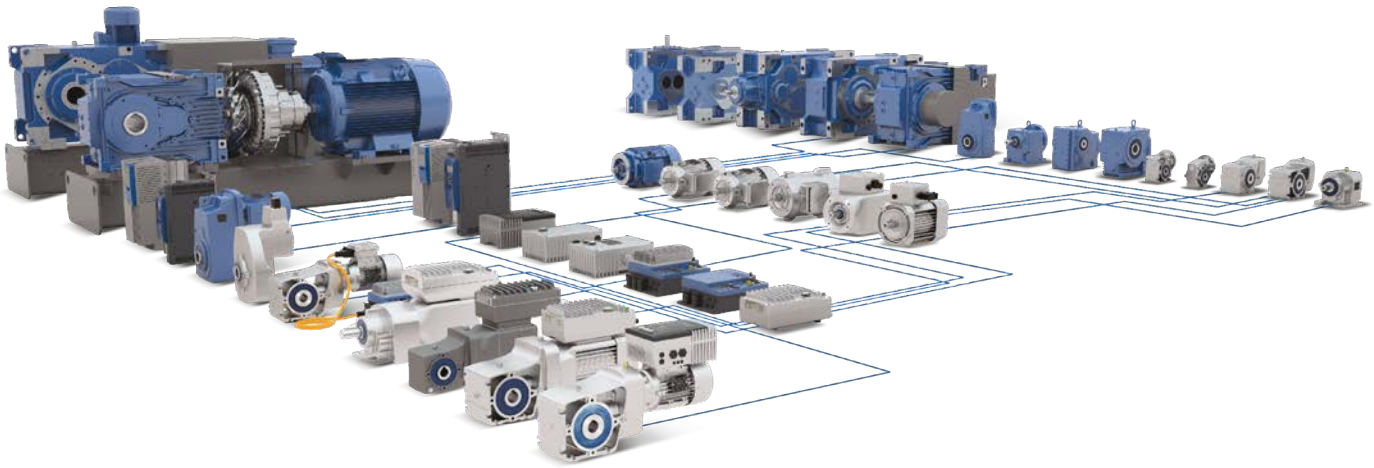


- Developing and manufacturing a wide range of automation products and technology since 1965
- Global headquarters and technology center in Bargteheide near Hamburg
- Innovative drive solutions for more than 100 industries
- 7 production locations with cutting edge technology produce gear units, motors, and drive electronics for complete drive systems from a single source
- NORD has 48 subsidiaries in 36 countries and further sales partners in more than 50 countries, providing local stock, assembly centers, technical support, and customer service
- More than 4,900 employees throughout the world create customized solutions




Headquarters in Bargteheide


Gear unit production




Inverter production


Motor production


Production and assembly


Motor assembly

Gear Motors



UNICASE™ Helical Inline Gear Units

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

Sizes	11
hp	0.16 – 200.0
lb-in	89 – 230,119
i	2.76:1 – 14,340.31:1



NORDBLOC.1® Helical Inline Gear Units

- Foot- or flange-mounted
- Die-cast aluminum housing
- UNICASE housing
- Industry standard dimensions

Sizes	16
hp	0.16 – 50.0
lb-in	266 – 29,207
i	1.07:1 – 456.77:1



UNICASE™ Parallel Shaft Gear Units

- Foot-, flange-, or face-mounted
- Hollow or solid shaft
- UNICASE housing
- Compact design

Sizes	15
hp	0.16 – 200.0
lb-in	974 – 680,200
i	4.03:1 – 15,685.03:1



NORDBLOC.1® Helical Bevel Gear Units

- Foot-, flange-, or face-mounted
- Hollow or solid shaft
- Aluminum housing

Sizes	6
hp	0.16 – 10.0
lb-in	443 – 5,842
i	3.03:1 – 70.00:1



UNICASE™ Worm Gear Units

- Foot-, flange-, or face-mounted
- Hollow or solid shaft
- Cast-iron or aluminum housing

Sizes	6
hp	0.16 – 20.0
lb-in	823 – 27,066
i	4.40:1 – 7,095.12:1



UNIVERSAL SI Worm Gear Units

- Universal mounting
- Modular aluminum housing
- Life-long lubrication

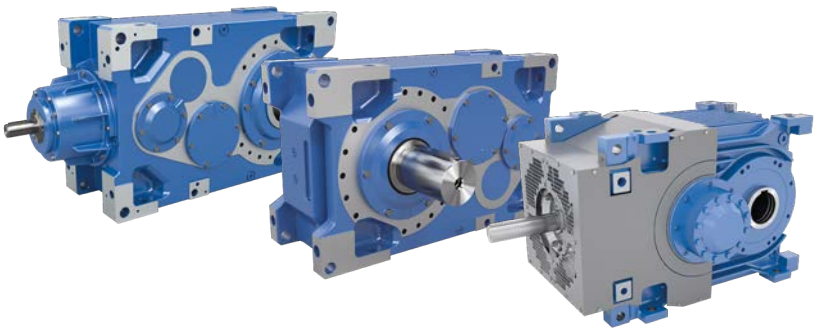
Sizes	5
hp	0.16 – 5.0
lb-in	186 – 3,780
i	5.00:1 – 3,000.00:1



UNICASE™ Helical Bevel Gear Units

- Foot-, flange-, or face-mounted
- Hollow or solid shaft
- UNICASE housing

Sizes	11
hp	0.16 – 200.0
lb-in	1,593 – 442,537
i	8.04:1 – 13,432.68:1



MAXXDRIVE® Industrial Gear Units

- All bearing points and sealing surfaces are machined in a single operation
- UNICASE housing, no sealing surfaces subject to torque
- High-precision axis alignment, quiet operation
- Gear ratio range 5.54 to 400:1 with the same foot dimensions
- Parallel axis and right-angled gear units

	MAXXDRIVE	MAXXDRIVE XT
Sizes	11	7
hp	2.0 – 8,075.0	30.0 – 2,825.0
lb-in	132,800 – 2,495,900	132,800 – 663,800
i	5.54:1 – 30,000:1	6.14:1 – 22.91:1



UNIVERSAL SMI Worm Gear Units

- Universal mounting
- Smooth surfaces
- Life-long lubrication

Sizes	5
hp	0.16 – 5.0
lb-in	186 – 3,780
i	5.00:1 – 3,000.00:1



DuoDrive Integrated Gear Unit and Motor

- IE5+ motor and a single-stage helical gear unit in one housing
- System efficiency up to 92%
- Simple Plug-and-Play commissioning

Sizes	2
hp	0.5 - 4.0
lb-in	230 – 2,186
i	3.24:1 – 18.1:1

NORD is the only manufacturer that produces modular industrial gear units with an output torque of up to 2,495,900 lb-in in a one-piece UNICASE housing.

ATEX

NORD gear motors and industrial gear units are also available in ATEX certified versions.

Drive Electronics

Functions

- High precision regulation with current vector control
- Compatible with all common bus systems
- 4-quadrant operation
- Integrated PLC functionality for drive-related functions
- Energy-saving function during partial load operation
- Control and parameterization tools and simple parameter structure
- Integrated line filter for compliance with EMC regulations
- Operation of synchronous and asynchronous motors
- Control and closed loop regulation
- POSICON – integrated positioning mode and synchronization
- STO and SS1 – integrated functional safety
- Integrated brake rectifier for motor brake control

Advantages

- Scalable functionality – flexibility of equipment and function
- High torque capability for all drive applications
- Simple commissioning and operation

NORD drive electronics are available in ATEX certified versions.



NORDAC *PRO*: Control Cabinet Variable Frequency Drive SK 500E

Product Status: Phase-Out

The frequency drive for all drive applications. Proven technology, large power range, and capable of functional expansion with plug-in option modules. Optimized heat dissipation thanks to the variable cooling concept.

Nominal ratings:
- Power up to 200.0 hp
- Control cabinet installation
- IP20



NORDAC *PRO*: Control Cabinet Variable Frequency Drive SK 500P

The innovative next generation of control cabinet variable frequency drives. Features a compact size, extremely flexible communication and interface concept, and functional expansion with optional modules.

Nominal ratings:
- Power up to 200.0 hp
- Control cabinet installation
- IP20



NORDAC *ON*: Decentralized Variable Frequency Drive SK 300P

Decentralized drive unit specially developed to meet the special requirements of horizontal conveyor applications and compatibility with IE5+ synchronous motors.

Nominal ratings:
- Power up to 5.0 hp
- Wall or motor mounting
- IP55, IP66, IP69



NORDAC *FLEX*: Decentralized Variable Frequency Drive SK 200E

Modular decentralized drive unit with versatile installation options, simple commissioning and maintenance through extensive plug-in capability, and simple parameter transfer via EEPROM.

Nominal ratings:
- Power up to 30.0 hp
- Wall or motor mounting
- IP55, IP66



NORDAC *BASE*: Decentralized Variable Frequency Drive SK 180E

Product Status: Phase-Out

Economical decentralized solution for simple drive applications. Low installation costs as well as robust design for simple installation outside the control cabinet.

Nominal ratings:
- Power up to 3.0 hp
- Wall or motor mounting
- IP55, IP66

Motors



Energy-saving motors



Switchable pole motors



Single-phase motors



Smooth motors



ATEX
Explosion protected motors, gas atmospheres



ATEX
Explosion protected motors, dust atmospheres

Special Features

- Motors developed and produced by NORD
- We produce energy-efficient products for all parts of the world
- Products available at all international locations
- IE3, IE4, IE5+



NORDAC *START*:
Motor Starter SK 135E
Product Status: Phase-Out

The decentralized starter for all types of soft starting with integrated motor protection and reversing function for flexible integration into application systems.

Nominal ratings:
- Power up to 10.0 hp
- Wall or motor mounting
- IP55, IP66



NORDAC *LINK*:
Variable Frequency Drive
SK 250E-FDS

The field distribution system for flexible, decentralized installation. Configurable based on application requirements and available as a variable frequency drive or starter version.

Fast commissioning through high level of plug-in capability. Simple servicing of the system through integrated maintenance switch and local manual control facility.

Nominal ratings:
- Power up to 10.0 hp
- Wall mounting
- IP55, IP65



NORDAC *LINK*:
Motor Starter
SK 155E-FDS

Nominal ratings:
- Power up to 4.0 hp
- Wall mounting
- IP55, IP65

Why Drive Solutions from NORD DRIVESYSTEMS are the Ideal Choice

Since 1965, we have provided our customers with extensive advice for the planning and implementation of standardized and customized drive solutions with electronic drive technology.

- NORD provides everything from a single source. All components such as gear units, motors, and drive electronics are optimally matched.
- NORD provides competent local support throughout the world for the planning, design and integration of suitable drive technology.
- NORD supplies pre-assembled drive systems that are simple and easy to install and maintain.



Experience, Competence, and Innovation

In addition to excellent quality and reliability, drive solutions from NORD DRIVESYSTEMS also feature a great depth of production. The drive specialist produces all high-quality components in its own facilities. At the beginning of the 1980s, NORD started to produce electronic drive technology in Aurich, Germany. Over the years, the range of variable frequency drives, motor starters, and electronics has continually expanded and now includes electronic drive technology up to 200.0 hp.

The production facility has also been continually expanded with up to 400,000 units capable of being produced per year.





Drives Designed with Safety in Mind
Basic Operational Standards







User Friendliness

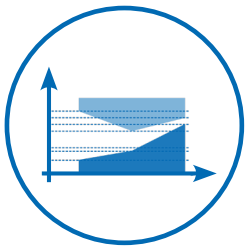
- Easy adaptation to bus communication systems with optional hardware/software options
- Quick and simple diagnostics via easily visible LED indicators
- Technology units available for display, operation, and parameterization
- Clear display by large LCD screen in 14 languages (optional)
- Simple operation and parameterization through logical parameter structure and intuitive layout of control elements
- Variants for control cabinet installation, hand-held technology, or direct mounting on the VFD available (only NORDAC *PRO*)
- Wireless interface for operation and parameterization with mobile terminal devices available

Protection and Safety Functions

- Protective monitoring of
  - Overvoltage
  - Temperature
  - Excess current
- Communication monitoring
  - Timeout functions
- Motor protection through
  - Overload monitoring
  - Thermistor evaluation
  - Temperature monitoring
- Functional safety
  - Safe torque switch-off STO
  - Safe stop SS1-t
  - Safe speed SLS, SOS
  - Secure bus communication

  (not available in all series)

Electronic Drive Technology
Basic to Advanced Functionality



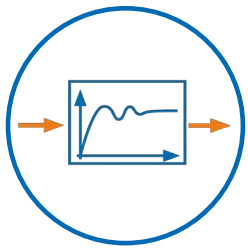
Load Monitoring

- Monitoring of load torque depending on the output frequency
- Individual adaptation of load monitoring to protect the system from overload in particular frequency ranges



Energy-Saving Function

- Maximum efficiency in partial load operation
- Reduced operating costs due to energy savings of up to 60%
- Simple adjustment



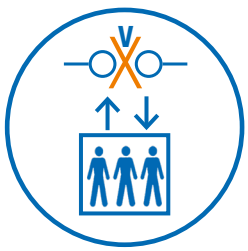
PI Process Controller/PID Controller

- Feedback and evaluation of actual values for implementation of closed-loop control circuit (e.g. flow or dancer control)
- P and I components can be set separately



Master/Follower Operation

- Control of one or more drives from a single drive that is designated as the Master
- Communication via USS or CANopen with control word and setpoint values



Evacuation Run

- Evacuation run possible if the main supply fails
- Emergency operation with low DC voltage from UPS (e.g. battery) possible

(not available in all series)









Lifting Gear Functions

- High-precision current vector control for rapid and precise load take-up
- Integrated brake chopper to divert generated energy to a brake resistor (brake resistor optional)
- Brake management for optimum control of an electromechanical holding brake for wear-free brake actuation



Encoder Feedback (Servo Mode)

- High-precision speed regulation
- Highest possible acceleration due to direct feedback of the actual speed characteristics to the variable frequency drive
  - Full torque down to standstill (0 speed)
  - Digital speed controller with wide range of setting

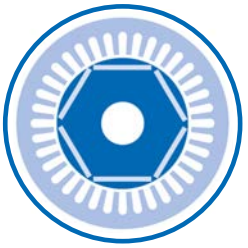
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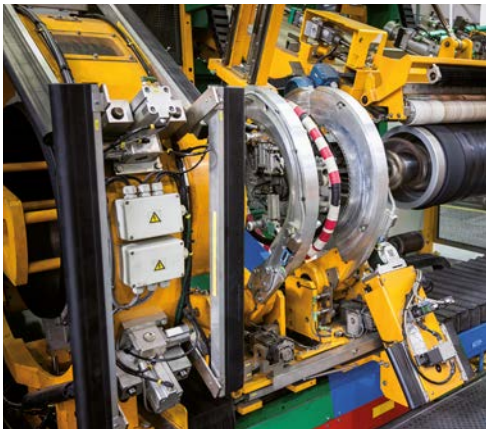




Operation Without Encoder of PMSM Synchronous Motors

- High-precision speed control without incremental encoder (open-loop)
- Maximum acceleration
- Dynamic applications with high-efficiency motors (CFC open-loop injection control)

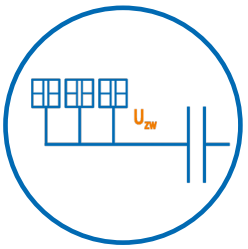




Link Circuit Coupling

- Coupling of the link circuits of multiple variable frequency drives
- Energy-saving effect with balanced motor and generator operation
- Elimination of brake resistors possible

(not available in all series)



NORDAC Variable Frequency Drives for CO_2 Reduction:



Electronic Speed Adjustment

Electronic speed adjustment of system drives can save mechanical power losses from control methods such as throttle valves or bypass lines in pump systems. Regulated by a variable frequency drive, the motor provides the exact speed needed by the system – saving energy, operational costs, and protecting the environment.

NORD offers different frequency drive solutions that can be integrated in almost all system topologies. The customer can choose between conventional cabinet mounted installation or a decentralized motor- or wall-mounted solution.

NORD Variable Frequency Drives

Whether motor-mounted, wall-mounted, or installed in a control cabinet, NORD VFDs are highly efficient and comply with the current energy efficiency regulation IE2. In the devices' technical documentation, NORD indicates the power loss values for several operating points – providing general technical data as well as characteristics for different operating points. Individual workload of the driven machine is also included into the selection of the most suitable variable frequency drive.





Motors in the Partial Load Range

Oversized drive systems are widespread and often done to maintain safety factors, standardize drive components, and to accommodate dynamic characteristics during system operation. This often causes the motor to operate in a partial load range rather than in a nominal operation range. The optimum efficiency of an asynchronous motor is only achieved around its nominal operating point. For speeds and powers below the nominal operating point, its efficiency significantly decreases. Here is where the variable frequency drive can help: it recognizes the workload situation and, after a short time in the partial load range, lowers the motor magnetism to the reduced, required level. This results in reduced motor losses and optimized efficiency. For higher load requirements, an automatic readjustment takes place.





Environmentally Friendly Drive Technology

Modern electric motors such as the IE4 or IE5+ motors from NORD, are at their most efficient when used in combination with a variable frequency drive. These synchronous motors offer a considerably higher efficiency than asynchronous motors and expand the nominal speed and power range beyond what asynchronous motors are capable of.

NORDAC frequency drives and IE4/IE5+ high-efficiency motors have been jointly developed and perfectly matched. This optimized combination also offers the potential to quickly pay for itself through energy cost savings – making it the perfect modern engineering solution for environmentally friendly drive technology.



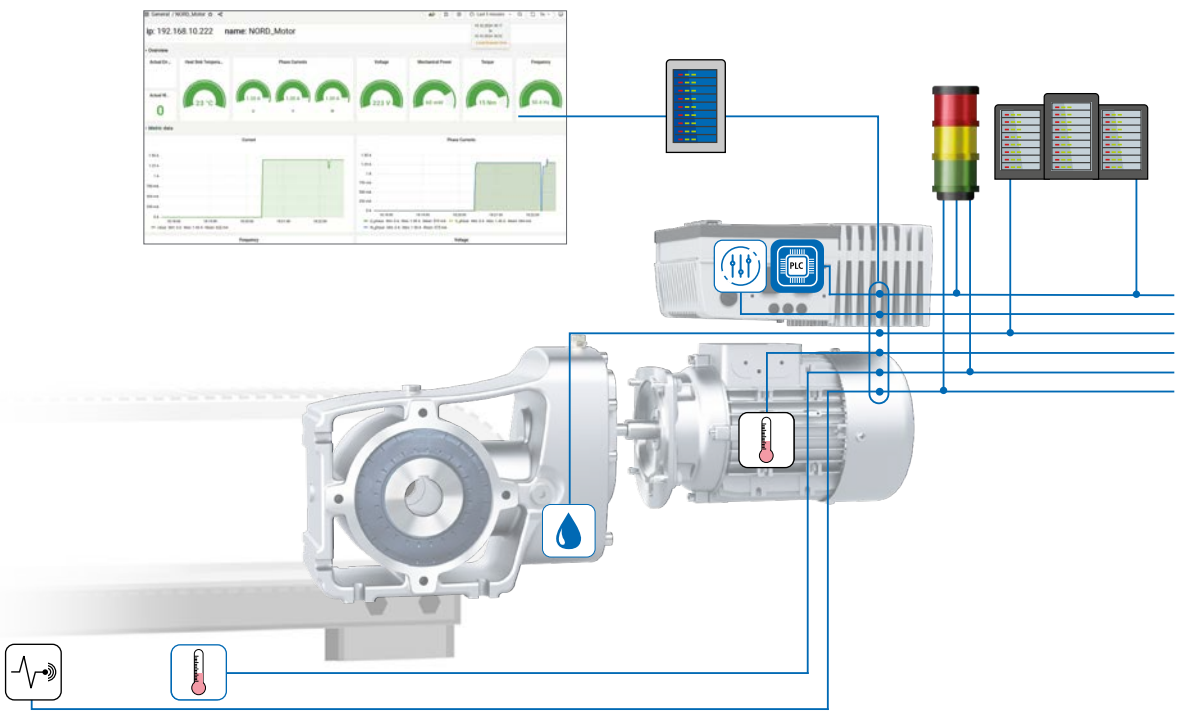
Condition Monitoring for Predictive Maintenance
NORD DRIVE MONITOR

With the IIoT solution from NORD, dynamically calculated and sensor-based operating values from electronic drive systems are continuously provided for further processing. This data can be used to analyze the current state of a system or machine, detect anomalies or wear at an early stage, and plan maintenance in advance. The objective is to prevent failures and increase the service life of the system or machine while optimizing resource use and the overall production process.

