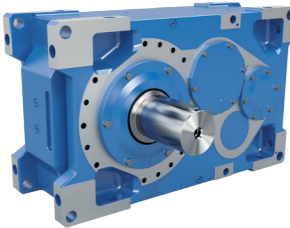
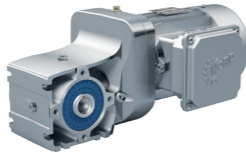


Drive solutions for
end-of-line packaging
Packaging





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. They provide local stocks, assembly centres, technical support and customer service
- ▶ With more than 4,900 employees worldwide, we create customised solutions



Headquarters in Bargteheide



Gear unit production



Inverter production



Motor production



Production and assembly



Motor assembly

€ Cost reduction

Comprehensive communication options

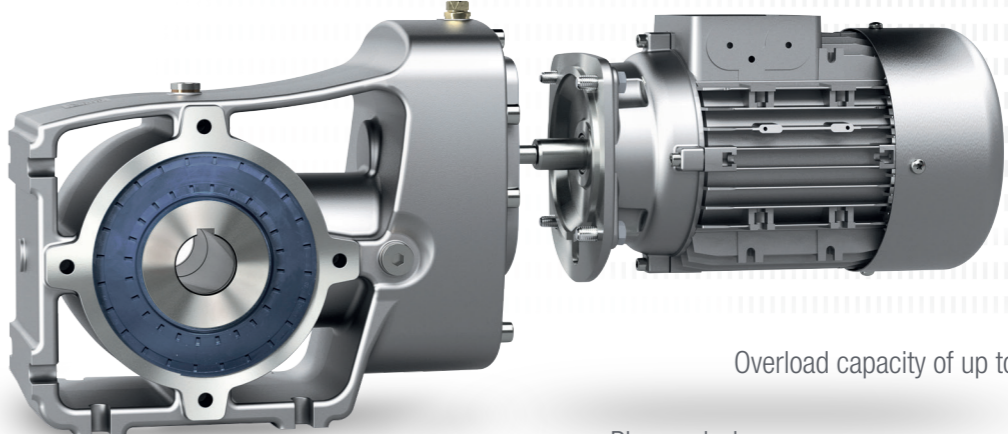
Functional safety

Integrated PLC

Decentralised frequency inverter



⊕ Reducing installation space



POSI-CON functionality

Overload capacity of up to 200%

Plug-and-play

Modular

Cost-effective system components

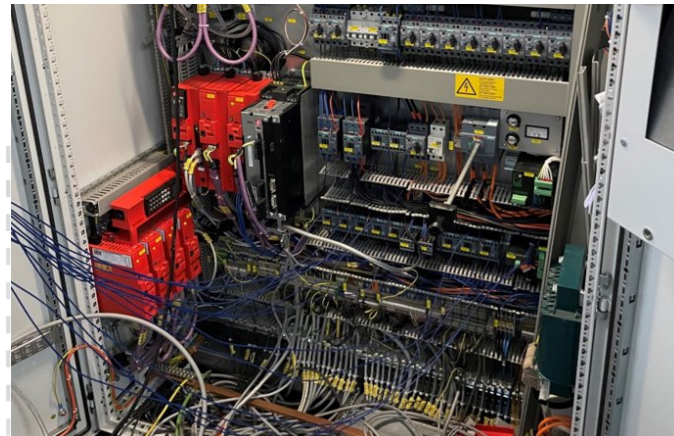
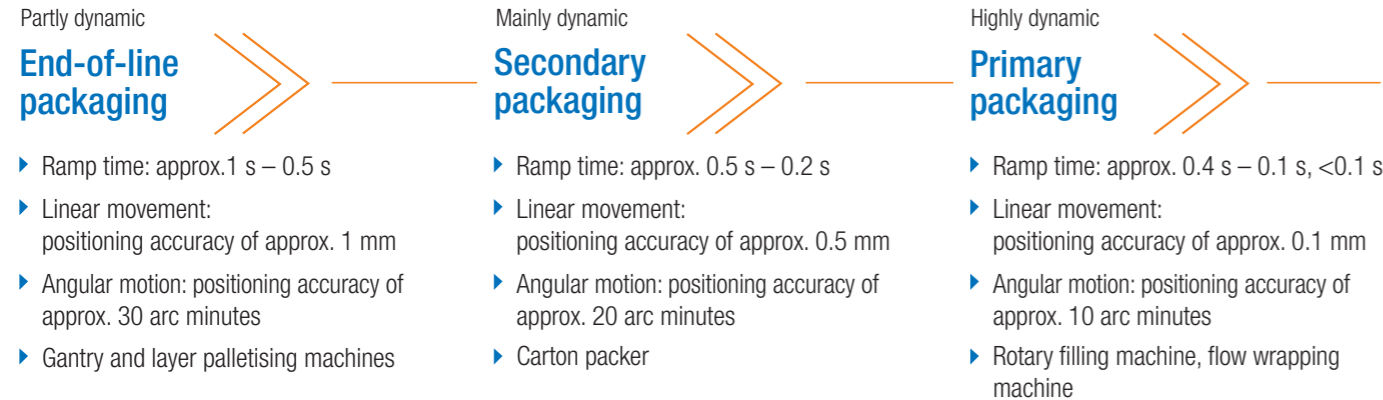
🔧 Maintenance-friendly

Compact design

End-of-line packaging

In end-of-line packaging, heavy pallets, boxes, bags and containers are moved. Heavy loads must be transported over long travel distances. This requires individual and powerful drive systems. NORD DRIVESYSTEMS offers drive components for all types of packaging, strapping and palletising machinery from a single source. NORD's decentrally controlled asynchronous motors with higher inertia are particularly beneficial compared to conventional servo motors. Electric drives with higher inertia in the rotor ensure good (motion) control when moving heavy loads. Additionally, they enable maximum process stability.

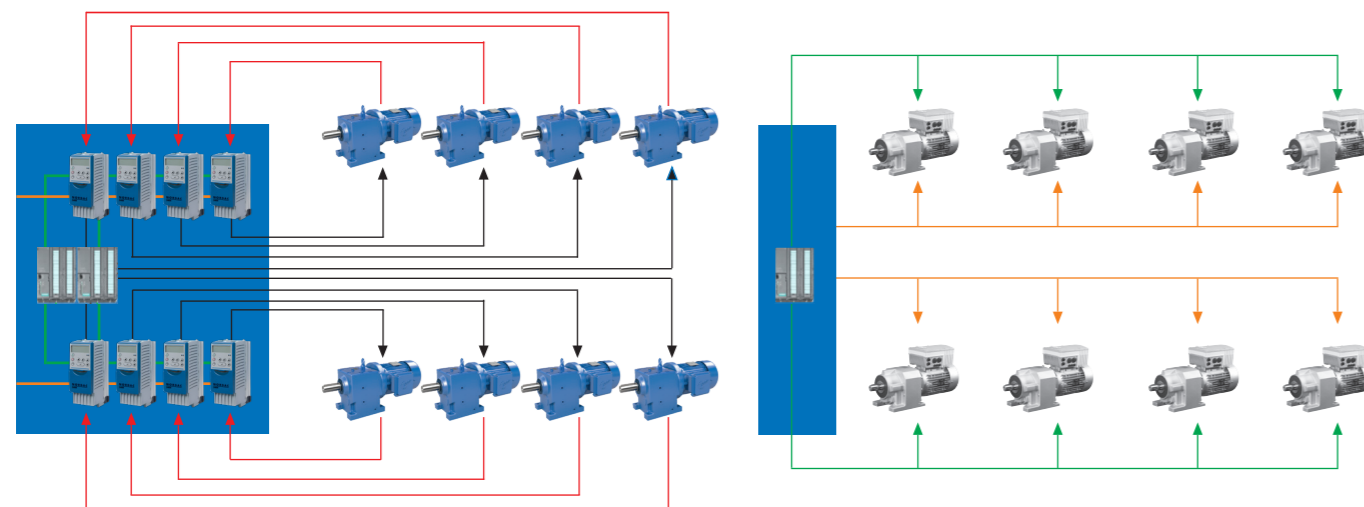
Drive solutions for end-of-line packaging



