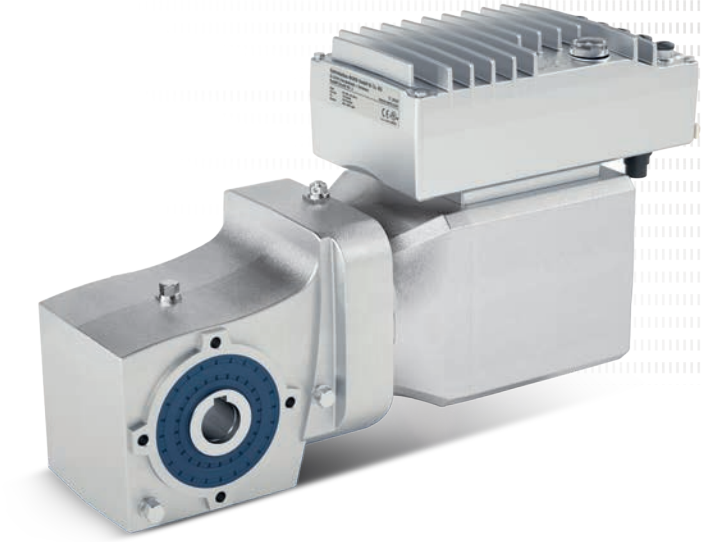


Complete Drive Solutions From a Single Source

Technical handbook

NORD® DRIVESYSTEMS

NORD DRIVESYSTEMS

Complete Drive Solutions from a Single Source

NORD Delivers

NORD offers first-class customer service and support along with full-featured drive solutions that can tackle the toughest requirements. All components are carefully selected and precisely configured to meet your exact specifications. In the rare case that standard components won't meet your needs, our in-house engineering team will work with you to design custom components or a complete customized system.

Reduce Lead Times and Decrease Inventory

- Fastest lead times in the industry with NO expedite fees
- Over 20,000,000 standard configurations to reduce or eliminate the need for custom components
- Modular drives, motors, and electronic controls minimize inventory of replacement units and parts

Global Product Designs, Standards, and Support

- Innovative, industry-standard products to support a wide range of applications
- Global sales and support network
- Dedicated mechanical and electrical application engineers ready to assist you
- Online resources available to you any time
- 24/7/365 emergency breakdown service

Increase Efficiency and Reduce Operation Costs

- myNORD online tools for fast selection, configuration, ordering, and tracking of your drive units
- Drive systems that are perfectly matched to your application for optimum performance and energy efficiency
- Program personalization, such as weekly shipment schedules and custom nameplates
- Partner with a company that is easy to do business with and wants to see you succeed!

NORD DRIVESYSTEMS

Services

Competitor Interchange

- Drop-in and/or functional replacements for competitor products

NORD 911 Emergency Breakdown Service

- 24/7/365 emergency hotline for replacement parts and units with parts in stock

Mechatronic Selection, Design, and Support

- Mechanical Application Engineering
- Electrical Application Engineering
- Large Industrial Gear Unit Engineering
- Project Engineering

Aftermarket Service

- Inspection and Repair
- Warranty
- Spare Parts

NORD ECO

- Energy and carbon emission optimization program
- Analyzes results to reveal opportunities to reduce your energy requirements

Training

- Authorized Distributor training on-site at NORD or on-location at your facility

NORD Allows You to Customize Gear Units With a Wide Range of Standard Options.

Standard:

- Autovent breather
- QUADRILIP™ sealing
- High-quality gearing
- High-strength gear case

Optional:

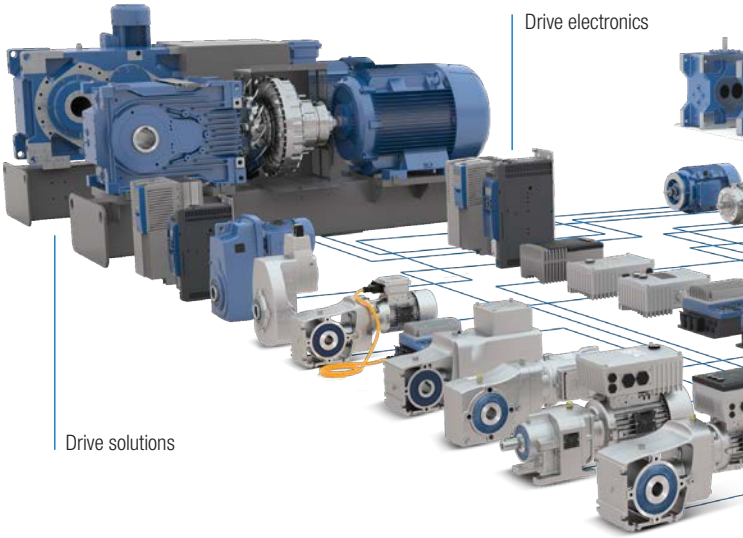
- Customer-specific shaft designs
- Stainless steel output shafts and bores
- Long-term storage options
- High/low temperature sealing solutions
- Backstops
- Housing modifications
- Oil level and oil temperature monitoring
- Extensive lubrication options, including synthetic, food grade, and low temp

World-Class Service and Support

NORD's customer-first approach means we take extra care to support our customers throughout the entire buying process and beyond. We also offer services such as myNORD online tools and live phone support from 7:00 a.m. to 7:00 p.m. Central Time.

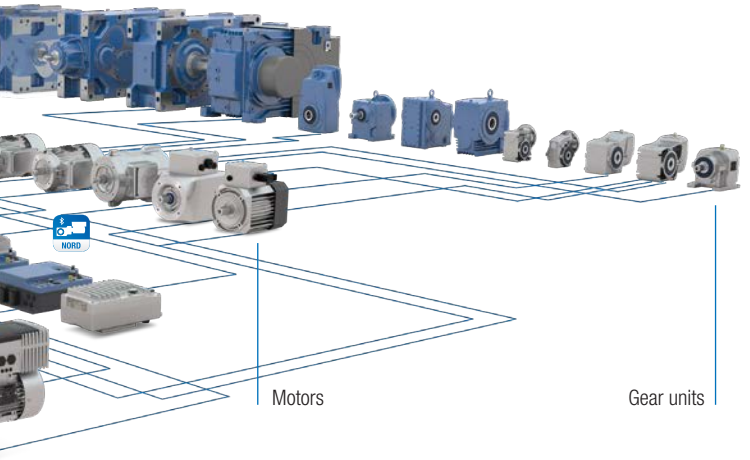
In the rare case of a breakdown, NORD also provides a 24/7/365 emergency hotline for expedited replacement products and parts. At NORD, we do everything possible to keep you moving!

NORD DRIVESYSTEMS



Complete Drive Solutions From a Single Source

An optimum and specialized drive solution can be created using the modular NORD system consisting of gear units, motors, and drive electronics. Every variant features the highest product quality, short planning and assembly times, high delivery availability, and a good price / performance ratio.



Safe

- Reliable products
- Coordinated components
- Own development and production

Flexible

- Modular products
- Scalable functions
- Large range of drive units
- Complete drive solutions
- Integrated customer logistics

International

- Globally networked organization
- Local advice, assembly, and service

NORD DRIVESYSTEMS

Gear Units

MAXXDRIVE® Industrial Gear Units

Electric Motors

NORDAC® Variable Frequency Drives and Motor Starters

Technical Information

Installation Orientations

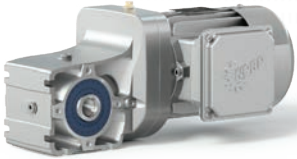
NORD DRIVESYSTEMS

Geared Motors

Industrial Gear Units

Worm Gear Units

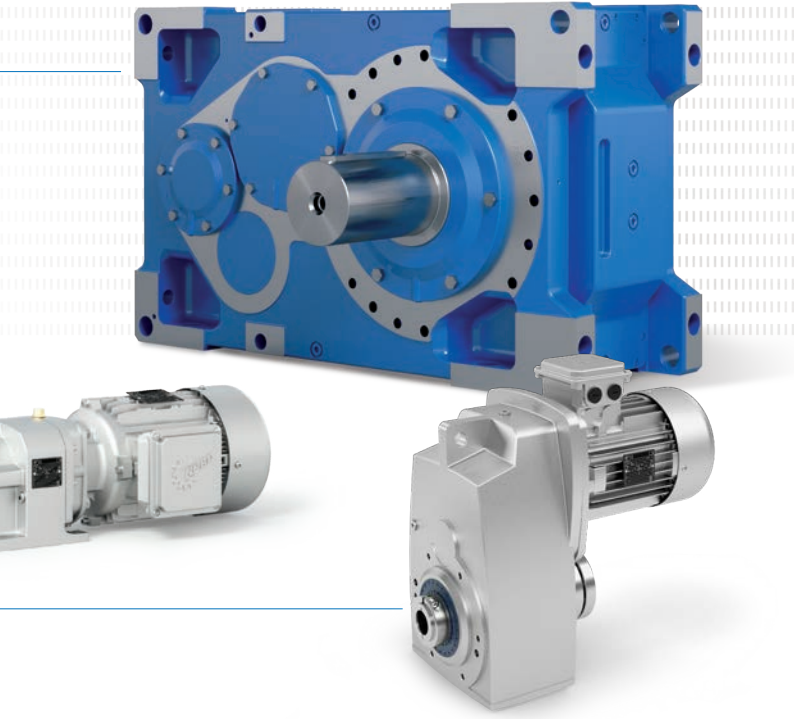
Bevel Gear Units



Helical Inline Gear Units

Parallel Shaft Gear Units

DRIVESYSTEMS



Geared Motors

UNICASE™ Helical Inline Gear Units – Robust and Versatile (G1000 catalog)

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

Sizes: 11
Power: 0.16 – 200 hp
Torque: 89 – 230,119 lb-in
Speed ratio: 2.76:1 – 14,340.31:1

UNICASE™ Helical Inline Gear Units

SK 7 2

- 2 — No options (solid shaft, foot mounting)
- 1 — Gear stages
- 7 — Housing size

Special nomenclature:

- SK 33 = Standard series
- SK 33N = UNICASE™ series

Geared Motors

NORDBLOC.1® Helical Inline Gear Units – Innovative Performance (G1000 catalog)

- Foot or flange mounted versions
- Die-cast aluminium alloy housing (cast iron housing for SK 772.1 and above)
- UNICASE™ housing
- Single-stage version available for high speed applications (SK x71.1)
- Long bearing life
- High permissible radial and axial forces
- Smooth surface
- Compact design, even with NEMA / IEC adapter
- Natural corrosion protection, even without painting

Sizes: 13
Power: 0.16 – 50 hp
Torque: 266 – 29,207 lb-in
Speed ratio: 1.07:1 – 456.77:1

NORDBLOC.1® 1-Stage Helical Inline Gear Units

SK 5 7 1 .1

- 5 — Housing size
- 7 — NORDBLOC.1® design
- 1 — Gear stages
- .1 — New design
- No options (solid shaft, foot mounting)

NORDBLOC.1® 2-, 3-Stage Helical Inline Gear Units

SK 8 7 2 .1 F

- 8 — Housing size
- 7 — NORDBLOC.1® design
- 2 — Gear stages
- .1 — New design
- F — B5 flange

Geared Motors

UNICASE™ Parallel Shaft Gear Units – Compact and Efficient (G1000 catalog)

- Foot, flange, or shaft mounted
- Hollow or solid shaft
- Compact design
- UNICASE™ housing, optional die-cast aluminium housing for SK 0182.1, SK 0282.1, SK 1282.1, and SK 1382.1
- Long service life
- Low-maintenance
- Quiet operation
- Keyless shaft designs with shrink disc and GRIPMAXX™

Sizes: 15
Power: 0.16 – 200 hp
Torque: 974 – 680,200 lb-in
Speed ratio: 4.03:1 – 15,685.03:1