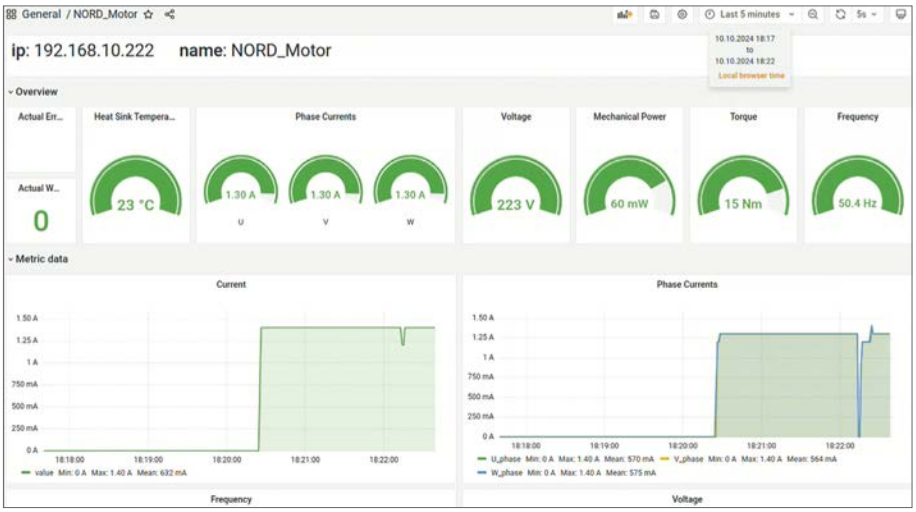




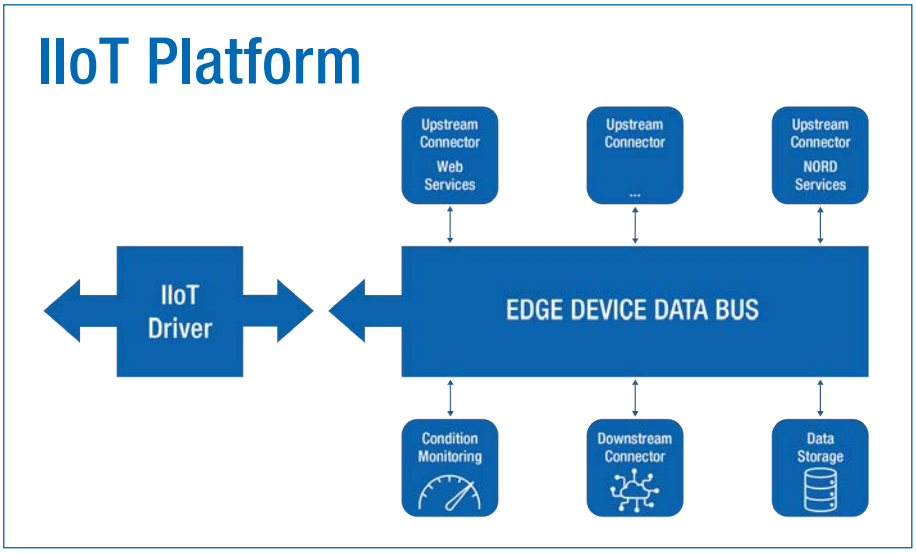
The modular and scalable architecture of NORD's IIoT solution is based on common technologies such as MQTT and TimescaleDB for data integration and processing, as well as Grafana for the visualization of operating values on a dashboard to implement its individual modules. This solution provides modular, standardized interfaces for easy integration into application-specific solutions while also creating a robust platform for data collection, storage, and analysis. The IIoT solution can be used in any IT infrastructure as it is provided in Docker containers.



- Configurable dashboard via Grafana
- Threshold check
- Trend forecast



- Common market technologies such as MQTT and TimescaleDB for data integration and data processing
- Its modularity enables adaptation to the size of the system
- The IIoT solution can be used in any IT infrastructure as it is provided in Docker containers

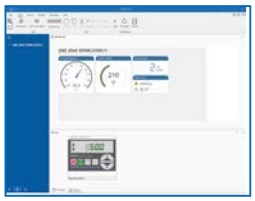




NORDCON Software Inclusive

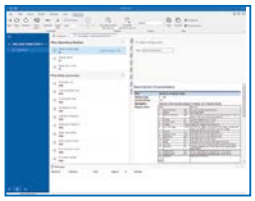
NORDCON Software

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



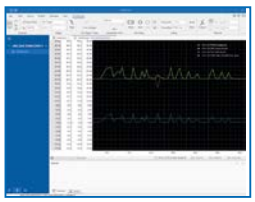
Control

A virtual control unit, analogous to a SimpleBox (optional control and parameterization unit), enables the display of operating values, parameterization, and control of a connected variable frequency drive or motor starter.



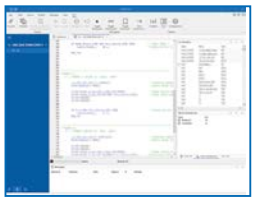
Parameterization

The user can view and adjust each available parameter via a convenient overview. With the corresponding printing option, parameter lists are generated in printed form completely or only with the values which deviate from the factory settings. The final data sets can be saved on a PC/laptop and either archived for future use or sent by e-mail.



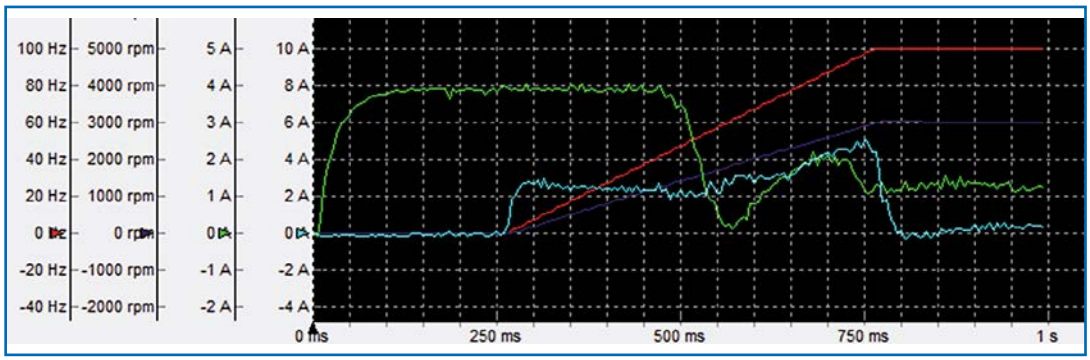
Diagnosis

The NORDCON oscilloscope function is an extremely useful instrument for optimum adjustment of drive systems. By means of line graphs, all drive characteristics (current, torque, etc.) can be recorded and analyzed. Based on the results, the relevant drive unit can be fine tuned to the ideal parameter settings.



PLC Programming

A PLC editor is available for creating, editing, and managing the PLC program. The PLC programs can also be tested (debugged) with this editor and communicated to the variable frequency drive. The programming languages “Structured Text” and “Instruction List” according to IEC 61131-3 are supported.



Wireless Commissioning is Possible

NORD DRIVESYSTEMS Opens up a New Communication Method

You can now make 1:1 connections to your mobile terminal device with the NORDAC *ACCESS BT* removable Bluetooth stick. Together with the free NORDCON *APP*, available for both Android and iOS, you have a practical, smart tool in your pocket that conveniently enables access to your variable frequency drive. Available functions including display operating values, parameterization, and oscilloscope functions are reimagined from the Windows-based NORDCON software with next level intelligence.



Service with the NORDCON *APP*

The NORDCON *APP* is a mobile commissioning and service solution with the following advantages for all NORD drives:

- 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





NORDCON *APP*

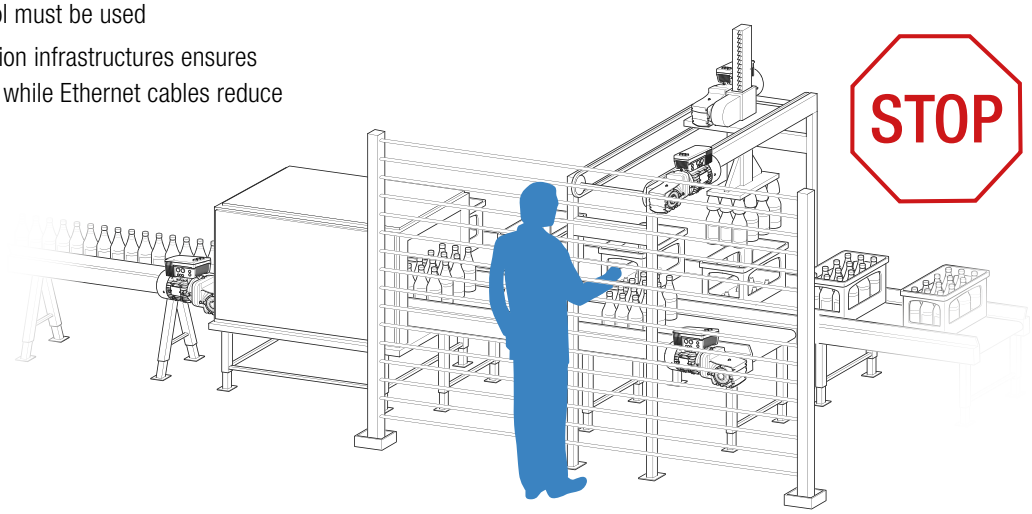
Wireless Works Harder

- Increases radius of action when you are working on the device
- Communication with a device inside a safety area without having to enter the danger zone

Safe Monitoring of NORD Drives – Functional Safety with NORD

Functional safety ensures that a system operates reliably while preventing hazards caused by malfunctions. It minimizes risk and protects people and the environment from dangerous events. The implementation of functional safety is required by law.

- Functional safety functions can also be implemented using safe Ethernet protocols
- Depending on the manufacturer of the higher-level control, the corresponding safety protocol must be used
- Building on existing communication infrastructures ensures safe and error-free data transfer while Ethernet cables reduce the amount of wiring required



NORDAC *LINK*	NORDAC *FLEX*	NORDAC *ON*	NORDAC *PRO*
			
SK 260E and SK 280E ▸ STO, SS1	SK 210E, 230E, 215E, and 235E ▸ STO, SS1-t ▸ + 1 safe digital input	Size 2 and higher: SK 301P and SK 311P ▸ STO, SS1-t ▸ + 1 safe digital input	SK 510P and SK 540P ▸ Safety function via control terminals ▸ STO, SS1-t ▸ + 1 safe pulse block ▸ + 1 safe digital input
SK 260E and SK 280E + SK CU4-PNS (optional) ▸ STO, SS1, SLS, SSR, SDI, SOS, SSM ▸ + Safety SIN/COS encoder ▸ + 2 safe digital inputs ▸ + 2 safe digital outputs	With SK TU4-PNS (optional) ▸ STO, SS1, SLS, SSR, SDI, SOS, SSM ▸ + Safety SIN/COS encoder ▸ + 2 safe digital inputs ▸ + 3 safe digital outputs	SK 302P and SK 312P ▸ As stand-alone or with bus operation: ▸ PROFISAFE, FSoE, CIP Safety (in preparation) ▸ STO, SS1,SS2, SLS, SMS, SSM ▸ + 2 safe digital inputs	SK 530P and SK 550P + SK CU5-STO (optional) ▸ STO, SS1-t ▸ + 1 safe pulse block ▸ + 1 safe digital input
			SK 530P and SK 550P + SK CU5-MLT (optional) ▸ Same as SK CU5-STO, with encoder interface

Functional Safety
Safe Stop STO and SS1

Safe Stop

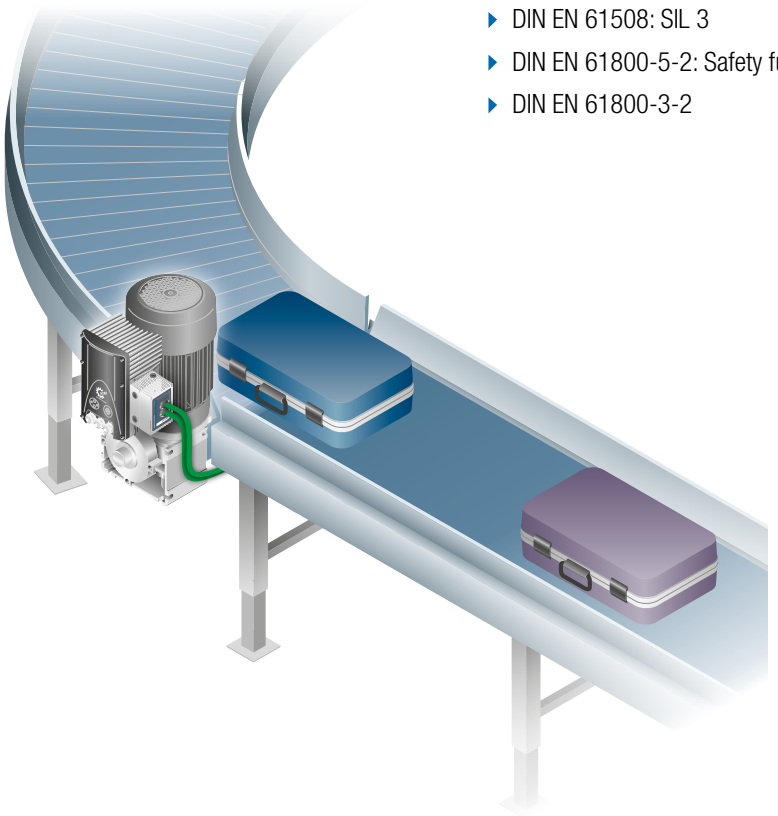
Personnel safety and reliable machine availability are the primary focus in system operations. When a safety circuit is actuated by opening a safety cover or door, it must be ensured that no rotating components can result in an accident.

Motors controlled by NORD VFDs use a Safe Pulse Block that provides a safe shut-down method for stopping the drive and protection against the motor restarting in compliance with safety standards.

This safe block includes the voltage supply to the circuit breaker via a safety switching device, enabling the frequency drive to be switched on immediately without re-initialization after the safety circuit is closed.

Standards

- DIN EN ISO 13849-1: Performance Level e
- DIN EN 61508: SIL 3
- DIN EN 60204-1: Stop function
- DIN EN 61800-5-2: Safety functions



PROFIsafe/FSoE

Drives that have been integrated in system controls via Industrial Ethernet can flexibly transmit safe communication through the existing Ethernet-based network. This eliminates the need for a hardwire fail-safe for functions such as STO and allows drive control information and safety information to be transmitted via the same network.

Decentralized and integrated functional safety from NORD drive systems enables new safety concepts for different industries. Fail-safe functions in application solutions can be implemented without needing to stop the machine. The optional modules read a fail-safe encoder for the fail-safe monitoring of movements. In combination with a higher-level and fail-safe control, these modules can monitor speed ranges and recognize safe directions of rotation.

The NORD solution also provides opportunities to connect functional elements of the operational safety environment such as a light-blocking grill or emergency stop switch to the module, and to transmit the signal states as fail-safe to the control.

Standards

- DIN EN ISO 13849-1: Performance Level e
- DIN EN 61508: SIL 3
- DIN EN 61800-5-2: Safety functions
- DIN EN 61800-3-2

Encoders

If the main aim of a drive application is maximum accuracy, the integration of an encoder into the drive system is essential. The encoder's task can be subdivided into two categories: speed detection and position detection.

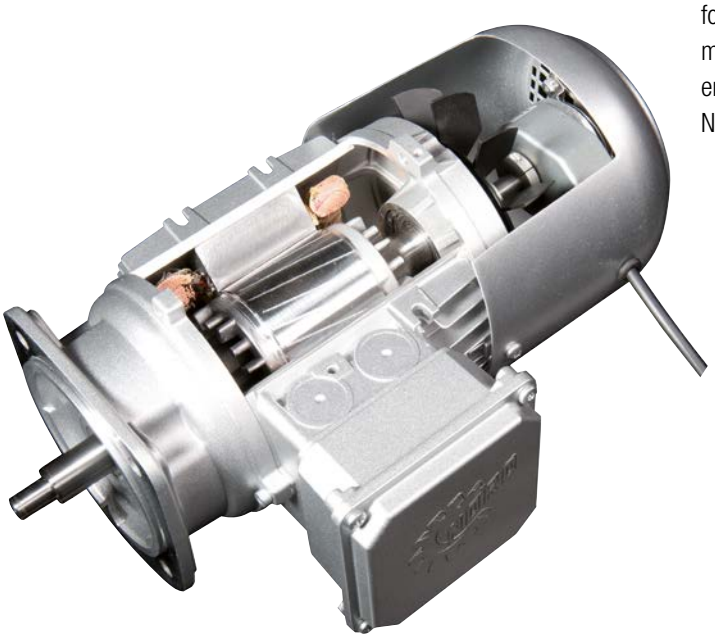
Speed Detection for Speed Control

A variable frequency drive with integrated speed control can control the motor speed with utmost accuracy and directly compensate load changes. This requires the use of an incremental encoder. The encoder is directly mounted on the motor shaft and connected to the VFD. The variable frequency drive evaluates the speed detected by the encoder and uses it to control the motor speed.

Position Detection for Position Control

Variable frequency drives with integrated position control (POSICON) enable performance of drive applications involving exact positioning without additional components such as photocells or limit switches. Continuous monitoring of operating values and intelligent calculation methods of NORDAC variable frequency drives allow for optimum control of target positioning at any time and acceleration values matched to the drive application.

Any common encoder type such as incremental encoders, absolute encoders, or combination encoders (absolute encoders with additional incremental track) may be used for position control. When using position control, the encoder is usually mounted on the motor shaft and connected to the frequency drive.



Encoder Types

Absolute encoders and combination encoders register the rotation angle and the number of rotations of the encoder shaft, coding it as a unique position transmitted to the VFD for direct processing. Absolute and combination encoders "remember" the position and can correctly render it even upon system switch-off and switch-on. Referencing the encoder (adjustment to one reference point) is thus not required or only required once during system commissioning.

Incremental encoders, however, only transmit binary pulses to the VFD. These pulses are based on the so-called encoder resolution, that is the number of defined pulses per rotation of the encoder shaft. The frequency drive determines the position by counting the pulses sent by the encoder. By using two tracks shifted by 90° (¼ pulse width), the frequency drive identifies the direction of rotation of the drive. As incremental encoders can only submit pulses but not absolute positions, faults on the encoder cables may lead to misinterpretations by the frequency drive. Encoders with an additional zero track, however, deliver an additional "zero pulse" per full rotation of the encoder shaft and can be used to compensate minor faults. Switching off the system will lead to the total loss of the position. Positioning tasks with an incremental encoder therefore require additional measures (e.g. regular referencing) and, where necessary, additional components (limit or referencing switches) to ensure permanent and safe positioning operation.