Challenges with centrally controlled servo motors in EOL packaging

- X High costs for hardware, installation and maintenance
- X Space requirements in the control cabinet
- X Complexity and scaling problems
- X High wiring effort
- X Low energy efficiency
- X Overshoot with heavy loads due to low inertia in the rotor

Example: Centralised and decentralised technology for a large number of drives



€ Cost reduction

Low procurement and operating costs: decentralised drive solutions

Cost-effective system components

- ▶ Elimination of the control cabinet incl. air conditioning system
- ▶ Reduction of cable sets

Integrated PLC

- ▶ Mapping of drive-related functions
- ▶ Relief of the main PLC: structuring into subsystems
- ▶ No conventional control cabinet required

Easy commissioning

- ▶ Significantly lower wiring effort
- ▶ Less programming effort: factory configuration of the integrated PLC

Reducing installation space

Space savings thanks to compact system design

Decentralised frequency inverter

- ▶ Space savings in the field
- ▶ Only compact version required for central PLC
- ▶ Hardly any wiring: elimination of cable conduits and glands

Modular

- ▶ Application-specific selection of the drive system
- ▶ Gear unit type: available installation space, ratio
- ▶ Motor type (IE3/IE4/IE5+): depending on operating mode and dynamics requirements
- ▶ Inverter type: depending on functionality (encoder)
- ▶ No conventional control cabinet required

🔧 Maintenance-friendly

Maintenance-friendly and reliable thanks to pluggable system

High system availability

- ▶ Overload capacity of up to 200%
- ▶ High dynamic load capacity of control electronics

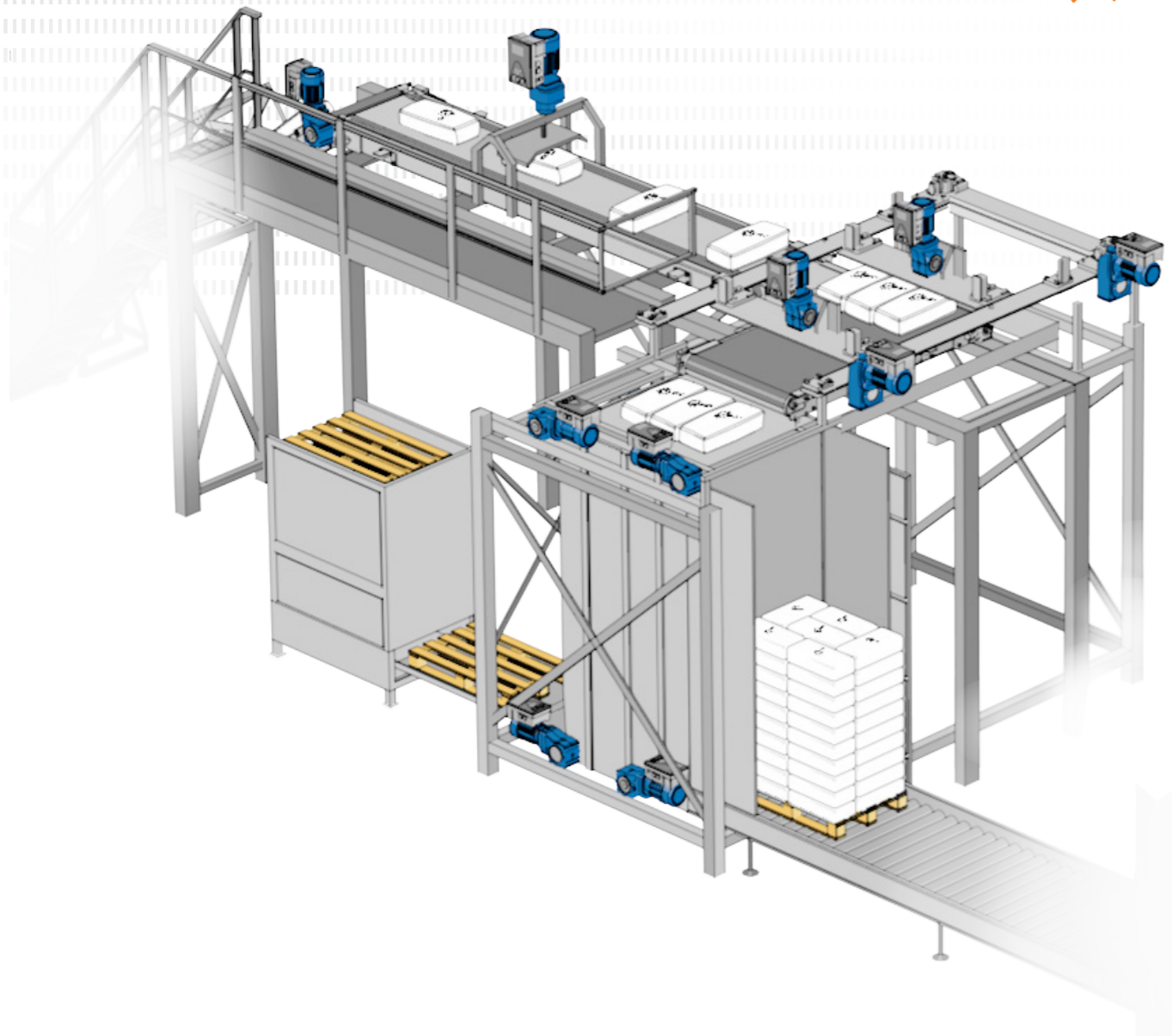
Attractive service conditions

- ▶ Short-term service offer
- ▶ Minimisation of downtimes
- ▶ Cost-effective spare parts
- ▶ Worldwide availability

Modular

- ▶ Simple repair
- ▶ Plug-and-play for system components
- ▶ Time savings during assembly thanks to plug-in connections

Palletising machine

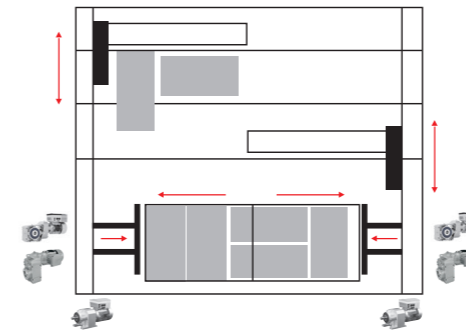


Layer palletising machines

Find out more about the wide range of applications for our drive technology in layer palletising machines! Our technologies enable precise motion control and targeted drive design for various applications within the machine.

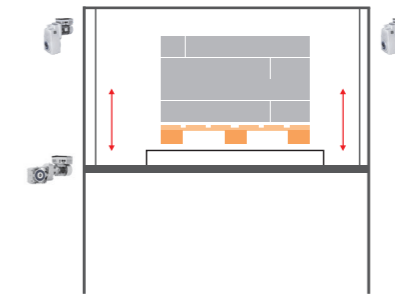
Creation of layers (top view)

- ▶ 2x Layer pushers
- ▶ 2x Layer table actuation
- ▶ 2x Format pusher



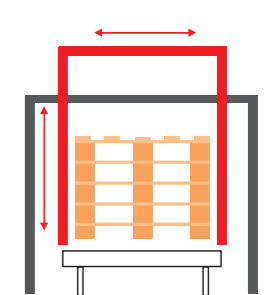
Pallet lift (side view)

- ▶ 2x Lift drive
- ▶ Roller conveyors



Pallet magazine (side view)

- ▶ Magazine movement
- ▶ Magazine actuation

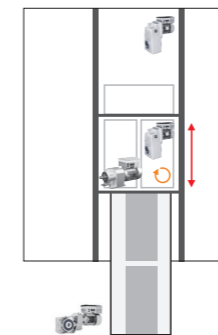


Gantry palletising machines

Discover the flexibility and variety of our drive technology in gantry palletising machines! They not only enable the handling of various packaging sizes and patterns, but also adapt seamlessly to variable production requirements.