UNICASE™ Parallel Shaft Gear Units

SK 9 3 82 AZ SH

- SH – Shrink disc / cover
- AZ – Hollow shaft / B14 flange
- 82 – Parallel shaft gear unit
- 3 – Gear stages
- 9 – Housing size

NORDBLOC.1® Parallel Shaft Gear Units

SK 1 2 82 .1 VX

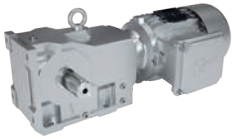
- VX – Solid shaft / foot mounting
- .1 – New design
- 82 – Parallel shaft gear unit
- 2 – Gear stages
- 1 – Housing size

Special nomenclature (NORDBLOC.1):

- For SK 0182.1 and SK 0282.1, the number of stages can be obtained from the nomenclature (2- and 3-stage versions are available)

Geared Motors

UNICASE™ Helical Bevel Gear Units – Powerful and Proven (G1000 catalog)



- Foot, flange, or shaft mounted
- Hollow or solid shaft
- UNICASE™ housing
- High efficiency
- Robust design
- Cast iron housing
- Various bearing optons for high axial and radial load capacities
- Quiet operation – i.e. for theater applications

Sizes: 11
Power: 0.16 – 200 hp
Torque: 1,593 – 442,537 lb-in
Speed ratio: 8.04:1 – 13,432.68:1

UNICASE™ Helical Bevel Gear Units

SK 90 4 2 .1 AZ

- AZ — Hollow shaft / B14 flange
- .1 — New design
- 2 — Gear stages: 2 helical gear stages, 1 bevel gear stage
- 4 — Housing size
- 90 — 90 series

Special nomenclature:

- A 6 at the designation end indicates a reinforced version, 3-stage
- A 7 at the designation end indicates a reinforced version, 4-stage (including the bevel gear stage)

Geared Motors

NORDBLOC.1® 2-Stage Bevel Gear Units – Power and Performance (G1000 Catalog)

- Foot, flange, or shaft mounted
- Hollow or solid shaft
- UNICASE™ housing
- Aluminium housing
- Compact design
- Wash-down design
- High power density

Sizes: 6
Power: 0.16 – 10 hp
Torque: 443 – 5,842 lb-in
Speed ratio: 3.03:1 – 70:1

NORDBLOC.1® 2-Stage Bevel Gear Units

SK 92 3 7 2 .1 VZ

- VZ — Solid shaft / B14 flange
- .1 — New design
- 2 — Gear stages: 1 helical gear stage, 1 bevel gear stage
- 7 — NORDBLOC.1® design
- 3 — Housing size
- 92 — 92 series

SK 93 6 7 2 .1 AZ

- AZ — Hollow shaft / B14 flange
- .1 — New design
- 2 — Gear stages: 1 helical gear stage, 1 bevel gear stage
- 7 — NORDBLOC.1® design
- 6 — Housing size
- 93 — 93 series

- SK 920072.1 / SK 930072.1 have the smallest available housing (size 00)

Geared Motors

UNICASE™ Worm Gear Units – Quiet and Powerful (G1000 catalog)

- Foot, flange, or shaft mounted
- Hollow or solid shaft
- UNICASE™ housing
- Smooth, quiet operation
- High overload capacity
- High axial and radial loads
- Cast iron housing

Sizes: 6
Power: 0.16 – 20 hp
Torque: 823 – 27,066 lb-in
Speed ratio: 4.40:1 – 7,095.12:1

UNICASE™ Worm Gear Units

SK 1 2 080

- 080 — Worm gear size (center distance between gear and pinion – 80 mm)
- 2 — Gear stages: 1 helical gear stage, 1 worm gear stage
- 1 — Housing size (in combination with worm gear size)

- Worm gear units with a following .1 in the nomenclature (SK 02040.1) indicate new aluminum housing designs

Geared Motors

UNIVERSAL SI Worm Gear Units – Modular and Flexible (G1000 catalog)

- Modular
- Universal mounting design
- Life-long lubrication
- NEMA or IEC input versions
- Aluminium housing

Sizes: 5
Power: 0.16 – 5.00 hp
Torque: 186 – 3,780 lb-in
Speed ratio: 5.00:1 – 3,000:1

UNIVERSAL SMI Worm Gear Units – Modular and Flexible (G1000 catalog)

- Smooth surfaces
- Life-long lubrication
- NEMA, IEC, or direct motor mount options
- Aluminium housing
- Universal mounting design

Sizes: 5
Power: 0.16 – 5.00 hp
Torque: 186 – 3,780 lb-in
Speed ratio: 5.00:1 – 3,000:1

UNIVERSAL SI Worm Gear Units

SK 1 SI 75/H10

- H10 — Helical gear pre-stage 10:1
- 75 — Worm gear size (center distance between gear and pinion – 75 mm)
- SI — SI design
- 1 — Gear stages

UNIVERSAL SMI Worm Gear Units

SK 1 SMI 31 AZ

- AZ — Hollow shaft / B14 flange
- 31 — Worm gear size (31 mm)
- SMI — SMI design
- 1 — Gear stages

Geared Motors

DuoDrive – Integrated Gear Unit and Motor (G5010 catalog)

- High-efficiency IE5+ motor
- System efficiency up to 92 %
- Results in a significant reduction of the TCO (Total Cost of Ownership) compared to other drive systems
- High power density
- Minimal noise emissions
- Simple plug-and-play commissioning
- Hygienic design (wash-down)
- Flexible mounting: M1, M4, M5, M6

Sizes: 2
Power: 0.50 – 4.00 hp
Torque: 230 – 2,186 lb-in
Speed ratio: 3.24:1 – 18.1:1

DuoDrive – Integrated Gear Unit and Motor

SK EVO 80 - 1

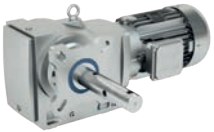
- 1 – Power class
- 80 – Torque class
- EVO – DuoDrive series

Geared Motors

Screw Conveyor Package (G1129 catalog)

- Available for UNICASE parallel shaft gear units and UNICASE helical bevel gear units
- Directly coupled input design
- Closely stepped ratios
- Standand CEMA mounting
- Compact and cost-effective
- Versatile flange with multiple bolt patterns

Sizes: 11
Power: 0.16 – 60 hp
Torque: Up to 53,100 lb-in
Speed ratio: 4.32:1 – 4,246.38:1



Overhead Conveyors (G1043 catalog)

- Output flange mounted
- High overhung load capacity
- QUADRILIP™ sealing system
- Low maintenance
- Long service life
- Industry standard mounting and shafts
- Standard VL3 bearing design with dry cavity

Sizes: 3
Power: 0.33 – 60 hp
Torque: Up to 75,225 lb-in
Speed ratio: 8.10:1 – 3,735.92:1

Geared Motors

Gear Unit Options

Designation	Meaning
A	Hollow shaft
AF	Hollow shaft, B5 flange
AX	Hollow shaft, foot mounting
AXF	Hollow shaft, foot mounting, B5 flange
AZ	Hollow shaft, B14 flange
AZD	Hollow shaft, B14 flange with torque arm
AZK	Hollow shaft, B14 flange with torque bracket
B	Fastening element for hollow shaft
D	Torque arm
EA	Hollow shaft, splined, DIN 5480
G	Rubber buffer for torque arm
H	Hollow shaft cover
IEC	Adapter for fitting IEC standard motors
LX	Double solid shaft
MK	Top motor mount
R	Integrated backstop
RLS	Backstop in input
S	Hollow shaft with shrink disc

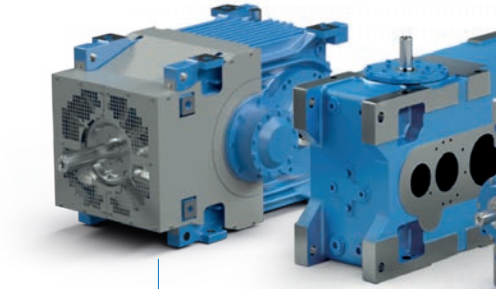
Gear Unit Options

Designation	Meaning
SEK	Servo adapter with clamp coupling
SEP	Servo adapter with parallel key coupling
V	Solid shaft
VF	Solid shaft, B5 flange
VL	Reinforced bearings
VL2	Spread bearing design
VL3	Spread bearing design with oil-safe cavity
VX	Solid shaft, foot mounting
VXF	Solid shaft, foot mounting, B5 flange
VXZ	Solid shaft, foot mounting, B14 flange
VZ	Solid shaft, B14 flange
W	Solid shaft input
XF	Foot mounting, B5 flange
XZ	Foot mounting, B14 flange

- Not all options are available for all gear units
- Detailed descriptions and diagrams can be found in the relevant catalogs
- Further options available in the cited catalogs or on request (e.g. belt drives)
- Multiple options are stated in succession, e.g. SK 2282SHG (hollow shaft with shrink disk, cover, rubber buffer)

NORD DRIVESYSTEMS

Industrial Gear Units



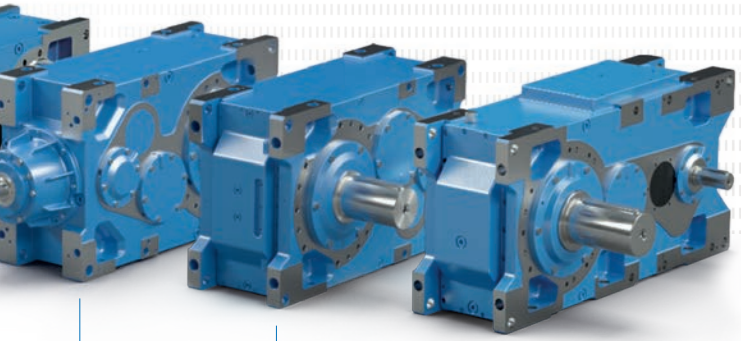
MAXXDRIVE® XT Right-Angle Gear Units

MAXXDRIVE® XJ Right-Angle Gear Units

MAXXDRIVE® Right-Angle Gear Units

MAXXDRIVE® Parallel Gear Units

MAXXDRIVE® XD Parallel Gear Units



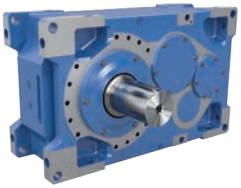
NORD DRIVESYSTEMS

Industrial Gear Units

MAXXDRIVE® Industrial Gear Units

- UNICASE™ housing, no joints subject to torque
- All bearing points and sealing surfaces are machined in a single process
- High precision axis alignment, quiet operation
- Long life, low-maintenance
- Parallel shaft and right-angle options

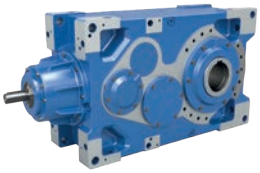
MAXXDRIVE® Parallel Gear Units (G1050 catalog)



- Universal gear units
- 2- and 3-stage
- Multiple mounting and cooling options
- Variety of bearing options for high radial and axial loads
- Compact design
- Flexible installation positions

Sizes: 11
Power: 2 – 8,075 hp
Torque: 132,800 – 2,495,900 lb-in
Speed ratio: 5.54:1 – 30,000:1

MAXXDRIVE® Right-Angle Gear Units (G1050 catalog)



- Universal gear units
- 3- and 4-stage
- Multiple mounting and cooling options
- Variety of bearing options for high radial and axial loads
- Compact design
- Flexible installation positions

Sizes: 11
Power: 2 – 2,850 hp
Torque: 132,800 – 2,301,200 lb-in
Speed ratio: 12.61:1 – 30,000:1

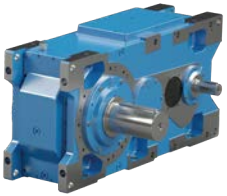
MAXXDRIVE® XT Parallel Gear Units (S1055 flyer)

- 2-stage
- Thermally optimized gear units
- Integrated high power axial fan
- High powers with low speed ratios
- Optimized for horizontal installation orientation
- Ideal for applications such as belt or bucket conveyors

Sizes: 7
Power: 30 – 2,825 hp
Torque: 132,800 – 663,800 lb-in
Speed ratio: 6.14:1 – 22.91:1

