIVESYSTEMS is one of the world's leading drive technology manufacturers. Our industry-specific, innovative drive solutions are used throughout the world for a wide variety of applications in the wastewater treatment industry.

We know your business, precisely understand your requirements, and strive for long-term collaboration with our customers and partners. You can be confident that we will do everything that we can to reinforce the reputation of your brand.

### NORD DRIVESYSTEMS provides:

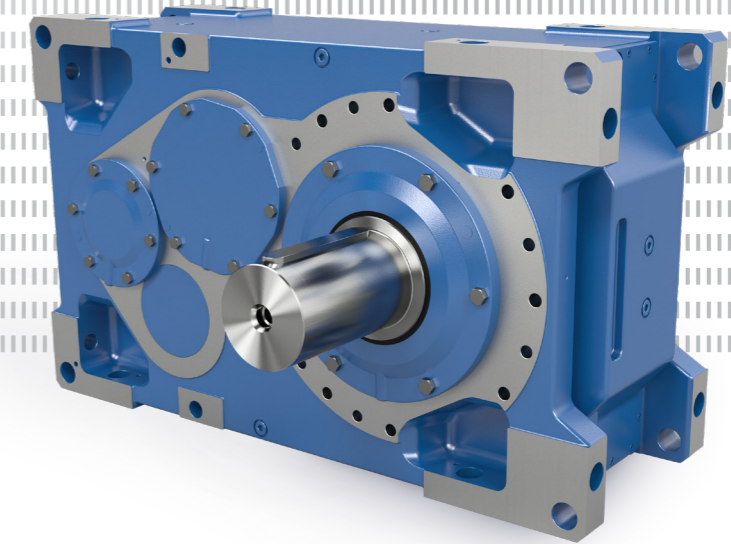
- ▶ Extensive knowledge of applications and technical support
- ▶ Complete drive solutions from a single source
- ▶ Strong global presence and service
- ▶ Thousands of installed drives in wastewater systems
- ▶ Wide range of products with high quality standards
- ▶ Great reliability, economy, and service life
- ▶ Recognized product quality compliant with international standards

## Complete Support Before and After the Sale

NORD DRIVESYSTEMS designs, engineers, and manufactures scalable drive solutions for all segments of the wastewater treatment industry. Our drive solutions are efficient, reliable, and highly-specialized for precise application needs.

### Drive solutions for:

- ▶ Brush aerators
- ▶ Surface aerators
- ▶ Clarifier tanks
- ▶ Pumps
- ▶ Aerated grit chambers
- ▶ Agitators and mixers
- ▶ Air flotation systems
- ▶ Screw pumps



### Screens

NORD's robust, cost-effective gear units deliver high efficiency performance to keep screening machines running effectively.

- ▶ IP66 protection
- ▶ UNICASE one-piece housings
- ▶ Long life, low maintenance
- ▶ Compact design



### Pumps

NORD's energy-efficient gear units, motors, and variable frequency drives ensure top reliability to keep energy costs low.

- ▶ IP66 ingress protection
- ▶ Corrosion resistant with high-quality surface protection options
- ▶ Advanced QUADRALIP™ sealing system to prevent leaks
- ▶ Dual shaft sealing rings



### Clarifiers

Clarification systems using NORD drive units operate more efficiently with less downtime, resulting in more clean, effluent water and overall better plant production.

- ▶ Wide range of surface treatment options for added protection
- ▶ Corrosion resistant shaft material
- ▶ Energy-efficient drives to reduce costs



### Screw Pumps

NORD's robust gear units can handle the high flow rates and heavily contaminated liquids moved by screw pumps.

- ▶ Torque range up to 2,495,900 lb-in
- ▶ Flexible mounting solutions
- ▶ High-performance sealing systems
- ▶ Variety of surface treatment options



### Aeration

Brush and surface aerator drives from NORD require little to no preventative maintenance.