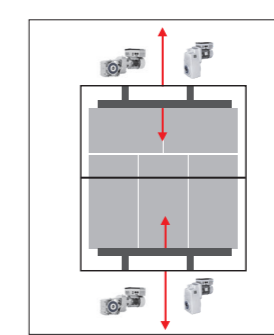
Gantry gripper (top view)

- ▶ X-axis
- ▶ Y-axis
- ▶ Rotation gripper
- ▶ Product infeed



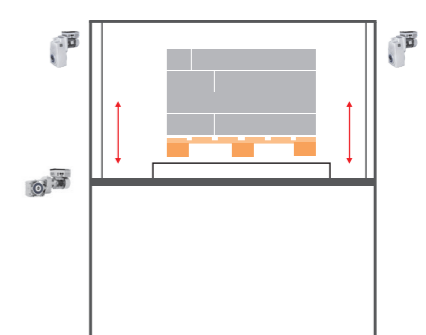
Layer table (top view)

- ▶ Opening
- ▶ Pusher



Pallet lift (side view)

- ▶ 2x Lift drive
- ▶ Roller conveyors

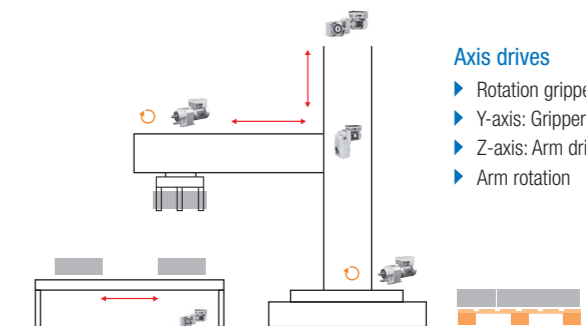


Linear palletising machines

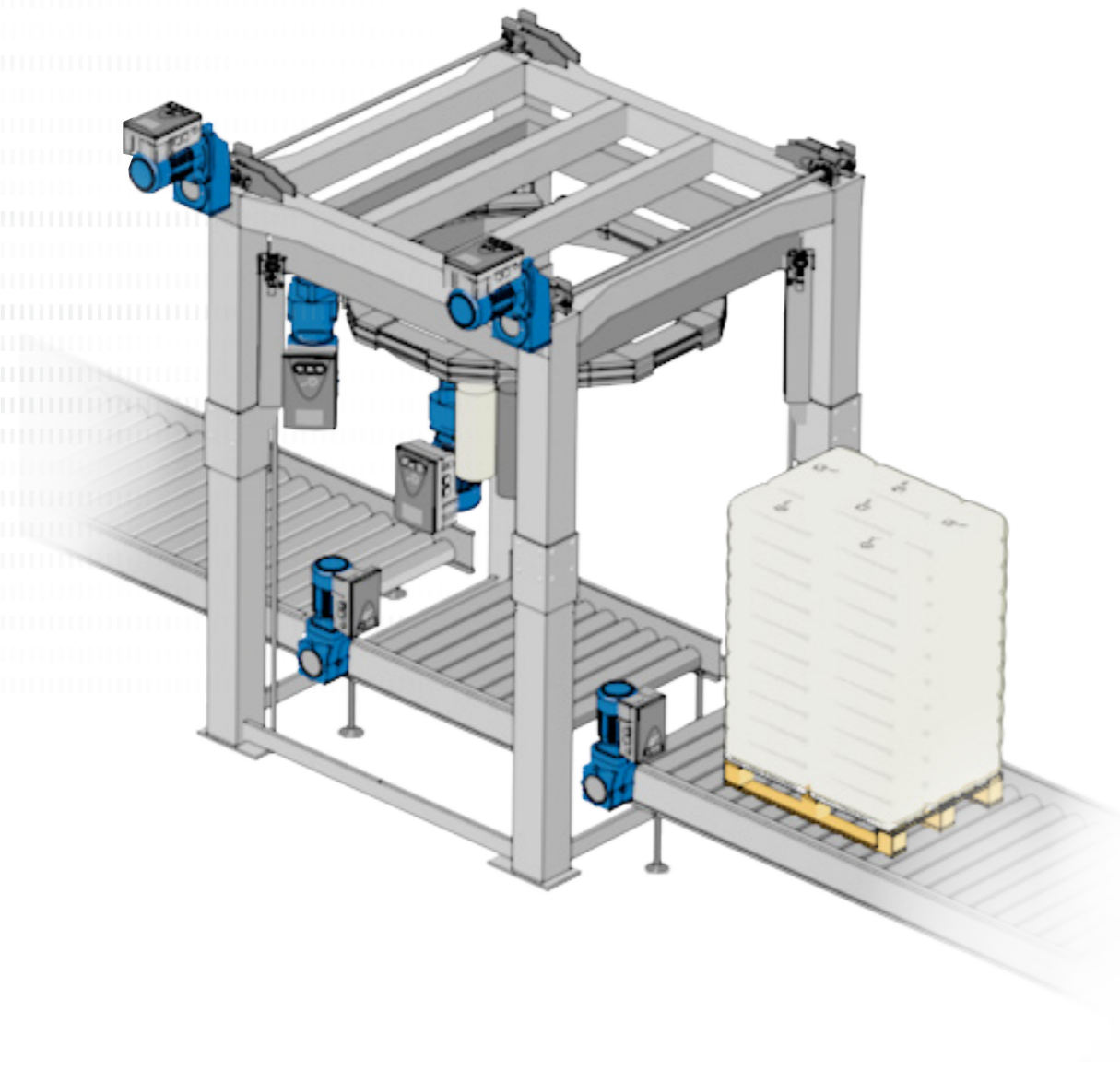
Experience the advantages and flexibility of our drive technology in linear palletising machines! They represent an economic option for entry into automated palletising and enable adaptation to various requirements. See for yourself how our innovative drive solutions can increase throughput and reduce investment costs!

Axis drives

- ▶ Rotation gripper
- ▶ Y-axis: Gripper drive
- ▶ Z-axis: Arm drive
- ▶ Arm rotation



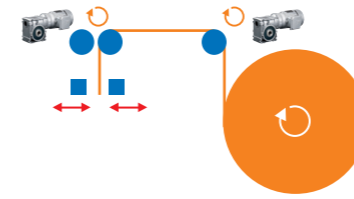
Wrapping



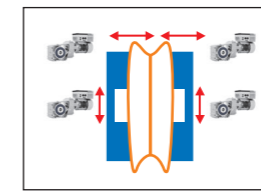
Stretch hood wrapping machines

Stretch hood wrapping machines are crucial for powerful end-of-line packaging and require reliable and robust drive technology due to the large number of movements required. NORD offers exactly the right portfolio for these demanding applications to ensure maximum operational reliability and added value. Rely on our proven solutions for your pallet stabilisation.

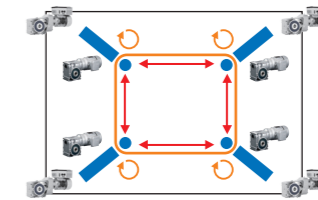
▶ Film infeed and sealing (side view)



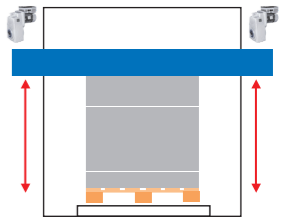
▶ Opening the film (top view)



▶ Horizontal film stretching: Film feed and stretching units (top view)



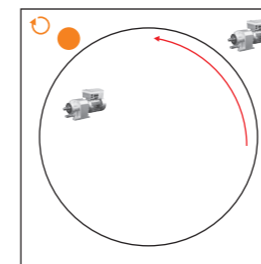
▶ Vertical film stretching (side view)



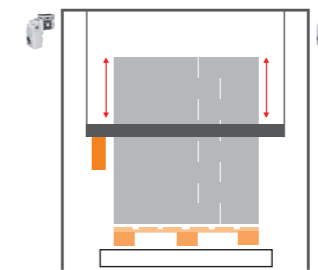
Ring wrapping machines

Ring wrapping machines are the most proven method for pallet stabilisation. With decentralised control concepts from NORD, you can significantly reduce the amount of wiring and minimise the need for large control cabinets. We offer a targeted solution for every machine concept to meet your specific requirements.