Industrial Gear Units

MAXXDRIVE® XD Parallel Gear Units (G1050 catalog)



- 3- and 4-stage
- Increased center distances in housing
- Inspection cover
- Housing optimized for downward radial loads
- Ideal for lifting equipment

Sizes: 10
Power: 1 – 8,075 hp
Torque: 60,200 – 2,496,000 lb-in
Ratio: 5.6:1 – 400:1

MAXXDRIVE® XJ Right-Angle Gear Units (G1050 catalog)

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

Sizes: 5
Power: 7.5 – 1,710 hp
Torque: 132,761 – 947,030 lb-in
Ratio: 12.5:1 – 100:1

Industrial Gear Units

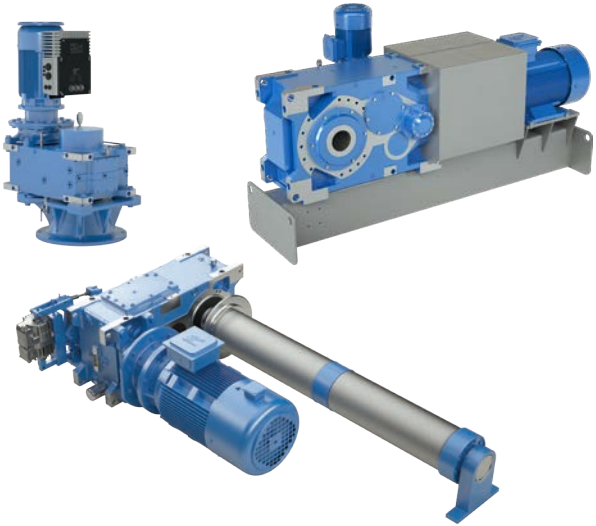
MAXXDRIVE® Industrial Gear Units

SK 11 2 17 AS H MS FAN 355LP/4

- Motor designation
- Additional options (FAN, CC, ...)
- Motor adapters (IEC, NEMA, MS, ...)
- Additional options (D, H, B, ...)
- Shaft and mounting options (A, V, L, ...)
- Type designation
- Size (5 – 15)

	Parallel Gear Units		Right-Angle Gear Units		
	07	21	07	17	18
	G1050	XD	G1050	XT	XJ
2-stage	2	–	–	2	–
3-stage	3	3	4	–	4
4-stage	–	4	5	–	–

MAXXDRIVE® Drive Systems (G1050 catalog)



- Complete drive systems consisting of the gear unit, motor, and drive electronics
- Wide selection of other components, e.g. couplings, brakes, etc.
- Standardized solutions for rockers and base frames, e.g. for belt conveyors or bucket elevators, etc.
- Systems tailored to applications, e.g. agitators, hoists, extruders, etc.
- Individually adaptable

Industrial Gear Units

Industrial Gear Unit Options

Designation	Meaning
A	Hollow output shaft with key groove
AS	Hollow output shaft for shrink disc
B	Fastening set for hollow shaft
CC	Internal water cooling system
CS1	External oil-water cooler
CS2	External oil-air cooler
D	Torque arm
DRY	“True Drywell” agitator version with standard bearing
EA	Splined hollow output shaft, DIN 5480
ED	Elastic torque arm
EV	Splined solid output shaft, DIN 5480
EW	Splined solid input shaft, DIN 5480
F	Flat output flange (B14 with threaded holes)
FAN	Fan or electrical fan
FK	High output flange (B5 with through holes)
F1	Drive flange (SK..207 / SK..307)
H/H66	Cover (contact guard) / IP66 cover
IEC	Adapter for B5 mounting, IEC standard motors
L	Double solid output shaft
LC	Pressurized oil lubrication (bearings)
LCX	Pressurized oil lubrication with “Drywell” (bearings and gearwheels)
MC	Motor bracket
MO	Measuring devices and sensors
MF	Motor frame (options: see MF...)
MFB	Base frame with brake
MS	Motor swing base (options: see MS...)
MSB	Motor swing base with brake
MFK	Motor frame with elastic coupling

Designation	Meaning
MFT	Motor frame with turbo coupling
MSK	Motor swing base with elastic coupling
MSKB	Motor swing base with elastic coupling and brake
MST	Motor swing base with turbo coupling
MFTB	Motor frame with turbo coupling and brake
MSTB	Motor swing base with turbo coupling and brake
MT	Motor mount
NEMA	Adapter for fitting B5 NEMA C flange, standard motors
OT	Oil reservoir tank
OH	Oil heater
R*	Back stop
V	Solid output shaft
VL2	Agitator version
VL3	Agitator version with "Drywell"
VL4	Agitator version with "True Drywell"
VL5	Extruder flange
VL6	Agitator version with “True Drywell” without flange
WX	Auxiliary drive unit
WG	First-stage gear unit
W1, W2*, W3*	W1/2/3 – number of solid input shafts, W3 – for 407 and 507 types
–	Brakes
–	Couplings
–	Paintings
–	Endurance Package

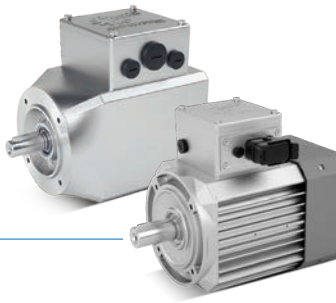
** R, W2, W3 – not available for all ratios*

- Not all options/combinations are available for all gear units
- Detailed descriptions and diagrams can be found in the relevant catalogs
- Further options can be found in the relevant catalogs or on request
- Multiple options are stated consecutively, e. g. SK 11217 AS H ED (hollow output shaft with shrink disc, cover, and elastic torque arm)

NORD DRIVESYSTEMS

Electric Motors

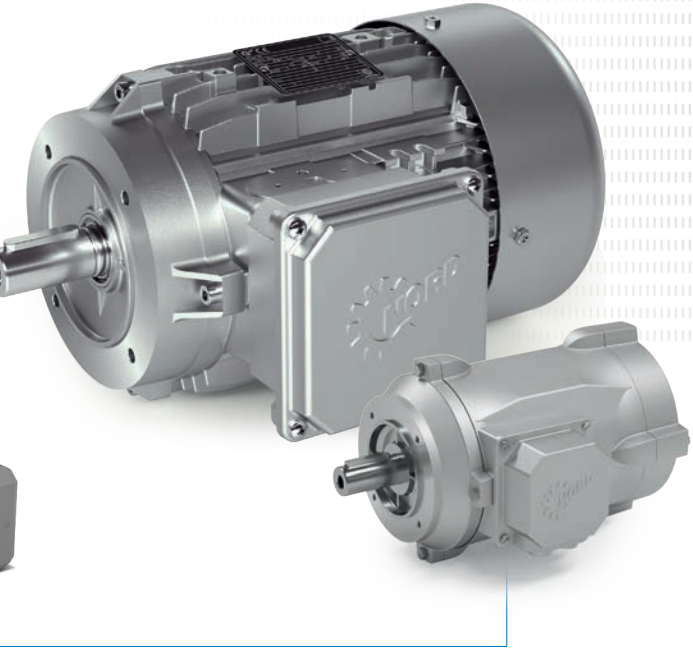
Synchronous and Asynchronous Motors



IE5+ Synchronous Motors

Smooth Surface Motors

IE3 IE4 IE5+



Electric Motors

Standard Asynchronous Motors (M7000 catalog)

- Complies with international regulations and directives
- Extensive options available
- ISO F used according to class B (ISO H as option)
- Suited for VFD operation
- High overload reserves

Sizes: 63 – 250
Power: 0.16 – 75 hp
Number of poles: 2, 4, 6
Protection class: IP55, optional IP66
Efficiency class: IE1, IE3

Switchable Pole Asynchronous Motors (M7000 catalog)

- ISO F used according to class B

Sizes: 63 – 160
Power: 0.13 – 22 hp
Number of poles: 4-2, 8-2, 8-4 (others on request)
Protection class: IP55, optional IP66
Efficiency class: IE1

Single-Phase Asynchronous Motors (M7000 catalog)

- ISO F used according to class B
- Supplied with starting and operating capacitors or Steinmetz circuit

Sizes: 63 – 90
Power: 0.16 – 2 hp
Number of poles: 4
Protection class: IP55, optional IP66
Efficiency class: IE1

Electric Motors

IEC Asynchronous Motors

SK 100 L H / 4 SH

- SH — Anti-condensation heating
- 4 — Number of poles
- H — Efficiency class
- L — Power class
- 100 — Frame size

- X or W in the nomenclature designates a smaller size, e.g. SK 250WP is a 75 hp motor in a size 225 housing

NEMA C-FACE Asynchronous Motors

SK 90 L H / 4 145 TC TW

- TW — Motor option (TW = thermostat)
- TC — C-flange
- 145 — Housing size
- 4 — Number of poles
- H — Efficiency class
- L — Power class
- 90 — Frame size

Switchable Pole Asynchronous Motors

SK 132 M 8 / 2 WU

- WU – Silumin rotor
- 2 – Number of poles – high speed
- 8 – Number of poles – low speed
- M – Power class
- 132 – Frame size

Single-Phase Asynchronous Motors

SK 90 LB / 4 EHB1

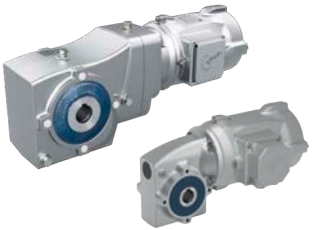
- EHB1 – with capacitor
  EAR1 – with operating and starting capacitor
  EST – with Steinmetz circuit
  ECR – with operating and starting capacitor, CUS approved
- 4 – Number of poles
- LB – Power class
- 90 – Frame size

Electric Motors

Asynchronous Smooth Surface Motors (M7010 catalog)

- ISO F
- Suited for VFD operation
- Wash-down design
- Various motor protection options
- Smooth surfaces, especially suitable for food industry applications

Sizes: 71 – 100
Power: 0.16 – 1.5 hp
Number of poles: 4
Protection class: IP66, optional IP69K
(in combination with the gear unit)
Efficiency class: IE3



Asynchronous Smooth Surface Motors

SK 100 L H / 4 HM

- HM: Smooth motor type
- 4: Number of poles
- H: Efficiency class
- L: Power class
- 100: Frame size

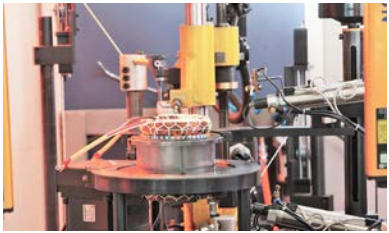
- For non-ventilated smooth motors, the efficiency code letter is H or P for Premium Efficiency (IE3)

Electric Motors

IE4 Standard Synchronous Motors (TI60-0001 and TI60-0004)

- ISO B
- Only for VFD operation
- Open or closed loop operation with NORD frequency drives
- High overload reserves

Sizes: 80 – 100
Power: 1.5 – 7.5 hp
Number of poles: 4
Protection class: IP55, optional IP66
Efficiency class: IE4



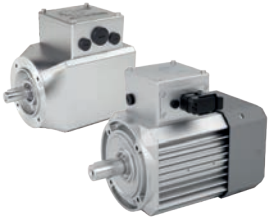
IE4 Standard Synchronous Motors

SK 100 T 2 / 4 Δ

- Frame size
- Synchronous motor
- Stator code (depending on motor size)
- Number of poles
- Rated speed
  (Δ = 3,000 rpm, without = 2,100 rpm)

Electric Motors

IE5+ Permanent Magnet Synchronous Motors (M5000 catalog)



- Ultimate operational efficiency with permanent magnet technology
- Reduced TCO (Total Cost of Ownership) and fast ROI (Return on Investment)
- Reduced number of variants through constant torque over a wide speed range
- Motor can be operated worldwide
- Flexible motor mounting: direct mounting, NEMA, IEC
- Non-ventilated motors with smooth surface housing for wash-down applications
- Ventilated motor version for maximum heat dissipation in applications with heavy loads
- Optional motor-integrated encoder
- Optional integrated mechanical brake

Sizes: 71, 90
Power: Non-ventilated (TENV) 0.5 – 3 hp
Ventilated (TEFC) 0.5 – 5 hp
Number of poles: 8
Torque: 14.2 – 130.1 lb-in
Protection class: IP55, optional IP66, or IP69K (in combination with the gear unit)
Efficiency class: IE5 is exceeded in some cases

IE5+ Permanent Magnet Synchronous Motors

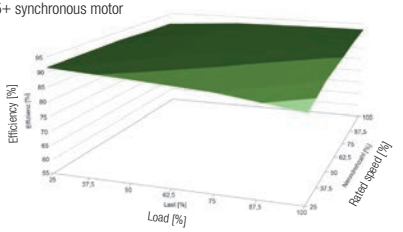
SK 71 N 1 / 8

- 8 — Number of poles
- 1 — Rotor length (size)
- N — IE5+ series
  - N = non-ventilated
  - F = ventilated
- 71 — Frame size

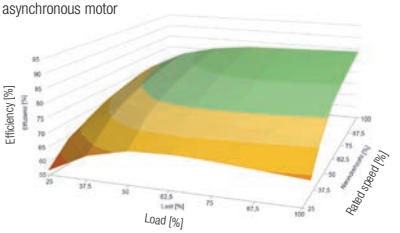
The IE5+ synchronous motor is characterized by its high efficiency. Compared to asynchronous motors, significant energy savings are possible, especially in the partial load and partial speed range.* This minimizes the customer's TCO.

