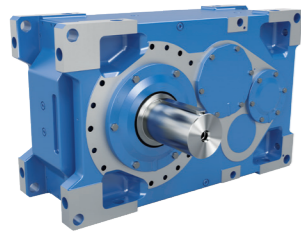


Intralogistics – Pallet conveyor technology

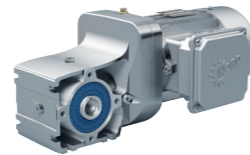
Drive solutions for pallet conveyor technology



NORD DRIVESYSTEMS Group



Industrial gear units

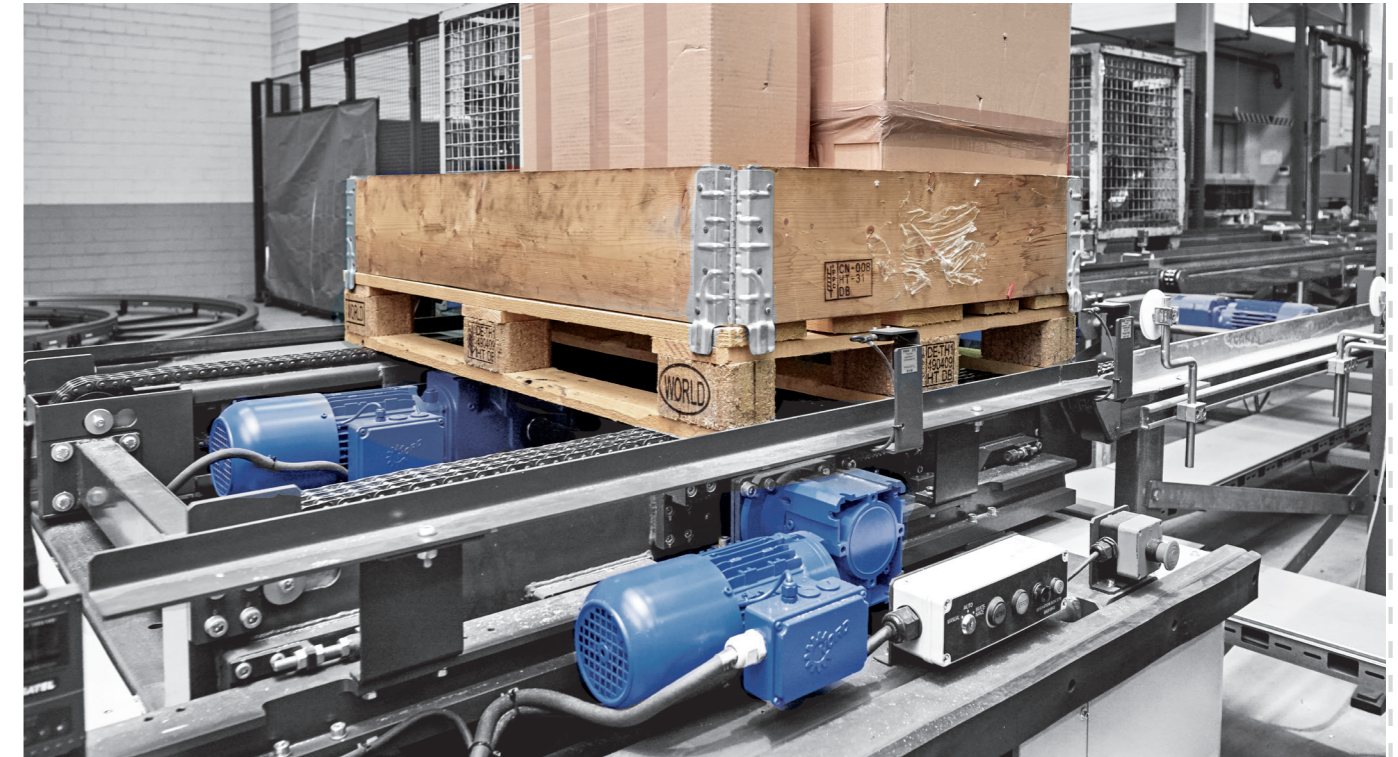


Geared motors



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



Pallet conveyor technology is used to convey general goods (pallets and boxes). It is mostly used for intralogistical transport within a company. Usually, it is permanently installed and represents an alternative to transport with industrial trucks.

Pallets weighing up to 3600 kg are commonly transported by chain or roller conveyors in a power range of up to approx. 1.5 kW. The typical maximum speed is 0.4 m/s.

It is important that the general goods are not moved during the starting or braking process.