▶ Ring gantry drive and film handling



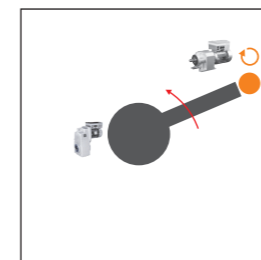
▶ Vertical height adjustment for ring gantry



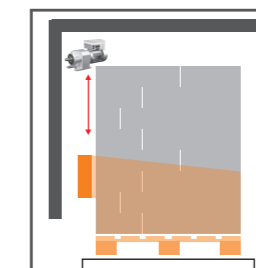
Arm wrapping machines

Arm wrapping machines are a cost-effective alternative due to the small number of drives required for applications with low product throughput. For this, NORD offers cost-efficient, robust and durable drive solutions that are specifically matched to the requirements of arm wrapping machines. Benefit from our economic and reliable solutions to optimise your efficiency and longevity.

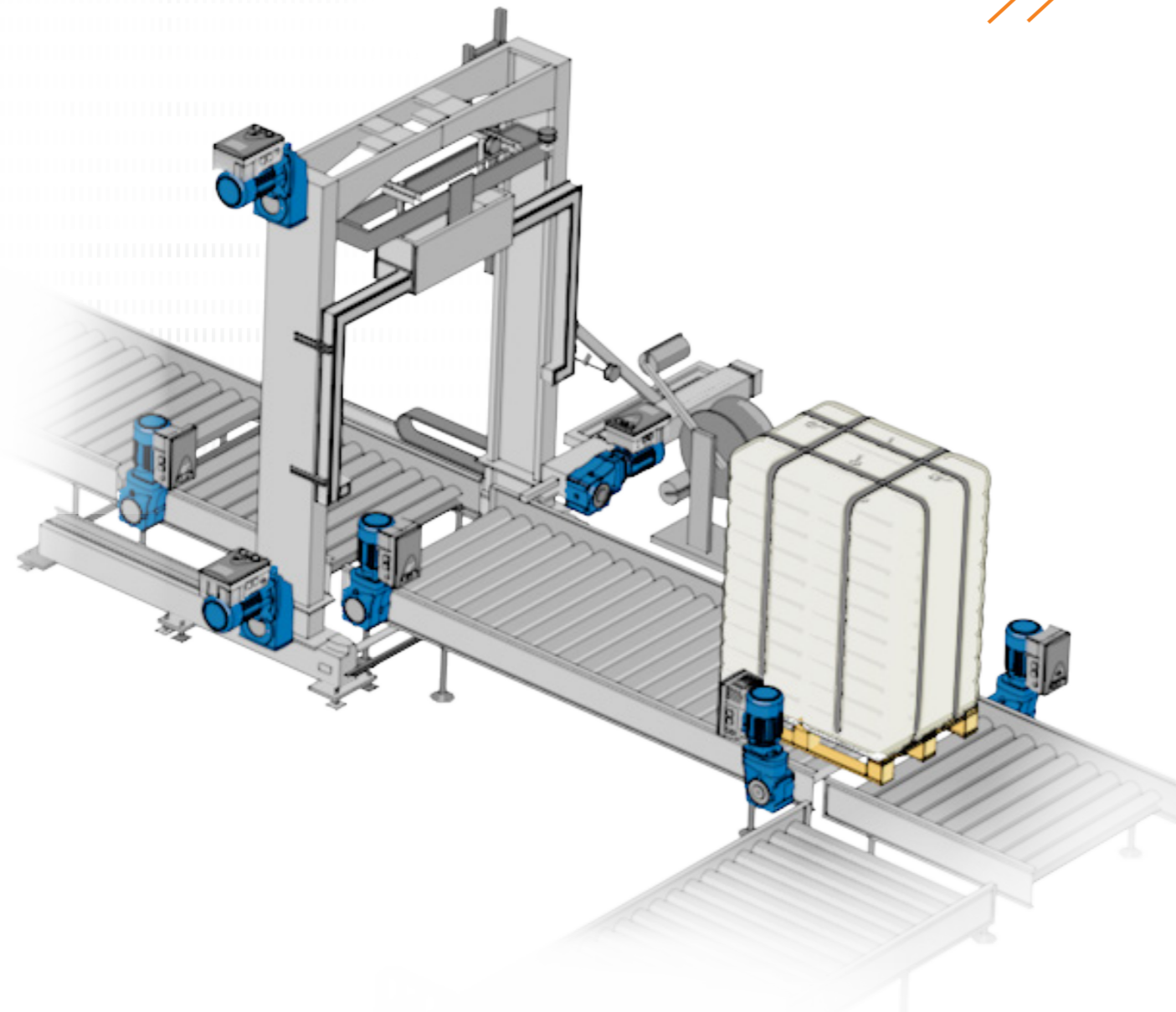
▶ Arm drive and film dispenser (top view)



▶ Height adjustment for film dispenser (side view)



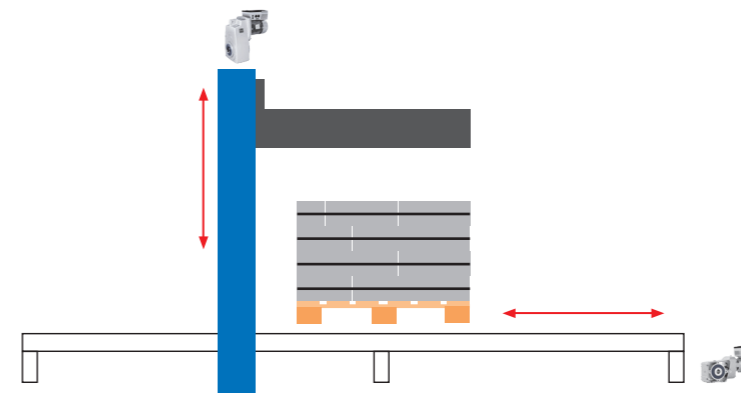
Strapping



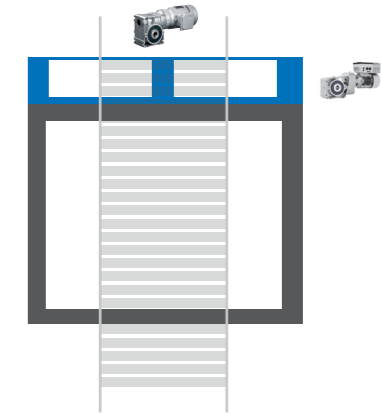
Horizontal strapping machine

Strapping machines are essential when it comes to maximum stabilisation and adaptability in load securing. These machines require precise and robust drive technologies to efficiently secure various product forms and sizes. NORD offers specifically tailored, powerful drive solutions that not only enable flexible and safe strapping, but also reduce the number of components used. Choose our decentralised solutions to optimise the power and reliability of your strapping machines and benefit from the many advantages.

- ▶ Gantry drive (side view)
 - ▶ Height adjustment
- ▶ Product infeed
 - ▶ Roller conveyors