* Efficiency example:
Load 50% / speed 37.5%

IE5+ synchronous motor



IE3 asynchronous motor



Electric Motors

Motor Options

Designation		Meaning
BRE +		Brake / brake torque + sub-options
	RG *	Rust protected version
	SR *	Dust and rust protected version
	IR *	Current relay
	FHL *	Lockable manual release
	HL	Manual release
	MIK	Microswitch
	AS55 *	Outdoor installation
BRB		Anti-condensation heater / brake
NRB1/2		Noise-reduced brake
ERD		External earthing terminal
TF		Thermistor, PTC resistor
TW		Temperature sensor, bi-metal
SH		Anti-condensation heater
WU		Silumin rotor
Z		Additional flywheel, cast iron fan
WE		Second shaft end
HR		Hand wheel
RD		Protective shield
RDT		Protective shield, textile fan cowl
RDD		Double fan cowl

Motor Options

Designation	Meaning
AS66	Outdoor installation
OL	Without fan
OL/H	Without fan, without fan cowl
KB	Closed condensation drain hole
MS	Motor plug connection
EKK	One-piece terminal box
KKV	Encapsulated terminal box
F	External fan
RLS	Backstop
MG	Magnetic incremental encoder
SL	Sensor bearings
IG	Incremental encoder
IG.P	Incremental encoder with plug connector
IG.K	Incremental encoder with terminal box
AG	Absolute encoder

- Not all options are available for all motors
- Detailed descriptions and drawings of the options can be found in the M7000 catalog
- Further options on request (e.g. 2xTF, PT100 etc.)

Drive Electronics

NORDAC *LINK* FDS Variable Frequency Drives

NORDAC *START* Motor Starters

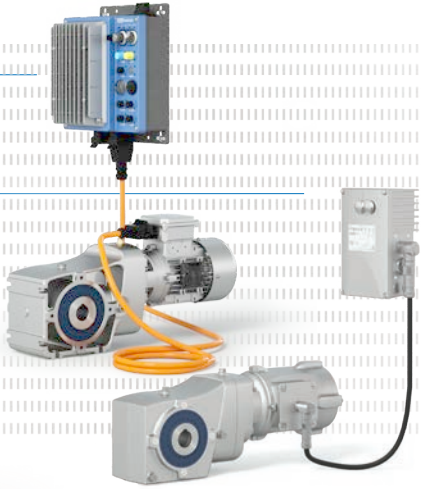
NORDAC *PRO* Cabinet Variable Frequency Drives

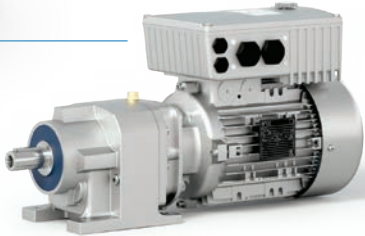
NORDAC *FLEX* Decentralized Variable Frequency Drives

NORDAC *BASE* Decentralized Variable Frequency Drives

NORDAC *PRO* Cabinet Variable Frequency Drives

DRIVESYSTEMS





Drive Electronics

NORDAC *PRO* SK 500P – Versatile Functionality (E3000 catalog)

Cabinet Variable Frequency Drive

- Universal drive in various basic versions, can be modularly extended
- Precise current vector control with high overload reserve up to 200% for operation of asynchronous and synchronous motors
- POSICON – integrated positioning mode
- Universal interface for real-time Ethernet PROFINET, ETHERCAT, ETHERNET IP, and POWERLINK
- Integrated CANopen as series equipment
- Drive profile DS402 for CANopen, ETHERCAT, and POWERLINK
- Integrated PLC for drive-related functions, even in basic version
- TTL encoder interface and optional universal encoder interface
- Optional: Safe Stop with “Safe Torque Off“ (STO) and “Safe Stop 1“ (SS1-t) according to EN 61800-5-2
- MicroSD card
- USB interface for connection to NORDCON, may also be used without a power supply
- Compact slim design, can be mounted directly adjacent to other components
- In sizes 1 and 2, all terminals are implemented as plug connections, including the power

Sizes: 5
Voltage: 1~ 200 – 240 V, 3~ 380 – 480 V
Power: 0.33 – 30 hp

NORDAC *PRO* SK 500P

SK 500P 551 3 40 A

- A: EMC line filters: A = Class A1 (C2)
- 40: Mains voltage: x23 = 230 V; x40 = 400 V
- 3: Number of mains phases: 1xx = 1-phase; 3xx = 3-phase
- 51: Digits before decimal point for power: 0 = 0.xx; 1 = 0x.x0; 2 = 0xx.0; 3 = 0xx0.0
- 551: Rated power (xx): 250 = 0.25 kW / 0.33 hp ... 551 = 5.5 kW / 7.0 hp etc.
- SK 500P: Device type: SK 500P, SK 510P, SK 530P, SK 550P

Drive Electronics

NORDAC *PRO* SK 500E – Versatile Functionality (E3000 catalog)

Cabinet Variable Frequency Drive

- Maximum functionality
- Sensorless current vector control (ISD control)
- Multi-encoder interface
- PLC functionality for drive-integrated functions SK 520E and higher
- Optional: POSICON positioning SK 530E and higher
- Optional: Safe stop with “Safe Torque Off” (STO) and “Safe Stop 1” (SS1) according to EN 61800-5-2 (for SK 510E and SK 530E)
- ASM and PMSM motor operation
- Energy-saving function
- High overload reserves (200%) for all power ratings up to 160 kW / 215 hp
- Many field bus and Industrial Ethernet-based bus systems
- Optional: CANopen integrated in SK 511E and higher
- Integrated Class C1 line filter
- Alternative cooling systems, e.g. “Cold Plate”
- IP20 control cabinet installation

Sizes: 11
Voltage: 1~ 110 – 120 V, 1~ 200 – 240 V, 3~ 200 – 240 V, 3~ 380 – 480 V
Power: 0.33 – 215 hp

NORDAC *PRO* SK 500E

SK 500E 11 3 3 40 A

- EMC line filters:
  A = Class A1 (C2)
- Mains voltage:
  x12 = 115 V; x23 = 230 V; x40 = 400 V
- Number of mains phases:
  1xx = 1-phase; 3xx = 3-phase
- Digits before decimal point for power:
  0 = 0.xx; 1 = 0x.x0; 2 = 0xx.0; 3 = 0xx0.0
- Rated power (xx):
  751 = 7.5 kW / 10 hp; 113 = 110 kW / 150 hp, etc.
- Device type: SK 500E ... SK 545E

Drive Electronics

NORDAC *ON/ON+* SK 300P – Optimized Function (E3000 catalog)

Decentralized Variable Frequency Drive

NORDAC *ON/ON+* variable frequency drives were developed for the special requirements of horizontal conveyor technology. The NORDAC *ON* is for use with IE3 motors while the NORDAC *ON+* is optimized for combination with IE5+ synchronous motors. They are characterized by an integrated Ethernet interface, full pluggability, and a compact design. An economic plug-and-play solution for IIoT environments.

- 4 digital inputs, 2 digital outputs
- Functional safety: STO, SS1
- Integrated Ethernet interface can be configured for each parameter
- Firmware update via Ethernet
- Encoder interfaces: RS485
- Simple installation and maintenance due to full pluggability
- 4 parameter sets that can be switched online
- 4-quadrant operation with integrated brake chopper
- V/f control, current vector control in open-loop and closed-loop mode
- High precision control and high overload characteristics for synchronous and asynchronous motors
- PLC functionality for drive-related functions
- POSICON – integrated positioning mode
- Ambient temperature: -30…+40°C (S1)

NORDAC *ON*/*ON+* SK 300P

NORDAC *ON* ▸ With optimized IE3 motor

NORDAC *ON+* ▸ With the latest IE5+ motor

Sizes: 3
Power: NORDAC *ON*: 0.50 – 3 hp
NORDAC *ON+*: 0.50 – 4 hp
Mains voltage: 3 ~ 400 V
Supply voltage: 24 V DC external

- NORDAC *ON* typical overload capacity: 150% for 60 s, 200% for 5 s, 250% for 1s
- NORDAC *ON+* typical overload capacity: 150% for 60 s, 200% for 5 s, up to 300% for 1s
- NORDAC *ON* protection class: IP55
- NORDAC *ON+* protection class: IP55 / IP66

SK 300P 360 340 A

- A: EMC line filters: A = Class A1 (C2)
- 340: Mains voltage: 3-phase, 400 V
- 360: Power: 360 = 0.37 kW / 0.5 hp in Size 1
  450 = 0.45 kW / 0.6 hp in Size 1
  370 = 0.37 kW / 0.5 hp in Size 2 –
  950 = 0.95 kW / 1.27 hp in Size 2
  111 = 1.1 kW / 1.5 hp in Size 3 –
  371 = 3.7 kW / 5 hp in Size 3
- 300P: Device type: 300P = NORDAC *ON* without functional safety
  301P = NORDAC *ON* with functional safety
  310P = NORDAC *ON+* without functional safety
  311P = NORDAC *ON+* with functional safety

Drive Electronics

NORDAC *LINK* SK 250E FDS – Easy to Install (E3000 catalog)

Variable Frequency Drive

- Simple installation and maintenance due to full pluggability
- Optional maintenance switch and plug-in EEPROM for easy servicing
- Free configuration for your application
- Field installation close to the geared motor thanks to high protection class IP55 / IP65
- Operation of asynchronous and synchronous motors
- High overload up to 200% and 4-quadrant operation thanks to optional braking resistor solutions
- Multiple field bus and Industrial Ethernet-based bus systems as well as ASi
- Local control via optional key / manual switches, buttons, and potentiometers
- Safe stop with “Safe Torque Off” (STO) and “Safe Stop 1” (SS1) according to EN 61800-5-2 as well as ProfiSAFE with functional safety functions, e.g. Safe Limit Speed
- POSICON – integrated positioning mode

Sizes: 3
Voltage: 3~ 380 – 500 V
Power: 0.75 – 10 hp

NORDAC *LINK* SK 250E FDS

SK 250E FDS 30 1 3 40 A

- EMC line filters:
  A = Class A1 (C2)
- Mains voltage:
  x40 = 400 V
- Number of mains phases:
  3xx = 3-phase
- Digits before decimal point for power:
  0 = 0.xx; 1 = 0x.x0
- Rated power (xx):
  301 = 3.0 kW / 4.0 hp
- NORDAC *LINK* FDS
- Device type: SK 250E ... SK 280E

