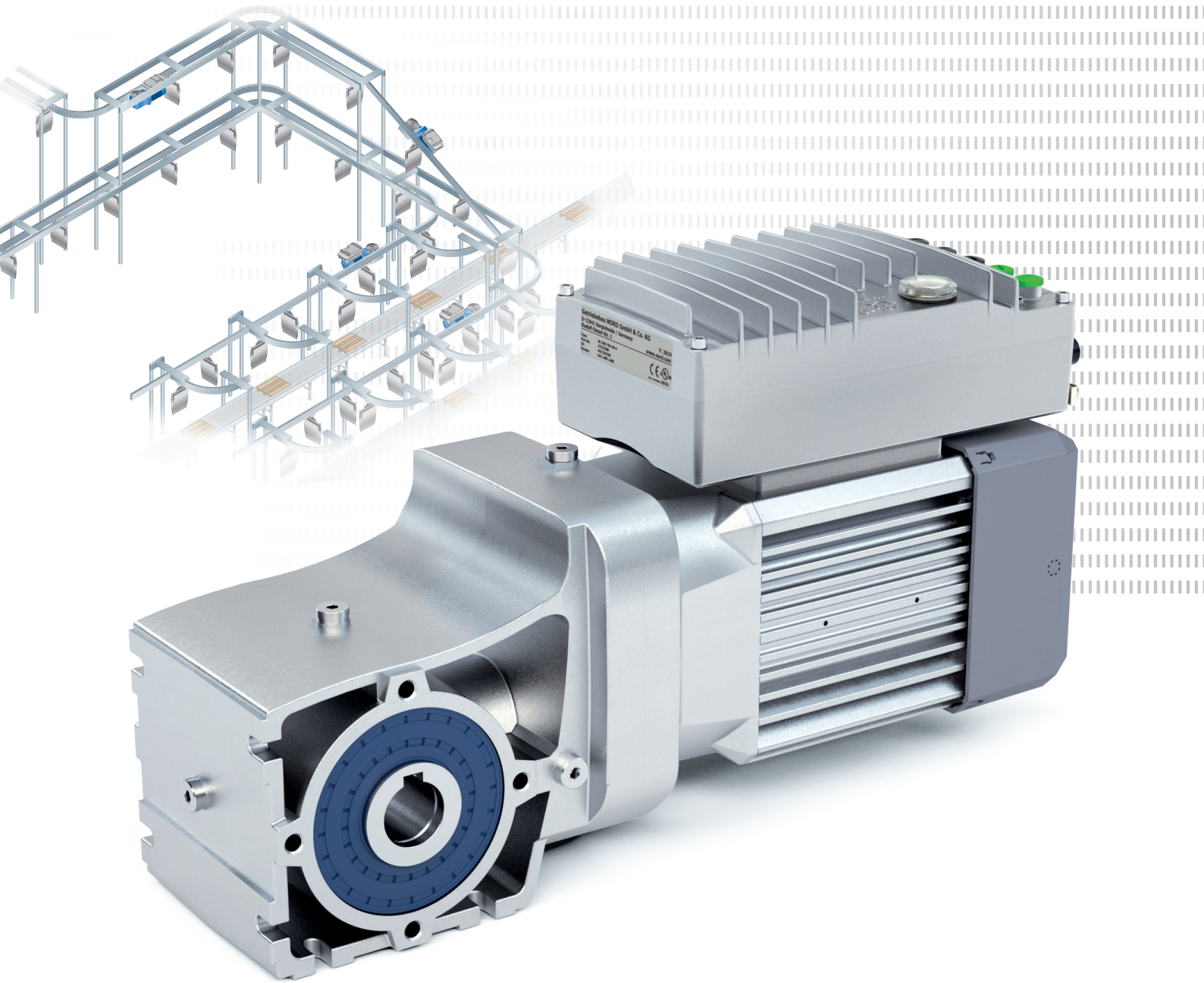
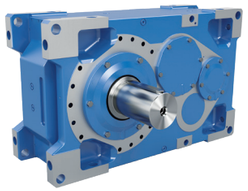