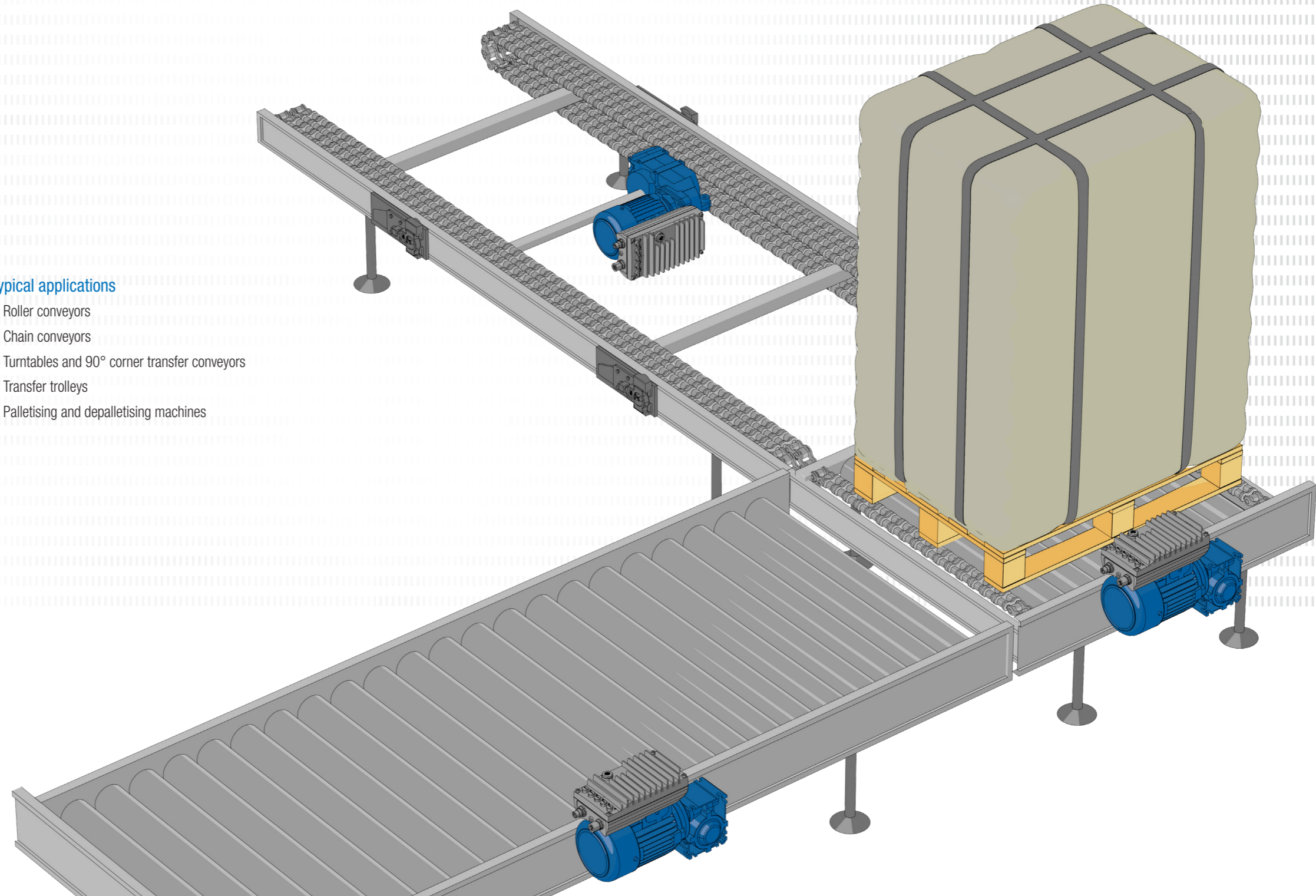
The highest overload for the drive occurs when aligning at the stop of a corner transfer conveyor.

Typical conveyor technology components are: chain conveyors, roller conveyors, corner transfer conveyors, turntables, transfer trolleys, lifters, palletising and depalletising machines as well as infeed and outfeed stations.

The NORD solution

The NORD LogiDrive solution for warehouse uses a NORDAC *ON* for Ethernet applications and a NORDAC *FLEX* for other applications. The solution is rounded off with an IE3 87 Hz universal motor or an IE5+ motor. For all common gear unit types, NORD makes use of its large modular system.