- ▶ UNICASE compact housing
- ▶ Special output cover design to help protect oil seals
- ▶ High quality, low friction bearings for long operating life
- ▶ Dual output seals



### Sludge Thickening

Equipping variable frequency drives on sludge thickening tanks allows the speed of the vertical paddles to be controlled by the drive. The speed can be adjusted at any point to fit the application.

- ▶ Robust design for long life, low maintenance
- ▶ Integrated PLC function
- ▶ Reinforced output shaft extensions

# Drive solutions for the wastewater industry



Efficient, safe, and proven drive solutions from a single source

## Efficient

NORD drive solutions are environmentally friendly and fulfill all current national and international energy saving standards.

- ▶ Lightweight aluminium or cast iron construction
- ▶ NORD motors for all requirements, including IE3, IE4, and IE5+
- ▶ Intelligent NORD variable frequency drives with energy saving flux reduction for optimal operation under partial load or low speeds.

## Reliable

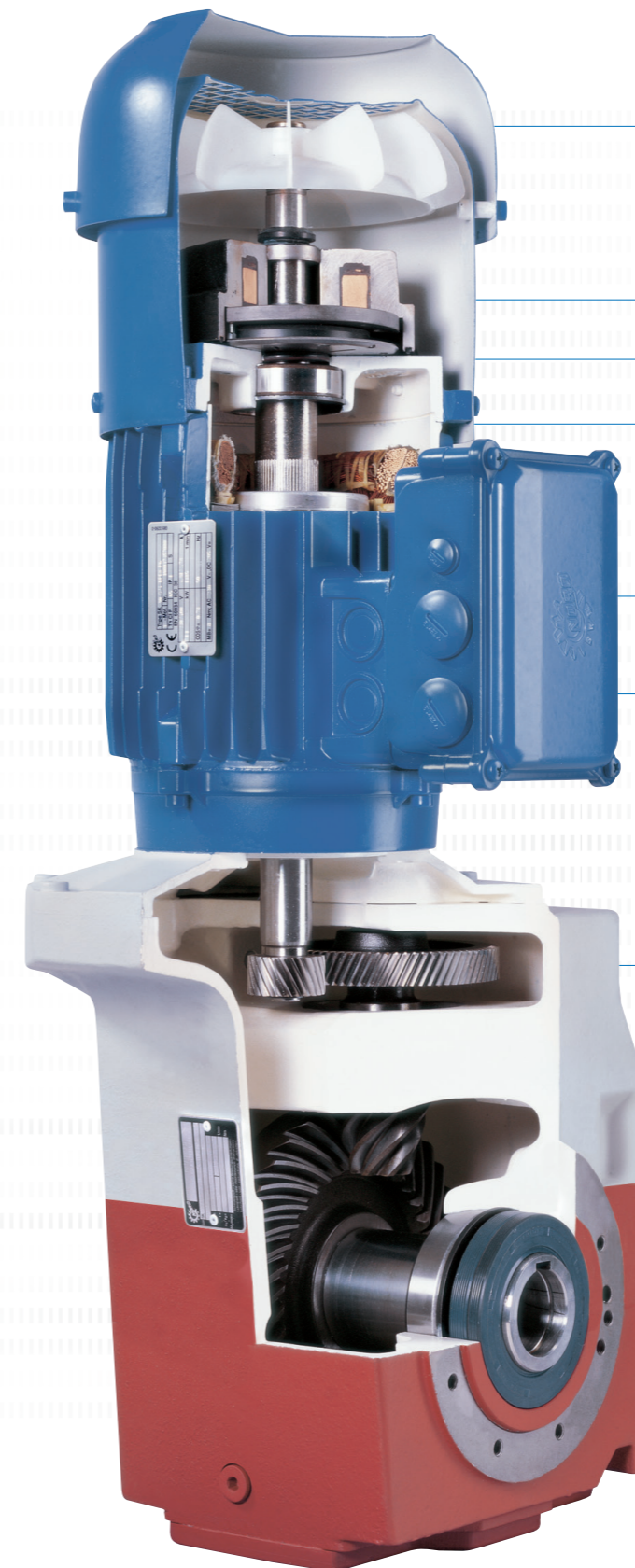
From pinions to circuit boards, all NORD mechatronic components are produced in our own factories, which means unsurpassed reliability, long service life, and low Total Cost of Ownership (TCO). Countless options can be configured for all requirements of the wastewater treatment industry.