Intralogistics – Pouch sorter application

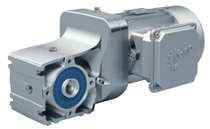
Drive solution for pouch sorter

NORD DRIVESYSTEMS

NORD DRIVESYSTEMS Group



Industrial gear units



Geared motors

Frequency inverters and motor starters

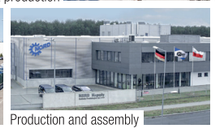
- Headquarters and technology centre in Bargteheide, near Hamburg
- Innovative drive solutions for more than 100 branches of industry
- 7 production locations with cutting-edge technology produce gear units, motors and drive electronics for complete drive systems from a single source
- NORD has 48 subsidiaries 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 4,700 employees worldwide, we create customised solutions

Headquarters in Bargteheide

Gear unit production

Inverter production

Motor production



Production and assembly

Motor mounting

Pouch sorters are overhead conveyor systems for fully-automatic storage, buffering, transport, sorting and commissioning of hanging and flat goods – be they polybags, round or cylindrical items or boxes. The items are in hanging pouches (weight: 8-15 kg) which are usually conveyed below the ceiling in overhead conveyors. Typically, 5,000 to 8,000 pouches per hour pass through the system. Pouch sorters enable a seamless process chain up to the packaging station and provide high efficiency and flexibility.

In the fields of e-commerce and omnichannel distribution, pouch sorters are already standard. The fashion industry in particular uses the intelligent sorting systems to process orders and returns. But demand is also increasing in other industries, for example in retail and in the pharmaceutical industry.

Requirements for the drive technology

Pouch sorters are compact systems with which storage areas can be optimally utilised. The drives are directly attached to the overhead conveyors. Thus, small, lightweight, compact and decentralised drive units are required. The powers and torques are in the lower range. Nevertheless, high process-related radial and axial forces must be absorbed. Further keywords are easy servicing, system integration, low maintenance, Ethernet, IIoT interfaces, variant reduction and safety. For international customers, compliance with global standards and directives is also important.

The NORD solution

For pouch sorters, NORD implements compact and low-maintenance drive solutions which at the same time offer a minimum of drive variants and energy-efficient operation. The first choice is a combination of the UNIVERSAL motor, a bevel or worm gear unit and the decentralised NORDAC *ON*.

- The energy-efficient UNIVERSAL motor is certified according to CE, UL, CSA, CCC, ISI and EAC and can thus be used worldwide. It is preferably operated at 87 Hz and is optimally suited for combination with the NORDAC *ON* thanks to corresponding stator winding. By using a frequency inverter, it can be operated on a 50 Hz / 60 Hz mains supply.
- Bevel and worm gear units are characterised by compact design and, thanks to optimally reinforced bearings, enable the absorption of large axial forces.
- The NORDAC *ON* frequency inverter was specially designed for horizontal conveyor technology. It is decentralised, compact and plug-and-play compatible. The integrated multi-protocol Ethernet interface results in a reduction of variants with additional space saving and cost benefits.