▸ FDS = **F**ield **D**istribution **S**ystem

Drive Electronics

NORDAC *FLEX* SK 200E – Flexible Use (E3000 catalog)

Decentralized Variable Frequency Drive

- Sensorless current vector control (ISD control)
- PLC functionality for drive-integrated functions
- Integrated POSICON positioning control
- Safe stop with “Safe Torque Off” (STO) and “Safe Stop 1” (SS1) according to EN 61800-5-2 as well as ProfiSAFE with functional safety functions, e.g. Safe Limit Speed
- ASM and PMSM motor operation
- Energy-saving function
- Motor or wall mounting
- IP55 (optional IP66)
- AS-Interface integrated in SK 22xE and SK 23xE
- Many field bus and Industrial Ethernet-based bus systems
- Extensive selection of plug connectors for control and power cable connections
- ATEX Zone 22, Category 3D (Sizes 1 – 3)
- POSICON – integrated positioning mode

Sizes: 4
Voltage: 1~ 110 – 120 V, 1~ 200 – 240 V, 3~ 200 – 240 V, 3~ 380 – 500 V
Power: 0.33 – 30 hp

NORDAC *FLEX* SK 200E

SK 200E 55 0 3 40 A (-C)

- (-C) Protection class:
  without = IP55 (standard)
  C = IP66
- A EMC line filters:
  A = Class A1 (C2)
- 40 Mains voltage:
  x12 = 115 V; x23 = 230 V; x40 = 400 V
- 3 Number of mains phases:
  1xx = 1-phase; 3xx = 3-phase
- 0 Digits before decimal point for power:
  0 = 0.xx; 1 = 0x.x0; 2 = 0xx.0
- 55 Rated power (xx):
  550 = 0.55 kW / 0.75 hp ... 222 = 22 kW / 30 hp, etc.
- 200E Device type: SK 200E ... SK 230E and SK 205E ... SK 235E

Drive Electronics

NORDAC *BASE* SK 180E – Compact and Economical (E3000 catalog)

Decentralized Variable Frequency Drive

- Sensorless current vector control (ISD control)
- PLC functionality for drive-integrated functions
- Operation on standard RCD possible, leakage current <16 mA
- AS-Interface integrated in SK 190E
- Energy-saving function
- Motor or wall mounting
- IP55 (optional IP66)
- Integrated line filter
- 2 analog inputs, 3 digital inputs, 2 digital outputs
- Temperature sensor input (TF+/TF-)
- RS485 (System bus/RS232 interface)
- ATEX Zone 22, Category 3D

Sizes: 2
Voltage: 1~ 110 – 120 V, 1~ 200 – 240 V, 3~ 200 – 240 V, 3~ 380 – 500 V
Power: 0.33 – 3 hp

NORDAC *BASE* SK 180E

SK 180E 75 0 3 40 B (-C) XXX

- XXX: without = Standard; BRI (internal braking resistor)
- (-C): Protection class: without = IP55 (standard); C = IP66
- B: EMC line filters: Class C1, B = Class C1
- 40: Mains voltage: x12 = 115 V; x23 = 230 V; x40 = 400 V
- 3: Number of mains phases: 1xx = 1-phase; 3xx = 3-phase
- 0: Digits before decimal point for power: 0 = 0.xx; 1 = 0x.x0
- 75: Rated power (xx): 250 = 0.25 kW / 0.33 hp ... 221 = 2.2 kW / 3.0 hp, etc.
- SK 180E: Device type: SK 180E or SK 190E

Drive Electronics

NORDAC *LINK* SK 155E/175E FDS – Economical Operation (E3000 catalog)

Motor Starter

- All I/O, bus interface and power connections are plug-in version for easy commissioning and maintenance
- Extensive options e.g. key switch, maintenance switch
- PLC functionality for drive-integrated functions
- Wear-free full electronic starting with reversing function
- Functions comparable to the modular NORDAC *START*
- Protection class IP65
- Simple commissioning
- AS-Interface or PROFIBUS available
- Can be parameterized on-site

Sizes: 1
Voltage: 3~ 380 – 500 V
Power: 0.16 – 4 hp

NORDAC *LINK* SK 155E / 175E FDS

SK 175E FDS 301 340 A

- A: EMC line filters: A = Class A1 (C2)
- 40: Mains voltage: x40 = 400 V
- 3: Number of mains phases: 3xx = 3-phase
- 0: Digits before decimal point for power: 1 = 0x.x0
- 01: Rated power (xx): 301 = 3.0 kW / 4.0 hp
- FDS: NORDAC *LINK* FDS
- 175E: Device type: SK 155E (unidirectional), SK 175E (bidirectional)

▸ FDS = **F**ield **D**istribution **S**ystem

Drive Electronics

NORDAC *START* SK 135E – Wear-Free Starting (E3000 catalog)

Decentralized Motor Starter

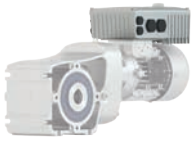
- Motor starter with soft start and reversing function
- Integrated brake rectifier for brake control (BRE)
- Integrated PROFIBUS or AS-Interface
- Wall or motor mounting
- IP55 (optional IP66)
- Integrated line filter
- 2 digital inputs, 2 digital outputs
- Temperature sensor input (TF+/TF-)
- RS232 interface
- ATEX Zone 22, Category 3D
- Electronic starter switches without wear
- Reduced mechanical wear due to reduced start-up torque

Sizes: 2
Voltage: 3~ 200 – 240 V, 3~ 380 – 500 V
Power: 0.16 – 4 hp resp. up to 10 hp

NORDAC *START* SK 135E

SK 135E 301 340 B ASI C

- SK 135E — Device type: SK 135E or SK 175E
- 301 — Rated power (xx): 301 = 3 kW / 4 hp or 751 = 7.5 kW / 10 hp
- 340 — Number of mains phases: 3xx = 3-phase
- B — Mains voltage: x23 = 230 V; x40 = 400 V
- ASI — EMC line filters: Class B = Class C1
- C — Communication: ASI = AS-Interface; PBR = PROFIBUS-Interface
- Protection class: Standard = IP55; C = IP66



Drive Electronics

NORDCON Software

NORDCON is the free operating software for control, parameterization, and diagnostics of all NORD frequency drives and motor starters.

- Control
  A virtual control unit, similar to a SimpleBox (optional control and parameterization unit), enables the display of operating values, parameterization, and control of a connected frequency drive or motor starter.
- Parameterization
  By means of a convenient overview, the user can view and adjust each available parameter. With the corresponding printing option, parameter lists are generated in printed form in entirety or with only the values that deviate from the factory settings. The final data sets can be saved on a PC / laptop and archived for future use or sent via e-mail.
- Diagnostics
  The oscilloscope function of the NORDCON software is an extremely useful instrument for the optimum adjustment of drive systems. By means of line graphs, all drive characteristics (current, torque, etc.) can be recorded and analyzed. Based off the results, fine tuning of the ideal parameter settings of the relevant drive unit is possible.
- PLC Programming
  A PLC editor is available for creating, editing, and managing a PLC program. The PLC programs can also be tested (debugged) with this editor and communicated to the variable frequency drive. "Structured Text" and "Instruction List" programming languages are supported according to IEC 61131-3.

Mobile Commissioning and Service Solution

NORDAC *ACCESS BT*

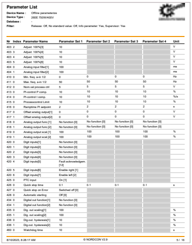
With the NORDAC *ACCESS BT* removable Bluetooth stick, you can now make 1:1 connections to your mobile device. Together with the free NORDCON *APP*, available for both Android and iOS, you have a practical, smart tool in your pocket to conveniently access your frequency drive. The available functions (display operating values, parameterization, and oscilloscope) are based on the Windows NORDCON software and feature enhanced intelligence.

- Stand-alone parameter memory
- Bluetooth interface for VFD and NORDCON *APP*
- Data transfer to PC via USB
- Can be plugged in or disconnected during operation

NORDCON *APP*

- Dashboard-based visualization for drive monitoring and fault diagnosis
- Parameterization with help function and rapid access to parameters
- Individually configurable oscilloscope function for drive analysis
- Backup and recovery function for simple handling of drive parameters

Automatic Device Configuration (ADC)



Parameter List

Device Name : Offline parameterize
Device Type : 260E 750W/400V
Database : -
Filter: Release: Off, No standard value: Off, Info parameter: Yes, Supervisor: Yes

Nr	Index	Parameter Name	Parameter Set 1	Parameter Set 2	Parameter Set 3	Parameter Set 4	Unit
403	2	Adjust: 100%[3]	10				V
403	3	Adjust: 100%[4]	10				V
403	4	Adjust: 100%[5]	10				V
403	5	Adjust: 100%[6]	10				V
404	0	Analog input filter[1]	100				ms
404	1	Analog input filter[2]	100				ms
410	0	Min. freq. a-in 1/2	0	0	0	0	Hz
411	0	Max. freq. a-in 1/2	50	50	50	50	Hz
412	0	Nom.val process ctrl	5	5	5	5	V
413	0	PI-control P comp.	10	10	10	10	%
414	0	PI-control I comp.	10	10	10	10	%/s
415	0	Processcontrol Limit	10	10	10	10	%
416	0	Ramptime PI setpoint	2	2	2	2	s
417	0	Offset analog output[1]	0	0	0	0	V
417	1	Offset analog output[2]	0	0	0	0	V
418	0	Analog output func.[1]	No function [0]	No function [0]	No function [0]	No function [0]	
418	1	Analog output func.[2]	No function [0]	No function [0]	No function [0]	No function [0]	
419	0	Analog output scal.[1]	100	100	100	100	%
419	1	Analog output scal.[2]	100	100	100	100	%
420	0	Digit inputs[1]	No function [0]				
420	1	Digit inputs[2]	No function [0]				
420	2	Digit inputs[3]	No function [0]				
420	3	Digit inputs[4]	No function [0]				
420	4	Digit inputs[5]	Fault acknowledgem. [12]				
420	5	Digit inputs[6]	Enable right [1]				
420	6	Digit inputs[7]	Enable left [2]				
425	0	PTC input	On [1]				
426	0	Quick stop time	0.1	0.1	0.1	0.1	s
427	0	Quick stop on Error	Switched off [0]				
428	0	Automatic starting	Off [0]				
434	0	Digital out function[1]	No function [0]				
434	1	Digital out function[2]	No function [0]				
435	0	Dig. out scaling[1]	100				%
435	1	Dig. out scaling[2]	100				%
436	0	Dig.out. hysteresis[1]	10				%
436	1	Dig.out. hysteresis[2]	10				%
460	0	Watchdog time	10				s

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The NORD Automatic Device Configration system features Add-On Instruction (AOI) designed to manage messages sent to a NORD electronic device. These messages can be used to read or write individual parameters in the PLC. The configurator can additionally back up current drive parameters or optionally restore a backup file to the drive. This enables easy drive replacement without the need of programming.

Automatic Device Configurator Functionality

- Create a backup file to be saved in the PLC
- Automatically detect when a new drive is connected
- Program the new drive from the stored backup file
- Individual read/write of parameters (acyclic comms)

Available for use with: NORDAC *PRO* SK 550P VFDs,
NORDAC *PRO* SK 5xxE VFDs,
NORDAC *ON/ON+* SK 3xxP VFDs,
NORDAC *FLEX* 2xxE VFDs,
NORDAC *BASE* SK 1x0E VFDs,
NORDAC *LINK* 2xxE VFDs

Automatic Device Configuration (ADC)

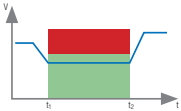
NORD offers an ADC AOI for quick, simple implementation into studio 5000 with tag generation and setup. Download manual BU 0970 to learn more.