- ▶ UNICASE™ housings ensure precise positioning of bearings and shafts
- ▶ AUTOVENT™ ensures a leak free operation
- ▶ Protection class IP66 or IP69K
- ▶ Biodegradable oils available
- ▶ Moisture, rust, and dust protection  
(See the S3400 Surface Protection flyer for more information).

## Tried and tested

The reliability and cost-effectiveness of NORD drive solutions have proven themselves in the wastewater industry throughout the world.

- ▶ Various options for reinforcing output shafts
- ▶ Increased bearing spacing available as an option to reduce bearing loads, extending service life
- ▶ Corrosion-resistant shaft material



Double cover

IP66 brake

IP66 motor protection class

ICP (Internal Corrosion Protection)

Stainless steel type plate

Potted terminal box (optional)

Increased corrosion protection through multiple coat painting

Stainless steel shaft available

## Available Seal Options

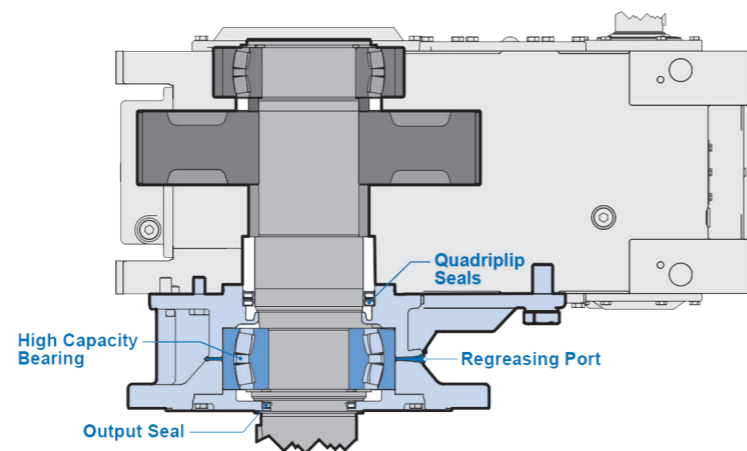
- ▶ Double Seal (NBR or FKM)
- ▶ Taconite
- ▶ Labyrinth
- ▶ Mechanical

## Components for Ultimate Protection

NORD offers reinforced outputs designed to handle high radial loads while keeping the bearing cavity dry and free from contaminants. There are four different levels of protection that are available beyond our standard offering.

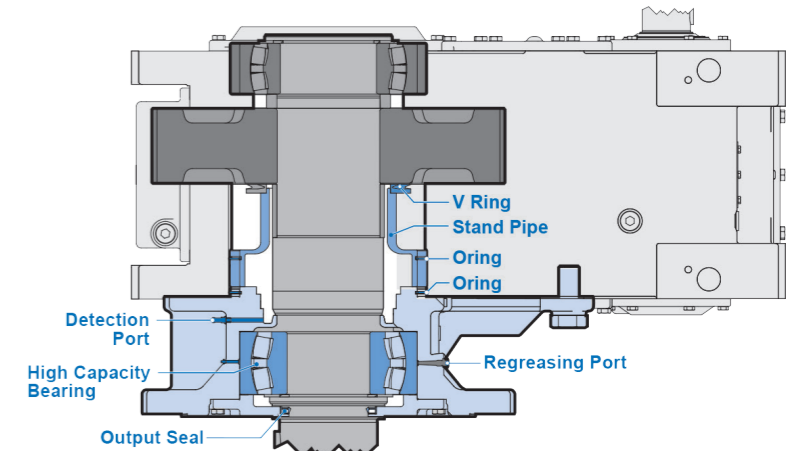
### VL2 Reinforced Spread Design Drive Shaft Bearings