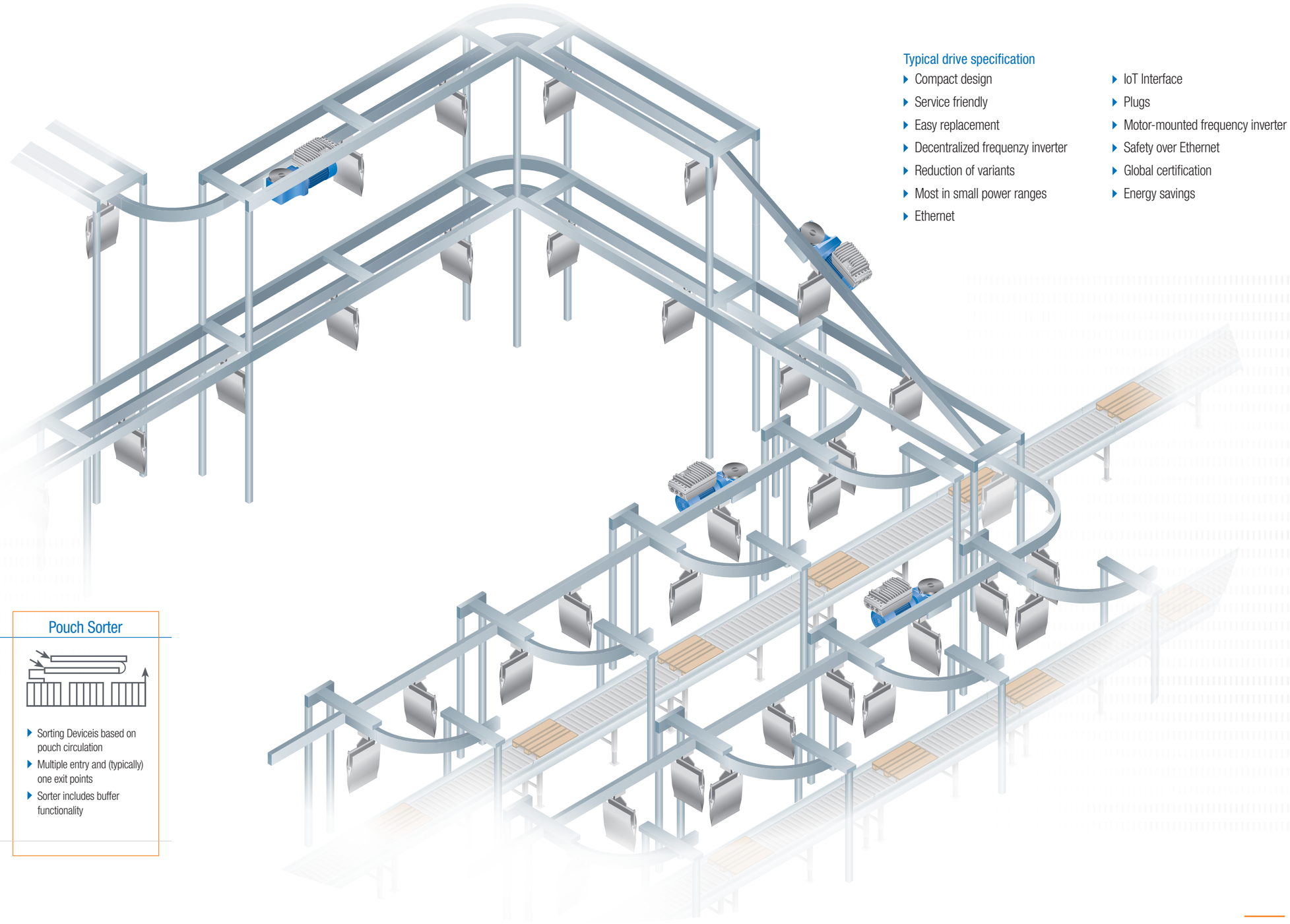
Intralogistics – Pouch sorter application

Intralogistics – Pouch sorter application

Fashion
Customers order different sizes, try on all of them, choose the right one and send the remaining items back. Pouch Sorter Systems deal with this reality. They store all goods in garments within large warehouses and let them run in a circle. Once ordered the good comes to the shipping area and finds its way to the customer.

General Trade
The only difference is the good to be sorted.

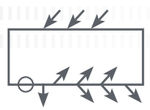
E-Commerce
Online shopping has matured:
easy ordering and convenient delivery are the norm today



Typical drive specification
- Compact design
- Service friendly
- Easy replacement
- Decentralized frequenzy inverter
- Reduction of variants
- Most in small power ranges
- Ethernet
- IoT Interface
- Plugs
- Motor-mounted frequency inverter
- Safety over Ethernet
- Global certification
- Energy savings

Sorted goods			
Cartons	Polybags	Cubic items	Cylindric items
+ (size limit)	++	++	++

Thoughput raus
Typically 5 000 to 8 000/h per matrix

Circular Sorter

- Sorting Device forms a closed loop
- Multiple entry and exit points
- Usage of different loading and unloading technologies / principles