The following table gives an overview of the common encoders approved by NORD. Further information on the encoder types can be found under "Options" in the motor catalogs M7000 (asynchronous motors) or M5000 (synchronous motors). Depending on the type of encoder, they can be combined with certain motors from NORD and NORDAC variable frequency drives.

Encoder		Motors			Variable Frequency Drives					
Interface	Cable Length Max. [m]	Asynchronous (ASM), no ATEX	Synchronous (PMSM) IE4	Synchronous (PMSM) IE5+	NORDAC *PRO* 500E	NORDAC *PRO* 500P	NORDAC *FLEX*	NORDAC *LINK*	NORDAC *ON+*	NORDAC *BASE*
HTL	10	IG12 IG22 IG42	IG12 IG22 IG42	IG62	● [1]	● [2]	●	●	● [1]	❍
MG Contelec	3	MGZ	MGZ	MGZ [1]	❍	●	●	●	● [1]	❍
TTL	50	IG11 IG21 IG41	IG11 IG21 IG41	IG61P8	● [3]	● [3]	❍	❍	● [9]	❍
RS 485	20	❍	❍	IG6	❍	● [5]	❍	● [6]	● [6]	❍
SSI	20	AE2	❍	❍	● [4]	● [1, 5]	❍	❍	●	❍
BISS-C	20	❍	❍	❍	● [4]	● [5]	❍	❍	●	❍
EnDat 2.1	20	❍	❍	❍	● [4]	● [5]	❍	❍	❍	❍
HIPERFACE	20	❍	❍	❍	● [4]	● [5]	❍	❍	❍	❍
CANopen	20	AG1 [7]	AG1 [7]	❍	●	●	❍	❍	❍	❍
		AG4 [8]	AG4 [8]	❍	❍	● [2]	●	●	❍	❍
		AG7 [1]	AG7 [1]	❍	●	●	●	●	❍	❍
		AG8 [7]	AG8 [7]	❍	●	●	❍	❍	❍	❍
		AG9 [8]	AG9 [8]	❍	❍	● [2]	●	●	❍	❍

● Available
❍ Not available

IG = Incremental encoder
AG = Absolute/combination encoder
MGZ = Incremental encoder with zero track

[1] Positioning only, no closed-loop operation
[2] No PMSM closed-loop operation
[3] SK 520E or SK 530P and higher
[4] SK 540E and higher
[5] SK 530P and higher, firmware version 1.4 and higher, and only in combination with the optional SK CU5-MLT customer unit
[6] Standard version for IE5+
[7] Combination encoder, AG with TTL track
[8] Combination encoder, AG with HTL track
[8] For asynchronous motor operation only

When Extreme Precision is Required
POSICON and PLC



POSICON

Variable frequency drives with integrated POSICON functionality are able to accurately determine the position of the drive. Incremental encoders (TTL/HTL) and absolute encoders are available as interfaces via CANopen® (NORDAC PRO from SK 540E and above, SK 530P and above.) Sine wave encoders, SSI, BiSS-C, EnDat 2.1, and HIPERFACE are also available. In addition to conventional point-to-point positioning (absolute positioning), POSICON also provides relative positioning of multiple axes as well as various functions like a rotating platform with travel optimization, synchronous operation, and flying saw.

With standard POSICON position memory and features such as Teach In, Approach Reference Point, Reset Position, Offset Position, Target Window Positioning and S-ramp, the VFD can carry out fully independent positioning control. The tasks for the external control system are reduced to the starting pulse and communication of the target position (via digital I/O or at the field bus level). The variable frequency drive can even monitor the positioning process and report the operating status.

Applications

- Lifting gear/shelf storage and retrieval devices requiring precise positions
- Running gear of material conveyors / portal cranes with synchronization of all driven axes
- Rotating table functions for tool magazines on machines
- Flying saw – coupling and parallel movement of a positioning axis relative to a moving object

PLC

Intelligent drive electronics with integrated PLC functionality greatly reduce the load on the higher level system control unit and enables a modular system design. Application data is able to be evaluated in real time by the decentralized PLC, for example: the optimization of diagnostic facilities. The PLC functionality enables the application to accurately respond according to the situation.

- The PLC can be programmed with the NORDCON software (IEC 61131-3, Structured Text ST, and Instruction List IL)
- There are no license fees or other runtime costs
- Customer-specific control functions can be easily integrated with the PLC; evaluation of sensor data and control of actuators replaces the machine control or drive control
- Motion control function blocks for implementation of movement control based on the PLCopen standard are available

Applications

- Regulation / control of one or more devices by the frequency drive

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NORDAC *PRO*, SK 500P series
variable frequency drives up to 200.0 hp
for control cabinet applications
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NORDAC *PRO*, SK 500E series
variable frequency drives up to 200.0 hp
for control cabinet applications
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NORDAC *ON*, SK 300P series
variable frequency drives up to 5.0 hp
for decentralized applications
Page 73



NORDAC *LINK*, SK 250E-FDS series
NORDAC *LINK*, SK 155E-FDS series
field distributors as variable frequency drives up to 10.0 hp,
field distributors as motor starters up to 4.0 hp
for decentralized applications
Page 89



NORDAC *FLEX*, SK 200E series
variable frequency drives up to 30.0 hp
for decentralized applications
Page 107



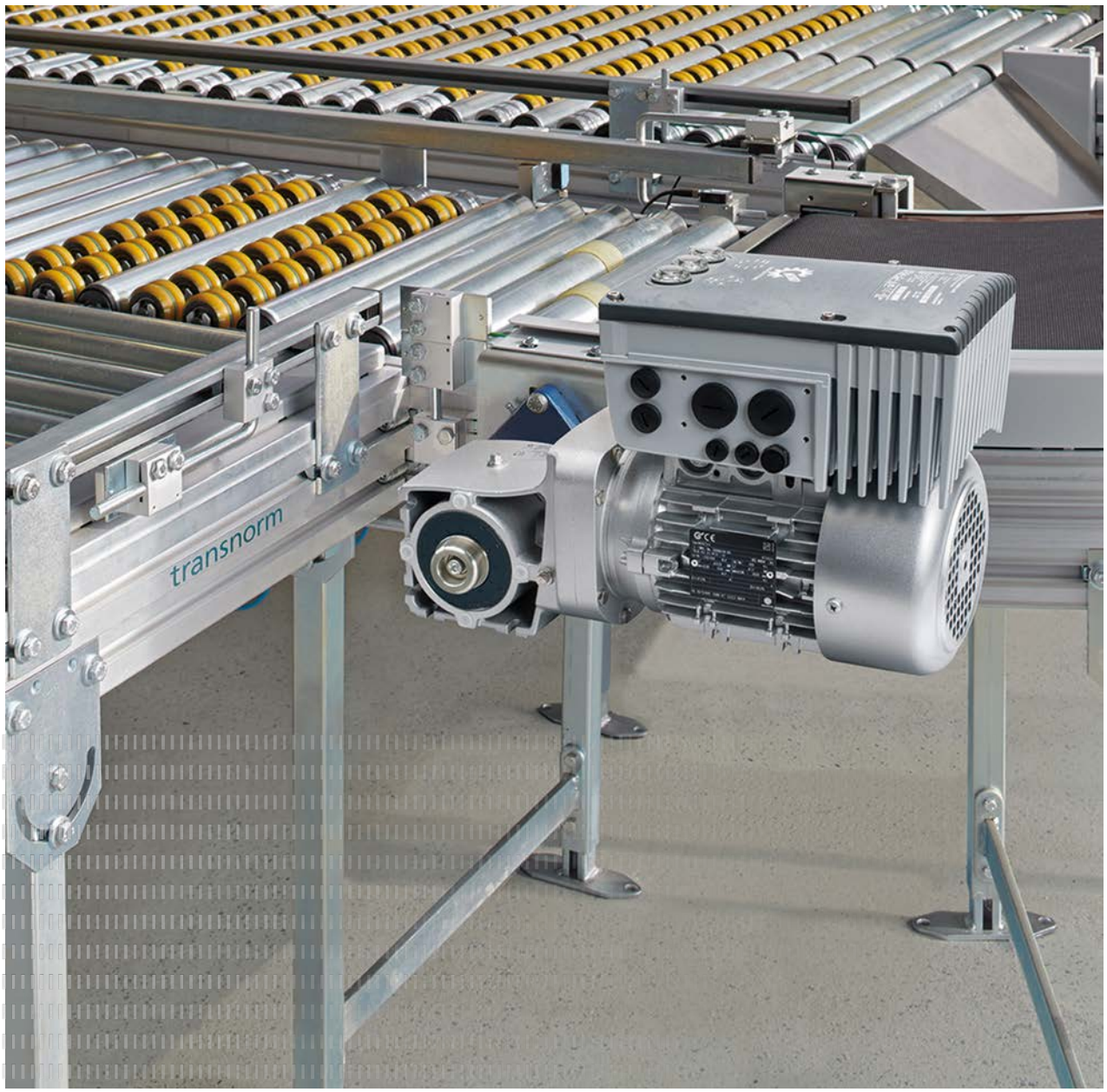
NORDAC *BASE*, SK 180E series
variable frequency drives up to 3.0 hp
for decentralized applications
Page 133



NORDAC *START*, SK 135E series
Motor starters up to 10.0 hp
for decentralized applications
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Accessories
for NORDAC *ON, LINK, FLEX, BASE,* and *START*
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transnorm



Variable Frequency Drives for Control Cabinet Applications

NORDAC *PRO* SK 500P series

NORD DRIVESYSTEMS

Top Class VFD Technology
NORDAC *PRO*, SK 500P Series

NORDAC *PRO* - SK 500P









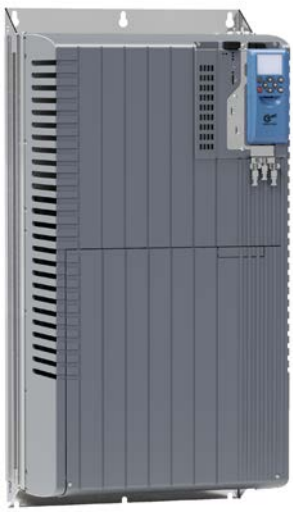












NORDAC *PRO* SK 500P variable frequency drives are available for motors with rated powers of 0.33 – 200.0 hp (20.0 hp available for SK 530P and higher.) With their compact, book-size design, they are ideal for space-saving installation in control cabinets.

Notable features across the entire product line:

- Sensorless current vector control ensures constant speeds even with fluctuating loads and significantly high torques during startup
- 200% overload reserve provides greater operational safety in cranes and lifting gear applications
- Operation of asynchronous and synchronous motors
- Integrated brake chopper for 4-quadrant operation
- Integrated line filter as the basis for optimal EMC performance
- Integrated PLC which enables convenient free programming of drive-related functions according to IEC 61131-3

These features are as much a part of the basic configuration as the separately configurable PID or the process controller.

Functional safety is increasingly becoming the focus of attention in drive technology. To meet the various safety requirements, the NORDAC *PRO* also offers functional extensions to implement single or dual channel solutions for Safe Torque Switch-off and Safe Stop.

A removable operating display is optionally available with an extensive selection of operational displays, status information, and direct parameterization access.

As a standard, the SK 500P variable frequency drives are equipped with an integrated mains unit that supplies power to the control board. The USB port, which is standard for configured version SK 530P and higher, also provides access to the VFD control board without connection to the mains voltage.

Devices with configuration level SK 530P and higher are equipped with a separate 24 V DC connection. These devices can also be parameterized when the power is switched off. Restricted diagnosis and communication with the bus is also retained.

Optional SK CU5 extensions, which can be configured with all SK 530P or SK 550P devices, complete the range of functions. These include the encoder extension or the universal encoder interface for connection of a wide range of encoders (e.g. SSI, EnDat 2.1), which in combination with the installed POSICON, are the ideal solution for all types of positioning (relative and absolute). Only one SK CU5 extension can be connected between the VFD and the operating display.

A multi-protocol Ethernet interface is integrated in the SK 550P and above versions. During commissioning, the protocol can simply be set by switching a parameter to the required dialect (Ethernet/IP®, EtherCAT®, PROFINET IO® or POWERLINK). Flexibility for system planning is enhanced due to the comparatively small variance in hardware.

Basic Configuration

- Sensorless current vector control (ISD control) for high precision control and fast response times
- CFC open-loop injection method for powerful control of synchronous motors without an encoder
- Brake management, electromechanical holding brake
- Brake chopper to divert generated energy to a brake resistor
- CANopen® including drive profile DS402
- POSICON variants with positioning function (relative and absolute)
- RS-485/RS-232 diagnostic interface
- 4 switchable parameter sets for flexible use of parameter settings (e.g. switching between drive units with different motor data)
- All common drive functions such as acceleration / braking on a ramp, S curves
- Parameters pre-set with standard values, immediately ready for use
- Scalable display values
- Stator resistance measurement to ensure optimal control characteristics
- Integrated PLC functionality
- Plug-in connection terminals

  Available for all devices up to 3.0 hp





Optional

- Interfaces for many Industrial Ethernet-based bus systems
- Removable operating display with extensive operating and status indicators and access to parameters
- Variants for implementation of safe drive functions (e.g. STO, SS1-t)
- Interface extensions for connection of encoders and IOs
- USB-C interface for parameterization via PC using the NORDCON software, without additional connection of a mains or control voltage

PROFINET® EtherNet/IP EtherCAT® ETHERNET POWERLINK



Top Class VFD Technology
NORDAC *PRO*, SK 500P Series

NORD Provides the New SK 500P with Features for Streamlined Use:



Electrical Connection
Power Terminals

In addition to the control terminals on the front, which are always pluggable, for the two small sizes of frequency drives with rated powers up to 3.0 hp, all other power terminals (e.g. line and motor connections, connections to multi-function relays, etc.) can be removed for maintenance. This enables wiring of the compact devices to be carried out easily and safely even in confined control cabinet spaces.



The engineering of Size 3 VFDs (rated powers of 4.0 hp and above) allows enough space that a plug-in design of the power terminals is not necessary.







Control Terminals

NORDAC *PRO* variable frequency drives are equipped with an integrated “3rd hand” that holds the spring terminals in place for easy wiring.





Parameter Setup

To view operating values, error messages, or access and modify variable frequency drive parameter settings, use one of these methods:

- Direct access with the snap-on SK TU5-CTR technology unit or SK TU5-PAR (optional)
- Separate SK PAR-5H or SK CSX-3E (optional) control and parameterization units which can be mounted in the control cabinet doors
- NORDCON software (free) – by connecting a Windows computer via USB-C [1] or RJ12
- NORDCON *APP* (free) for connection to a mobile terminal device via NORDCON *ACCESS BT* (optional)
- Removable data carrier (microSD) for backup and transfer of parameter data sets (optional)

  Available for SK 530P and higher

[1] No additional connection of a mains or control voltage required, USB-Cable SK CE-USB-C-PC-USB-3M required.







Standards and Approvals

All devices of the entire series comply with the standards and directives listed below.

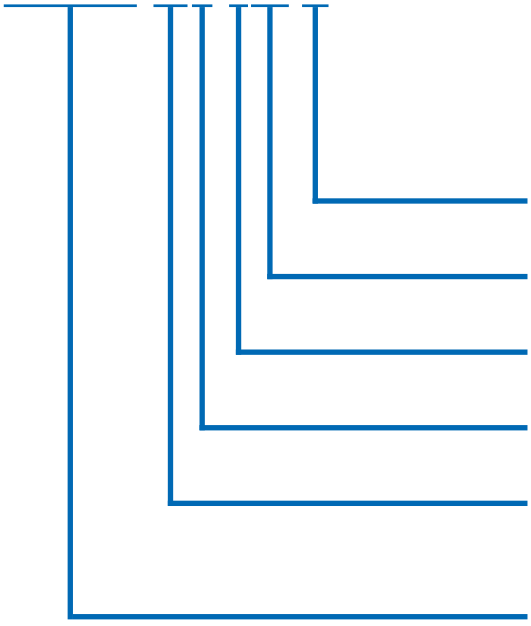
Approval	Directive		Applied Standards	Certificates	Code
CE (European Union)	Low Voltage Directive	2014/35/EU	EN 61800-5-1 EN 60529 EN 61800-3 EN 63000 EN 61800-9-1 EN 61800-9-2	C310601	CE
	EMC	2014/30/EU			
	RoHS	2011/65/EU			
	Delegated directive (EU)	2015/863			
	Ecodesign	2009/125/EG			
	Regulation (EU) Ecodesign	2019/1781			
UL (USA)			UL 61800-5-1	E171342[1]	c UL us LISTED
CSA (Canada)			C22.2 No.274-13	E171342[1]	
RCM (Australia)	F2018L00028		EN 61800-3		
EAC (Eurasia)	TR CU 004/2011, TR CU 020/2011		IEC 61800-5-1 IEC 61800-3	EAЭC N RU Д-DE.HB27.B02718/20	EAC
UkrSEPRO (Ukraine)	F2018L00028		EN 61800-5-1 EN 60529 EN 61800-3 EN 63000 EN 60947-1 EN 60947-4 EN 61558-1 EN 50581	C311900	
UKCA (United Kingdom)			EN 61800-5-1 EN 60529 EN 61800-3 EN 63000 EN 61800-9-1 EN 61800-9-2	C350601	UK CA

[1] UL/CSA: up to and including 150.0 hp only, above 150.0 hp on request

Type Code

Variable Frequency Drives

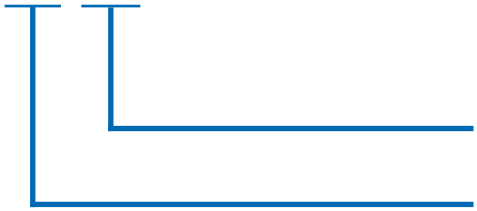
SK 530P-370-340-A



- Radio interference filter: **A** = Class A1(C2)
- Mains voltage: **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
- Device rated power: **250** = 0.25 kW / 0.33 hp, **370** = 0.37 kW / 0.5 hp, ... **372** = 37.0 kW / 50.0 hp
- Variable frequency drive series: SK 500P, SK 510P, SK 530P, SK 540P. SK 550P

Technology Units

SK TU5-CTR



- Option type: **CTR** = ControlBox, **PAR** = ParameterBox
- Group: **TU** = Technology unit

Customer Units

SK CU5-STO



- Option type: **STO** = Safe Stop, **MLT** = Multi-Encoder-Interface
- Group: **CU** = Customer interface