- ▶ Specially designed output bearings for agitator and mixer applications requiring increased bearing load capacities
- ▶ Increased bearing spacing provides maximum radial and axial load capacity
- ▶ Lower bearing is an oversized, double row spherical bearing that absorbs high overhung and thrust loads and compensates for alignment errors in long agitator shafts
- ▶ Includes grease fitting for the lower bearing and a removeable plug to allow excess grease to purge from the bearing cavity



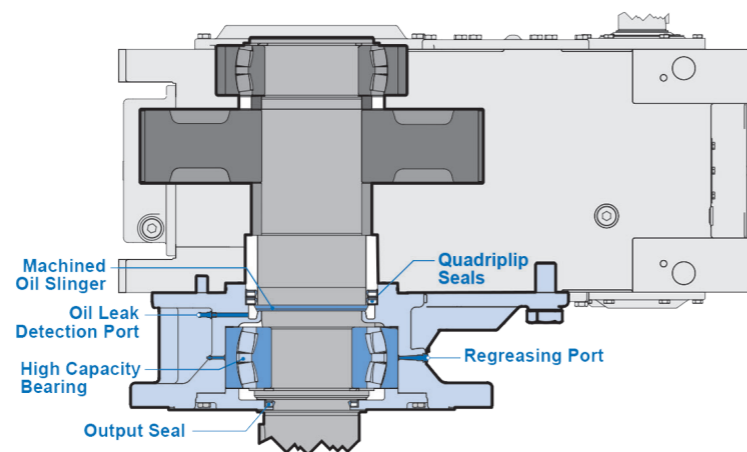
### VL4 Spread Design with True Drywell

- ▶ VL3 design with additional oil leak protection measures
- ▶ QUADRALIP seals are replaced with a standpipe that has additional sealing including a V-ring seal and multiple O ring seals
- ▶ Prevents the risk of leakage with downward facing output shafts
- ▶ No rubbing seals below the oil level
- ▶ Available for bevel gear, parallel shaft gear units
- ▶ Hollow shaft version with shrink disc, optionally with push-in shaft



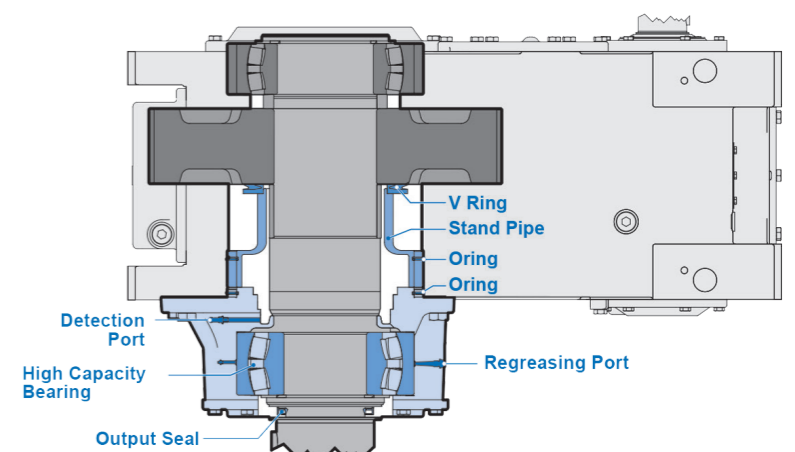
### VL3 Spread Design with Oil-Safe Dry Cavity

- ▶ VL2 design with added oil drip tray contour on the flange
- ▶ Includes an oil leakage detection port to enable early detection of wear on the seals between the grease cavity and the main oil chamber
- ▶ If oil leaks past the reducer seals, it flows down to the oil slinger mounted onto the shaft
- ▶ As the shaft rotates, oil will sling off into the dry cavity and is shown by an oil indicator. An electrical oil sensor is also available
- ▶ M5 mounting position only for MAXXDRIVE units



### VL6 Spread Design with True Drywell (No Flange)

- ▶ Includes all internal VL4 design elements housed by a bolt-on, non-flanged cover



## Optimized Sealing Systems

NORD gear units feature an advanced sealing system designed to meet the most stringent requirements. Each input shaft is equipped with a reliable radial FKM sealing ring and gamma ring as a standard, ensuring an advanced level of dust protection and maximizing service life.