Linear Sorter

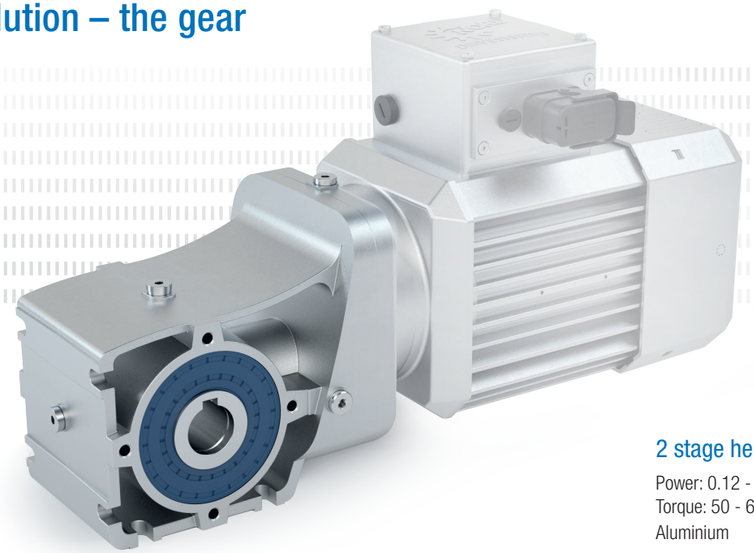
- Sorting Device forms a single line
- One entry and multiple exit points
- Usage of one loading and unloading technology / principle

Pouch Sorter

- Sorting Deviceis based on pouch circulation
- Multiple entry and (typically) one exit points
- Sorter includes buffer functionality

Intralogistics – Pouch sorter application

Pouch Sorter:
The NORD solution – the gear



2 stage helical bevel:

Power: 0.12 - 9.2 kW
Torque: 50 - 660 Nm
Aluminium

Type	Ratio Range	Input Power	Range Max	Torque Max	Hollw Shaft	Solid Shaft
SK 9x0072.1	3.03-47.67	1.10	1.50	54	20	20x40
SK 9x072,1	3.58-61.88	1.10	1.50	80	20, 25	20x40, 25x50
Sk 9x172.1	3.58-70.00	1.50	2.00	120	20, 25,30	20x40, 25x50
Sk 9x372.1	3.72-55.49	3.00	4.00	220	25,30,35	25x50, 30x60
Sk 9x672.1	4.36-48.56	9.20	10.00	365	30,35,40	30x60, 35x70
Sk 9x772.1	4.17-66.96	9.20	10.00	655	40,45,55	35x70, 40x80

Typical gear unit options

92.1 Housing, B14 Flange,
Solid Shaft, Integral Motor

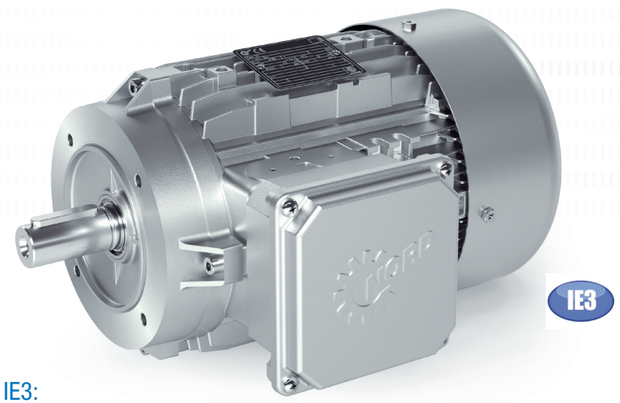
93.1 Housing, B5 Flange,
Hollow Shaft, Integral Motor

92.1 Housing, B14 Flange,
Double Solid Shaft, Integral Motor

93.1 Housing, B14 Flange, Torque Arm
Hollow Shaft, Integral Motor

Pouch Sorter:
The NORD solution – the motor in IE3 - standard Lösung

0.12 bis 5.5 kW and higher

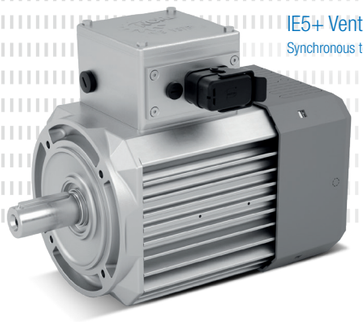


Universal world motor IE3:

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 60	0.18 0.18	400 460	10 10	1210 1630	1.42 1.05	0.54 0.43	0.82 0.72	58.7 68.6	1.50 1.50
63	LP/4	0.18	50 60	0.25 0.25	400 460	10 10	1270 1655	1.86 1.44	0.73 0.59	0.79 0.70	63.8 72.8	1.39 1.39
71	SP/4	0.25	50 60	0.37 0.37	400 460	10 10	1305 1680	2.71 2.10	0.99 0.77	0.85 0.78	65.7 74.8	1.48 1.48
71	LP/4	0.37	50 60	0.45 0.55	400 460	10 10	1345 1640	3.19 3.20	1.11 1.11	0.80 0.82	71.1 74.3	1.22 1.49
80	SP/4	0.55	50 60	0.75 0.75	400 460	10 10	1350 1685	5.31 4.25	1.77 1.49	0.81 0.78	75.3 80.1	1.36 1.36
80	LP/4	0.75	50 60	1.10 1.10	400 460	10 10	1335 1680	7.90 6.27	2.51 2.08	0.83 0.80	78.0 82.4	1.47 1.47
90	SP/4	1.10	50 60	1.50 1.50	400 460	10 10	1370 1700	10.2 8.30	3.18 2.66	0.84 0.83	80.5 84.8	1.36 1.36
90	LP/4	1.50	50 60	2.00 2.20	400 460	5 10	1330 1660	14.4 12.7	4.34 3.88	0.85 0.86	78.0 83.0	1.33 1.47
100	LP/4	2.20	50 60	3.00 3.00	400 460	10 10	1440 1750	19.9 16.4	5.90 5.02	0.84 0.84	87.2 89.6	1.36 1.36
100	1AP/4	3.00	50 60	4.00 4.00	400 460	10 10	1425 1740	26.8 22.0	7.82 6.71	0.86 0.84	86.0 88.9	1.33 1.33
112	MP/4	4.00	50 60	5.00 5.50	400 460	10 10	1420 1725	33.6 30.4	9.71 9.20	0.86 0.86	85.9 87.2	1.25 1.38
132	SP/4	5.50	50 60	7.50 7.50	400 460	10 10	1445 1750	49.6 40.9	14.6 12.8	0.84 0.83	87.8 88.8	1.36 1.36

Intralogistics – Pouch sorter application

Intralogistics – applications in IE5+ - the efficient solution



IE5+ Ventilated
Synchronous technology

IE5+ Unventilated
Synchronous technology

Options

- Brake with or without hand release
- Different encoders options for closed loop
- Plugs or hard wire for power supply / daisy chaining
- TF sensor
- Fast acceleration time with encoder
- IEC and NEMA adapters
- Up 50 % savings in size and volumen vers. IE3

Motor power labelling example

71	N	3	/8
Axial height	N = Non-ventilated (TENV) F = ventilated (TEFC)	Package length	Number of poles

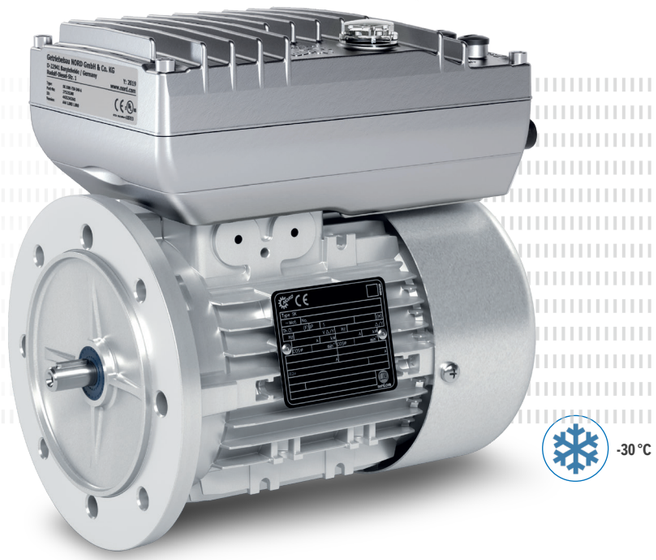
Size	M_N [Nm]	P_N [kW]	N_N [min-1]	I_N [A]	η_{MOT} [%] +/-	J_{MOT} [kgm²]	M_{MAX} [Nm]	M_A/M_N [-]	Imax [A]	K_T [Nm/A]	SF
71N1/8	1.6	0.35	2100	0.76	89.1	0.0002	3.2	2.0	1.52	2.11	1
71N2/8	3.2	0.7	2100	1.45	92.5	0.0004	6.4	2.0	2.9	2.21	1
71N3/8	4.8	1.05	2100	2.14	93.6	0.0006	8.6	2.0	4.28	2.24	1
90N1/8	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