NORDAC *PRO*
All Versions at a Glance

	SK 500P SK 510P Size 1 – 4	SK 530P SK 540P SK 550P Size 1 – 10
Sensorless current vector control (ISD control)	●	●
Asynchronous motor operation (closed-loop and open-loop)	●	●
Synchronous motor operation (PMSM) (CFC open-loop injection control)	●	●
Brake management for mechanical holding brake	●	●
Brake chopper (brake resistor optional)	●	●
RS-232 diagnostic interface	●	●
4 switchable parameter sets	●	●
All normal drive functions	●	●
Parameters pre-set with standard values	●	●
Stator resistance measurement	●	●
Energy-saving function, optimized efficiency in partial load operation	●	●
Integrated EMC line filter according to EN 61800-3, Category C2 up to 20 m motor cable, Category C1 up to 5 m motor cable (devices above 1.0 hp)	●	●
Shielding plate for connection of shielded control cables for EMC-compliant wiring	●	●
Extensive monitoring functions	●	●
Load monitor	●	●
Link circuit coupling	●	●
Lifting gear functionality	●	●
PID controller	●	●
Process controller / compensator control	●	●
Incremental encoder input (HTL / TTL) for speed feedback - servo mode	●[1]	●
POSICON	●	●
PLC functionality	●	●
USS, Modbus RTU (RJ12)	●	●
CANopen® (connection terminals)	●	●
PROFINET IO® (default), EtherCAT®, Ethernet IP®, POWERLINK	❍	●[2]
"Safe Torque Switch-off" and "Safe Stop" (STO, SS1) functions	○[3]	○[4]
USB port (Parameterization of the FI by means of NORDCON without mains or control voltage connection)	❍	●
Internal 24 V power supply unit to supply the control board	●	●
External 24 V DC supply for the control board voltage supply with automatic switch-over between the internal and external 24 V DC control voltage	❍	●
Universal encoder interface	❍	○
MicroSD slot, port for removable data carrier	❍	●
Removable data carrier (microSD) for backup and transfer of parameter data sets	❍	○
Operating display, removable for display of status and operating information and for control	○	○
Communication interface, removable, for wireless communication between the variable frequency drive and mobile terminal devices (tablet, smartphone)	○	○

[1] HTL only
[2] SK 550P only
[3] SK 510P only, single channel
[4] SK 540P as standard, single channel

● Available as standard
○ Optional
❍ Not available

		SK 500P SK 510P Size 1 – 4	SK 530P SK 540P SK 550P Size 1 – 10
Control Terminals	DIN	5	6[1]
	DOUT	0	2
	Signal relay2 (… 230 V AC, 2 A)	2	2
	AIN[3]	2	2
	AOUT[3]	1	1
	Temperature sensor (PTC)	1[4]	1
Encoder Interfaces	TTL RS422	❍	●
	RS485	❍	●[5]
	HTL[4]	●	●
	CANopen®	●	●
	SIN / COS	❍	●[5]
	SSI	❍	●[5]
	BISS-C	❍	●[5]
	Hiperface	❍	●[5]
	Endat 2.1	❍	●[5]
Communication	CAN / CANopen®	●[6]	●
	RS-485 / RS-232 via RJ12	●	●



Temperature sensor (PTC)
SK 530P and above

TTL encoder interface
SK 530P and above

1 Extendable with the optional SK CU5-... customer interface
2 Parameterizable with DOUT functions
3 AIN/AOUT can also be used for digital signals
AIN: 0(2) – 10 V, 0(4) – 20 mA
AOUT: 0 – 10 V, 0 – 20 mA
4 Function can only be implemented through a digital input, permissible length of encoder cables: max. 10 m
5 Available via optional customer unit CK CU5-MLT, not SK 540P
6 System bus functions can only be used with restrictions





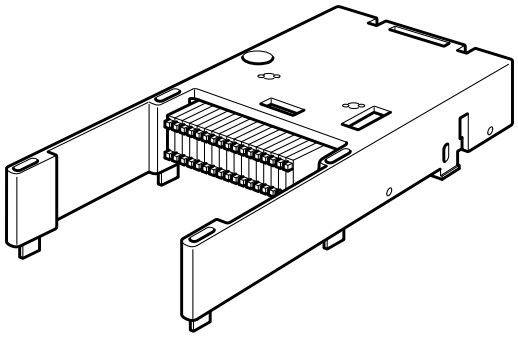
Control terminals AIN/ AIN / DIN

zAdditional control terminals DIN / DOUT
SK 530P and above

Optional Modules for Function Extension

Variable frequency drives with configuration versions SK 530P and SK 550P can be extended with a plug-in optional module. This increases the installation depth by 23 mm.

One of the following variants can be selected.



Type	Material No.	Functions	IOs	Remarks
SK CU5-MLT	275 298 200	Encoder interface: TTL, SIN/COS, HIPERFACE, EnDat 2.1, BiSS-C, SSI, UART Functional safety: STO - PLe / SIL 3 SS1-t - PLd / SIL 2	4 IO (usable as DIN or DOUT) 1 Safe DIN	Functional safety: 2-channel connection
SK CU5-STO	275 298 000	Functional safety: STO - PLe / SIL 3 SS1-t - PLd / SIL 2	1 Safe DIN	Functional safety: 2-channel connection


NORDAC PRO
OK
ESC
DRIVESYSTEMS
Getriebebau NORD GmbH & Co.KG
DANGER!

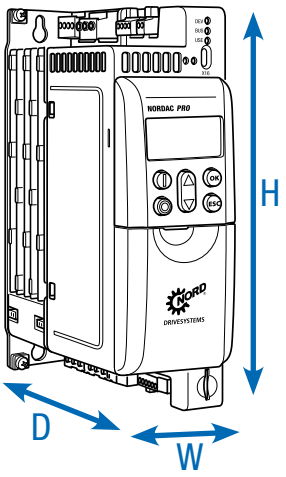
NORDAC *PRO* SK 500P Variable Frequency Drive
1~ 200 ... 240 V

Output Frequency	0.0 ... 400.0 Hz
Pulse Frequency	3.0 ... 16.0 kHz
Typical Overload Capacity	150% for 60 s, 200% for 3.5 s
Energy Efficiency Class	IE2
Efficiency	Size 1 – 3 approx. 95% Size 4 – 6 approx. 97% Size 7 – 10 approx. 98%
Ambient Temperature	-10°C ... +40°C (S1) -10°C ... +50°C (S3, 70% ED)

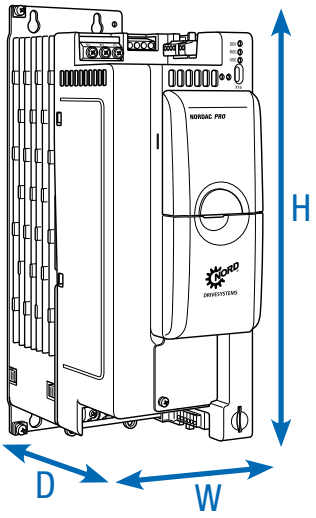
Protection Class	IP20
Regulation and Control	Sensorless current vector control (ISD), linear V/f characteristic curve
Motor Temperature Monitoring	I^2t Motor PTC / bi-metal switch
Leakage Current	<30 mA, may be considerably less depending on the size and configuration of the VFD (refer to the manual for details)

Variable Frequency Drives SK 5xxP ...	Nominal Motor Power 230 V [kW]	Nominal Motor Power 240 V [hp]	Nominal Output Current rms [A]	Mains Voltage	Output Voltage
-250-123-A	0.25	0.33	1.7	1~ 200 ... 240 V, +/- 10%, 47 ... 63 Hz	3~ 0 up to mains voltage
-370-123-A	0.37	0.50	2.4		
-550-123-A	0.55	0.75	3.2		
-750-123-A	0.75	1.00	4.2		
-111-123-A	1.10	1.50	5.7		
-151-123-A	1.50	2.00	7.3		
-221-123-A	2.20	3.00	9.6		

Size 1 – 2



Size 3 – 11



Variable Frequency Drives SK 5xxP ...	Weight [kg]	Weight [lbs]	Overall Dimensions H x W x D [mm]	Overall Dimensions H x W x D [in]	Size
-250-123-A	1.2	2.6	200 x 66 x 141	7.87 x 2.59 x 5.55	1
-370-123-A	1.2	2.6	200 x 66 x 141	7.87 x 2.59 x 5.55	1
-550-123-A	1.2	2.6	200 x 66 x 141	7.87 x 2.59 x 5.55	1
-750-123-A	1.2	2.6	200 x 66 x 141	7.87 x 2.59 x 5.55	1
-111-123-A	1.6	3.5	240[1] x 66 x 141	9.44 x 2.59 x 5.55	2
-151-123-A	1.6	3.5	240[1] x 66 x 141	9.44 x 2.59 x 5.55	2
-221-123-A	1.6	3.5	240[1] x 66 x 141	9.44 x 2.59 x 5.55	2

[1] SK 5xxP-221-123: Connection terminal protrudes beyond the stated overall dimension H about 15 mm.

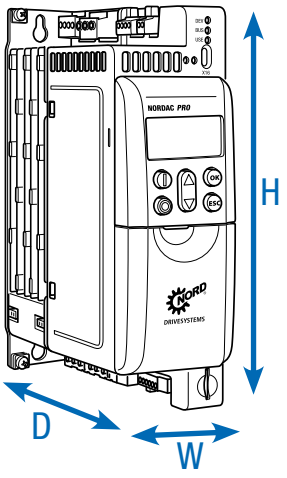
NORDAC *PRO* SK 500P Variable Frequency Drive 3~ 380 ... 480 V

Output Frequency	0.0 ... 400.0 Hz
Pulse Frequency	3.0 ... 16.0 kHz
Typical Overload Capacity	150% for 60 s, 200% for 3.5 s
Energy Efficiency Class	IE2
Efficiency	Size 1 – 3 approx. 95% Size 4 – 6 approx. 97% Size 7 – 10 approx. 98%
Ambient Temperature	-10°C ... +40°C (S1) -10°C ... +50°C (S3, 70% ED)

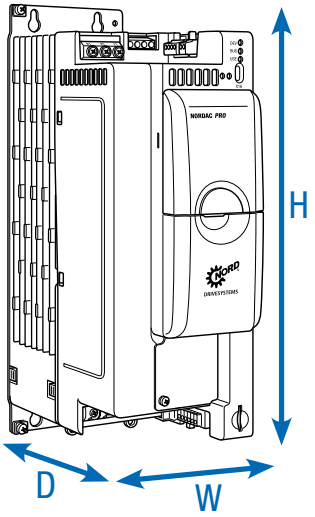
Protection Class	IP20
Regulation and Control	Sensorless current vector control (ISD), linear V/f characteristic curve
Motor Temperature Monitoring	I^2t Motor PTC / bi-metal switch
Leakage Current	<30 mA, may be considerably less depending on the size and configuration of the VFD (refer to the manual for details)

Variable Frequency Drives SK 5xxP ...	Nominal Motor Power 400 V [kW]	Nominal Motor Power 480 V [hp]	Nominal Output Current rms [A]	Mains Voltage	Output Voltage
-250-340-A	0.25	0.33	1.0	3~ 380 ... 480 V, -20% / +10%, 47 ... 63 Hz	3~ 0 up to mains voltage
-370-340-A	0.37	0.50	1.3		
-550-340-A	0.55	0.75	1.8		
-750-340-A	0.75	1.00	2.4		
-111-340-A	1.10	1.50	3.1		
-151-340-A	1.50	2.00	4.0		
-221-340-A	2.20	3.00	5.6		
-301-340-A	3.00	4.00	7.5		
-401-340-A	4.00	5.00	9.5		
-551-340-A	5.50	7.50	12.5		
-751-340-A	7.50	10.0	16.0		
-112-340-A	11.0	15.0	24.0		
-152-340-A	15.0	20.0	31.0		
-182-340-A	18.5	25.0	38.0		
-222-340-A	22.0	30.0	46.0		
-302-340-A	30.0	40.0	60.0		
-372-340-A	37.0	50.0	75.0		
-452-340-A	45.0	60.0	90.0		
-552-340-A	55.0	75.0	110.0		
-752-340-A	75.0	100.0	150.0		
-902-340-A	90.0	125.0	180.0		
-113-340-A	110.0	150.0	220.0		
-133-340-A	132.0	180.0	260.0		
-163-340-A	160.0	200.0	320.0		

Size 1 – 2



Size 3 – 11



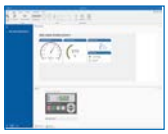
Variable Frequency Drives SK 5xxP ...	Weight [kg]	[lbs]	Overall Dimensions H x W x D [mm]	[in]	Size
-250-340-A	1.2	2.6	200 x 66 x 141	7.87 x 2.59 x 5.55	1
-370-340-A	1.2	2.6	200 x 66 x 141	7.87 x 2.59 x 5.55	1
-550-340-A	1.2	2.6	200 x 66 x 141	7.87 x 2.59 x 5.55	1
-750-340-A	1.2	2.6	200 x 66 x 141	7.87 x 2.59 x 5.55	1
-111-340-A	1.6	3.5	240 x 66 x 141	9.44 x 2.59 x 5.55	2
-151-340-A	1.6	3.5	240 x 66 x 141	9.44 x 2.59 x 5.55	2
-221-340-A	1.6	3.5	240 x 66 x 141	9.44 x 2.59 x 5.55	2
-301-340-A	2.6	5.7	286 x 91 x 175	11.25 x 3.58 x 6.88	3
-401-340-A	2.6	5.7	286 x 91 x 175	11.25 x 3.58 x 6.88	3
-551-340-A	2.6	5.7	286 x 91 x 175	11.25 x 3.58 x 6.88	3
-751-340-A	3.8	8.3	331 x 91 x 175	13.03 x 3.58 x 6.88	4
-112-340-A	3.8	8.3	331 x 91 x 175	13.03 x 3.58 x 6.88	4
-152-340-A	7.1	15.6	371 x 126 x 232	14.60 x 4.96 x 9.13	5
-182-340-A	7.1	15.6	371 x 126 x 232	14.60 x 4.96 x 9.13	5
-222-340-A	7.1	15.6	371 x 126 x 232	14.60 x 4.96 x 9.13	5
-302-340-A	15.0	33.1	495 x 185 x 246	19.49 x 7.28 x 9.69	6
-372-340-A	15.0	33.1	495 x 185 x 246	19.49 x 7.28 x 9.69	6
-452-340-A	20.0	44.1	598 x 265 x 286	23.54 x 10.43 x 11.26	7
-552-340-A	20.0	44.1	598 x 265 x 286	23.54 x 10.43 x 11.26	7
-752-340-A	25.0	55.1	636 x 265 x 286	25.04 x 10.43 x 11.26	8
-902-340-A	25.0	55.1	636 x 265 x 286	25.04 x 10.43 x 11.26	8
-113-340-A	46.0	101.4	720 x 395 x 292	28.35 x 15.55 x 11.50	9
-133-340-A	49.0	108.0	720 x 395 x 292	28.35 x 15.55 x 11.50	9
-163-340-A	52.0	114.6	799 x 395 x 292	31.46 x 15.55 x 11.50	10

Interfaces for Operation, Parameterization, and Communication

Operation and Parameterization

Optional modules are available with up to 14 languages for displaying status, operational indicators, parameterization, and operation of the variable frequency drive. There are variants for direct mounting on the device, installation in a control cabinet door, and hand held versions. See also Accessories starting on page 165.

	Type Designation Material No.	Description	Remarks
	ControlBox SK TU5-CTR 275 297 000	Suitable for operation and parameterization, LCD screen (illuminated), 5-digit, 7-segment display, display of measurement unit, various status and operating displays, display of utilization level, convenient keypad.	Installation in the SK TU5 slot on the device.
	ParameterBox SK TU5-PAR 275297100	Suitable for control and parameterization, LCD screen (illuminated), plain text display in 14 languages, memory for 5 device data sets, convenient control keypad.	Installation in the SK TU5 slot on the device. Required firmware version of the frequency inverter: V1.4 R0 and higher.
	ParameterBox SK PAR-5H 275 281 614	Control and parameterization, LCD screen (illuminated), plain text display in 14 languages, direct control of up to five devices, memory for five device data sets, convenient control keypad, communication via RS485, including 1.5 m connection cable. Handheld, suitable for installation in a control cabinet door. IP54.	Connection for data exchange with NORDCON *STUDIO* to a PC (USB 2.0), (standard “USB-C” connection cable required, e.g. material number: 275 292 100) Power supply, e.g. directly via frequency inverter or PC.
	SimpleControlBox SK CSX-3E 275 281 413	Suitable for control and parameterization, 4-digit, 7-segment display, direct control of a device, convenient control keypad, for installation in control cabinet doors.	Electrical data: 4.5 … 30 V DC / 1.3 W, Supply e.g. directly via the VFD, control cabinet installation.

	Type Designation Material No.	Description	Remarks
	Control and parameterization software NORDCON	Software for control and parameterization as well as support for commissioning and fault analysis of NORD electronic drive technology. Available in 14 languages.	Free download at: www.nord.com
	Bluetooth stick NORDAC *ACCESS BT* SK TIE5-BT-STICK 275 900 120	Interface for wireless connection to a mobile terminal device (e.g. tablet or smartphone) via Bluetooth. The NORDCON *APP*, the NORDCON software for mobile terminal devices, enables smart operation and parameterization as well as commissioning assistance and fault analysis of NORD electronic drive technology.	Available free of charge for Android and iOS:

Line Filter
Improvement of EMC

General

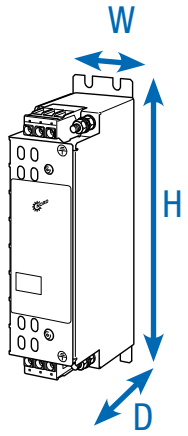
Line filters are used to reduce the emission of electromagnetic interference. SK 500P variable frequency drives are equipped with an integrated Class C2 line filter, Class C3 line filter for 30.0 kW/40.0 hp and higher (max. 20 m of shielded motor cable). For devices with nominal powers from 750 W to 5.5 kW / 7.0 hp, Class C1 (max. 5 m of shielded motor cable) is achieved.

Various adaptive line filters are available for longer cable lengths or to improve interference suppression.

Chassis Line Filter, SK HLD

The line filter meets Protection Class IP20 and enables interference suppression Class C1 with max. 25 m shielded motor cable and Class C2 with max. 50 m cable.

The line filters are installed separately from the VFD.



	Variable Frequency Drives SK 5xxP ...	Line Filter Type Material No.	Continuous Current [A]	Leakage Current[1] [mA]	Overall Dimensions H x W x D
3~ 400 V	0.55 … 2.2 kW 0.75 … 3.0 hp	SK HLD 110-500/8 278 272 008	8.0	20 / 190	190 x 45 x 75 mm 7.48 x 1.77 x 2.95 in
	3.0 … 5.5 kW 4.0 … 7.5 hp	SK HLD 110-500/16 278 272 016	16.0	21 / 205	250 x 45 x 75 mm 9.84 x 1.77 x 2.95 in
	7.5 kW 10.0 hp	SK HLD 110-500/30 278 272 030	30.0	29 / 280	270 x 55 x 95 mm 10.63 x 2.17 x 3.74 in
	11.0 kW 15.0 hp	SK HLD 110-500/42 278 272 042	42.0	30 / 290	310 x 55 x 95 mm 12.20 x 2.17 x 3.74 in
	15.0 ...18.5 kW 20.0 … 25.0 hp	SK HLD 110-500/55 278 272 055	55.0	30 / 290	255 x 85 x 95 mm 10.04 x 3.35 x 3.74 in
	22.0 kW 30.0 hp	SK HLD 110-500/75 278 272 075	75.0	22 / 210	310 x 85 x 135 mm 12.20 x 3.35 x 5.31 in

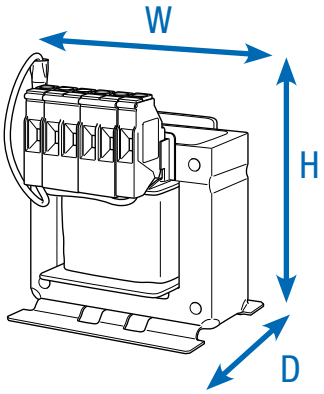
[1] Leakage current 1st value: rated for the maximum permissible input voltage fluctuation according to IEC 38 + 10%
Leakage current 2nd value: calculated at maximum input voltage and failure of 2 phases (typically at 50 Hz)

Mains Chokes
Reduction of Mains Feedback

General

It may be necessary for some drive systems to use mains chokes to reduce dangerous mains current peaks. They considerably reduce external mains feedback effects, keep the proportion of current harmonics to a minimum, and reduce the input current to approximately the value of the output current.