Drive Electronics

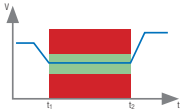
PROFIsafe

Safe Motion PROFIsafe via PROFINET
with module SK TU4-PNS

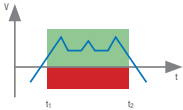
Safety functions for drives according to IEC 61800-5-2



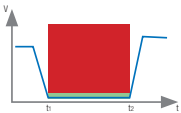
Safely Limited Speed (SLS)



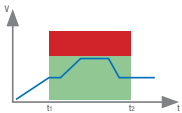
Safe Speed Range (SSR)



Safe Direction (SDI)



Safe Operation Stop (SOS)



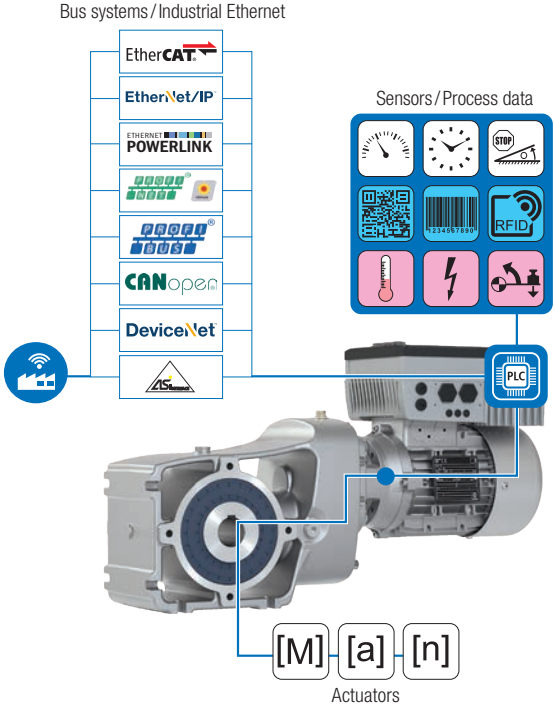
Safe Speed Measurement (SSM)

- PL_e (Performance Level) Cat. 4 according to ISO 13849-1
- SIL 3 (Safety Integrity Level) according to IEC 62061

+ user-defined safe I/O configuration

- Easy implementation of safe reactions available for NORDAC *FLEX* and NORDAC *LINK*
- Comprehensive safety for reliable operation of plant and machinery
- Functional safety with a single network cable
- Minimum wiring effort
- Global availability of fail-safe machine data

Bus Systems and Industrial Ethernet



Drive Electronics

Correct Connection Technology – Pre-Assembled (E3000 catalog)

NORD DRIVESYSTEMS supplies an extensive range of connection and control cables.

- Depending on the version, connecting cables include power connection cables (mains and motor) and if necessary, cables for thermistors and 24 V DC control voltage
- Control cables are exclusively used for transmitting control signals (encoder, bus, I/O signals)

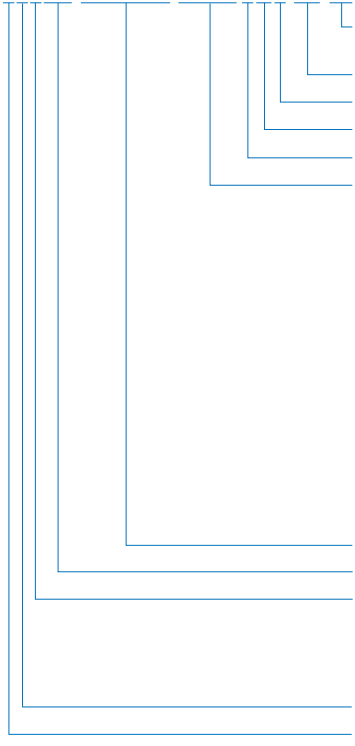
Connection and control cables are supplied pre-assembled. They are available in various lengths and can be optionally provided with open ends or plug connectors.

Connection cables are certified for global use according to the relevant IEC and UL standards.

- Cables for motor and variable frequency drive connection
- Mains connection and Daisy-Chain cables
- Signal and brake resistor cables

Correct Connection Technology – Pre-Assembled

SC H4G2.5 HQ8SMM H10E1SMF 1.5 UL



UL marking is included if required
All cables are CE compliant

The length is given in meters

M = plug connector (male) **F** = socket (female)

Plug connector material P = plastic, M = metal

Plug connector design S = straight, A = angled

Cable end
HQ8 = HAN Q8/0 plug connector
HQ4 = HAN Q4 plug connector (w/o = without)
HQ42 = HAN Q4/2 plug connector (24 V DC)
H10E1 = HAN 10E plug connector with 1 bracket
H10E2 = HAN 10E plug connector with 2 brackets
NQ16 = Plug connector, round / 6-pole
M8-A4 = M8 plug connector, A-coded / 4-pole
...
OE = Open end
OE25A4 = Open end with M25 cable gland / max. A4 cable lug
OECC = Open end, crimp contact
OEFI = Open end, insulated wire end sleeves
OEF = Open end, wire end sleeves
OECLA4 = Open end, without cable gland / max. A4 cable lug
...

Second cable end accordingly

Max. cable cross-section in mm

Cable version:
S = shielded with protective earth
Y = shielded without protective earth
G = shielded with protective earth
X = unshielded without protective earth

Number of wires with max. cross section

Cable type: P = power, S = signal, H = hybrid

Drive Electronics

LogiDrive® (S5200 flyer)

The Ideal Solution for Post & Parcel, Airport, and Warehouse

Service-friendly, standardized modular system utilizes NORD products customized to respective industry standards and application requirements. For every area, there are advanced versions with IE5+ permanent magnet synchronous motor technology and a basic version with IE3 asynchronous motors.

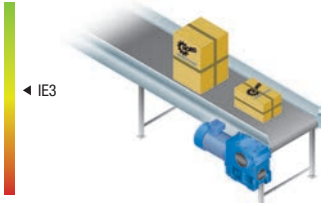
Advanced

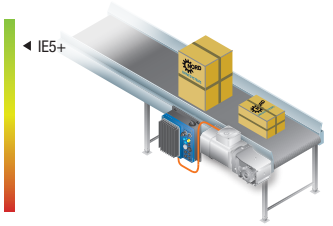
- Focus on energy efficiency, variant reduction, and Total Cost of Ownership (TCO)
- IE5+ permanent magnet synchronous motors
- Decentralized variable frequency drive
- Expandable through optional module
- Plug-and-Play
- PLC functionality for drive-related functions

Basic

- Main focus is cost efficiency
- IE3 high efficiency motor
- Decentralized variable frequency drive
- Flexible gear unit selection - modular
- Encoder optional
- PLC functionality for drive-related functions

Efficiency at Full Load & Partial Speed



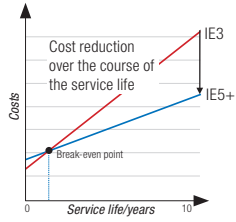


Motor Size	IE3	IE5+
71	0.33 - 0.5 hp	0.5 - 3.0 hp
80	0.75 - 1.0 hp	0.5 - 3.0 hp
90	1.5 - 2.0 hp	1.5 - 4.0 hp
100	3.0 - 4.0 hp	1.5 - 5.0 hp

PROFINET® EtherCAT® EtherNet/IP™

Total Cost of Ownership (TCO)

IE5+ synchronous motors unfold their full potential in applications with partial load and low speed ranges. By using IE5+ synchronous motors, systems can achieve significant cost reductions and increased operational efficiency.



Drive Electronics

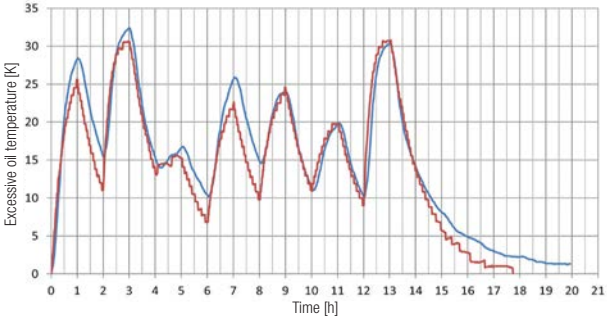
Condition Monitoring for Predictive Maintenance (S9091 flyer)

Condition monitoring periodically or continuously records drive and status data in order to optimize the operational safety and efficiency of machines and plants. The objective is to maintain machines and plants proactively, reduce downtimes, and increase the efficiency of entire plants.

The Industrial Internet of Things (IIoT) focuses on internet usage in industrial processes and procedures and aims to increase operational efficiency, reduce costs, and optimize processes. Sensors and sensor data play a central role in providing the basis for Condition Monitoring and Predictive Maintenance.

- Condition monitoring solutions for predictive maintenance systems integrated into the variable frequency drive
- System is IIoT / INDUSTRY 4.0 READY!
- Available for decentralized and control cabinet solutions

Temperature Curve of the Oil in the Gear Unit



Sensors

- Virtual sensors – the internal PLC can calculate information such as the optimal oil change time
- Interface for digital / analog sensors

Communication Interfaces

- Threshold values or general status information can be communicated externally (via normal Industrial Ethernet dialects)

Integrated PLC

- Local pre-processing of data with the integrated PLC
- Pre-processing of threshold values

Drive Electronics

Condition Monitoring for Predictive Maintenance (S9091 flyer)

System vibration sensor
- NORD qualified sensors
- Connection of customized sensors (analog / digital)

Temperature sensor
- PT1000-based motor temperature sensor
- Ambient or system temperature

Oil change
- Determination of the optimal time for oil change based on the virtual oil temperature
- The algorithm is executed in the integrated PLC

Drive parameters
- Readout of drive system parameters
- Basis for virtual sensors

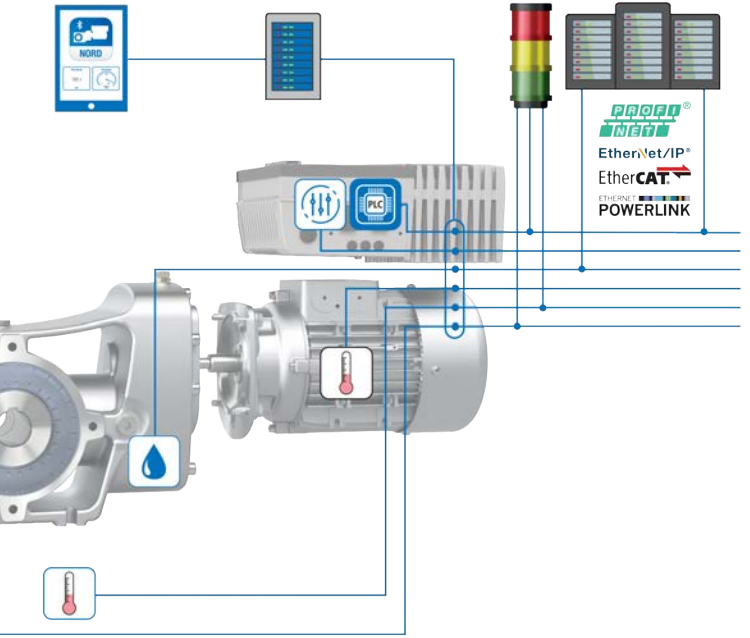
Integrated PLC
- Pre-processing of drive-specific parameters and sensors related to the drive
- Evaluation of drive conditions

Signal beacon
- Local display of drive conditions
- Scalable display

Local data management (IPC)
- Processing of drive data for drive and system analysis
- Condition monitoring

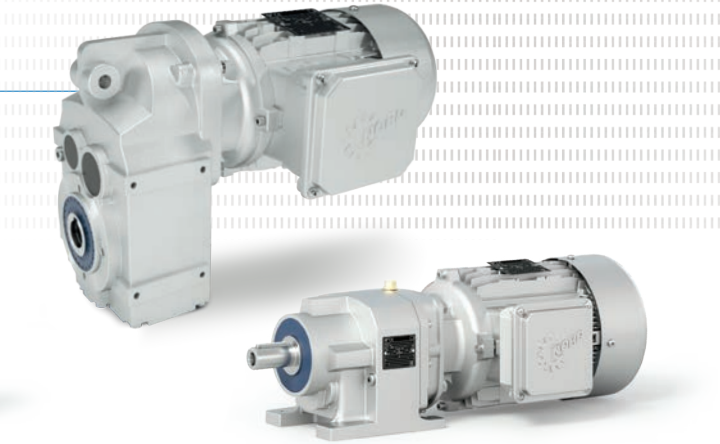
Local dashboard
- Display of drive and system data