Pouch Sorter:
The NORD solution – the Inverter

NORDAC *ON*

- 0.18 - 0.95 kW (size 1 and 2) up to 3 kW* in size 3
- 24 V integrated into the main power cable
- Integrated industrial Ethernet interfaces switchable via parameters
- Supply voltage:
  - 24V DC external typical overload:
    - 150% for 60s, 200% for 5s, 250% for 1s
- Ambient temperature: -30…+40°C (S1)
- IP 55 (IP 66 NORDAC *ON+*)
- Encoder interface for NORDAC ON +
- Optional functional safety: STO from size 2
- Optional internal braking resistors from size 2
- Brake control
- Safety over Ethernet
  - PROFISAFE
  - FSoE

** More sizes in preparation*

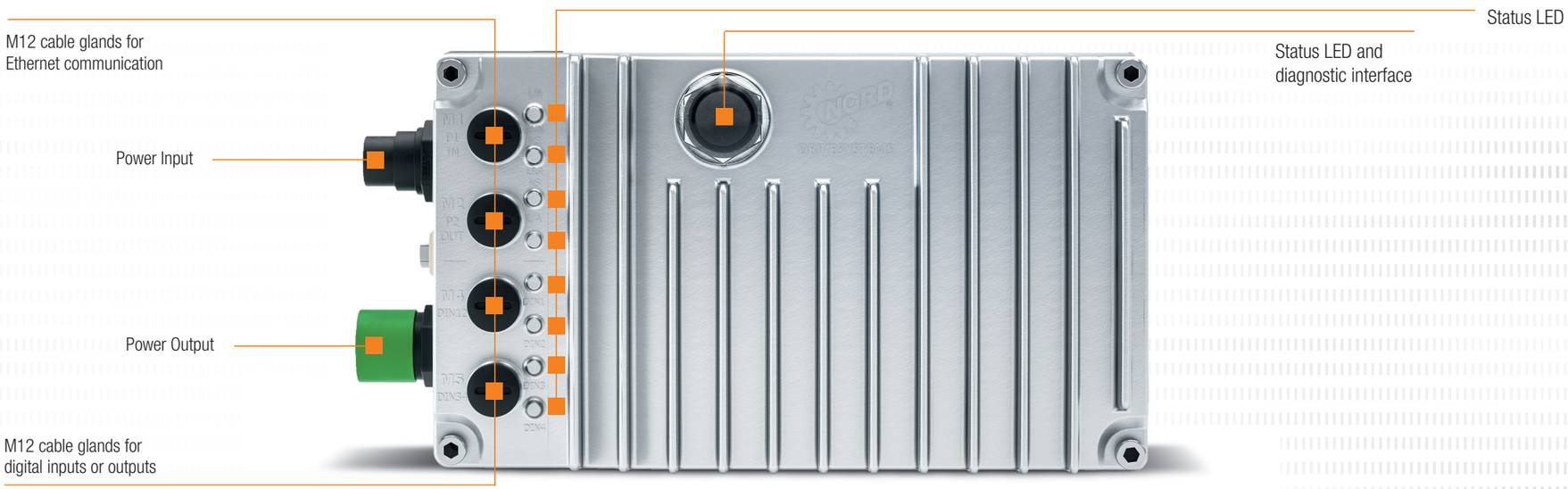


System overview

Motor	BG1	BG2	BG3
63 LP/4 – 2.600 U/min	1.25 Nm – 0.31 kW – 1.2 A	1.25 Nm – 0.31 kW – 1.2 A*	
71 SP/4 – 2.600 U/min	1.7 Nm – 0.43 kW – 1.5 A	1.7 Nm – 0.43 kW – 1.5 A*	
71 LP/4 – 2.600 U/min		2.5 Nm – 0.64 kW – 1.9 A	
80 SP/4 – 2.600 U/min		3.67 Nm – 0.95 kW – 2.2 A	
ASM 80 – 2.600 U/min			Q3 2023 – up to 3 kW