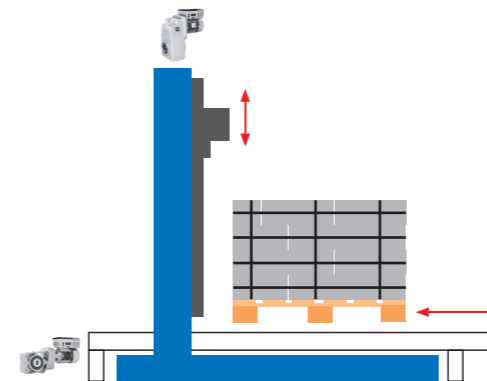


- ▶ Strapping gantry (top view)
 - ▶ Locking
 - ▶ Strap infeed

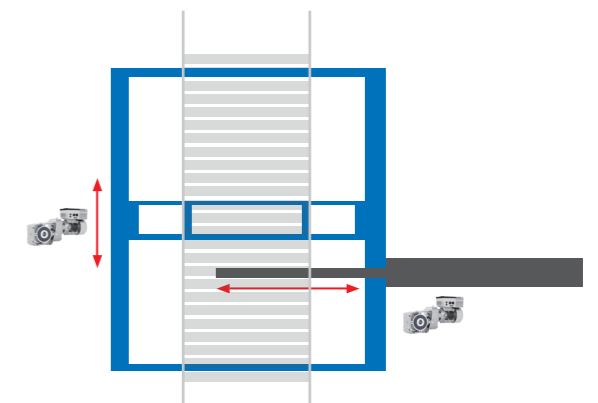


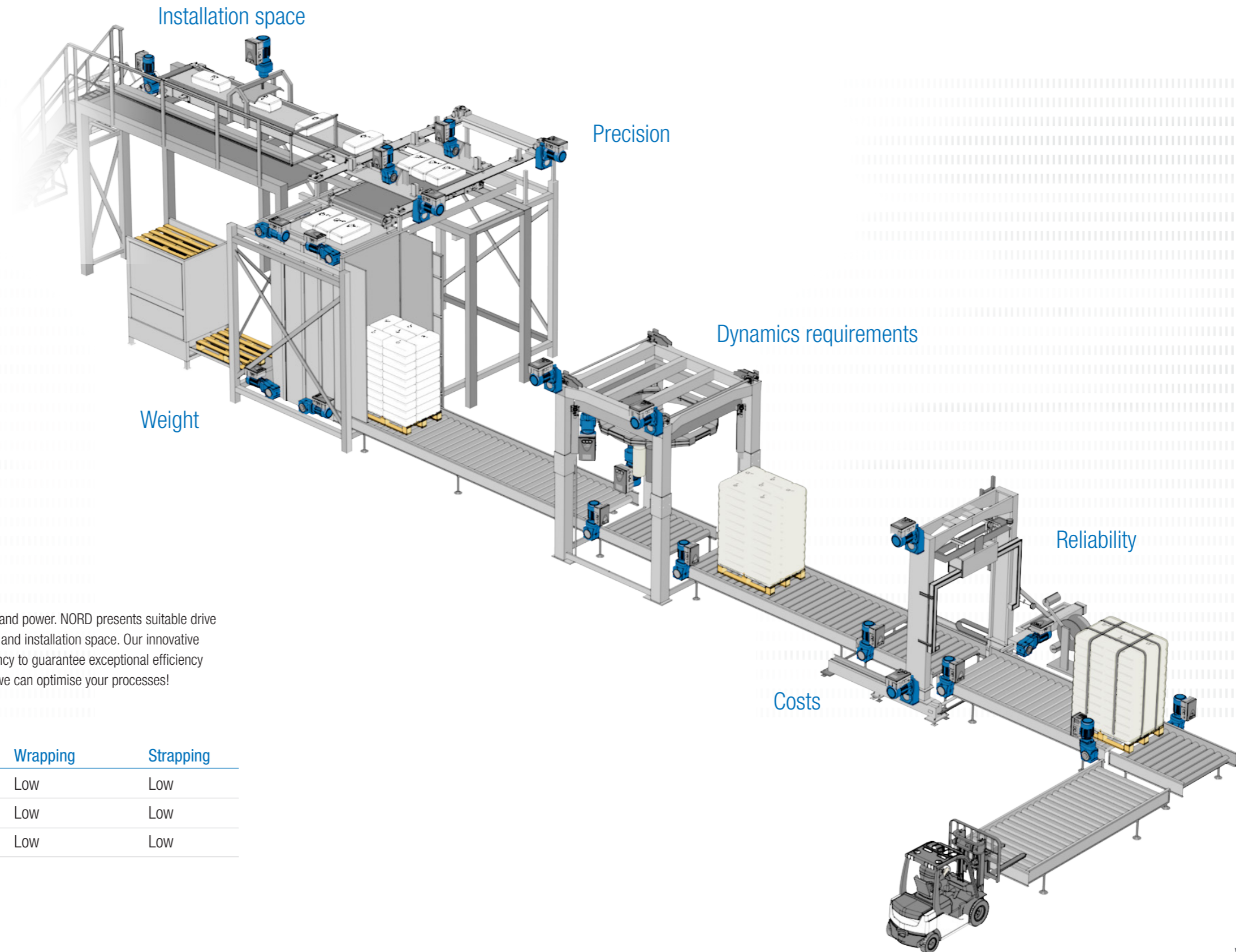
Vertical strapping machine

- ▶ Gantry height adjustment (side view)
 - ▶ Product infeed



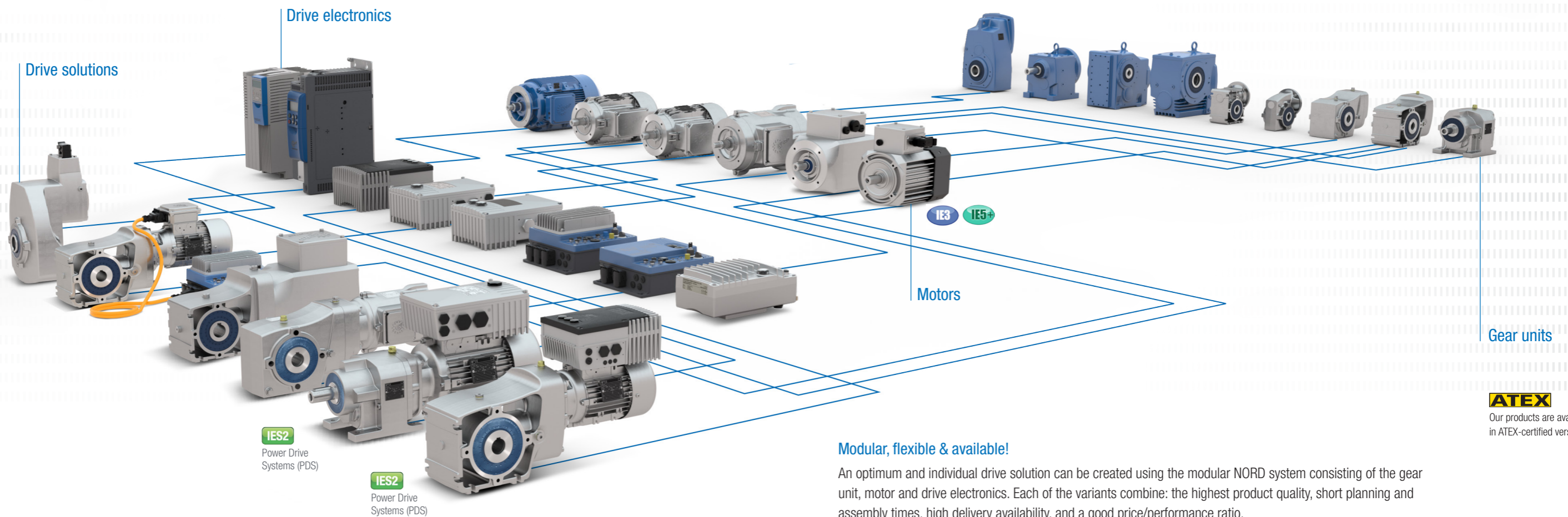
- ▶ Strap infeed (top view)
 - ▶ Actuation
- ▶ Gantry travel drive





End-of-line packaging requires maximum dynamics, precision and power. NORD presents suitable drive solutions that provide maximum torques with minimum weight and installation space. Our innovative technologies combine high performance with economic efficiency to guarantee exceptional efficiency and cost effectiveness in all packaging phases. Discover how we can optimise your processes!

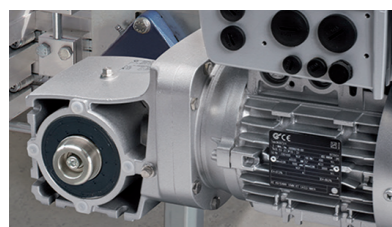
Requirements	Palletising	Wrapping	Strapping
Dynamics	High	Low	Low
Precision	High	Low	Low
Installation space	Medium	Low	Low



ATEX
Our products are available in ATEX-certified versions.

Modular, flexible & available!

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



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

- ▶ 2-stage bevel gear design with high efficiency
- ▶ High power density
- ▶ Long service life



Powerful motors up to IE5+ keep drive systems in motion in all operating situations.

- ▶ Designed in compliance with international standards
- ▶ High overload capacity
- ▶ Maximum energy efficiency



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

- ▶ Scalable functions
- ▶ Full field bus connection facilities
- ▶ Wide power range
- ▶ Flexible configuration



Extensive communication options enable access to the drive units from all levels. This provides a wide range of setting options.