It is recommended that a mains choke be used at all times for a variable frequency drive capacity of 45.0 kW / 60.0 hp and above. This provides additional positive effects on device protection and EMC characteristics. All chokes have Protection Class IP00 and are UL recognized.

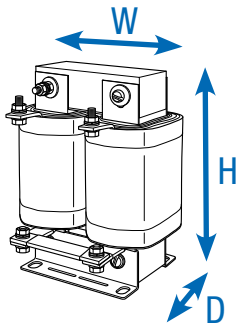


	Variable Frequency Drives SK 5xxP ...	Choke Type Material No.	Continuous Current [A]	Inductance [mH]	Overall Dimensions H x W x D
1~ 230 V	0.25 ... 0.37 kW 0.33 ... 0.5 hp	SK CI5-230/006-C 276 993 005	6.0	4.88	70 x 66 x 60 mm 2.76 x 2.60 x 2.36 in
	0.55 ... 0.75 kW 0.75 ... 1.0 hp	SK CI5-230/010-C 276 993 009	10.0	2.93	95 x 78 x 84 mm 3.74 x 3.07 x 3.31 in
	1.1 ... 2.2 kW 1.5 ... 3.0 hp	SK CI5-230/025-C 276 993 024	25.0	1.17	98 x 87 x 84 mm 3.86 x 3.43 x 3.31 in
3~ 400 V	0.25 ... 0.75 kW 0.33 ... 1.0 hp	SK CI5-500/004-C 276 993 004	4.0	3 x 7.35	117 x 80 x 60 mm 4.61 x 3.15 x 2.36 in
	1.1 ... 2.2 kW 1.5 ... 3.0 hp	SK CI5-500/008-C 276 993 008	8.0	3 x 3.68	140 x 120 x 85 mm 5.51 x 4.72 x 3.35 in
	3.0 ... 5.5 kW 4.0 ... 7.5 hp	SK CI5-500/016-C 276 993 016	16.0	3 x 1.84	140 x 120 x 95 mm 5.51 x 4.72 x 3.74 in
	7.5 ... 11.0 kW 10.0 ... 15.0 hp	SK CI5-500/035-C 276 993 035	35.0	3 x 0.84	167 x 155 x 110 mm 6.57 x 6.10 x 4.33 in
	15.0 ... 22.0 kW 20.0 ... 30.0 hp	SK CI5-500/063-C 276 993 063	63.0	3 x 0.47	206 x 185 x 122 mm 8.11 x 7.28 x 4.80 in
	30.0 ... 37.0 kW 40.0 ... 50.0 hp	SK CI5-500/100-C 276 993 101	100.0	3 x 0.30	205 x 267 x 155 mm 8.07 x 10.51 x 6.10 in
	45.0 kW 60.0 hp	SK CI1-480/100-C 276 993 100	100.0	3 x 0.29	263 x 240 x 148 mm 10.35 x 9.45 x 5.86 in
	55.0 … 75.0 kW 75.0 ... 100.0 hp	SK CI1-480/160-C 276 993 160	160.0	3 x 0.18	268 x 352 x 140 mm 10.55 x 13.86 x 5.51 in
	90.0 kW 125.0 hp	SK CI1-480/280-C 276 993 280	280.0	3 x 0.10	268 x 352 x 169 mm 10.55 x 13.86 x 6.65 in
	110.0 ... 132.0 kW 150.0 ... 180.0 hp	SK CI1-480/350-C 276 993 350	350.0	3 x 0.08	268 x 352 x 169 mm 10.55 x 13.86 x 6.65 in
	160.0 kW 200.0 hp	Not available			

Link Circuit Choke
Reduction of Mains Feedback

Link Circuit Choke
SK DCL

Similar to a mains choke, a link circuit choke reduces the network loads of a variable frequency drive that are inherent to its functional principle. It is connected to easily accessible contacts in the frequency drive's intermediate circuit and available for 45.0 kW/60.0 hp and above. All chokes have Protection Class IP00 and are UL recognized.



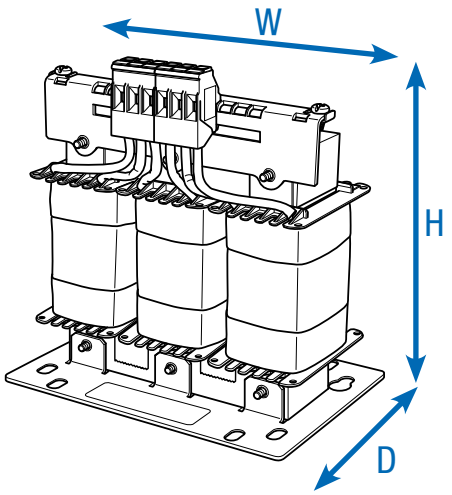
Variable Frequency Drives SK 5xxP ...	Choke Type Material No.	Continuous Current [A]	Inductance [mH]	Overall Dimensions H x W x D
45.0 ... 55.0 kW 60.0 ... 70.0 hp	SK DCL-950/120-C 276 997 120	120.0	0.50	230 x 148 x 147 mm 9.06 x 5.83 x 5.79 in
75.0 ... 90.0 kW 100.0 ... 125.0 hp	SK DCL-950/200-C 276 997 200	200.0	0.30	260 x 170 x 153 mm 10.24 x 6.69 x 6.02 in
110.0 kW 150.0 hp	SK DCL-950/260-C 276 997 260	260.0	0.25	284 x 180 x 174 mm 11.18 x 7.09 x 6.85 in
132.0 kW 180.0 hp	SK DCL-950/320-C 276 997 320	320.0	0.20	282 x 180 x 189 mm 11.10 x 7.09 x 7.44 in
160.0 kW 200.0 hp	SK DCL-950/380-C 276 997 380	200.0	0.17	282 x 180 x 189 mm 11.10 x 7.09 x 7.44 in

Motor Chokes
Compensation of Cable Capacities

General

Long motor cable lengths (cable capacity) often require the use of additional motor chokes on the VFD output. The use of motor chokes has a positive effect on device protection and EMC characteristics.

The specified motor chokes are rated for a pulse frequency of 3 to 6 kHz and an output frequency of 0 to 120 Hz. All chokes have Protection Class IP20 and are UL recognized.

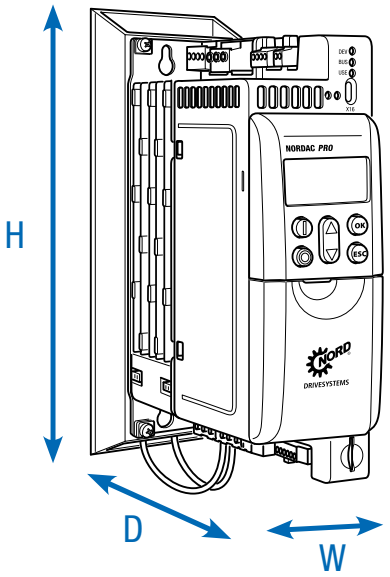


	Variable Frequency Drives SK 5xxP ...	Choke Type Material No.	Continuous Current [A]	Inductance [mH]	Overall Dimensions H x W x D
1~ 230 V	0.25 ... 0.37 kW 0.33 ... 0.5 hp	SK CO5-500/002-C 276 992 002	2.5	3 x 3.68	140 x 120 x 85 mm 5.51 x 4.72 x 3.34 in
	0.55 ... 0.75 kW 0.75 ... 1.0 hp	SK CO5-500/006-C 276 992 006	6.0	3 x 1.54	140 x 120 x 95 mm 5.51 x 4.72 x 3.74 in
	1.1 ... 2.2 kW 1.5 ... 3.0 hp	SK CO5-500/012-C 276 992 012	12.5	3 x 0.74	165 x 155 x 95 mm 6.49 x 6.10 x 3.74 in
3~ 400 V	0.25 ... 0.75 kW 0.33 ... 1.0 hp	SK CO5-500/002-C 276 992 002	2.5	3 x 3.68	140 x 120 x 85 mm 5.51 x 4.72 x 3.34 in
	1.1 ... 2.2 kW 1.5 ... 3.0 hp	SK CO5-500/006-C 276 992 006	6.0	3 x 1.54	140 x 120 x 95 mm 5.51 x 4.72 x 3.74 in
	3.0 ... 5.5 kW 4.0 ... 7.5 hp	SK CO5-500/012-C 276 992 012	12.5	3 x 0.74	165 x 155 x 95 mm 6.49 x 6.10 x 3.74 in
	7.5 ... 11.0 kW 10.0 ... 15.0 hp	SK CO5-500/024-C 276 992 024	24.0	3 x 0.383	197 x 185 x 112 mm 7.75 x 7.28 x 4.40 in
	15.0 ... 22.0 kW 20.0 ... 30.0 hp	SK CO5-500/046-C 276 992 046	46.0	3 x 0.20	240 x 210 x 125 mm 9.44 x 8.26 x 4.92 in
	30.0 ... 37.0 kW 40.0 ... 50.0 hp	SK CO5-500/75-C 276 992 075	75.0	3 x 0.122	260 x 230 x 149 mm 10.24 x 9.06 x 5.87 in
	45.0 kW 60.0 hp	SK CO1-460/90-C 276 996 090	90.0	3 x 0.22	352 x 144 x 325 mm 13.86 x 5.67 x 12.80 in
	55.0 … 75.0 kW 70.0 ... 100.0 hp	SK CO1-460/170-C 276 996 170	170.0	3 x 0.13	320 x 412 x 200 mm 12.60 x 16.22 x 7.87 in
	90.0 ... 110 kW 125.0 ... 150.0 hp	SK CO1-460/240-C 276 996 240	240.0	3 x 0.07	320 x 412 x 225 mm 12.60 x 16.22 x 8.86 in
	132.0 ... 160.0 kW 180.0 ... 200.0 hp	SK CO1-460/330-C 276 996 330	330.0	3 x 0.03	268 x 352 x 188 mm 10.55 x 13.86 x 7.40 in

Braking Resistors for Dynamic Drive Characteristics

Bottom-Mounted Braking Resistors SK BRU5

Available in four sizes, brake resistors can be mounted flat underneath the variable frequency drive. Although this increases the installation length and depth by a few centimeters, the basic installation surface in the control cabinet is considerably reduced. The specified resistance values are electrically matched to standard applications. Brake resistors have Protection Class IP65 and are UL recognized.

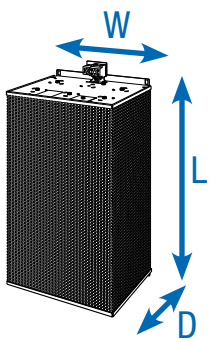


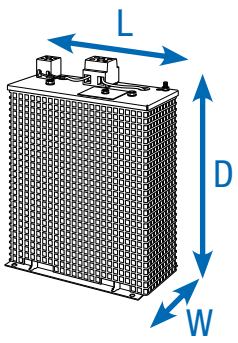
Variable Frequency Drives SK 5xxP ...		Resistor Type Material No.	Resistance [Ω]	Continuous Output [W]	Short-Term Power [kW][1]	Overall Dimensions L x W x D
3~230 V	0.25 … 0.75 kW 0.33 ... 1.0 hp	SK BRU5-1-240-050 275 299 004	240	50	0.75	240 x 66 x 181 mm 9.49 x 2.59 x 7.13 in
	1.1 … 2.2 kW 1.5 ... 3.0 hp	SK BRU5-2-075-200 275 299 210	75	200	3.0	280 x 66 x 181 mm 11.02 x 2.59 x 7.13 in
3~400 V	0.25 … 0.75 kW 0.33 ... 1.0 hp	SK BRU5-1-400-100 275 299 101	400	100	1.5	240 x 66 x 181 mm 9.49 x 2.59 x 7.13 in
	1.1 … 2.2 kW 1.5 ... 3.0 hp	SK BRU5-2-220-200 275 299 205	220	200	3.0	280 x 66 x 181 mm 11.02 x 2.59 x 7.13 in
	3.0 … 5.5 kW 4.0 ... 7.5 hp	SK BRU5-3-100-300 275 299 309	100	300	4.5	340 x 91 x 225 mm 13.38 x 3.58 x 8.85 in
	7.5 ... 11.0 kW 10.0 ... 15.0 hp	SK BRU5-4-44-400 275 299 512	44	400	7.5	385 x 91 x 210 mm 15.15 x 3.58 x 8.26 in
	Temperature monitoring for SK BR5 resistors with installation close to the VFD 275 991 100		Bimetallic switch as opener Nominal switching temperature: 180°C			Broad brake resistor + 10 mm (on one side) dimensions apply to the VFD, including the braking resistor
	Temperature monitoring for SK BR5 resistors with direct installation under the VFD 275 991 200		Bimetallic switch as opener Nominal switching temperature: 100°C			

[1] Once within 120s, for a maximum duration of 1.2s

Chassis Braking Resistors SK BR2

Chassis braking resistor elements are integrated into a housing cage and connected to the VFD via a separate connecting cable. These brake resistors need to be mounted horizontally (apart from SK BR2-xxx/400-C) and should use a shielded cable that is as short as possible. The chassis brake resistors have Protection Class IP20 and are UL recognized.





Only SK BR2-xxx/400-C

	Variable Frequency Drives SK 5xxP ...	Resistor Type Material No.	Resistance [Ω]	Continuous Output [W]	Short-Term Power [kW][1]	Overall Dimensions L x W x D
3~ 400 V	3.0 ... 4.0 kW 4.0 ... 5.5 hp	SK BR2-100/400-C[1] 278 282 040	100	400	12.0	178 x 100 x 252 mm 7.00 x 3.93 x 9.92 in
	5.5 ... 7.5 kW 7.5 ... 10.0 hp	SK BR2-60/600-C 278 282 060	60	600	18.0	385 x 110 x 120 mm 15.15 x 4.33 x 4.72 in
	11.0 ... 15.0 kW 15.0 ... 20.0 hp	SK BR2-30/1500-C 278 282 150	30	1500	45.0	585 x 185 x 120 mm 23.03 x 7.28 x 4.72 in
	18.50 ... 22.0 kW 25.0 ... 30.0 HP	SK BR2-22/2200-C 278 282 220	22	2200	66.0	485 x 275 x 120 mm 19.09 x 10.82 x 4.72 in
	30.0 ... 37.0 kW 40.0 ... 50.0 hp	SK BR2-12/4000-C 278 282 400	12	4000	120.0	585 x 266 x 210 mm 23.03 x 10.47 x 8.27 in
	45.0 ... 55.0 kW 60.0 ... 70.0 hp	SK BR2-8/6000-C 278 282 600	8	6000	180.0	395 x 490 x 260 mm 15.55 x 19.29 x 10.24 in
	75.0 ... 110.0 kW 110.0 ... 150.0 hp	SK BR2-6/7500-C 278 282 750	6	7500	225.0	595 x 490 x 260 mm 23.43 x 19.29 x 10.24 in
	132.0 ... 160.0 kW 180.0 ... 200.0 hp	SK BR2-3/7500-C 278 282 753	3	7500	225.0	595 x 490 x 260 mm 23.43 x 19.29 x 10.24 in
	132.0 ... 160.0 kW 180.0 ... 200.0 hp	SK BR2-3/17000-C 278 282 754	3	17 000	510.0	795 x 490 x 260 mm 31.30 x 19.29 x 10.24 in
	Temperature monitoring for SK BR2 resistors integrated (2 terminals 4 mm²)		Bimetallic switch as opener. Nominal switching temperature: 180°C.			

[1] Type of assembly: vertical
[2] Once within 120s, for a maximum duration of 1.2s

NORDAC *PRO* Variable Frequency Drive Accessories



Signal Converter +/- 10 V

For connection of a bipolar analog signal to the unipolar analog input of a variable frequency drive, top-hat rail mounting.
Material No.: 278910320



Electronic Brake Rectifier SK EBGR-1

For direct control and supply of an electromagnetic holding brake.
Material No.: 19140990



IO Expansion SK EBIOE-2 Product Status: Phase-Out

The standard number of inputs and outputs on the device can be supplemented using an extension provided for top-hat rail mounting.
Material No.: 275900210
Available for SK 530P and higher



NORDAC *ACCESS BT*

Bluetooth adapter SK TIE5-BT-STICK that establishes a wireless connection between the VFD and mobile terminal devices (e.g. smartphone, tablet). Together with the free NORDCON *APP* for Android or iOS, NORD provides a smart aid for control, parameterization, and troubleshooting of variable frequency drives.
Material No.: 275900120



MicroSD Card, 128 MB

Removable data carrier for archiving and transfer of parameter data sets for the variable frequency drive.
Material No.: 275292200
Available for SK 530P and higher

EMV-Kit

Available for EMC-compliant connection of shielded cables and to produce strain relief. Depending on size and configuration level, various EMC kits are available.

Variable Frequency Drive Size	Shield Motor Connection (1)	Shield IO ports (2)	Shield Control Terminals (SK CU5-...)[1] (3)
1	SK HE5-EMC-MS-HS12 275 292 300	SK HE5-EMC-IS-HS1 275 292 304	SK HE5-EMC-CS-HS1 275 292 310
2	SK HE5-EMC-MS-HS12 275 292 300	SK HE5-EMC-IS-HS2 275 292 305	SK HE5-EMC-CS-HS23 275 292 311
3	SK HE5-EMC-MS-HS34[2] 275 292 301	SK HE5-EMC-IS-HS3 275 292 306	SK HE5-EMC-CS-HS23 275 292 311
4	SK HE5-EMC-MS-HS34[2] 275 292 301	SK HE5-EMC-IS-HS4 275 292 307	SK HE5-EMC-CS-HS4 275 292 312
5	SK HE5-EMC-MS-HS5[2] 275 292 302	SK HE5-EMC-IS-HS5 275 292 308	SK HE5-EMC-CS-HS5 275 292 313
6	SK HE5-EMC-MS-HS6[2] 275 292 303		
7 and 8	SK EMC 2-6 275 999 061		
9 and 10	SK EMC 2-7 275 999 071		

[1] Available for SK 530P and higher only in combination with (1) “motor connection shield”
[2] Two-part







CANopen® Connection

The CANopen® interface is equipped with a 4-pole screw terminal as standard. The following alternatives are optionally available.

Designation	Material No.	Description
SK TIE5-CAO-WIRE-2X4P	275 292 201	CANopen® double terminal (screw terminal, 2x4-pole)
SK TIE5-CAO-2X-RJ45[1]	275 292 202	CANopen® RJ45 adapter

[1] Can only be used for devices up to size 3. Size 4 and higher are in preparation.



Optional:
RJ45 adapter for CANopen





Variable Frequency Drives for Control Cabinet Applications

NORDAC *PRO* SK 500E series Product Status: Phase-Out

NORD® DRIVESYSTEMS

Powerful and Versatile
NORDAC *PRO*, SK 500E Series

NORDAC *PRO* - SK 500E

NORDAC PRO SK 500E variable frequency drives are available for motors with rated powers of 0.33 – 200.0 hp. Their compact design makes them perfect for space-saving installation in control cabinets.

Notable features across the entire product line include:

- Sensorless current vector control ensures constant speeds even with fluctuating loads and extremely high torques during startup
- 200% overload reserve, which provides greater operational safety in cranes and lifting gear applications
- Operation of asynchronous and synchronous motors
- Integrated brake chopper for 4-quadrant operation
- Integrated line filter as the basis for optimal EMC performance

Along with the separately configurable PID or process controller, these features are a part of the basic configuration and independently carry out the control tasks. The range is supplied with either an integrated 24 V power supply unit or a separate connection for the control board supply.