Typical drive specifications

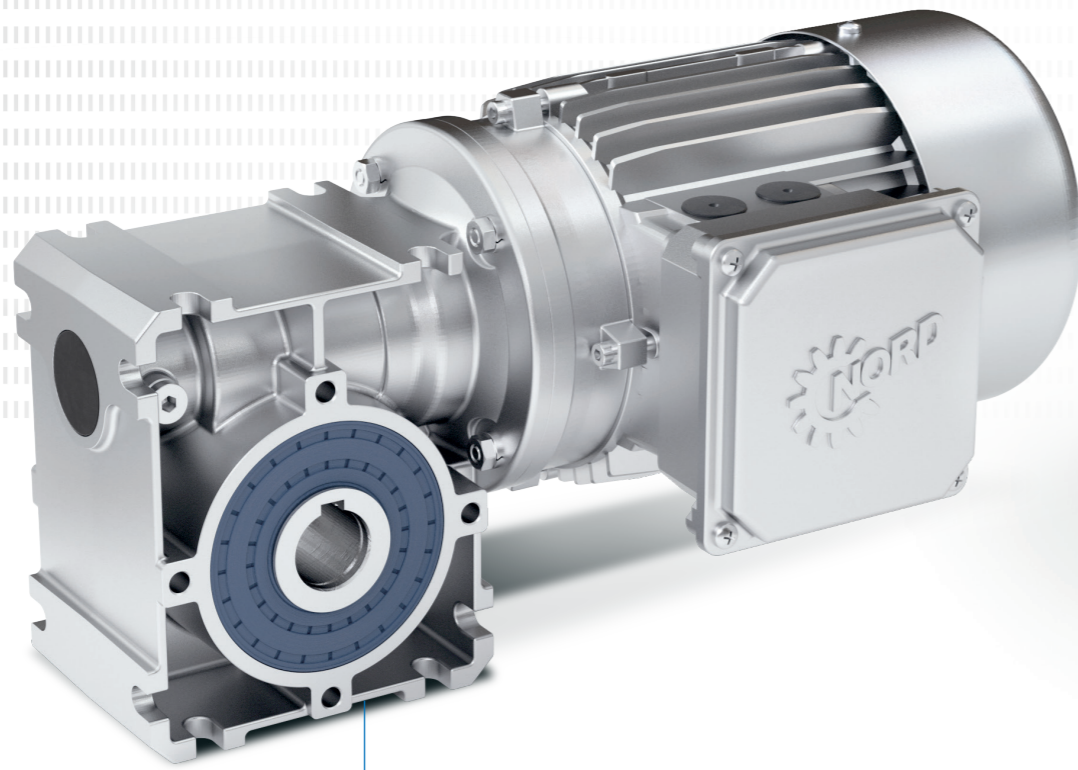
- ▶ Compact design (small, lightweight, economical)
- ▶ Installation position (universal installation possible)
- ▶ Standardisation
- ▶ Brake control
- ▶ High overload capacity
- ▶ Low power sizes from 0.12 kW
- ▶ Energy savings with IE5+ (ROI < 1 year)
- ▶ Smooth, gentle start and stop
- ▶ Reproducible braking distances
- ▶ Decentralised frequency inverter (ASI bus or Ethernet)
- ▶ PROFIsafe and FSoE
- ▶ Low stock through less variants
- ▶ Global certification
- ▶ Global availability and service
- ▶ Service-friendly (plug-and-play, short replacement time)
- ▶ 24/7 application

Typical applications

- ▶ Roller conveyors
- ▶ Chain conveyors
- ▶ Turntables and 90° corner transfer conveyors
- ▶ Transfer trolleys
- ▶ Palletising and depalletising machines

Intralogistics – Pallet conveyor technology

The NORD solution for pallet conveyor technology – the gear units



UNIVERSAL SI worm gear units (Catalogue G1035)

- ✓ Modular
- ✓ Life-long lubrication
- ✓ IEC version
- ✓ Universal installation position

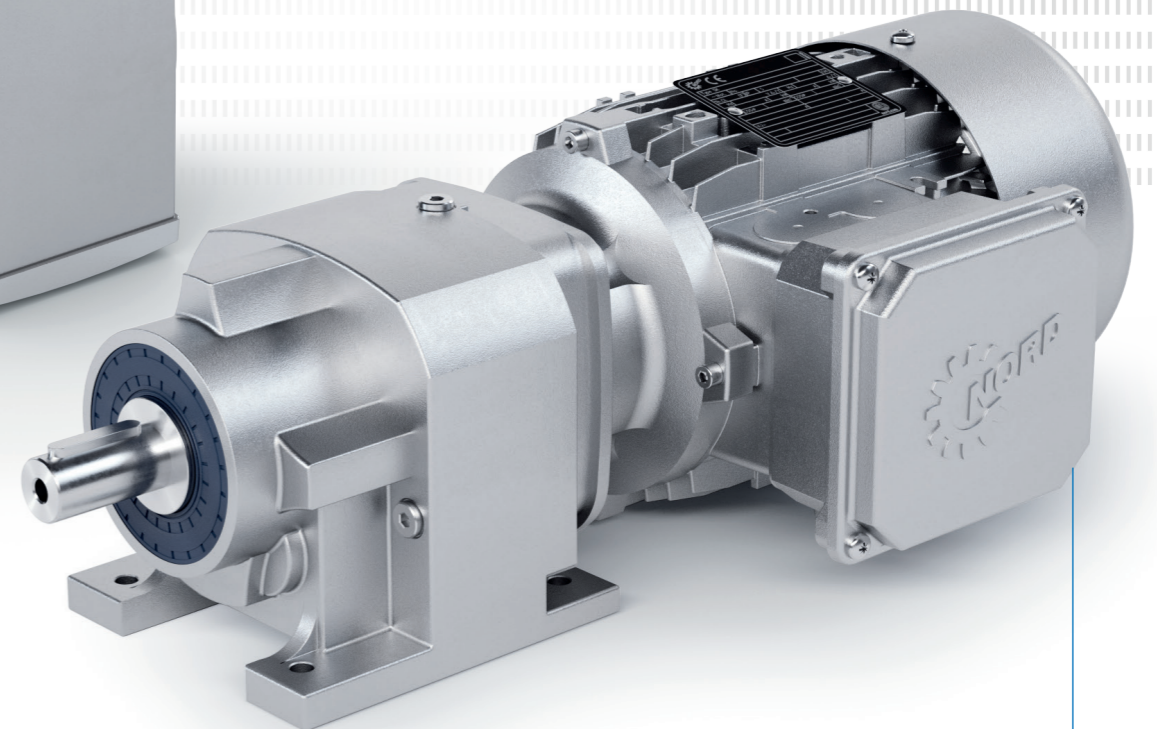
Sizes: 5
Power: 0.12–4.0 kW
Torque: 21–427 Nm
Ratio: 5.00–3,000:1