- ▶ All common bus systems
- ▶ Quick and simple commissioning with plug-in control box or using NORDCON software and NORDAC ACCESS BT



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

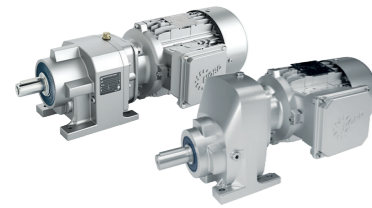
- ▶ Mains switch
- ▶ Selector switch for local or remote control
- ▶ Start/Stop and Forward/Reverse switch
- ▶ Key switch



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

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

NORDBLOC.1® helical in-line gear units (Catalogue G1000)



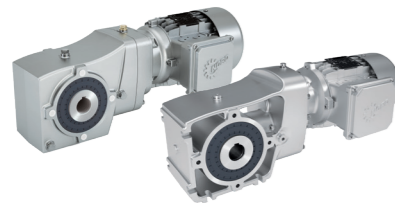
- ✓ Foot- or flange-mounted version
- ✓ Long life, low-maintenance
- ✓ Optimum sealing
- ✓ UNICASE housing

Sizes: 13
Power: 0.12–37 kW

Torque: 30–3,300 Nm
Ratio: 1.07–456.77:1

Field of use	Advantages	Disadvantages
<ul style="list-style-type: none"> ▶ Layer palletising machines: Pusher drives ▶ Rotary drive: Gripper rotation 	<ul style="list-style-type: none"> ▶ High efficiency (up to 98%) ▶ Transmission of large torques possible ▶ Cost-effective manufacture and maintenance 	<ul style="list-style-type: none"> ▶ Noise development under load ▶ Require precise positioning

NORDBLOC.1® 2-stage bevel gear units (Catalogue G1014)



- ✓ Foot-mounted, flange-mounted or face-mounted
- ✓ Hollow or solid shaft
- ✓ Aluminium housing
- ✓ Chemically resistant nsd tupH possible

Sizes: 6
Power: 0.12–9.2 kW

Torque: 50–660 Nm
Ratio: 3.03–70:1

Field of use	Advantages	Disadvantages
<ul style="list-style-type: none"> ▶ Infeed / outfeed conveyor belts in EOL packaging ▶ Continuous operation 	<ul style="list-style-type: none"> ▶ Compact design ▶ High efficiency: Efficiency 	<ul style="list-style-type: none"> ▶ Higher manufacturing effort than helical in-line gear units ▶ Precise assembly required to minimise wear

UNIVERSAL SI / SMI worm gear units (Catalogue G1035)



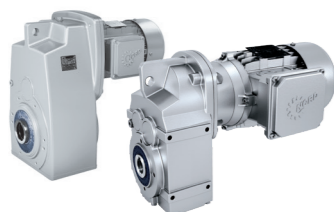
- ✓ Modular
- ✓ Universal mounting
- ✓ Life-long lubrication
- ✓ IEC version

Sizes: 5
Power: 0.12–4.0 kW

Torque: 21–427 Nm
Ratio: 5.00–3,000:1

Field of use	Advantages	Disadvantages
<ul style="list-style-type: none"> ▶ Strapping machines ▶ Roller conveyor drives / belt drives ▶ Cycled drive applications for low speeds 	<ul style="list-style-type: none"> ▶ Self-locking, e.g. safety applications ▶ Compact design ▶ High gear ratio 	<ul style="list-style-type: none"> ▶ Lower efficiency due to sliding contact between the teeth ▶ Heating can occur due to friction

UNICASE parallel gear units



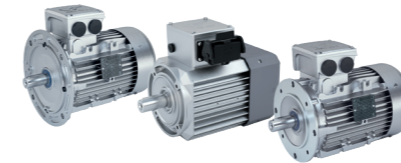
- ✓ Foot-mounted, flange-mounted or face-mounted
- ✓ Hollow or solid shaft
- ✓ Compact design
- ✓ Cast iron or aluminium UNICASE housing, aluminium housing available up to size 4

Sizes: 15
Power: 0.12–200 kW

Torque: 110–100,000 Nm
Ratio: 4.03–15,685.03:1

Field of use	Advantages	Disadvantages
<ul style="list-style-type: none"> ▶ Gantry palletising machines: Gripper gantry ▶ Axis drives with high inertia 	<ul style="list-style-type: none"> ▶ Enable very quiet and low vibration running ▶ High positioning accuracy 	<ul style="list-style-type: none"> ▶ Complex design and more expensive to manufacture

Motors (Catalogue M7000)



- ✓ IE3 motors from 0.12 kW (size 63)
- ✓ IE5+ motors



NORDAC FLEX SK 200E frequency inverter (Catalogue 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: 0.25–22 kW

NORDAC ON/ON+ SK 300P (Catalogue E3000)



- ✓ Optimised by focus
- ✓ Plug-and-play for fast commissioning
- ✓ Very compact design
- ✓ Integrated Ethernet interface

Sizes: 3
Voltage: 3 ~ 400 V
Power: 0.37–3 kW

NORDAC LINK SK 250E Field Distribution System (FDS) (Catalogue E3000)



- ✓ Frequency inverter or motor starter
- ✓ All connections in plug-in design for easy commissioning and maintenance
- ✓ PLC functionality for drive-related functions

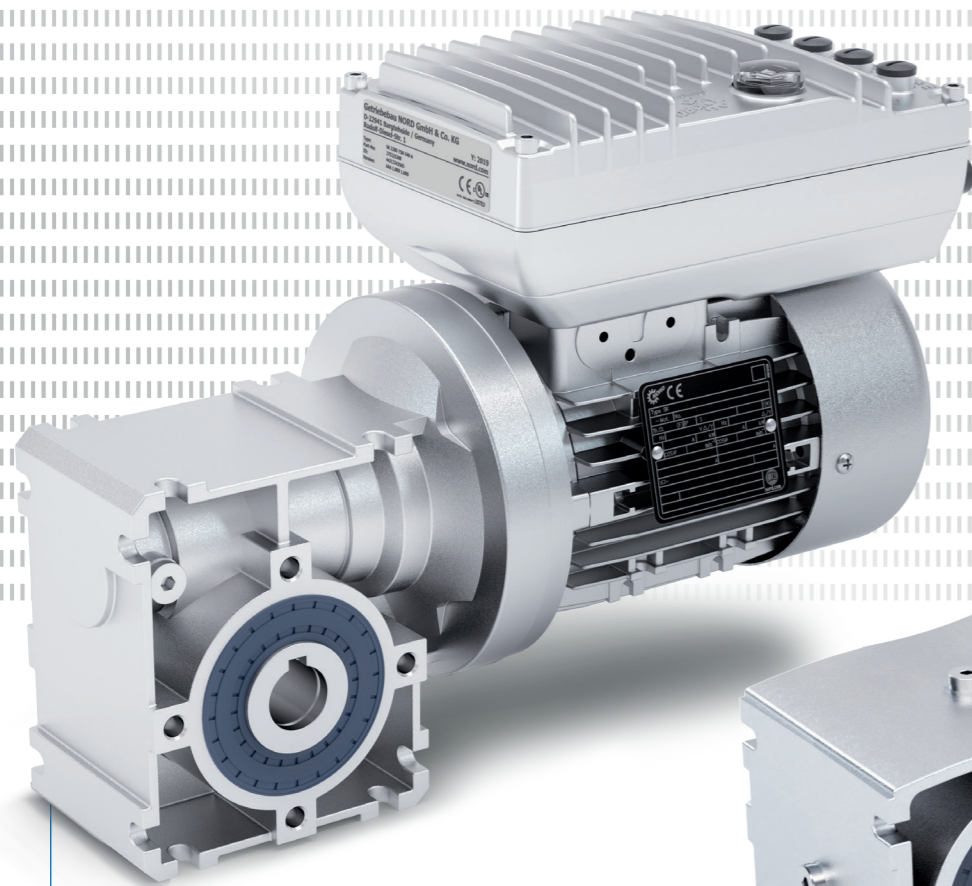
Sizes: 3
Voltage: 3 ~ 380–500 V
Power: Frequency inverter 0.37–7.5 kW, motor starter 0.12–3 kW

NORDAC® PRO SK 500P frequency inverter (Catalogue E3000)



- ✓ Precise current vector control with high overload reserves for operating asynchronous and synchronous motors
- ✓ Universal interface for real-time Ethernet
- ✓ Integrated PLC for drive-related functions, even in the basic device