The advantage of externally powered frequency drives is that access to parameter data and communication via bus interfaces is possible even when the power is switched off. Moreover, an evacuation run controlled by the VFD can be performed, resulting in an enormous boost in safety for lifting gear and similar safety-critical drive applications.

The SK 51xE and SK 530E and SK 535E models support the Safe Stop function according to EN 13849-1 (up to the maximum safety category 4, stop category 0 and 1). In addition, the SK 53xE version is equipped with the built-in POSICON function, making it suitable for all types of positioning tasks (relative and absolute).

Integrated PLC on all SK 520E models and higher allows simple and free programming of drive-related functions in accordance with IEC 61131-3. In addition, the top model SK 540E/SK 545E features a universal encoder interface which allows connection of SSI or EnDat 2.1 encoders. The variable frequency drives maintain uniform dimensions even with different functional configurations.



Basic Configuration

- Sensorless current vector control (ISD control) for high precision control and fast response times
- Brake management, electromechanical holding brake
- Brake chopper to divert generated energy to a brake resistor
- RS-232 diagnostic interface
- 4 switchable parameter sets for flexible use of parameter settings (e.g. switching between drive units with different motor data)
- All common drive functions such as acceleration/braking on a ramp
- Parameters pre-set with standard values, immediately ready for use
- Scalable display values
- Stator resistance measurement to ensure optimal control characteristics





Optional

- Interfaces for many bus systems
- Various control options (switches, potentiometers or parameterization units)
- Variants with functional safety (Safe Stop – STO, SS1)
  Available for SK 510E and above
  (except for frequency drives with mains voltages <230 V AC)
- Variants with incremental encoder interface for speed feedback (servo mode)
  Available for SK 520E and higher
- Variants with PLC functionality
  Available for SK 520E and higher
- POSICON variants with positioning function (relative and absolute)
  Available for SK 530E and higher
- Universal encoder interface
  Available for SK 540E and higher





Standards and Approvals

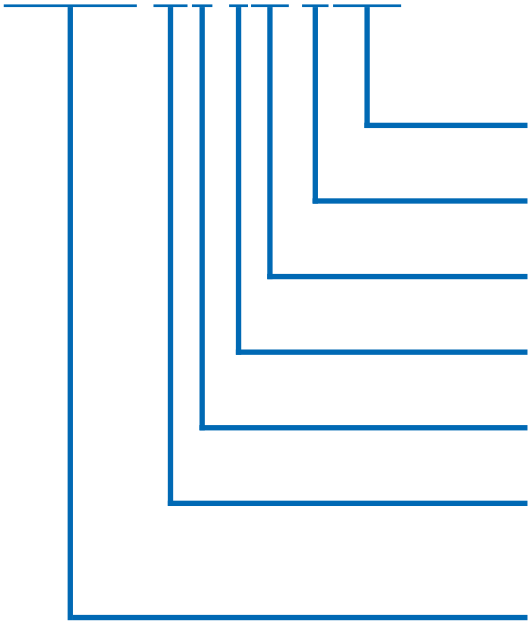
All drives of the series comply with the standards and directives listed below.

Approval	Directive		Applied Standards	Certificates	Code
CE (European Union)	Low Voltage Directive	2014/35/EU	EN 61800-5-1 EN 60529 EN 61800-3 EN 63000 EN 61800-9-1 EN 61800-9-2	C310600	CE
	EMC	2014/30/EU			
	RoHS	2011/65/EU			
	Delegated directive (EU)	2015/863			
	Ecodesign	2009/125/EG			
	Regulation (EU) Ecodesign	2019/1781			
UL (USA)			UL 508C	E171342	c UL us LISTED
CSA (Canada)			C22.2 No.274-13	E171342	
RCM (Australia)	F2018L00028		EN 61800-3	133520966	
EAC (Eurasia)	TR CU 004/2011, TR CU 020/201		IEC 61800-5-1 IEC 61800-3	N RU Д-DE. HB27.B.02721/ 20	EAC
UkrSEPRO (Ukraine)			EN 61800-5-1 EN 60529 EN 61800-3 EN 63000 EN 60947-1 EN 60947-4 EN 61558-1 EN 50581	C311900	
UKCA (United Kingdom)			EN 61800-5-1 EN 60529 EN 61800-3 EN 63000 EN 61800-9-1 EN 61800-9-2	C350600	UK CA

Type Code

Variable Frequency Drives

SK 530E-370-323-A(-CP)



Configuration versions **CP** = Cold Plate or “External heat sink” technology

Radio interference filter: **0** = without, **A** = Class A1(C2) or B (C1)

Mains voltage: **x12** = 115 V, **x23** = 230 V, **x40** = 400 V, **x50** = 500 V

Number of mains phases: **1xx** = 1-phase, **3xx** = 3-phase[1]

Digits before decimal point for power: **0** = 0.xx, **1** = 0x.x0, **2** = 0xx.0

Device rated power: **250** = 0.25 kW / 0.33 hp, **370** = 0.37 kW / 0.5 hp, ...
163 = 160.0 kW / 200.0 hp

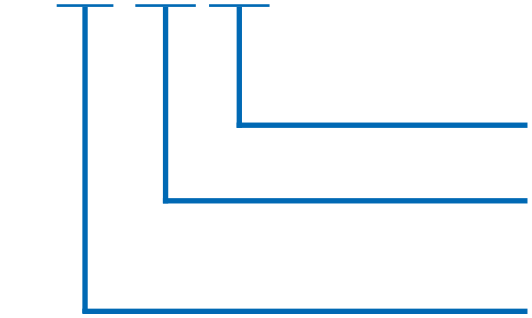
Variable frequency drive series: SK 500E, SK 505E, SK 510E, SK 511E, SK 515E, SK 520E, SK 530E, SK 535E, SK 540E, SK 545E

(…) Options, only implemented if required

[1] Designation -3 also includes combined devices which are intended for single and three-phase operation (please refer to the technical data)

Technology Units

SK TU3-PNT(-…)



Version labeling

Option type: **ECT** = EtherCAT®, **EIP** = EtheNet/IP®
POL = POWERLINK, **PNT** = PROFINET IO®

Group: **TU** = Technology unit

(...) Options, only implemented if required.

NORDAC *PRO* SK 500E
All Versions at a Glance

	SK 500E	SK 505E	SK 510E	SK 511E	SK 520E	SK 530E	SK 535E	SK 540E	SK 545E	SK 515E	SK 535E	SK 545E
	Size 1 – 4									Size 5 – 11		
Sensorless current vector control (ISD control)	●	●	●	●	●	●	●	●	●	●	●	●
Brake management for mechanical holding brake	●	●	●	●	●	●	●	●	●	●	●	●
Brake chopper (brake resistor optional)	●	●	●	●	●	●	●	●	●	●	●	●
RS-232 diagnostic interface	●	●	●	●	●	●	●	●	●	●	●	●
4 switchable parameter sets	●	●	●	●	●	●	●	●	●	●	●	●
All normal drive functions	●	●	●	●	●	●	●	●	●	●	●	●
Parameters pre-set with standard values	●	●	●	●	●	●	●	●	●	●	●	●
Stator resistance measurement	●	●	●	●	●	●	●	●	●	●	●	●
Energy-saving function, optimized efficiency in partial load operation	●	●	●	●	●	●	●	●	●	●	●	●
Integrated EMC line filter according to EN 61800-3, Category C2 up to 20 m motor cable, Category C1 up to 5 m motor cable (devices up to Size 4)	●	●	●	●	●	●	●	●	●	●	●	●
Monitoring functions	●	●	●	●	●	●	●	●	●	●	●	●
Load monitor	●	●	●	●	●	●	●	●	●	●	●	●
Link circuit coupling	●	●	●	●	●	●	●	●	●	●	●	●
Lifting gear functionality	●	●	●	●	●	●	●	●	●	●	●	●
PID controller	●	●	●	●	●	●	●	●	●	●	●	●
Process controller / compensator control	●	●	●	●	●	●	●	●	●	●	●	●
Synchronous motor operation (PMSM)	●	●	●	●	●	●	●	●	●	●	●	●
Cold plate up to Size 4, External heat sink technology up to Size 2	○	○	○	○	○	○	○	○	○	❍	❍	❍
Safe Stop function (STO, SS1) (not for 115 V devices)	❍	❍	●	●	❍	●	●	●	●	●	●	●
All common field bus systems	○	○	○	○	○	○	○	○	○	○	○	○
CANopen® on board	❍	❍	❍	●	●	●	●	●	●	●	●	●
USS	●	●	●	●	●	●	●	●	●	●	●	●
Modbus RTU	❍	❍	❍	❍	❍	❍	❍	●	●	❍	❍	●
Evacuation run	❍	❍	❍	❍	❍	❍	●	❍	●	●	●	●
Incremental encoder input (servo mode)	❍	❍	❍	❍	●	●	●	●	●	❍	●	●
POSICON	❍	❍	❍	❍	❍	●	●	●	●	❍	●	●
Internal 24 V power supply unit to supply the control board	●	❍	●	●	●	●	❍	●	❍	●	●	●
External 24 V power supply for the control board	❍	●	❍	❍	❍	❍	●	❍	●	●	●	●
Automatic switching between external and internal 24 V control voltage	❍	❍	❍	❍	❍	❍	❍	❍	❍	●	●	●
PLC functionality	❍	❍	❍	❍	●	●	●	●	●	❍	●	●
Universal encoder interface	❍	❍	❍	❍	❍	❍	❍	●	●	❍	❍	●

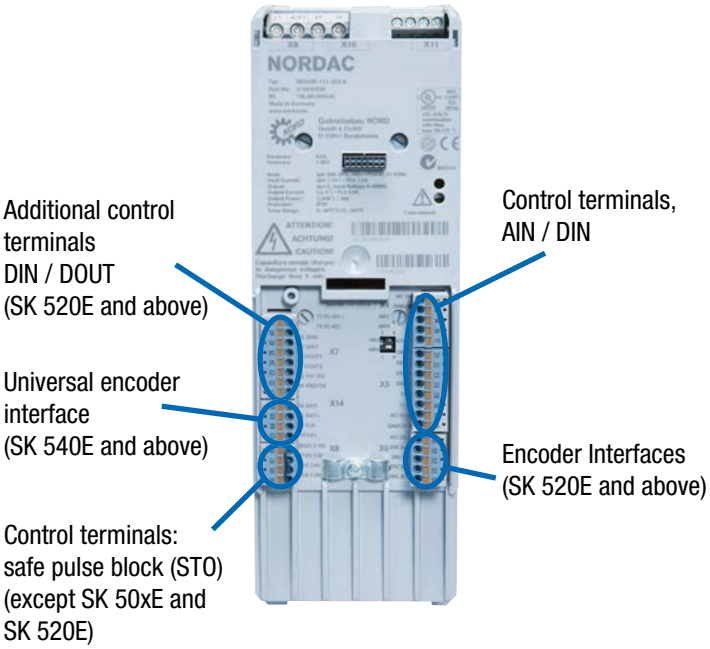
● Available as standard
○ Optional
❍ Not available

		SK 500E	SK 510E	SK 511E	SK 520E	SK 530E	SK 535E	SK 540E	SK 545E	SK 515E	SK 535E	SK 545E
		Size 1 – 4								Size 5 – 11		
Control Terminals	DIN	5	5	5	7	7	7	5-7[1]	5-7[1]	5	7	6-8[1]
	DOUT	0	0	0	2	2	2	3-1[1]	3-1[1]	0	2	3-1[1]
	Signal relay[2] (… 230 V AC, 2 A)	2	2	2	2	2	2	2	2	2	2	2
	AIN[3]	2	2	2	2	2	2	2	2	2	2	2
	AOUT[3]	1	1	1	1	1	1	1	1	1	1	1
	TF (PTC)	1[4]	1[4]	1[4]	1[4]	1[4]	1[4]	1	1	1	1	1
Encoder Interfaces	TTL RS422	❍	❍	❍	●	●	●	●	●	❍	●	●
	HTL[4, 5]	●	●	●	●	●	●	●	●	●	●	●
	CANopen®	❍	❍	❍	❍	●	●	●	●	❍	●	●
	SIN / COS	❍	❍	❍	❍	❍	❍	●	●	❍	❍	●
	SSI	❍	❍	❍	❍	❍	❍	●	●	❍	❍	●
	BISS	❍	❍	❍	❍	❍	❍	●	●	❍	❍	●
	HIPERFACE	❍	❍	❍	❍	❍	❍	●	●	❍	❍	●
	EnDat 2.1	❍	❍	❍	❍	❍	❍	●	●	❍	❍	●
Communication	CAN / CANopen®	❍	❍	2	2	2	2	2	2	2	2	2
	RS485 / RS232 via RJ12	1	1	1	1	1	1	1	1	1	1	1
	RS485 via terminals	❍	❍	❍	1	1	1	1	1	❍	1	1

[1] 2 digital IOs optionally parameterizable as DIN or DOUT
[2] Parameterizable with DOUT functions
[3] AIN/AOUT can also be used for digital signals
AIN: 0(2) – 10 V, 0(4) – 20 mA, size 5 and above additionally ± 10 V
[4] Function can only be implemented through a digital input
[5] Speed control only available with SK 520E or higher

● Available as standard
● Optional
❍ Not available



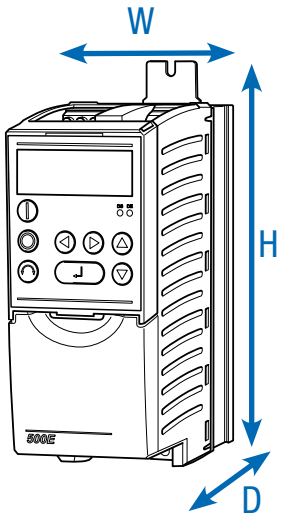


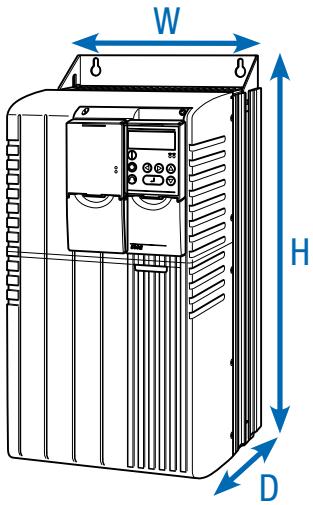
NORDAC *PRO* SK 500E Variable Frequency Drive 1~ 110 ... 120 V und 1 / 3~ 200 ... 240 V

Output Frequency	0.0 ... 400.0 Hz
Pulse Frequency	3.0 ... 16.0 kHz
Typical Overload Capacity	150% for 60 s, 200% for 3.5 s
Energy Efficiency Class	IE2
VFD Efficiency	Size 1 – 4 approx. 95% Size 5 – 7 approx. 97% Size 8 – 11 approx. 98%
Ambient Temperature	0°C ... +40°C (S1) 0°C ... +50°C (S3, -70% ED)
Protection Class	IP20
Regulation and Control	Sensorless current vector control (ISD), linear V/f characteristic curve
Motor Temperature Monitoring	I^2t Motor PTC / bi-metal switch
Leakage Current	<30 mA, may be considerably less depending on the size and configuration of the VFD (refer to the manual for details)

Variable Frequency Drives SK 5xxE ...	Nominal Motor Power 230 V [kW]	Nominal Motor Power 240 V [hp]	Nominal Output Current rms [A]	Mains Voltage	Output Voltage
-250-112-0	0.25	0.33	1.7	1~ 110 ... 120 V. +/- 10%. 47 ... 63 Hz	3~ 0 - 2x mains voltage
-370-112-0	0.37	0.50	2.2		
-550-112-0	0.55	0.75	3.0		
-750-112-0	0.75	1.00	4.0		
-111-112-0	1.10	1.80	5.3		

Variable Frequency Drives SK 5xxE ...	Nominal Motor Power 230 V [kW]	Nominal Motor Power 240 V [hp]	Nominal Output Current rms [A]	Mains Voltage	Output Voltage
-250-323-A	0.25	0.33	1.7	1 / 3~ 200 ... 240 V, +/- 10%, 47 ... 63 Hz	3~ 0 up to mains voltage
-370-323-A	0.37	0.50	2.2		
-550-323-A	0.55	0.75	3.0		
-750-323-A	0.75	1.00	4.0		
-111-323-A	1.10	1.50	5.5		
-151-323-A	1.50	2.00	7.0		
-221-323-A	2.20	3.00	9.5		
-301-323-A	3.00	4.00	12.5	3~ 200 ... 240 V, +/- 10%, 47 ... 63 Hz	
-401-323-A	4.00	5.00	16.0		
-551-323-A	5.50	7.50	22.0		
-751-323-A	7.50	10.0	28.0		
-112-323-A	11.0	15.0	46.0		
-152-323-A	15.0	20.0	60.0		
-182-323-A	18.5	25.0	73.0		





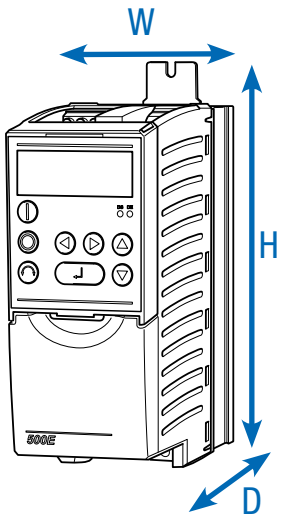
Variable Frequency Drives SK 5xxE ...	Weight [kg]	[lbs]	Overall Dimensions H x W x D [mm]	[in]	Size
-250-112-0	1.4	3.1	220 x 74 x 153	8.66 x 2.91 x 6.02	1
-370-112-0	1.4	3.1	220 x 74 x 153	8.66 x 2.91 x 6.02	1
-550-112-0	1.4	3.1	220 x 74 x 153	8.66 x 2.91 x 6.02	1
-750-112-0	1.4	3.1	220 x 74 x 153	8.66 x 2.91 x 6.02	1
-111-112-0	1.8	4.0	220 x 74 x 153	8.66 x 2.91 x 6.02	1

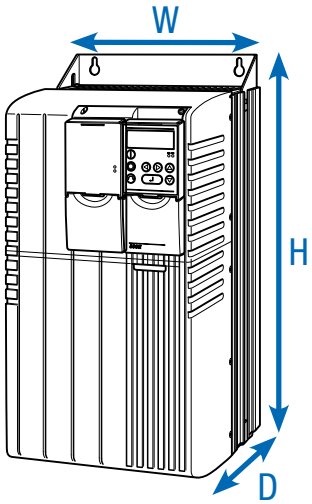
Variable Frequency Drives SK 5xxE ...	Weight [kg]	[lbs]	Overall Dimensions H x W x D [mm]	[in]	Size
-250-323-A	1.6	3.5	220 x 74 x 153	8.66 x 2.91 x 6.02	1
-370-323-A	1.6	3.5	220 x 74 x 153	8.66 x 2.91 x 6.02	1
-550-323-A	1.6	3.5	220 x 74 x 153	8.66 x 2.91 x 6.02	1
-750-323-A	1.6	3.5	220 x 74 x 153	8.66 x 2.91 x 6.02	1
-111-323-A	2.0	4.4	260 x 74 x 153	8.66 x 2.91 x 6.02	2
-151-323-A	2.0	4.4	260 x 74 x 153	8.66 x 2.91 x 6.02	2
-221-323-A	2.0	4.4	260 x 74 x 153	8.66 x 2.91 x 6.02	2
-301-323-A	2.7	6.0	275 x 98 x 181	10.83 x 3.89 x 7.13	3
-401-323-A	2.7	6.0	275 x 98 x 181	10.83 x 3.89 x 7.13	3
-551-323-A	8.0	17.6	357 x 162 x 224	14.06 x 6.38 x 8.82	5
-751-323-A	8.0	17.6	357 x 162 x 224	14.06 x 6.38 x 8.82	5
-112-323-A	10.3	22.7	397 x 180 x 234	15.63 x 7.09 x 9.21	6
-152-323-A	15.0	33.0	485 x 210 x 236	19.09 x 8.27 x 9.29	7
-182-323-A	15.0	33.0	485 x 210 x 236	19.09 x 8.27 x 9.29	7