Higher level PLC
- Processing of condition monitoring information by the customer
- Combination of collected condition monitoring data with process data


NORD
PLC
PROFINET
EtherNet/IP
EtherCAT
ETHERNET
POWERLINK

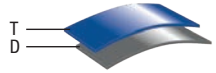
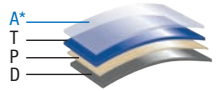
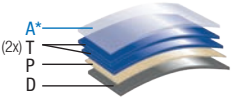
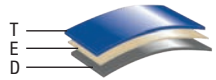
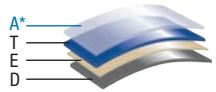
NORD DRIVESYSTEMS

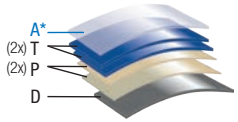
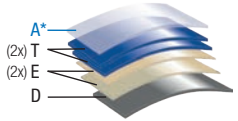
Technical Information



Technical Information

Surface Protection for NORD drive solutions

Coating / Application Range	Class**	Structure
Basic Indoor installation: Unheated buildings where condensation may occur (warehouses, etc...)	C2	
NORD Severe Duty 2 (NSD2) NORD Severe Duty 2+ (NSD2+) Indoor installation: Unheated buildings where condensation may occur (warehouses, etc...) Outdoor installation: Atmosphere with low pollution level, mostly rural areas	C2	
NORD Severe Duty 3 (NSD3) NORD Severe Duty 3+ (NSD3+) Indoor installation: Production rooms with high humidity and increased levels of air pollution, e.g. laundries, breweries, dairies Outdoor installation: Urban and industrial atmosphere with moderate sulfur dioxide pollution and/or coastal atmosphere with low salinity	C3	
NORD Severe Chem Duty 3 (NSDC3) Indoor installation: Production rooms with high humidity and increased levels of chemical air pollution	C3	
NORD Severe Food Duty 3 (NSDF3) NORD Severe Food Duty 3+ (NSDF3+) Indoor installation: Production rooms with high humidity and increased levels of air pollution, e.g. food packaging	C3	

Coating / Application Range	Class**	Structure
NORD Severe Duty 4 (NSD4) NORD Severe Duty 4+ (NSD4+) Indoor installation: Chemial plants, swimming pools, offshore shipyards, and boat harbors Outdoor installation: Industrial or coastal atmosphere with moderate salinity	C4	
NORD Severe Duty 5 (NSD5) NORD Severe Duty 5+ (NSD5+) Indoor installation: Buildings or areas with near-permanent condensation and high levels of pollution Outdoor installation: Industrial areas with high humidity, aggressive environments, or coastal atmosphere with high salinity	C5	

A*	Optional clear top coat (+ version)
T	2-component polyurethane top coat
E	2-component EP zinc phosphate primer
P	2-component polyurethane primer
D	Single component dip primer (for cast iron units only)

***Comparable to DIN EN ISO 12944-2 classification of ambient conditions*

**Protocol of the coating thickness based on ISO 19840 available on request*

Technical Information

Overview of Energy Saving Directives for Motors

Region		Efficiency Standard / Directives	Minimum Energy Efficiency
	Europe	IEC 60034-30	IE3
	United Kingdom	IEC 60034-30	IE3
	Switzerland	IEC 60034-30	IE3
	Turkey	IEC 60034-30	IE3
	Egypt	ES 2623-3	IE3
	USA	NEMA MG-1	Premium Efficiency (IE3)
	Canada	CSA C390-10	Premium Efficiency (IE3)
	China	GB 18613-2012; GB 25958-2010	IE3
	Brasil	INMETRO NBR 17094-1	Alto Rendimento Plus (IE3)
	Mexco	NOM-016-ENER-2016	Premium Efficiency (IE3)
	Columbia	Resolución no 1012 : 2015	IE3
	Chile	PE N° 7/01/2; IEC 60034-30-1	IE2

Region		Efficiency Standard / Directives	Minimum Energy Efficiency
	Ecuador	NTE INEN 2498 : 2009	IE2
	Australia New Zealand	AS / NZS 1359.5 : 2004	IE2
	India	IS 12615 : 2018	IE2
	South Korea	KS C IEC 60034	IE3
	Singapore	S602 : 2018	IE3
	Taiwan	IEC 60034-2-1	IE3
	Japan	JIS C 4034-30 : 2011	IE3
	Saudi Arabia	IEC 60034-30 : 2013	IE3
	Eurasian Economic Union	IEC 60034-2-1	IE2 from 01. September 2022
	Ukraine	IEC 60034-2-1	IE3

Please note that the standards and guidelines are subject to constant change and this excerpt is only a rough overview. More detailed information can be found on our website at www.nord.com.

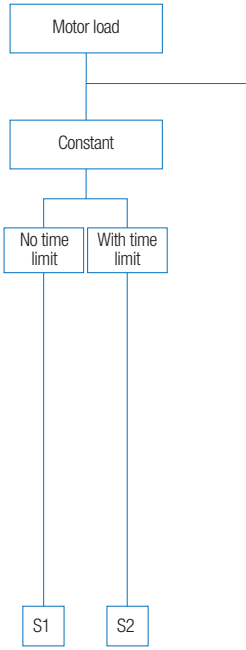
Technical Information

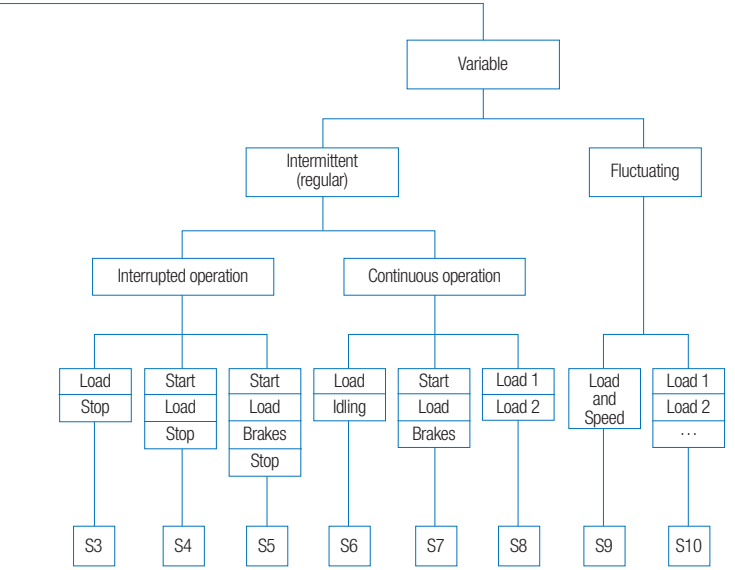
Nominal Operating Modes According to IEC 60034-1

Power increase in short-term and intermittent operation:
In short-term (S2) and intermittent operation (S3), electric motors can be subjected to greater loads than in continuous operation (S1). (See motor catalog M7000)

- In case of S2, the operating time in minutes must be stated as follows: “S2 15 minutes”
- In case of S3, S4, S5, and S6, a percentage value must be stated as follows: “S3 40 %“, i.e.: 40 % operating time on the basis of 10 minutes

Product catalog:
Asynchronous motors M7000




Variable
Intermittent (regular)
Fluctuating
Interrupted operation
Continuous operation
Load
Stop
Start
Load
Stop
Start
Load
Brakes
Stop
Load
Idling
Start
Load
Brakes
Load 1
Load 2
Load and Speed
Load 1
Load 2
...
S3
S4
S5
S6
S7
S8
S9
S10

Technical Information

Cooling Types for NORD Motors According to IEC 60034-6 and NEMA

IC411 “TEFC” – Totally Enclosed Fan Cooled Motor

- Ribbed or smooth surface housing
- Fan on the motor shaft
- Fan speed and air volume directly depend on the motor speed
- Air flow also cools driven components such as gear units
- Most common cooling method for electric motors

NORD products

- All NORD motors with ribbed housing

IC410 “TENV” – Totally Enclosed Non-Ventilated Motor

- Ribbed or smooth surface housing
- No fan
- Quiet operation – fan noise is eliminated
- Reduced length with OL/H option
- No ambient air turbulences
- Widely used in the hygiene sector as well as in theater and stage applications

NORD products

- OL or OL/H options
- Asynchronous smooth-surface motor
- Non-ventilated IE5+ synchronous motor

IC416 “TEBC” or “TEFV” – Totally Enclosed Blower Cooled Motor

- Ribbed or smooth surface housing
- External fan directly mounted on the motor
- Fan speed and air volume are independent of the motor speed
- External fan is a stand alone unit with separate voltage supply
- Air flow also cools driven components such as gear units
- Preferentially used during VFD operation, if full motor torque is required with low speed

NORD products

- NORD F option

Ingress Protection Codes (IP)

Digit 1	Protection Against Foreign Bodies
0	No protection
1	Protected against solid foreign bodies with diameter above 50 mm
2	Protected against solid foreign bodies with diameter above 12.5 mm
3	Protected against solid foreign bodies with diameter above 2.5 mm
4	Protected against solid foreign bodies with diameter above 1.0 mm
5	Protected against damaging amounts of dust
6	Dust-proof

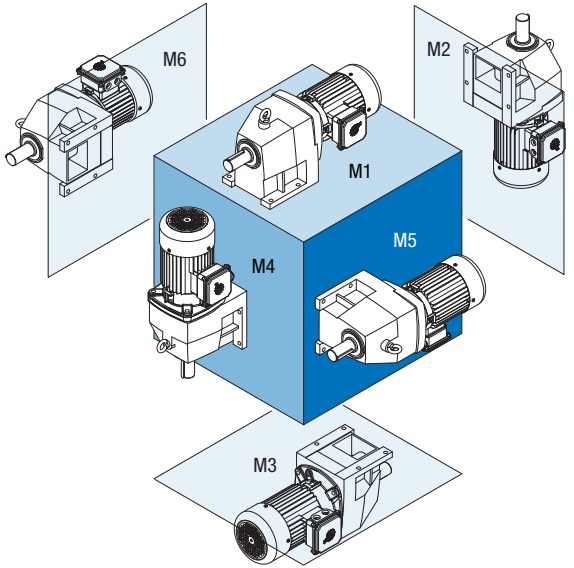
- If one of the numbers is not stated, this is indicated with an "X", e.g.: IP4X (protection against foreign bodies > 1.0 mm no details of protection against moisture)
- For IPX7 the immersion depth and the immersion time must also be stated
- Up to IPX6 the lower protection classes are included

Digit 2	Protection Against Humidity
0	No protection
1	Protection against dripping water
2	Protection against falling dripping water if the housing is inclined by up to 15°
3	Protection against falling sprayed water up to 60° from vertical
4	Protection against splashed water from all sides
5	Protection against water jets (nozzle) from any angle
6	Protection against strong water jets
7	Protection against temporary immersion
8	Protection against permanent immersion
9K (according to ISO 20653)	Protection against water for high pressure water jet and steam cleaning, specifically for road vehicles