Sizes: 3
Voltage: 1 ~ 200 – 240 V, 3 ~ 380 – 480 V
Power: 0.25–22 kW



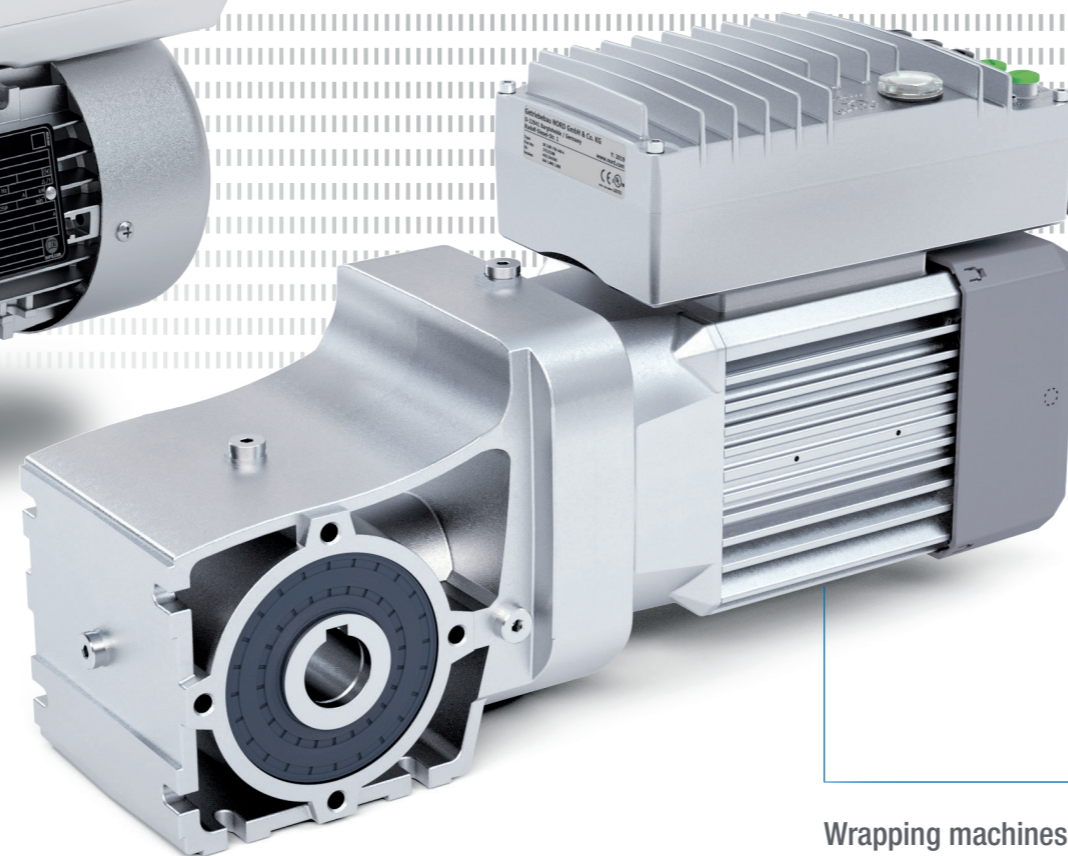
Conveyor belts,
infeed, outfeed

NORDAC ON SK300P

IE3 asynchronous motor
SI / SMI worm gear unit

Simple conveyor belt drives

Intermittent operation



Wrapping machines,
strapping machines

NORDAC ON SK300P

IE3 asynchronous motor (IE5+ permanent
magnet synchronous motor (PMSM)
UNICASE / NORDBLOC.1® gear unit

Conveyor belt drives in continuous operation

Position-independent, constant movements



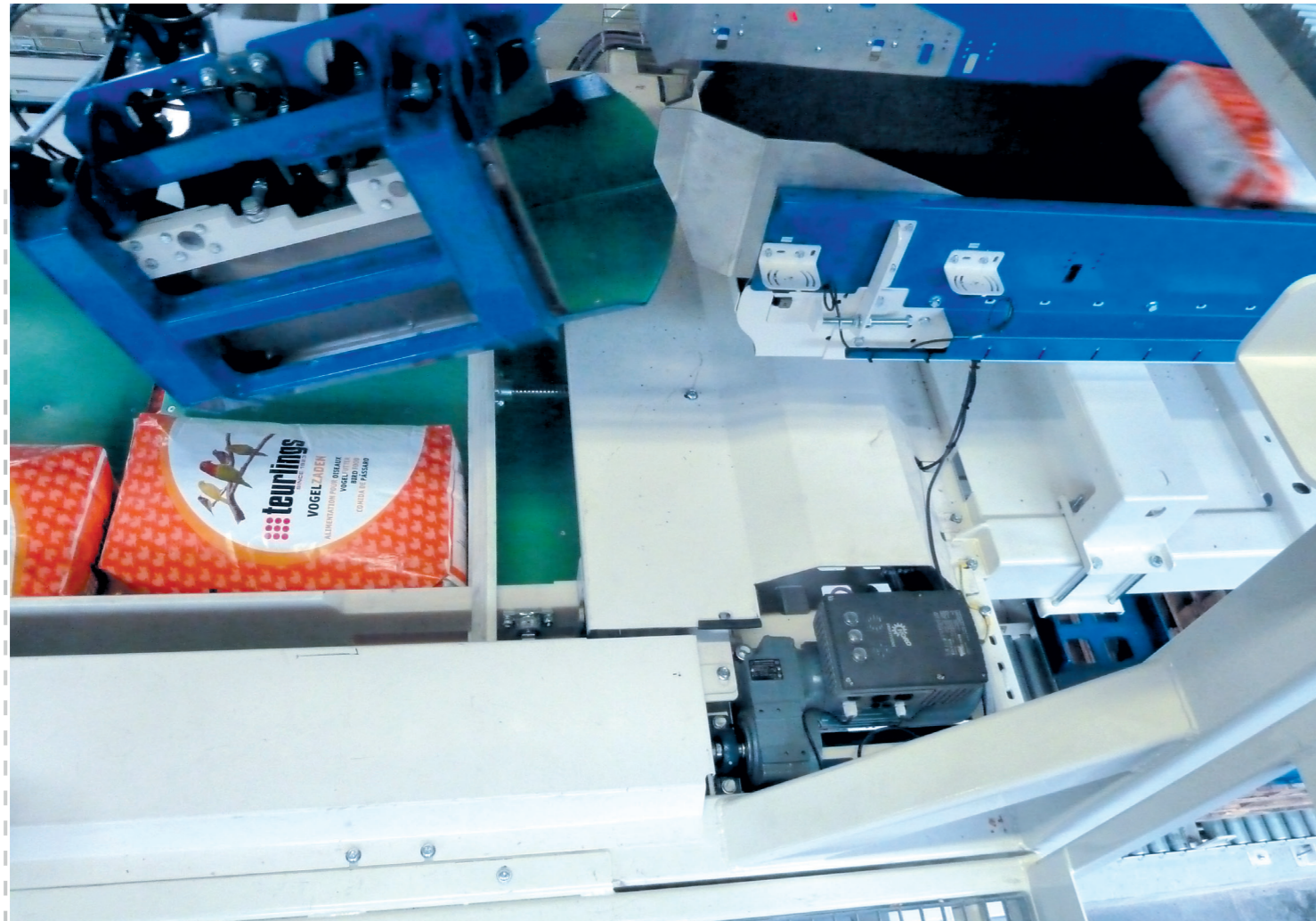
Palletising machine

NORDAC FLEX SK200E

IE3 asynchronous motor
IE4 permanent magnet synchronous motors (PMSM)
UNICASE gear unit