The sealing points on the output shaft are equipped with double sealing rings for enhanced performance. This combination includes an inner sealing ring (Type A), typically accompanied by an outer seal featuring a dust protection lip design (Type AS). The default output seal material is NBR (Buna N), with the option for FKM/Viton (Fluoroelastomer) as an alternative. When operating oil temperatures exceed 85°C / 185°F, FKM seals are the standard configuration.

In addition to NORD's standard seals, additional sealing configurations are available, including

- ▶ Taconite sealing systems for input shaft and output shaft
- ▶ DRYWELL sealing in combination with VL3/KL3
- ▶ TRUE DRYWELL as standalone sealing option or as an integral part of the output designs (VL4/KL4 and VL6/KL6 available for MAXXDRIVE units)

## Double Shaft Sealing Rings

- ▶ Optimum sealing
- ▶ Long life gasket
- ▶ Clean gear oil

## FKM Material

- ▶ Resistant to chemicals and high temperatures
- ▶ Consistent performance over a wide range of applications

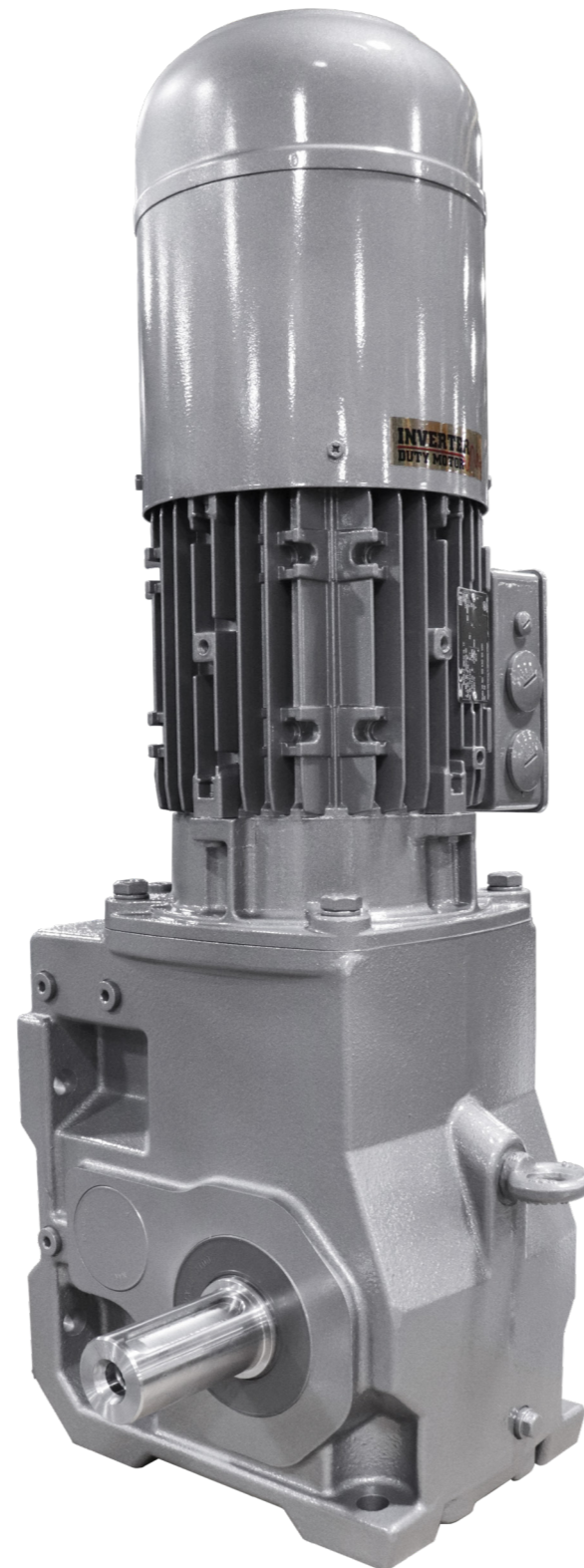
## Labyrinth Seals

- ▶ Re-greaseable / non-re-greaseable versions
- ▶ Protects against splashed water and dirt

## Mechanical Seal

- ▶ For contact with aggressive and contaminated liquids
- ▶ For use with underwater drive units

For more specific requirements, dedicated sealing systems can be applied on a case-by-case basis, e.g., metal face sealings (mechanical seals). Contact NORD for more information.