UNICASE parallel shaft gear units (Catalogue G1000)

- ✓ Foot mounted, flange mounted or face mounted
- ✓ Hollow or solid shaft
- ✓ Compact design
- ✓ Cast iron or aluminium UNICASE housing
- ✓ Universal installation position

Sizes: 15
Power: 0.12–200 kW
Torque: 110–100,000 Nm
Ratio: 4.03–15,685.03:1



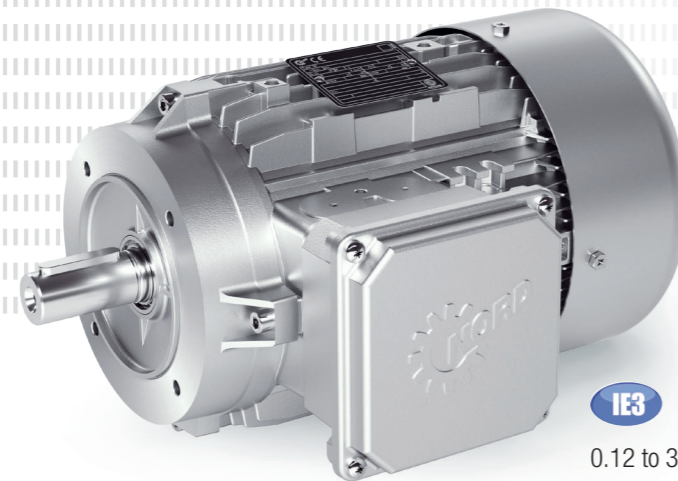
UNICASE helical in-line gear units (Catalogue G1000)

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

Sizes: 11
Power: 0.12–160 kW
Torque: 10–26,000 Nm
Ratio: 1.35–14,340.31:1

Intralogistics – Pallet conveyor technology

The NORD solution for pallet conveyor technology – the motor in IE3 – standard solution



IE3

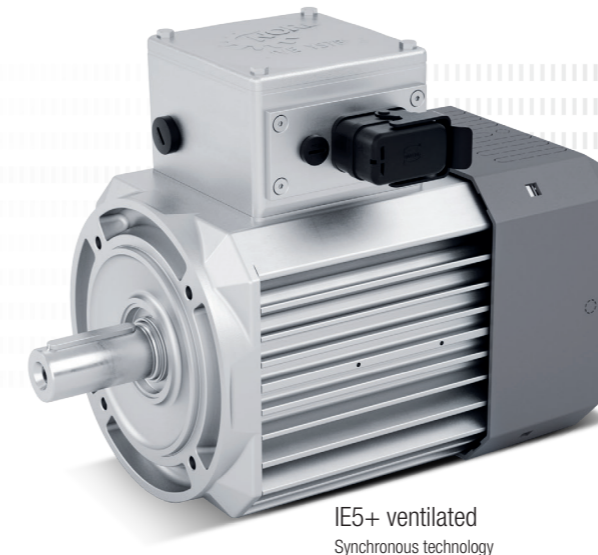
0.12 to 3 kW and higher

Universal world motor IE3:

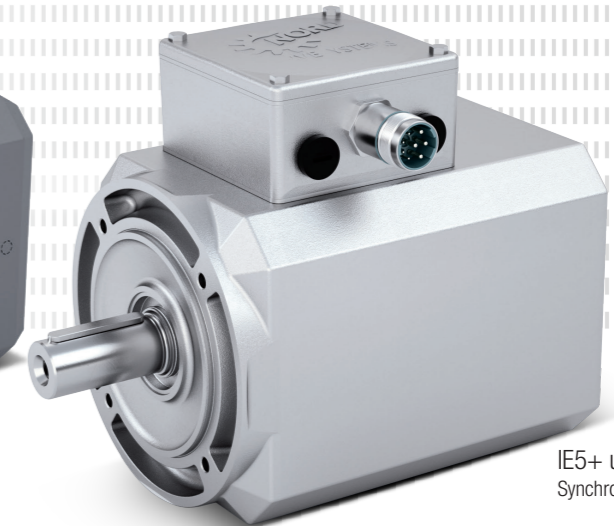


Typ	P_N [kW]	f [Hz]	P_{S1max} [kW]	U [V]	ΔU [%] +/-	n_N [rpm]	M_N [Nm]	I_N [A]	cos φ [A]	η [%]	Service-factor
63 SP/4	0.12	50	0.18	400	10	1210	1.42	0.54	0.82	58.7	1.50
		60	0.18	460	10	1630	1.05	0.43	0.72	68.6	1.50
63 LP/4	0.18	50	0.25	400	10	1270	1.86	0.73	0.79	63.8	1.39
		60	0.25	460	10	1655	1.44	0.59	0.70	72.8	1.39
71 SP/4	0.25	50	0.37	400	10	1305	2.71	0.99	0.85	65.7	1.48
		60	0.37	460	10	1680	2.10	0.77	0.78	74.8	1.48
71 LP/4	0.37	50	0.45	400	10	1345	3.19	1.11	0.80	71.1	1.22
		60	0.55	460	10	1640	3.20	1.11	0.82	74.3	1.49
80 SP/4	0.55	50	0.75	400	10	1350	5.31	1.77	0.81	75.3	1.36
		60	0.75	460	10	1685	4.25	1.49	0.78	80.1	1.36
80 LP/4	0.75	50	1.10	400	10	1335	7.90	2.51	0.83	78.0	1.47
		60	1.10	460	10	1680	6.27	2.08	0.80	82.4	1.47
90 SP/4	1.10	50	1.50	400	10	1370	10.2	3.18	0.84	80.5	1.36
		60	1.50	460	10	1700	8.30	2.66	0.83	84.8	1.36
90 LP/4	1.50	50	2.00	400	5	1330	14.4	4.34	0.85	78.0	1.33
		60	2.20	460	10	1660	12.7	3.88	0.86	83.0	1.47
100 LP/4	2.20	50	3.00	400	10	1440	19.9	5.90	0.84	87.2	1.36
		60	3.00	460	10	1750	16.4	5.02	0.84	89.6	1.36
100 1AP/4	3.00	50	4.00	400	10	1425	26.8	7.82	0.86	86.0	1.33
		60	4.00	460	10	1740	22.0	6.71	0.84	88.9	1.33