** These frequency inverter - motor combinations are possible when functions such as brake control or the installation of the SK CU6-STO / internal braking resistor is necessary.*

Intralogistics – Pouch sorter application



NORDAC *ON*

Available 2022: Size 1 – 0.37... 0.45 kW	Available 2023: Size 2 – 0.37... 0.95 kW	Available 2023: Size 3 – 1.1... 3 kW
	Diagnostic interface	
4 DIN (2 of which DOUT possible)	4 DIN + 2 DOUT[1]	DIN / DOUT
PLC integrated	PLC integrated	PLC integrated
Multi-protocol-Ethernet-Schnittstelle 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] Motor-mounted: 230 x 121 x 79 Wall-mounted: 211 x 161 x 84	Dimensions [mm] Motor-mounted: 260 x 130 x 83 Wall-mounted: 244 x 171 x 98	Dimensions[2] [mm] 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)	*[2] Dimensions for size 3 preliminary*

NORDAC *ON+*

Size 1 not available	Available 2023: Size 2 – 0.37... 0.95 kW	Available 2023: Size 3 – 1.1... 3 kW
	Diagnostic interface	
	4 DIN + 2 DOUT[1]	DIN / DOUT
	PLC integrated	PLC integrated
	Multi-protocol Ethernet interface on board	Multi-protocol Ethernet interface on board
	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] Motor-mounted: 251 x 130 x 83 Wall-mounted: 244 x 171 x 98	Dimensions[2] [mm] 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)	*[2] Dimensions for size 3 preliminary*

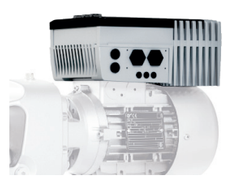
Alternative inverter:

NORDAC *LINK*

The customized wall-mounted inverter with all typical Intralogistics options and Ethernet, ASI and bus systems

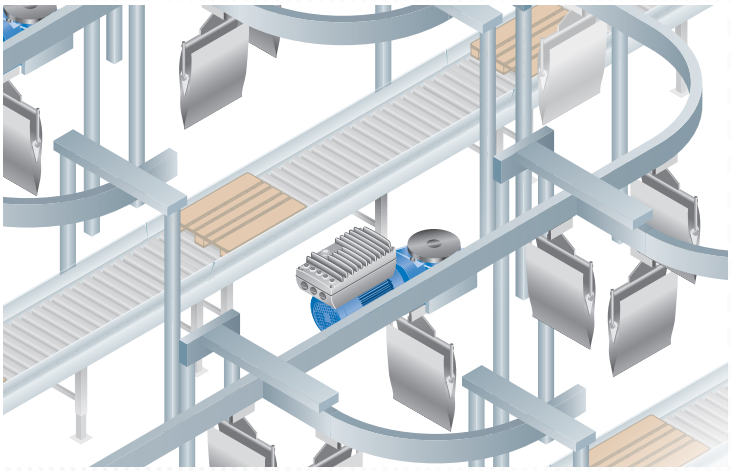
NORDAC *FLEX*

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



Centralized – the Inverter NORDAC *PRO*

- 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
- On-board PLC
- Integrated brake chopper
- Internal PLC
- Integrated line filter
- ASM and PMSM motors
- Multi-Ethernet interface
  - Profinet, EtherCAT, EthernetIP, POWERLINK
- CANopen system bus (Gateway function, Drive synchronization)
- NORDCON *APP* via Bluetooth (Useful tools such as an Oscilloscope function)



Drive solution for pouch sorter

- Small and compact drive system
- From IE3 to IE5+
- Energy-saving
- Cost savings through version reduction
- Decentralised inverters
- Ethernet dialect via parameter
- Reinforced axial bearing possible
- Global certification
- Pluggable inverters
- Daisy chaining
- Worldwide service and NORD presence
- Safety over Ethernet (PROFISAFE, FSoE)

EN

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