## Surface Protection Options

### Standard IP55 protection

- ▶ Motor with shaft sealing ring on the B side
- ▶ Electrolytically galvanized fan cover
- ▶ Corrosion resistance
- ▶ Optional high-quality surface protection
- ▶ Stainless friction plates for brakes optional
- ▶ Stainless type plate optional
- ▶ Stainless fastening screws optional

### Optional IP66 protection

- ▶ IP66 motor with shaft sealing ring on the B side
- ▶ Electrolytically galvanized fan cover
- ▶ IP66 brake
- ▶ Potted terminal box (optional)
- ▶ Stainless type plate
- ▶ Ball bearing in 2 RS version with sealing discs

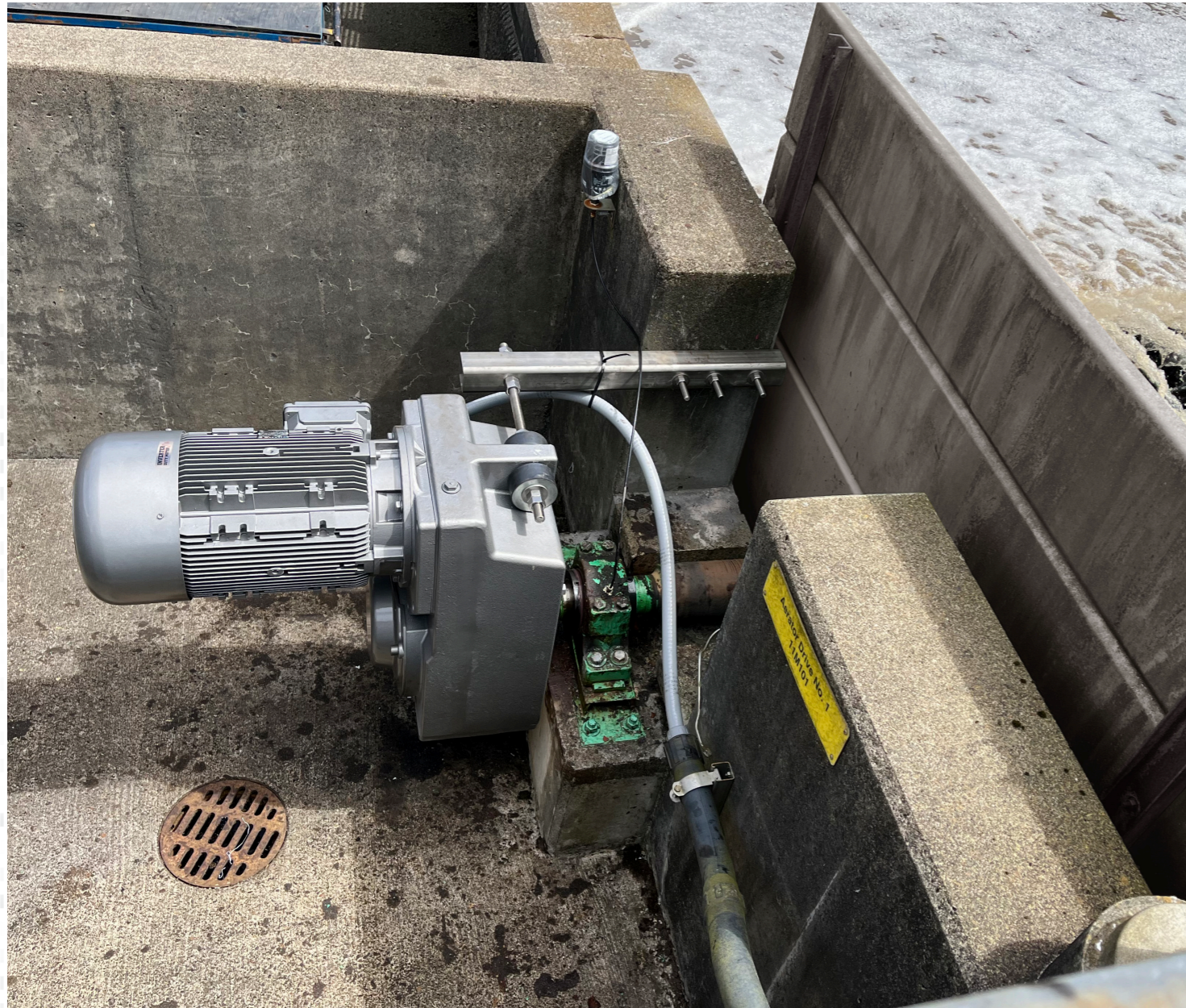


## Safety Features

### Overload Protection

- ▶ Safety coupling installed between the motor and the gear unit, alternatively between two gear units
- ▶ IEC/NEMA standard connection dimensions
- ▶ Backlash-free torque transfer
- ▶ Simple torque setting
- ▶ Integrated sensor
- ▶ Protected in housing





## Surface & Brush Aerator Applications

- ▶ MAXXDRIVE or Parallel Shaft Gear Unit
- ▶ High-efficiency electric motor based on the latest international requirements
- ▶ NEMA/IEC adapter
- ▶ Options for vertical and horizontal orientation
- ▶ Advanced sealing system
- ▶ Modular flange and bearing solutions
- ▶ High radial and axial load capacity