Intralogistics – applications in IE5+, the efficient solution



IE5+ ventilated
Synchronous technology



IE5+
IE5+ unventilated
Synchronous technology

IE5+ motor

71	N	3	/8								
Axial height	N = non-ventilated (TENV) F = ventilated (TEFC)	Package length	Number of poles								
Size	M_R [Nm]	P_N [kW]	N_N [min-1]	I_N [A]	η_{MOT} [%] +/-	J_{MOT} [kgm ²]	M_{MAX} [Nm]	M_{AMN} [-]	Imax [A]	K_T [Nm/A]	SF
71N1/8	1.6	0.35	2100	0.76	89.1	0.0002	3.2	2.0	1.52	2.11	1
71N2/8	3.2	0.7	2100	1.45	92.5	0.0004	6.4	2.0	2.9	2.21	1
71N3/8	4.8	1.05	2100	2.14	93.6	0.0006	8.6	2.0	4.28	2.24	1
90N1/8	5	1.1	2100	2.37	93.5	0.0009	9.6	1.9	4.2	2.11	1
90N2/8	6.8	1.5	2100	3.11	94	0.0011	11.8	1.7	6.02	2.19	1
90N3/8	10	2.2	2100	4.65	94.6	0.0018	18.2	1.8	8.7	2.15	1
71F1/8	2	0.5	2400	0.99	89.1	0.0002	4	2.0	1.98	2.02	1
71F2/8	4	1	2400	1.93	92.5	0.0004	8	2.0	3.85	2.08	1
71F3/8	6	1.5	2400	2.75	93.6	0.0006	12	2.0	5.51	2.18	1
71F4/8	8.7	2.2	2400	3.92	94.3	0.0008	17.6	2.0	7.85	2.23	1
90F1/8	6	1.5	2400	2.89	93.3	0.0009	12	1.8	5.78	2.08	1
90F2/8	8.8	2.2	2400	4.21	93.5	0.0013	17.6	2.0	8.41	2.09	1
90F3/8	11.9	3	2400	5.81	94	0.0018	23.8	2.0	11.62	2.05	1
90F4/8	14.7	3.7	2400	7.75	94.1	0.0022	29.5	2.0	15.5	2.05	1

Intralogistics – Pallet conveyor technology

Dimensions – comparison of IE3 to IE5+

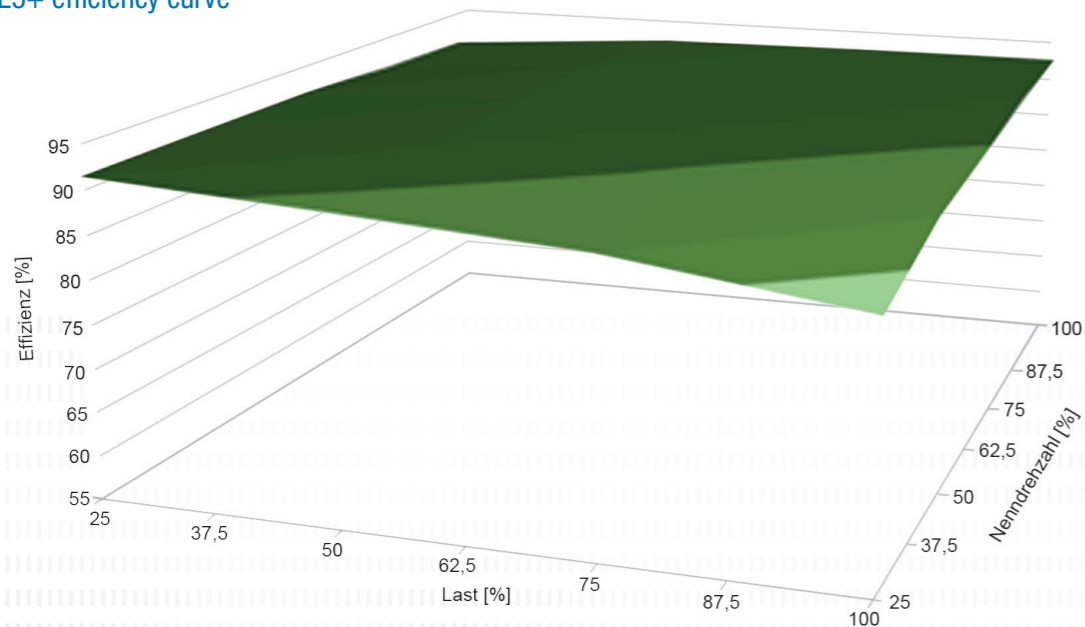
Power	IE5+	IE3
0.5	71 F1/8	80SP/4
1	71 F2/8	90SP/4
1.5	71F3/8	90LP/4