NORDAC *PRO* SK 500E Variable Frequency Drive 3~ 380 ... 480 V

Output Frequency	0.0 ... 400.0 Hz
Pulse Frequency	3.0 ... 16.0 kHz
Typical Overload Capacity	150% for 60 s, 200% for 3.5 s
Energy Efficiency Class	IE2
VFD Efficiency	Size 1 – 4 approx. 95% Size 5 – 7 approx. 97% Size 8 – 11 approx. 98%
Ambient Temperature	0°C ... +40°C (S1) 0°C ... +50°C (S3, -70% ED)
Protection Class	IP20
Regulation and Control	Sensorless current vector control (ISD), linear V/f characteristic curve
Motor Temperature Monitoring	I^2t Motor PTC / bi-metal switch
Leakage Current	<30 mA, may be considerably less depending on the size and configuration of the VFD (refer to the manual for details)

Variable Frequency Drives SK 5xxE ...	Nominal Motor Power 400 V [kW]	Nominal Motor Power 480 V [hp]	Nominal Output Current rms [A]	Mains Voltage	Output Voltage
-550-340-A	0.55	0.75	1.7	3~ 380 ... 480 V, -20% / +10%, 47... 63 Hz	3~ 0 up to mains voltage
-750-340-A	0.75	1.00	2.3		
-111-340-A	1.10	1.50	3.1		
-151-340-A	1.50	2.00	4.0		
-221-340-A	2.20	3.00	5.5		
-301-340-A	3.00	4.00	7.5		
-401-340-A	4.00	5.00	9.5		
-551-340-A	5.50	7.50	12.5		
-751-340-A	7.50	10.0	16.0		
-112-340-A	11.0	15.0	24.0		
-152-340-A	15.0	20.0	31.0		
-182-340-A	18.5	25.0	38.0		
-222-340-A	22.0	30.0	46.0		
-302-340-A	30.0	40.0	60.0		
-372-340-A	37.0	50.0	75.0		
-452-340-A	45.0	60.0	90.0		
-552-340-A	55.0	75.0	110.0		
-752-340-A	75.0	100.0	150.0		
-902-340-A	90.0	125.0	180.0		
-113-340-A	110.0	150.0	220.0		
-133-340-A	132.0	180.0	260.0		
-163-340-A	160.0	200.0	320.0		

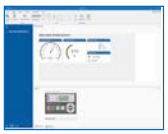




Variable Frequency Drives SK 5xxE ...	Weight [kg]	[lbs]	Overall Dimensions H x W x D [mm]	[in]	Size
-550-340-A	1.4	3.1	220 x 74 x 153	8.66 x 2.91 x 6.02	1
-750-340-A	1.4	3.1	220 x 74 x 153	8.66 x 2.91 x 6.02	1
-111-340-A	1.8	4.0	260 x 74 x 153	10.24 x 2.91 x 6.02	2
-151-340-A	1.8	4.0	260 x 74 x 153	10.24 x 2.91 x 6.02	2
-221-340-A	1.8	4.0	260 x 74 x 153	10.24 x 2.91 x 6.02	2
-301-340-A	2.7	6.0	275 x 98 x 181	10.83 x 3.86 x 7.13	3
-401-340-A	2.7	6.0	275 x 98 x 181	10.83 x 3.86 x 7.13	3
-551-340-A	3.1	6.8	320 x 98 x 181	12.59 x 3.86 x 7.13	4
-751-340-A	3.1	6.8	320 x 98 x 181	12.59 x 3.86 x 7.13	4
-112-340-A	8.0	17.6	357 x 162 x 224	14.06 x 6.38 x 8.82	5
-152-340-A	8.0	17.6	357 x 162 x 224	14.06 x 6.38 x 8.82	5
-182-340-A	10.3	22.7	397 x 180 x 234	15.63 x 7.09 x 9.21	6
-222-340-A	10.3	22.7	397 x 180 x 234	15.63 x 7.09 x 9.21	6
-302-340-A	16.0	35.3	485 x 210 x 236	19.09 x 8.27 x 9.29	7
-372-340-A	16.0	35.3	485 x 210 x 236	19.09 x 8.27 x 9.29	7
-452-340-A	20.0	44.1	598 x 265 x 286	23.54 x 10.43 x 11.26	8
-552-340-A	20.0	44.1	598 x 265 x 286	23.54 x 10.43 x 11.26	8
-752-340-A	25.0	55.1	636 x 265 x 286	25.04 x 10.43 x 11.26	9
-902-340-A	25.0	55.1	636 x 265 x 286	25.04 x 10.43 x 11.26	9
-113-340-A	46.0	101.4	720 x 395 x 292	28.35 x 15.55 x 11.50	10
-133-340-A	49.0	108.0	720 x 395 x 292	28.35 x 15.55 x 11.50	10
-163-340-A	52.0	114.6	799 x 395 x 292	31.46 x 15.55 x 11.50	11

Interfaces for Operation, Parameterization, and Communication

Optional modules are available with up to 14 languages for displaying status, operational indicators, parameterization, and operation of the variable frequency drive. Variants are available for direct mounting on the device, installation in a control cabinet door, and handheld versions. See also Acessories starting on page 165.

	Type Designation Material No.	Description	Remarks
	PotentiometerBox SK TU3-POT 275 900 110	Suitable for control, potentiometer 0 … 100% .	Installation in the SK TU3 slot on the FI.[1]
	ParameterBox SK TU3-PAR 275 900 100	Suitable for control and parameterization, LCD screen (illuminated), plain text display in 14 languages, memory for 5 device data sets, convenient control keypad.	Installation in the SK TU3 slot on the VFD.[1]
	ControlBox SK TU3-CTR 275 900 090	Suitable for control and parameterization, 4-digit, 7-segment display, convenient control keypad.	Installation in the SK TU3 slot on the FI.[1]
	SimpleBox SK CSX-0 275 900 095	Suitable for control and parameterization, 4-digit, 7-segment display, direct control of a device, one-button operation.	The module is connected to the RJ 12 interface of the VFD and does not occupy the option slot for SK TU3 modules. Simultaneous control of a bus interface is therefore possible. Mounted on the VFD.
	ParameterBox SK PAR-5H 275 281 614	Suitable for control and parameterization, LCD screen (illuminated), plain text display in 14 languages, direct control of up to five devices, memory for five device data sets, convenient control keypad, communication via RS485, including 1.5 m connection cable. Handheld, suitable for installation in a control cabinet door. IP54.	Connection for data exchange with NORDCON *STUDIO* to a PC (USB 2.0), (standard USB-C connection cable required, e.g. material number: 275 292 100). Power supply, e.g. directly via frequency drive or PC.
	SimpleControlBox SK CSX-3E 275 281 413	Suitable for control and parameterization, 4-digit, 7-segment display, direct control of a VFD, convenient control keypad.	Electrical data: 4.5 … 30 V DC / 1.3 W, Supply e.g. directly via the VFD. Control cabinet installation.
	Control and parameterization software NORDCON	Software for control and parameterization as well as support for commissioning and fault analysis of NORD electronic drive technology. Parameter names in 14 languages.	Free download at: www.nord.com
	Bluetooth stick NORDAC *ACCESS BT* SK TIE5-BT-STICK 275 900 120	Interface for wireless connection to a mobile terminal device (e.g. tablet or smartphone) via Bluetooth. The NORDCON *APP*, the NORDCON software for mobile terminal devices, enables smart operation and parameterization as well as commissioning assistance and fault analysis of NORD electronic drive technology.	Available free of charge for Android and iOS:

[1] Cannot be combined with other SK TU3 modules as only one slot is available on the device.

Industrial Ethernet, Field Bus and IO Extensions

Variant		Designation Material No.	Description Connection	Remarks
EtherCAT®		SK TU3-ECT 275 900 180	Ethernet-based bus interface Type EtherCAT®. 2 x RJ45	Baud rate: maximum 100 MBaud 24 V DC connection: via terminal Usable as a gateway to control up to four variable frequency drives.
PROFINET IO®		SK TU3-PNT 275 900 190	Ethernet-based bus interface Type PROFINET IO®. 2 x RJ45	Baud rate: maximum 100 MBaud 24 V DC connection: via terminal Usable as a gateway to control up to four variable frequency drives.

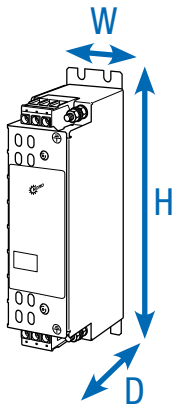
Line Filter
Improvement of EMC

General

Line filters are used to reduce the emission of electromagnetic interference. SK 500E series variable frequency drives are equipped with an integrated Class C2 (max. 20 m shielded motor cable) or Class C1 (size 1 – 4, max. 5 m shielded motor cable) line filter. Various adaptive line filters are available for longer cable lengths or to improve interference suppression.

Chassis Line Filter, SK HLD

The line filter meets Protection Class IP20 and enables interference suppression Class C1 with max. 25 m shielded motor cable and Class C2 with max. 50 m cable. The line filters are installed separately from the variable frequency drive.



	Variable Frequency Drives SK 5xxE ...	Line Filter Type Material No.	Continuous Current [A]	Leakage Current[1] [mA]	Overall Dimensions H x W x D
3~ 230 V	0.25 … 1.1 kW 0.33 … 1.5 hp	SK HLD 110-500/8 278 272 008	8.0	20 / 190	190 x 45 x 75 mm 7.48 x 1.77 x 2.95 in
	1.5 … 2.2 kW 2.0 … 3.0 hp	SK HLD 110-500/16 278 272 016	16.0	21 / 205	250 x 45 x 75 mm 9.84 x 1.77 x 2.95 in
	3.0 … 5.5 kW 4.0 … 7.5 hp	SK HLD 110-500/30 278 272 030	30.0	29 / 280	270 x 55 x 95 mm 10.62 x 2.16 x 3.74 in
	7.5 kW 10.0 hp	SK HLD 110-500/42 278 272 042	42.0	30 / 290	310 x 55 x 95 mm 12.20 x 2.16 x 3.74 in
	11.0 kW 15.0 hp	SK HLD 110-500/75 278 272 075	75.0	22 / 210	310 x 85 x 135 mm 12.20 x 3.34 x 5.31 in
	15.0 … 18.5 kW 20.0 … 25.0 hp	SK HLD 110-500/100 278 272 100	100.0	30 / 290	325 x 95 x 150 mm 12.79 x 3.74 x 5.90 in
3~ 400 V	0.55 … 2.2 kW 0.75 … 3.0 hp	SK HLD 110-500/8 278 272 008	8.0	20 / 190	190 x 45 x 75 mm 7.48 x 1.77 x 2.95 in
	3.0 … 5.5 kW 4.0 … 7.5 hp	SK HLD 110-500/16 278 272 016	16.0	21 / 205	250 x 45 x 75 mm 9.84 x 1.77 x 2.95 in
	7.5 kW 10.0 hp	SK HLD 110-500/30 278 272 030	30.0	29 / 280	270 x 55 x 95 mm 10.62 x 2.16 x 3.74 in
	11.0 kW 15.0 hp	SK HLD 110-500/42 278 272 042	42.0	30 / 290	310 x 55 x 95 mm 12.20 x 2.16 x 3.74 in
	15.0 …18.5 kW 20.0 … 25.0 hp	SK HLD 110-500/55 278 272 055	55.0	30 / 290	255 x 85 x 95 mm 10.03 x 3.34 x 3.74 in
	22.0 kW 30.0 hp	SK HLD 110-500/75 278 272 075	75.0	22 / 210	310 x 85 x 135 mm 12.20 x 3.34 x 5.31 in
	30.0 kW 40.0 hp	SK HLD 110-500/100 278 272 100	100.0	30 / 290	325 x 95 x 150 mm 12.79 x 3.74 x 5.90 in
	37.0… 45.0 kW 50.0 … 60.0 hp	SK HLD 110-500/130 278 272 130	130.0	22 / 210	325 x 95 x 150 mm 12.79 x 3.74 x 5.90 in
	55.0 kW 75.0 hp	SK HLD 110-500/180 278 272 180	180.0	31 / 300	440 x 130 x 181 mm 17.32 x 5.11 x 7.12 in
	75.0 … 90.0 kW 100.0 … 125.0 hp	SK HLD 110-500/250 278 272 250	250.0	37 / 355	525 x 155 x 220 mm 20.66 x 6.10 x 8.66 in

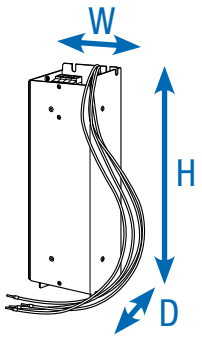
[1] Leakage current 1st value: rated for the maximum permissible input voltage fluctuation according to IEC 38 + 10%

Leakage current 2nd value: calculated at maximum input voltage and failure of 2 phases (typically at 50 Hz)

Bottom-Mounted Line Filter, Combination Filter, SK NHD

The line filter offers Protection Class IP20 and is available for variable frequency drive powers of 7.5 kW / 10.0 hp (400 V). The line filter is able to be mounted flat underneath the VFD, reducing the space required.

These combination filters combine the advantages of a line filter and a line choke in a single housing and provide Class C1 interference suppression with max. 50 m shielded motor cable and Class C2 with max. 100 m cable.



	Variable Frequency Drives SK 5xxE ...	Line Filter Type Material No.	Continuous Current [A]	Inductance [mH]	Leakage Current[1] [mA]	Overall Dimensions H x W x D
3~ 230 V	0.25 … 0.75 kW 0.33 … 1.0 hp	SK NHD-480/6-F 278 273 006	5.5	3 x 6.4	7.7 / 74.4	290 x 88 x 74 mm 11.41 x 3.46 x 2.91 in
	1.1 … 2.2 kW 1.5 … 3.0 hp	SK NHD-480/10-F 278 273 010	9.5	3 x 3.7	15.0 / 144.0	305 x 115 x 98 mm 12.00 x 4.52 x 3.85 in
	3.0 … 4.0 kW 4.0 … 5.5 hp	SK NHD-480/16-F 278 273 016	16.0	3 x 2.2	21.5 / 206.5	350 x 140 x 98 mm 13.77 x 5.51 x 3.85 in
3~ 400 V	0.55 … 0.75 kW 0.75 … 1.0 hp	SK NHD-480/3-F 278 273 003	2.3	3 x 15.3	4.3 / 40.0	250 x 75 x 60 mm 9.84 x 2.95 x 2.36 in
	1.1 … 2.2 kW 1.5 … 3.0 hp	SK NHD-480/6-F 278 273 006	5.5	3 x 6.4	7.7 / 74.4	290 x 88 x 74 mm 11.41 x 3.46 x 2.91 in
	3.0 … 4.0 kW 4.0 … 5.5 hp	SK NHD-480/10-F 278 273 010	9.5	3 x 3.7	15.0 / 144.0	305 x 115 x 98 mm 12.00 x 4.52 x 3.85 in
	5.5 … 7.5 kW 7.5 … 10.0 hp	SK NHD-480/16-F 278 273 016	16.0	3 x 2.2	21.5 / 206.5	350 x 140 x 98 mm 13.77 x 5.51 x 3.85 in

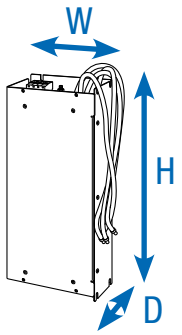
[1] Leakage current 1st value: rated for the maximum permissible input voltage fluctuation according to IEC 38 + 10%

Leakage current 2nd value: calculated at maximum input voltage and failure of 2 phases (typically at 50 Hz)

Line Filter
Improvement of EMC

Bottom-Mounted Line Filter, SK LF2

The line filter meets Protection Class IP00 and is available for variable frequency drive powers of 37.0 kW/50.0 hp (400 V). The line filter can be mounted flat underneath the VFD, reducing the space requirement. These line filters enable Class C1 interference suppression with max. 50 m shielded motor cable and Class C2 with max. 100 m cable.



	Variable Frequency Drives SK 5xxE ...	Line Filter Type Material No.	Continuous Current [A]	Leakage Current[1] [mA]	Overall Dimensions H x W x D
3~ 230 V	5.5 … 7.5 kW 7.5 … 10.0 hp	SK LF2-480/45-F 278 273 045	45.0	12 / 120	388 x 164 x 75 mm 15.27 x 6.45 x 2.95 in
	11.0 kW 15.0 hp	SK LF2-480/66-F 278 273 066	66.0	12 / 120	428 x 182 x 75 mm 16.85 x 7.16 x 2.95 in
	15.0 … 18.5 kW 20.0 … 25.0 hp	SK LF2-480/105-F 278 273 105	105.0	22 / 210	527 x 210 x 95 mm 20.74 x 8.26 x 3.74 in
3~ 400 V	0.55 … 0.75 kW 0.75 … 1.0 hp	SK LF2-480/2-F 278 273 002	2.3	6.4 / 61.5	250 x 75 x 48 mm 9.84 x 2.95 x 1.88 in
	1.1 … 2.2 kW 1.5 … 3.0 hp	SK LF2-480/5-F 278 273 005	5.5	7.7 / 74.3	290 x 88 x 48 mm 11.41 x 3.46 x 1.88 in
	3.0 … 4.0 kW 4.0 … 5.0 hp	SK LF2-480/9-F 278 273 009	9.5	19.5 / 187	305 x 115 x 54 mm 12.00 x 4.52 x 2.12 in
	5.5 … 7.5 kW 7.5 … 10.0 hp	SK LF2-480/15-F 278 273 015	16.0	20.2 / 193	350 x 115 x 54 mm 13.77 4.52 x 2.12 in
	11.0 … 15.0 kW 15.0 … 20.0 hp	SK LF2-480/45-F 278 273 045	45.0	12 / 120	388 x 164 x 75 mm 15.27 x 6.45 x 2.95 in
	18.5 … 22.0 kW 25.0 … 30.0 hp	SK LF2-480/66-F 278 273 066	66.0	12 / 120	428 x 182 x 75 mm 16.85 x 7.16 x 2.95 in
	30.0 … 37.0 kW 40.0 … 50.0 hp	SK LF2-480/105-F 278 273 105	105.0	22 / 210	527 x 210 x 95 mm 20.74 x 8.26 x 3.74 in

[1] Leakage current 1st value: rated for the maximum permissible input voltage fluctuation according to IEC 38 + 10%

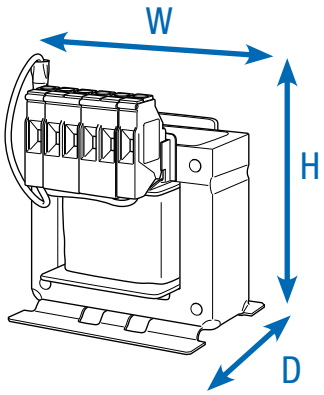
Leakage current 2nd value: calculated at maximum input voltage and failure of 2 phases (typically at 50 Hz)

Mains Chokes
Reduction of Mains Feedback

General

It may be necessary for some drive systems to use mains chokes to reduce dangerous mains current peaks. They considerably reduce external mains feedback effects, the proportion of current harmonics is reduced to a minimum, and the input current is reduced to approximately the value of the output current.