## Screw Pump Applications

### Configuration options:

- ▶ Helical Inline Gear Unit
- ▶ Electric motor based on the latest international requirements
- ▶ NEMA/IEC adapter
- ▶ Advanced sealing system
- ▶ Numerous low ratios available





## Mixing & Agitating Applications

**Configuration options:**

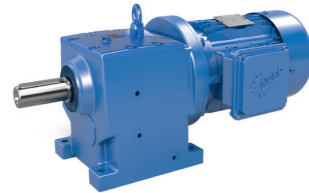
- ▶ MAXXDRIVE or Parallel Shaft Gear Unit
- ▶ High-efficiency electric motor based on the latest international requirements
- ▶ NEMA/IEC adapter
- ▶ Options for vertical and horizontal orientation
- ▶ Advanced sealing system
- ▶ Modular flange and bearing solutions
- ▶ High radial and axial load capacity

## Skimmer Applications

**Configuration options:**

- ▶ Helical Bevel or Parallel Shaft Gear Unit
- ▶ Electric motor based on the latest international requirements
- ▶ NEMA/IEC adapter
- ▶ Advanced sealing system

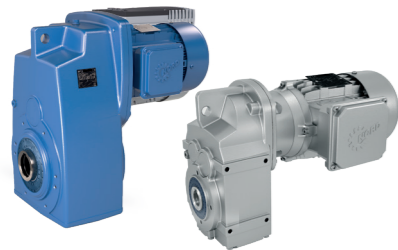
## UNICASE™ helical gear units (Catalog G1000)



- ✓ Foot or flange mounted
- ✓ Long life, low maintenance
- ✓ Closely stepped ratios
- ✓ Cast-iron UNICASE housing

Sizes: 11  
 Power: 0.16 – 200 kW  
 Torque: Up to 205,000 Nm  
 Ratio: 2.76:1 – 14,340.31:1

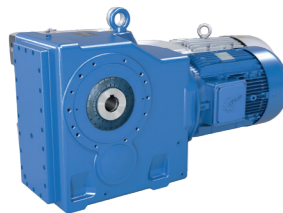
## Parallel shaft gear units (Catalog G1000)