Options

- ▶ Brake with or without hand release
- ▶ Different encoder options for closed loop
- ▶ Plugs or hard wire for power supply/ daisy chaining
- ▶ Temperature sensor
- ▶ Fast acceleration time with encoder
- ▶ IEC and NEMA adapter
- ▶ Up to 50% and more size and volume savings compared to IE3
- ▶ IE5+ up to 3.7 kW

Due to their high power density, IE5+ motors are always smaller than IE3 motors. Use IE3 as default and upgrade to IE5+ if required. One conveyor design, two solutions.

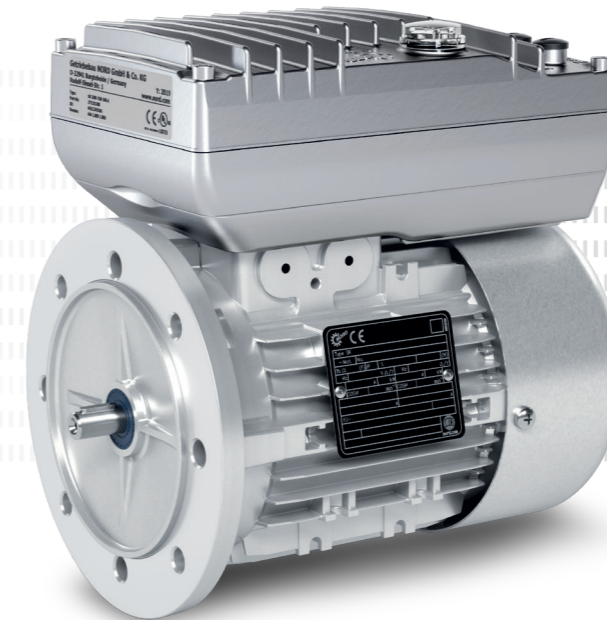
IE5+ efficiency curve



The NORD solution for pallet conveyor technology – the inverter

NORDAC ON

- ▶ 0.18 – 3 kW (in 3 sizes up to 3.7 kW)
- ▶ 24 V integrated into the main power cable
- ▶ Ethernet dialect via parameter (Profinet, EtherNet/IP, EtherCAT)
- ▶ Typical overload capacity:
 - ▶ 150% for 60 s, 200% for 5 s, 250% for 1 s
- ▶ Ambient temperature: -30...+40°C (S1)
- ▶ IP 55 (IP66 NORDAC ON+)
- ▶ Maintenance switch possible when wall-mounted
- ▶ Encoder interface for NORDAC ON+
- ▶ Optional functional safety: STO for size 2 and above
- ▶ Optional internal braking resistors from size 2
- ▶ Brake control
- ▶ Safety over Ethernet
 - ▶ PROFIsafe
 - ▶ FSoE Safety over EtherCAT



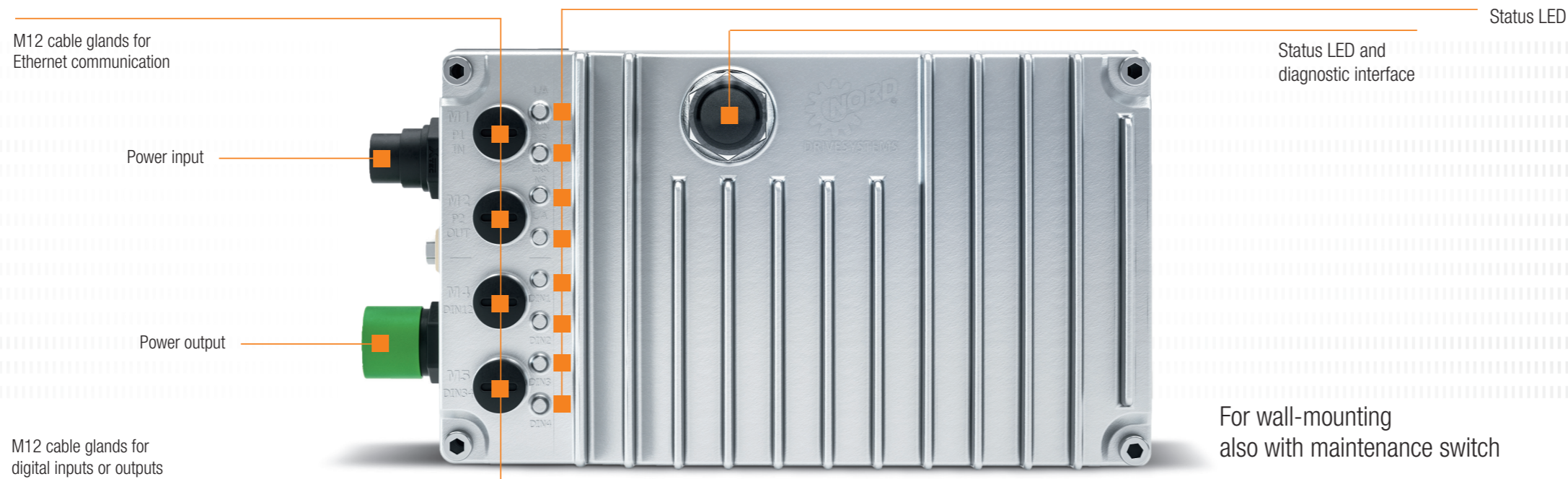
-30 °C for use in cold storage warehouses