Positioning applications, encoder feedback

Integrated PLC: drive-related functions



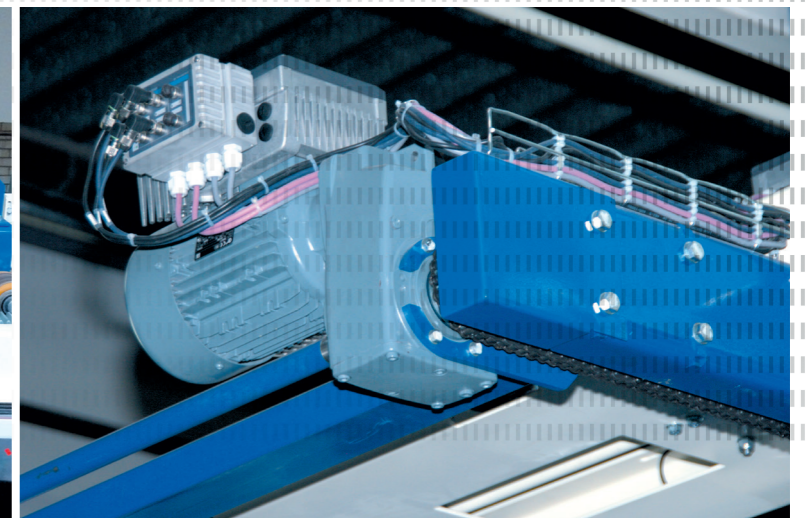
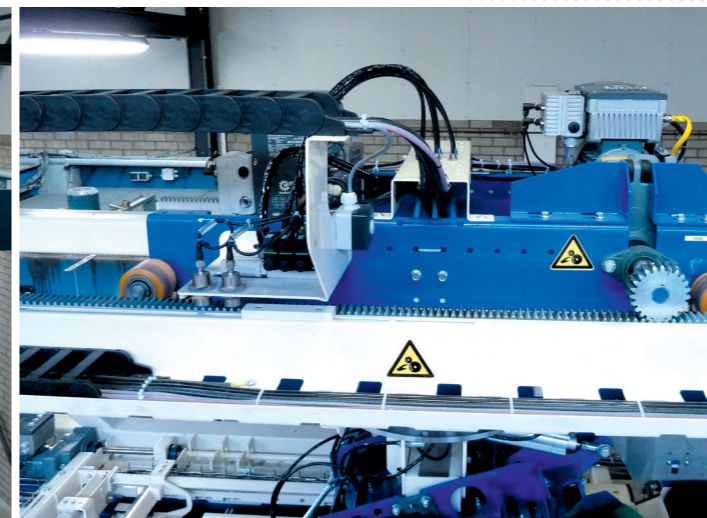
Implemented practical example: Palletising machines – Decentralised drive units replace servo technology

Conversion from centralised to decentralised drive technology – Palletising machines play a key role in the production and distribution process. They must function smoothly so that product flows do not come to a standstill and be flexible enough to adapt to various goods and applications. In the past, SYMACH completely relied on centralised drive control systems. This required control boxes installed on the top of the machine, which took up a lot of space and caused additional costs. “The height of a palletising machine requires the installation of a staircase to carry out any maintenance work”, Sacha Bakker, Managing Director and co-owner of the Dutch mechanical engineering company SYMACH Palletizers, explains. “The control cabinets for the servo controls obstructed access. We were able to solve this problem

through conversion with compact drive units from NORD.” In the new palletising machines, geared motors with SK 200E series motor-mounted frequency inverters do their job and control the complex motion sequences of the manipulator and centring unit. Upon NORD’s recommendation, dynamic asynchronous technology was chosen instead of servo technology. The advantages of this solution are not only lower procurement costs, but also greater choices for machine designers, as asynchronous motors are available everywhere, are easy to maintain and can be easily combined with various gear unit types. In addition, they are easy to replace in the push-on version. If you add up all advantages, “asynchronous palletising machines” result in lower Total Costs of Ownership (TCO) than palletising machines equipped with servo motors.

Energy-saving geared motors

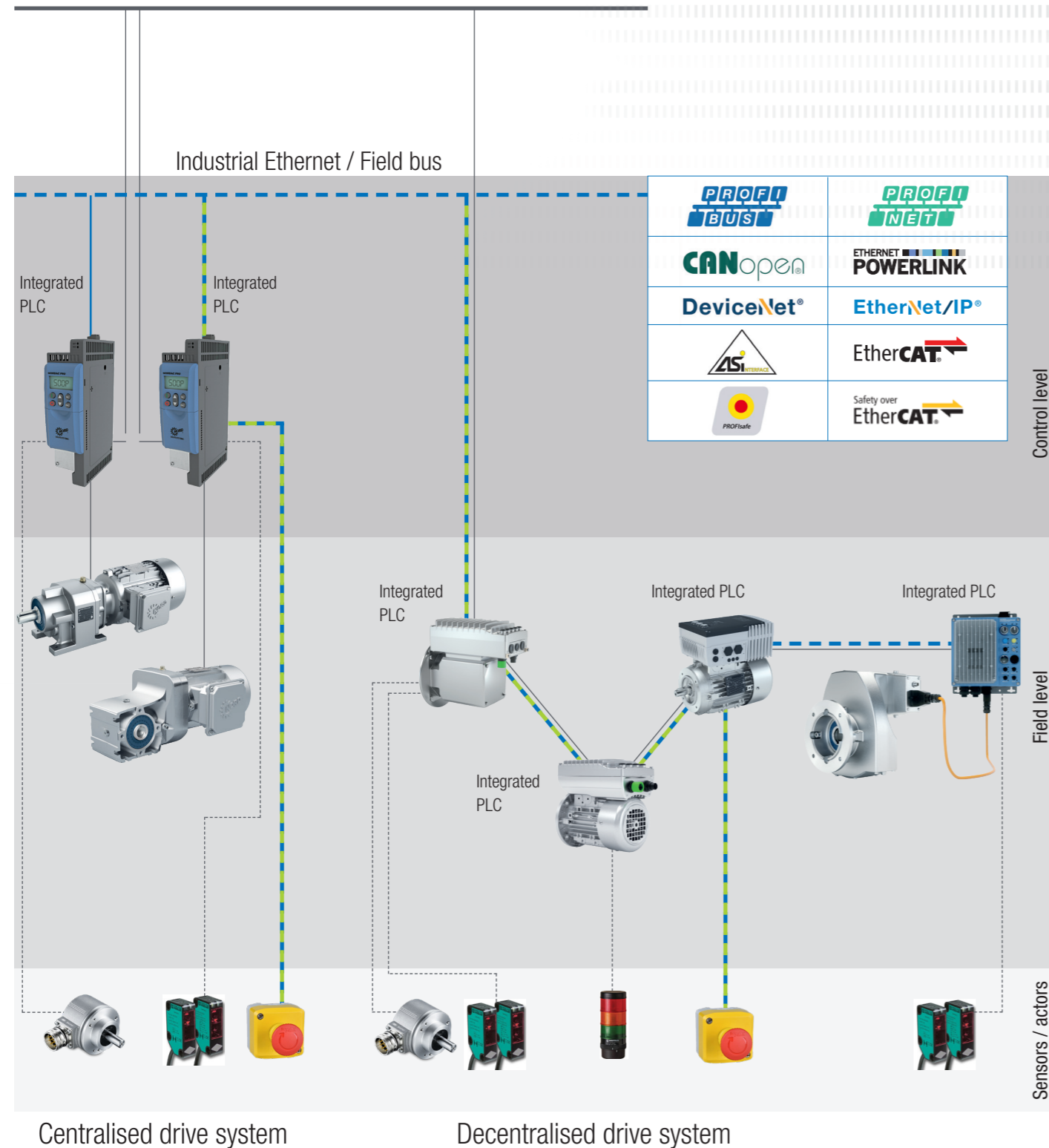
The decentralised NORD SK 200E series frequency inverters carry out demanding motion control tasks in palletising machines.



Drive solutions for end-of-line packaging

Increased efficiency and flexibility

3 x AC 400 V



Service at NORD



Commissioning support

Support for commissioning of NORD drive solutions and components. We provide support via telephone for individual products and NORD drive solutions, automation connections via communication modules and remote support.

Our NORD services for commissioning include:

- ▶ Support for installation and commissioning
- ▶ Optimisation and adjustment of NORD products
- ▶ Commissioning reports
- ▶ Laser-alignment
- ▶ Condition monitoring / vibration measurement
- ▶ Oil analysis by an independent institute
- ▶ Thermography
- ▶ Endoscopy

Reliable 24/7 support

Our technical support offers optimum solutions and rapid service to guarantee reliable availability of your drive technology. You can contact us 24 hours a day, 365 days a year – also without a service contract. We also provide you with direct contact to our experts – your personal contact persons.

Support via telephone for all product lines through our service technicians as well as delivery of in-stock spare parts and replacement drives via direct courier.



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