- ✓ Foot, flange, or shaft mounted
- ✓ Hollow or solid shaft
- ✓ Compact design
- ✓ Cast-iron or aluminum UNICASE housing

Sizes: 15  
 Power: 0.16 – 200 kW  
 Torque: Up to 680,000 Nm  
 Ratio: 4.03:1 – 15,685.03:1

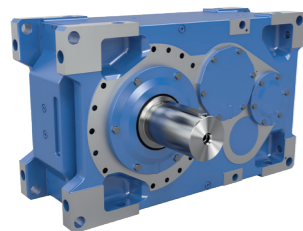
## UNICASE™ bevel gear units (Catalog G1000)



- ✓ Foot, flange, or shaft mounted
- ✓ Hollow or solid shaft
- ✓ Cast-iron UNICASE housing
- ✓ Closely-stepped ratios

Sizes: 11  
 Power: 0.16 – 200 kW  
 Torque: Up to 442,500 Nm  
 Ratio: 8.04:1 – 13,432.68:1

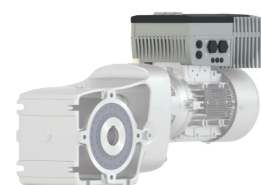
## MAXXDRIVE® industrial gear units (Catalog G1050)



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

Sizes: 11  
 Power: 2.5 – 8,075 kW  
 Torque: 132,800– 2,495,900 Nm  
 Ratio: 5.60:1 – 30,000:1

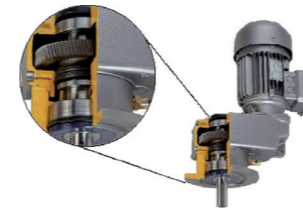
## NORDAC® FLEX SK 200E variable frequency drives (Catalog E3000)



- ✓ Energy saving function
- ✓ 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: 0.33 – 30 kW

## VL bearings



### VL II reinforced drive shaft bearings

- ✓ Large bearing spacing + reinforced bearings = maximum radial and axial load capacity
- ✓ Longer service life

### VL III DRYWELL

- ✓ Additional oil drip plate
- ✓ Oil leak detector or oil sensor

### VL IV TRUE DRYWELL

Prevents the risk of leakage with downward-facing output shafts

- ✓ No rubbing seals below the oil level
- ✓ Available for bevel gear and parallel shaft gear units
- ✓ Hollow shaft version with shrink disc, optionally with mit push-in shaft

## Overload protection



- ✓ Safety coupling installed between the motor and the gear unit, alternatively between two gear units
- ✓ IEC / NEMA connection dimensions
- ✓ Backlash-free torque transfer
- ✓ Simple torque setting
- ✓ Integrated sensor
- ✓ Protected in housing

## Various sealing systems and shaft material options



### Double shaft sealing rings

- ✓ Optimum sealing
- ✓ Long life gasket
- ✓ Clean gear oil

### FKM Material

- ✓ Resistant to chemicals
- ✓ High temperatures

### Labyrinth seals

- ✓ Re-greaseable with low maintenance or non-re-greaseable versions
- ✓ Protects against splashed water and dirt

### Mechanical seal

- ✓ For contact with aggressive and contaminated liquids
- ✓ For use with underwater drive units

### Sealing system prevents leakage with downward-facing output shafts

- ✓ TRUE DRYWELL

### Rust-proof shafts

## Outdoor motor installation



### IP55 protection class as standard

- ✓ IP55 motor with shaft sealing ring on the B side
- ✓ Electrolytically galvanized fan cover
- ✓ IP55 brake and brake drive made from corrosion-resistant material
- ✓ Special painting (optional)
- ✓ Stainless friction plates for brakes (optional)
- ✓ Stainless type plate (optional)
- ✓ Stainless fastening screws (optional)

### IP66 option

- ✓ IP66 motor with shaft sealing ring on the B side
- ✓ Electrolytically galvanized fan cover
- ✓ Potted terminal box
- ✓ Stainless type plate
- ✓ Ball bearing in 2 RS version with sealing discs
- ✓ IP66 brake

## EN

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