System overview (NORDAC ON and 87 Hz 350 volts motors)

Motor	Size 1	Size 2	Size 3
63 LP/4	1.25 Nm – 0.31 kW – 1.2 A	1.25 Nm – 0.31 kW – 1.2 A	
71 SP/4	1.7 Nm – 0.43 kW – 1.5 A	1.7 Nm – 0.43 kW – 1.5 A	
71 LP/4		2.5 Nm – 0.64 kW – 1.9 A	
80 SP/4		3.67 Nm – 0.95 kW – 2.2 A	
80 LP/4			5.1 Nm – 1.3 kW – 3.8 A
90 SP/4			7.3 Nm – 1.9 kW – 5.2 A
90 LP/4			10.1 Nm – 2.6 kW – 7.2 A



Intralogistics – Pallet conveyor technology



For wall-mounting
also with maintenance switch

NORDAC ON

Size 1 – 0.37 ... 0.45 kW	Size 2 – 0.37 ... 0.95 kW	Size 3 – 1.1 ... 3 kW
	Diagnostic interface	
4 DIN (2 of which DOUT possible)	4 DIN + 2 DOUT	DIN / DOUT
PLC integrated	PLC integrated	PLC integrated
	Pallet material flow SW available	
	Multi-protocol Ethernet interface on board (EtherCAT, EtherNet/IP, PROFINET)	
Motor temperature sensor	Motor temperature sensor	Motor temperature sensor
	Brake control	Brake control
	Optional: internal braking resistor	Optional: internal braking resistor
	Optional: functional safety	Optional: functional safety
Dimensions [mm]	Dimensions [mm]	Dimensions [mm]
Motor-mounted: 230 x 121 x 79 Wall-mounted: 211 x 161 x 84	Motor-mounted: 260 x 130 x 83 Wall-mounted: 244 x 171 x 98	Motor-mounted: 265 x 160 x 105 Wall-mounted: 265 x 190 x 110

¹ With SK CU6-STO: 4 DIN (2 of which DOUT possible)

NORDAC ON+

Size 1	Size 2 – 0.37 ... 0.95 kW	Size 3 – 3.7 kW with IE5+ NORD motor
	Diagnostic interface	
	4 DIN + 2 DOUT ¹	DIN / DOUT
	PLC integrated	PLC integrated
	Pallet material flow SW available	
	Multi-protocol Ethernet interface on board (EtherCAT, EtherNet/IP, PROFINET)	
	Motor temperature sensor	Motor temperature sensor
	Brake control	Brake control
	Optional: internal braking resistor	Optional: internal braking resistor
	Optional: functional safety	Optional: functional safety
	RS 485 encoder interface	RS 485 encoder interface
	Dimensions [mm]	Dimensions [mm]
	Motor-mounted: 251 x 130 x 83 Wall-mounted: 244 x 171 x 98	Motor-mounted: 265 x 160 x 105 Wall-mounted: 265 x 190 x 110

¹ With SK CU6-STO: 4 DIN (2 of which DOUT possible)

Alternative inverter:

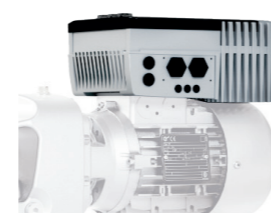
NORDAC LINK

The customised wall-mounted inverter with all typical intralogistics options and Ethernet, ASI and bus systems



NORDAC FLEX

The flexible motor-mounted inverter with all typical intralogistics options and Ethernet, ASI and bus systems