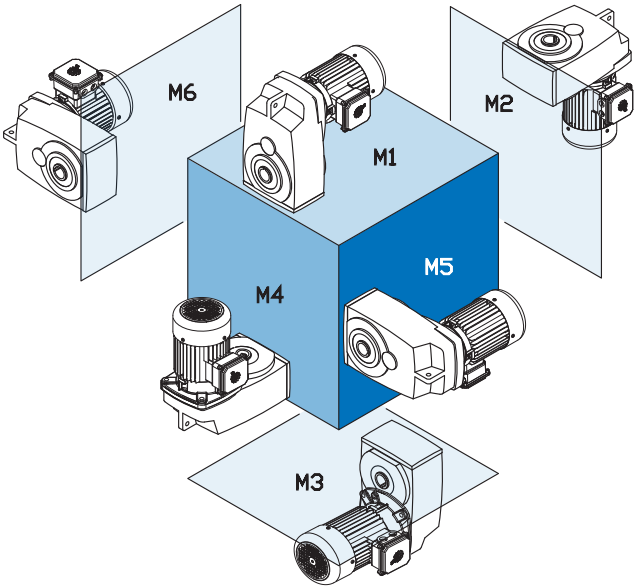
Overview Labels

Region		Label	Abbr.	Meaning
	Europe		CE	Conformité Européenne, Europäische Konformität
	United Kingdom		UKCA	UK Conformity Assessed
	China		CCC	China Compulsory Certification
 	USA Canada	 	UL CSA	Underwriters Laboratories Canadian Standards Association
	Eurasian Economic Union		EAC	Eurasian Conformity
	India		BIS	Bureau of Indian Standards
	Ukraine		UA	UkrSEPRO
	Mexico		NOM	Normas Oficiales Mexicanas
	Brasil		ABNT	Associação Brasileira de Normas Técnicas
	South Korea		KC	Korea Certification
	Australia		RCM	Regulatory Compliance Mark
	Morocco		VOC	Verification of Conformity

Installation Orientations - UNICASE™ Helical Inline Gear Units

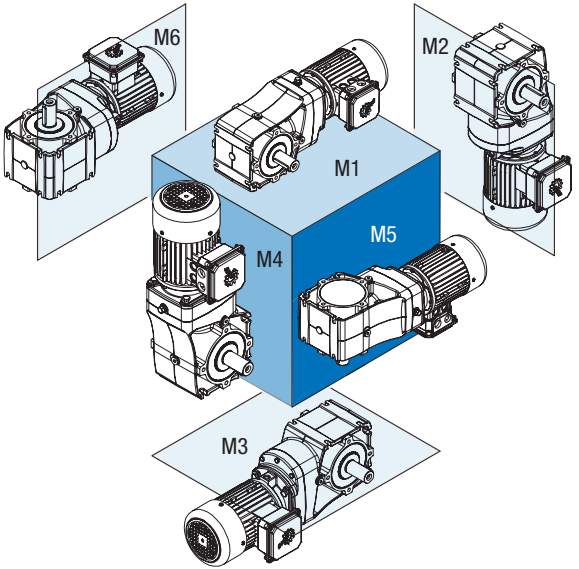


Installation Orientations - UNICASE™ Parallel Shaft Gear Units

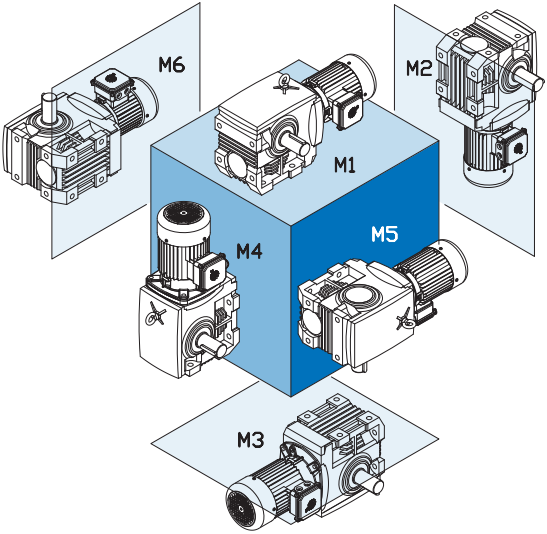


Technical Information

Installation Orientations - Helical Bevel Gear Units



Installation Orientations - UNICASE™ Helical Worm Gear Units



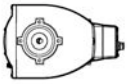
Technical Information

Installation Positions - DuoDrive Integrated Gear Unit and Motor

Designs

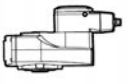
M1

M5



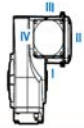
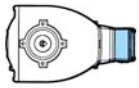
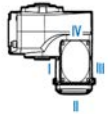
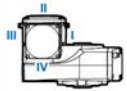
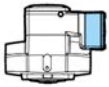
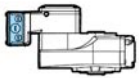
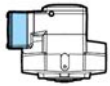
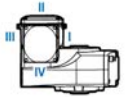
M6

M4

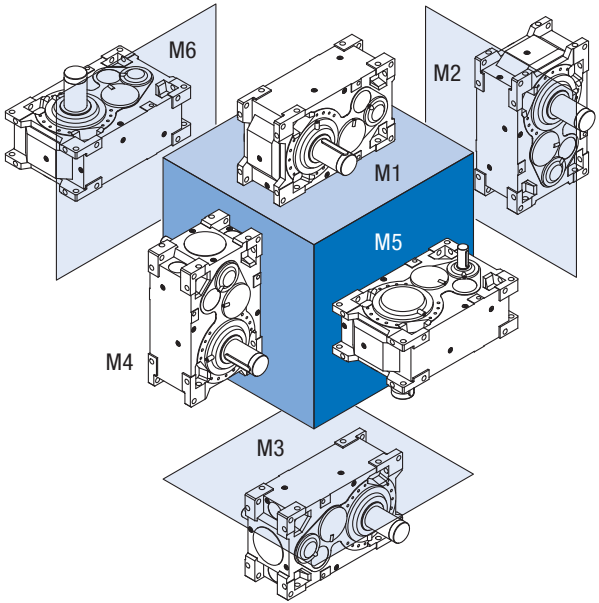


Cable Gland

Device Type	Cable Gland
SK EVO 80	1 x M25 x 1.5 2 x M16 x 1.5
SK EVO 200	1 x M25 x 1.5 2 x M16 x 1.5

Designs	Position of Electrical Connection			Position of Cable Gland
	1	2	3	
M1				
M5				
M6				
M4				

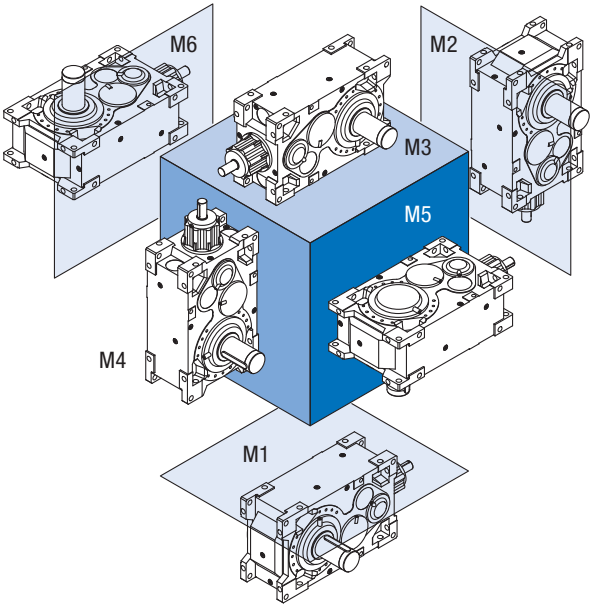
Installation Orientations - MAXXDRIVE® Parallel Shaft Gear Units



Standard mounting positions:

SKx207: M1
SKx307: M3
SKx321: M1
SKx421: M1

Installation Orientations - MAXXDRIVE® Right-Angle Gear Units



Standard mounting positions:

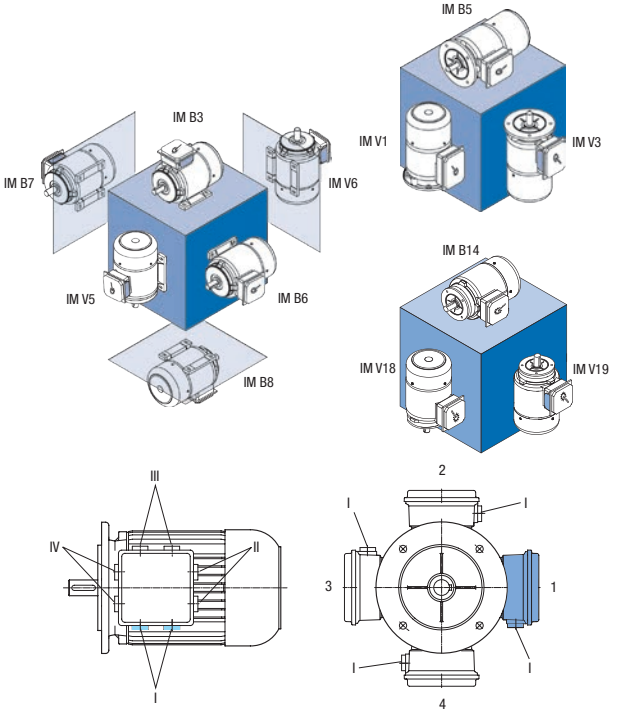
SKx407: M1

SKx507: M3

SKx418: M1

Technical Information

Installation Orientations for Motors and Terminal Boxes



Inquiry Process

Configurator for precisely tailored drives

Interactive where to buy map

Generate offer with purchase prices

Track order status

myNORD

The online product configurator in the myNORD customer portal (www.mynord.com) enables convenient selection of drive units.

- Precise configuration
- Direct generation of CAD data (3D models, dimensional sheets, outline drawings)
- Account specific quotes

The configurator indicates whether or not a selected drive unit is Ex compliant. Pricing information and an inquiry / order form are also included.

If configuration with myNORD is not possible, an inquiry form is available online (www.nord.com > Documentation > Forms > General Inquiry Form). Selection of the drive unit and checking of conformity will then be carried out by your local contact partner.

NORD inquiry form

Notes

NORD DRIVESYSTEMS

Product Literature

Gear Units


NORDBLOC.1® Helical Inline
Catalog: G1000


UNICASE™ Helical Inline
Catalog: G1000


UNICASE™ Parallel Shaft
Catalog: G1000


UNICASE™ Helical Bevel
Catalog: G1000


NORDBLOC.1® 2-Stage Helical Bevel
Catalog: G1000


DuoDrive Integrated Gear Motor
Catalog: G5010, Flyer: S5010


UNICASE™ Worm
Catalog: G1000


UNIVERSAL SI Worm
Catalog: G1000


SMI Worm
Catalog: G1000

Motors & Brakemotors


IE4/IE5+ Premium Efficiency Motors
Catalog: M5000, Flyer: S9012


VFD/AC Vector Duty Motors
Catalog: M7000


Smooth Body Motors
Catalog: Catalog: M7010, TI60-0002

Variable Frequency Drives


NORDAC® *START* Motor Starters
Catalog: E3000, Flyer: F3015


NORDAC® *BASE* VFDs
Catalog: E3000, Flyer: F3018


NORDAC® *FLEX* VFDs
Catalog: E3000, Flyer: F3020


NORDAC® *LINK* VFDs & Motor Starters
Catalog: E3000, Flyer: F3025


NORDAC® *PRO* VFDs
Catalog: E3000, Flyer: F3060


NORDAC® *ON/ON+* VFDs
Catalog: E3000, Flyer: S9013

Industrial Gear Units


MAXXDRIVE® Industrial Gear Units (Parallel, Right Angle)
Catalog: G1050, Flyer: F1050


MAXXDRIVE® XT Industrial Gear Units (Right Angle with High Thermal Limit)
Catalog: TI60-0011, Flyer: S1055


MAXXDRIVE® XD Industrial Gear Units (Parallel with Extended Center Distance)
Flyer: S1056


Endurance Package
Application Sheet: 106066000

Systems


Screw Conveyor Package (SCP)
Catalog: G1000


Overhead Conveyor Drives
Catalog: G1043

Ordering is Easy With myNORD Online Tools!

- Obtain drawing files direct from quote configuration
- Effortlessly select & configure customized drive solutions
- Create quotes with account-specific net pricing
- Order-specific documentation
- 24/7/365 order tracking
- Select and order spare parts

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