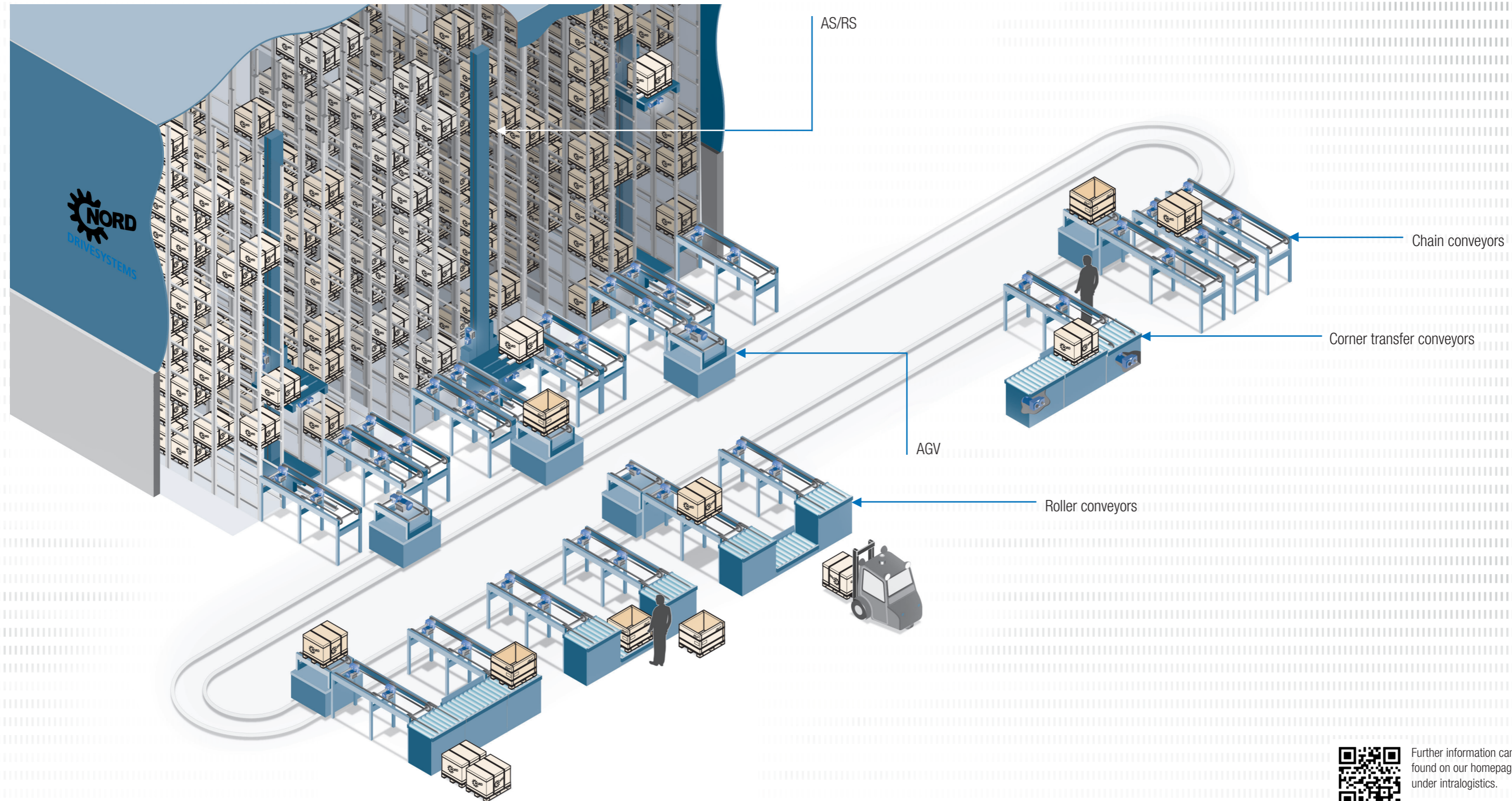


Centralised – the NORDAC PRO inverter

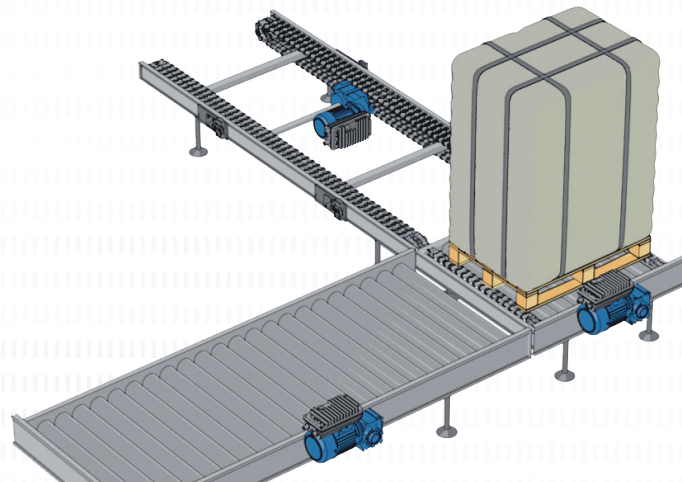
- ▶ Current vector control
- ▶ High overloads up to 200%
- ▶ Functional safety STO
- ▶ Certifications CE, cUL, EAC
- ▶ Integrated brake chopper
- ▶ Power: 0.25–22 kW
- ▶ Multi-encoder interface
- ▶ Voltage: 1~ 230 V to 2.2 kW
3~ 400 V to 22 kW
- ▶ Integrated brake chopper
- ▶ Internal PLC
- ▶ Integrated line filter
- ▶ ASM and PMSM motors
- ▶ Multi-Ethernet interface
 - ▶ Profinet, EtherCAT, EtherNet/IP, POWERLINK
- ▶ CANopen system bus (Gateway function, drive synchronisation)
- ▶ NORDCON APP via Bluetooth (useful tools such as an oscilloscope function)



Intralogistics – Pallet conveyor technology



Further information can be found on our homepage under intralogistics.



Drive solution for pallet conveyor technology

- ▶ Energy efficient
- ▶ Decentralised inverters
- ▶ Global service
- ▶ Global certified motors
- ▶ Reduction of variants
- ▶ Small, compact and lightweight
- ▶ Ethernet inverter (dialect selectable via parameter)
- ▶ Fast ROI with IE5+
- ▶ Safety via Ethernet

EN

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