It is recommended that a mains choke be used at all times for a VFD capacity of 45.0 kW / 60.0 hp and above. This will have an additional positive effect on device protection and EMC characteristics. All chokes have Protection Class IP00 and are UL recognized.

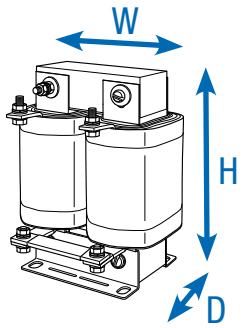


	Variable Frequency Drives SK 5xxE ...	Choke Type Material No.	Continuous Current [A]	Inductance [mH]	Overall Dimensions H x W x D
1~ 230 V	0.25 … 0.75 kW 0.33 … 1.0 hp	SK CI1-230/8-C 278 999 030	8.0	2 x 1.0	89 x 65 x 78 mm 3.50 x 2.56 x 3.07 in
	1.1 … 2.2 kW 1.5 … 3.0 hp	SK CI1-230/20-C 278 999 040	20.0	2 x 0.4	106 x 90 x 96 mm 4.17 x 3.54 x 3.78 in
3~ 230 V	0.25 … 0.75 kW 0.33 … 1.0 hp	SK CI1-480/6-C 276 993 006	6.0	3 x 4.88	117 x 96 x 60 mm 4.60 x 3.78 x 2.36 in
	1.1 … 1.5 kW 1.5 … 2.0 hp	SK CI1-480/11-C 276 993 011	11.0	3 x 2.93	140 x 120 x 85 mm 5.51 x 4.72 x 3.35 in
	2.2 … 3.0 kW 3.0 … 4.0 hp	SK CI1-480/20-C 276 993 020	20.0	3 x 1.47	177 x 155 x 110 mm 6.97 x 6.10 x 4.33 in
	4.0 … 7.5 kW 5.0 … 10.0 hp	SK CI1-480/40-C 276 993 040	40.0	3 x 0.73	172 x 155 x 115 mm 6.77 x 6.10 x 4.53 in
	11.0 … 15.0 kW 15.0 … 20.0 hp	SK CI1-480/70-C 276 993 070	70.0	3 x 0.47	220 x 185 x 122 mm 8.66 x 7.28 x 4.80 in
	18.5 kW 25.0 hp	SK CI1-480/100-C 276 993 100	100.0	3 x 0.29	263 x 240 x 148 mm 10.35 x 9.45 x 5.83 in
3~ 400 V	0.55 … 2.2 kW 0.75 … 3.0 hp	SK CI1-480/6-C 276 993 006	6.0	3 x 4.88	117 x 96 x 60 mm 4.60 x 3.78 x 2.36 in
	3.0 … 4.0 kW 4.0 … 5.0 hp	SK CI1-480/11-C 276 993 011	11.0	3 x 2.93	140 x 120 x 85 mm 5.51 x 4.72 x 3.35 in
	5.5 … 7.5 kW 7.5 … 10.0 hp	SK CI1-480/20-C 276 993 020	20.0	3 x 1.47	177 x 155 x 110 mm 6.97 x 6.10 x 4.33 in
	11.0 … 15.0 kW 15.0 … 20.0 hp	SK CI1-480/40-C 276 993 040	40.0	3 x 0.73	172 x 155 x 115 mm 6.77 x 6.10 x 4.53 in
	18.5 … 30.0 kW 25.0 … 40.0 hp	SK CI1-480/70-C 276 993 070	70.0	3 x 0.47	220 x 185 x 122 mm 8.66 x 7.28 x 4.80 in
	37.0 … 45.0 kW 50.0 … 60.0 hp	SK CI1-480/100-C 276 993 100	100.0	3 x 0.29	263 x 240 x 148 mm 10.35 x 9.45 x 5.83 in
	55.0 … 75.0 kW 75.0 … 100.0 hp	SK CI1-480/160-C 276 993 160	160.0	3 x 0.18	268 x 352 x 140 mm 10.55 x 13.86 x 5.51 in
	90.0 kW 125.0 hp	SK CI1-480/280-C 276 993 280	280.0	3 x 0.10	268 x 352 x 169 mm 10.55 x 13.85 x 6.65 in
	110.0 … 132.0 kW 150.0 … 180.0 hp	SK CI1-480/350-C 276 993 350	350.0	3 x 0.08	268 x 352 x 169 mm 10.55 x 13.85 x 6.65 in
	160.0 kW 200.0 hp	Not available			

Link Circuit Choke
Reduction of Mains Feedback

Link Circuit Choke
SK DCL

Similar to a mains choke, a link circuit choke reduces the network loads of a variable frequency drive that are inherent to its functional principle. It is connected to accessible contacts in the drive's intermediate circuit and is available for 45.0 kW/60.0 hp and above. All chokes have Protection Class IP00 and are UL recognized.



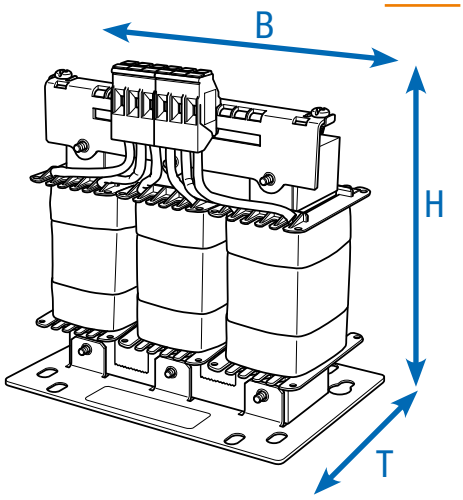
Variable Frequency Drives SK 5xxE ...	Choke Type Material No.	Continuous Current [A]	Inductance [mH]	Overall Dimensions H x W x D
45.0 … 55.0 kW 60.0 … 75.0 hp	SK DCL-950/120-C 276 997 120	120.0	0.50	230 x 148 x 147 mm 9.06 x 5.83 x 5.79 in
750 … 90.0 kW 100.0 … 125.0 hp	SK DCL-950/200-C 276 997 200	200.0	0.30	260 x 170 x 153 mm 10.24 x 6.69 x 6.02 in
110.0 kW 150.0 hp	SK DCL-950/260-C 276 997 260	260.0	0.25	284 x 180 x 174 mm 11.18 x 7.09 x 6.85 in
132.0 kW 180.0 hp	SK DCL-950/320-C 276 997 320	320.0	0.20	282 x 180 x 189 mm 11.10 x 7.09 x 7.44 in
160.0 kW 200.0 hp	SK DCL-950/380-C 276 997 380	200.0	0.17	282 x 180 x 189 mm 11.10 x 7.09 x 7.44 in

Motor Chokes
Compensation of Cable Capacities

General

Long motor cable lengths (cable capacity) often require the use of additional motor chokes (output chokes) on the VFD output. The use of motor chokes improves device protection and EMC characteristics.

The specified motor chokes are rated for a pulse frequency of 3 to 6 kHz and an output frequency of 0 to 120 Hz. All chokes have Protection Class IP00 and are UL recognized.



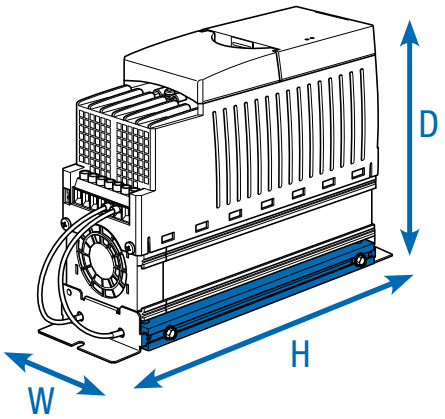
	Variable Frequency Drives SK 5xxE ...	Choke Type Material No.	Continuous Current [A]	Inductance [mH]	Overall Dimensions H x W x D
3~ 230 V	0.25 … 0.75 kW 0.33 … 1.0 hp	SK CO1-460/4-C 276 996 004	4.0	3 x 3.5	140 x 120 x 104 mm 5.51 x 4.72 x 4.09 in
	1.1 … 1.5 kW 1.5 … 2.0 hp	SK CO1-460/9-C 276 996 009	9.0	3 x 2.5	160 x 155 x 110 mm 6.30 x 6.10 x 4.33 in
	2.2 … 4.00 kW 3.0 … 5.0 hp	SK CO1-460/17-C 276 996 017	170.0	3 x 1.2	201 x 185 x 102 mm 7.91 x 7.28 x 4.02 in
	5.5 … 7.5 kW 7.5 … 10.0 hp	SK CO1-460/33-C 276 996 033	33.0	3 x 0.6	201 x 185 x 122 mm 7.91 x 7.28 x 4.80 in
	11.0 … 15.0 kW 15.0 … 20.0 hp	SK CO1-480/60-C 276 992 060	60.0	3 x 0.33	210 x 185 x 112 mm 8.27 x 7.28 x 4.41 in
	18.5 kW 25.0 hp	SK CO1-460/90-C 276 996 090	90.0	3 x 0.22	325 x 352 x 144 mm 12.80 x 13.86 x 5.67 in
3~ 400 V	0.55 … 1.5 kW 0.75 … 2.0 hp	SK CO1-460/4-C 276 996 004	4.0	3 x 3.5	140 x 120 x 104 mm 5.51 x 4.72 x 4.09 in
	2.2 … 4.0 kW 3.0 … 5.0 hp	SK CO1-460/9-C 276 996 009	9.0	3 x 2.5	160 x 155 x 110 mm 6.30 x 6.10 x 4.33 in
	5.5 … 7.5 kW 7.5 … 10.0 hp	SK CO1-460/17-C 276 996 017	17.0	3 x 1.2	201 x 185 x 102 mm 7.91 x 7.28 x 4.02 in
	11.0 … 15.0 kW 15.0 … 20.0 hp	SK CO1-460/33-C 276 996 033	33.0	3 x 0.6	201 x 185 x 122 mm 7.91 x 7.28 x 4.80 in
	18.5 … 30.0 kW 25.0 … 40.0 hp	SK CO1-480/60-C 276 992 060	60.0	3 x 0.33	210 x 185 x 112 mm 8.27 x 7.28 x 4.41 in
	37.0 … 45.0 kW 50.0 … 60.0 hp	SK CO1-460/90-C 276 996 090	90.0	3 x 0.22	352 x 144 x 325 mm 13.86 x 5.67 x 12.80 in
	55.0 … 75.0 kW 75.0 … 100.0 hp	SK CO1-460/170-C 276 996 170	170.0	3 x 0.13	320 x 412 x 200 mm 12.60 x 16.22 x 7.87 in
	90.0 … 110.0 kW 125.0 … 150.0 hp	SK CO1-460/240-C 276 996 240	240.0	3 x 0.07	320 x 412 x 225 mm 12.60 x 16.22 x 8.86 in
	132.0 … 160.0 kW 180.0 … 200.0 hp	SK CO1-460/330-C 276 996 330	330.0	3 x 0.03	268 x 352 x 188 mm 10.55 x 13.86 x 7.40 in

Braking Resistors for Dynamic Drive Characteristics

Bottom-Mounted Braking Resistors SK BR4

Available in four sizes for variable frequency drives of up to 7.5 kW / 10.0 hp (400 V), this brake resistor can be mounted flat or vertically next to the drive, reducing space requirements.

The specified resistance values are electrically matched to standard applications and all brake resistors have Protection Class IP40 and are UL recognized.

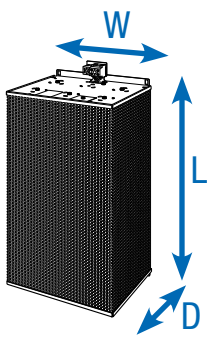


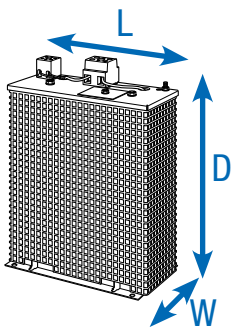
Variable Frequency Drives SK 5xxE ...		Resistor Type Material No.	Resistance [Ω]	Continuous Output [W]	Short-Term Power [kW][1]	Overall Dimensions H x W x D
1~/3~ 230V / 1~ 115V	0.25 … 0.37 kW 0.33 … 0.5 hp	SK BR4-240/100 275 991 110	240	100	2.2	230 x 88 x 175 mm 9.05 x 3.46 x 6.88 in
	0.55 … 0.75 kW 0.75 … 1.0 hp	SK BR4-150/100 275 991 115	150	100	2.2	230 x 88 x 175 mm 9.05 x 3.46 x 6.88 in
	1.1 … 2.2 kW 1.5 … 3.0 hp	SK BR4-75/200 275 991 120	75	200	4.4	270 x 88 x 175 mm 10.62 x 3.46 x 6.88 in
	3.0 … 4.0 kW 4.0 … 5.0 hp	SK BR4-35/400 275 991 140	35	400	8.8	285 x 98 x 239 mm 11.22 x 3.85 x 9.40 in
3~400 V	0.55 … 0.75 kW 0.75 … 1.0 hp	SK BR4-400/100 275 991 210	400	100	2.2	230 x 88 x 175 mm 9.05 x 3.46 x 6.88 in
	1.1 … 2.2 kW 1.5 … 3.0 hp	SK BR4-220/200 275 991 220	220	200	4.4	270 x 88 x 175 mm 10.62 x 3.46 x 6.88 in
	3.0 … 4.0 kW 4.0 … 5.0 hp	SK BR4-100/400 275 991 240	100	400	8.8	285 x 98 x 239 mm 11.22 x 3.85 x 9.40 in
	5.5 … 7.5 kW 7.5 … 10.0 hp	SK BR4-60/600 275 991 260	60	600	13.0	330 x 98 x 239 mm 12.99 x 3.85 x 9.40 in
	Temperature monitoring for SK BR4 resistors with installation close to the VFD 275 991 100		Bimetallic switch as opener Nominal switching temperature: 180°C			Broad brake resistor + 10 mm (on one side) the dimensions apply to the VFD, including the braking resistor
	Temperature monitoring for SK BR4 resistors with direct installation under the VFD 275 991 200		Bimetallic switch as opener Nominal switching temperature: 100°C			

[1] Once within 120 s, for a maximum duration of 1.2 s

Chassis Braking Resistors, SK BR2

Chassis braking resistor elements are integrated into a housing cage and connected to the variable frequency drive via a separate connecting cable. These brake resistors need to be mounted horizontally (apart from SK BR2-xxx/400-C) using a shielded cable as short as possible. All brake resistors have Protection Class IP20.





Only SK BR2-xxx/400-C

	Variable Frequency Drives SK 5xxE ...	Resistor Type Material No.	Resistance [Ω]	Continuous Output [W]	Short-Term Power [kW][2]	Overall Dimensions L x W x D
1~/3~ 230V / 1~ 115V	3.0 … 4.0 kW 4.0 … 5.0 hp	SK BR2-35/400-C[1] 278 282 045	35	400	12	178 x 100 x 252 mm 7.00 x 3.93 x 9.92 in
	5.5 … 7.5 kW 7.5 … 10.0 hp	SK BR2-22/600-C 278 282 065	22	600	18	385 x 92 x 120 mm 15.15 x 3.62 x 4.72 in
	11.0 kW 15.0 hp	SK BR2-12/1500-C 278 282 015	12	1500	45	585 x 185 x 120 mm 23.03 x 7.28 x 4.72 in
	15.0 … 18.5 kW 20.0 … 25.0 hp	SK BR2-9/2200-C 278 282 122	9	2200	66	485 x 275 x 120 mm 19.09 x 10.82 x 4.72 in
3~ 400 V	3.0 … 4.0 kW 4.0 … 5.0 hp	SK BR2-100/400-C[1] 278 282 040	100	400	12	178 x 100 x 252 mm 7.00 x 3.93 x 9.92 in
	5.5 … 7.5 kW 7.5 … 10.0 hp	SK BR2-60/600-C 278 282 060	60	600	18	385 x 110 x 120 mm 15.15 x 3.62 x 4.72 in
	11.0 … 15.0 kW 15.0 … 20.0 hp	SK BR2-30/1500-C 278 282 150	30	1500	45	585 x 185 x 120 mm 23.03 x 7.28 x 4.72 in
	18.5 … 22.0 kW 25.0 … 30.0 hp	SK BR2-22/2200-C 278 282 220	22	2200	66	485 x 275 x 120 mm 19.09 x 10.82 x 4.72 in
	30.0 … 37.0 kW 40.0 … 50.0 hp	SK BR2-12/4000-C 278 282 400	12	4000	120	585 x 266 x 210 mm 23.03 x 10.47 x 8.26 in
	45.0 … 55.0 kW 60.0 … 75.0 hp	SK BR2-8/6000-C 278 282 600	8	6000	180	395 x 490 x 260 mm 15.55 x 19.29 x 10.23 in
	75.0 … 110.0 kW 100.0 … 150.0 hp	SK BR2-6/7500-C 278 282 750	6	7500	225	595 x 490 x 260 mm 23.42 x 19.29 x 10.23 in
	132.0 … 160.0 kW 180.0 … 220.0 hp	SK BR2-3/7500-C 278 282 753	3	7500	225	595 x 490 x 260 mm 23.42 x 19.29 x 10.23 in
	132.0 … 160.0 kW 180.0 … 200.0 hp	SK BR2-3/17000-C 278 282 754	3	17000	510	795 x 490 x 260 mm 31.29 x 19.29 x 10.23 in
	Temperature monitoring for SK BR2 resistors integrated (2 terminals 4 mm²)		Bimetallic switch as opener. Nominal switching temperature: 180°C.			

[1] Type of assembly: vertical

[2] Once within 120 s, for a maximum duration of 1.2 s

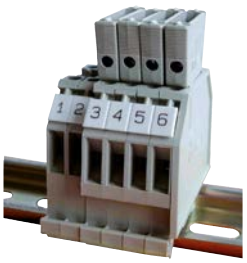
NORDAC *PRO* Variable Frequency Drive Accessories



EMV-Kit

For EMC-compliant connection of shielded cables and to produce strain relief.

Size of VFD	EMV-Kit	Material No.
Size 1 and size 2	SK EMC 2-1	275 999 011
Size 3 and size 4	SK EMC 2-2	275 999 021
Size 5	SK EMC 2-3	275 999 031
Size 6	SK EMC 2-4	275 999 041
Size 7	SK EMC 2-5	275 999 051
Size 8 and size 9	SK EMC 2-6	275 999 061
Size 10 and size 11	SK EMC 2-7	275 999 071



Connection Kit HTL Encoder WK 4/2/4*680 OHM

For connection of an HTL encoder to the TTL encoder input of the variable frequency drive, top-hat rail mounting.
Material No.: 278 910 340





RJ45 WAGO Connection Module

Connects a CANopen® encoder to one of the two RJ45 connection sockets of the variable frequency drive.
Material No.: 278 910 300



Signal Converter +/- 10 V

Connects a bipolar analog signal to the unipolar analog input of a variable frequency drive (up to size 4), top-hat rail mounting.
Material No.: 278 910 320



IO Expansion SK EBIOE-2

The standard number of inputs and outputs on the device can be supplemented using an extension provided for top-hat rail mounting.
Material No.: 275 900 210
Available for SK 540E and higher



Electronic Brake Rectifier SK EBGR-1

Used for direct control and supply of an electromagnetic holding brake.
Material No.: 191 409 90



Adapter Module V/I CONVERTER 10 V/20 mA

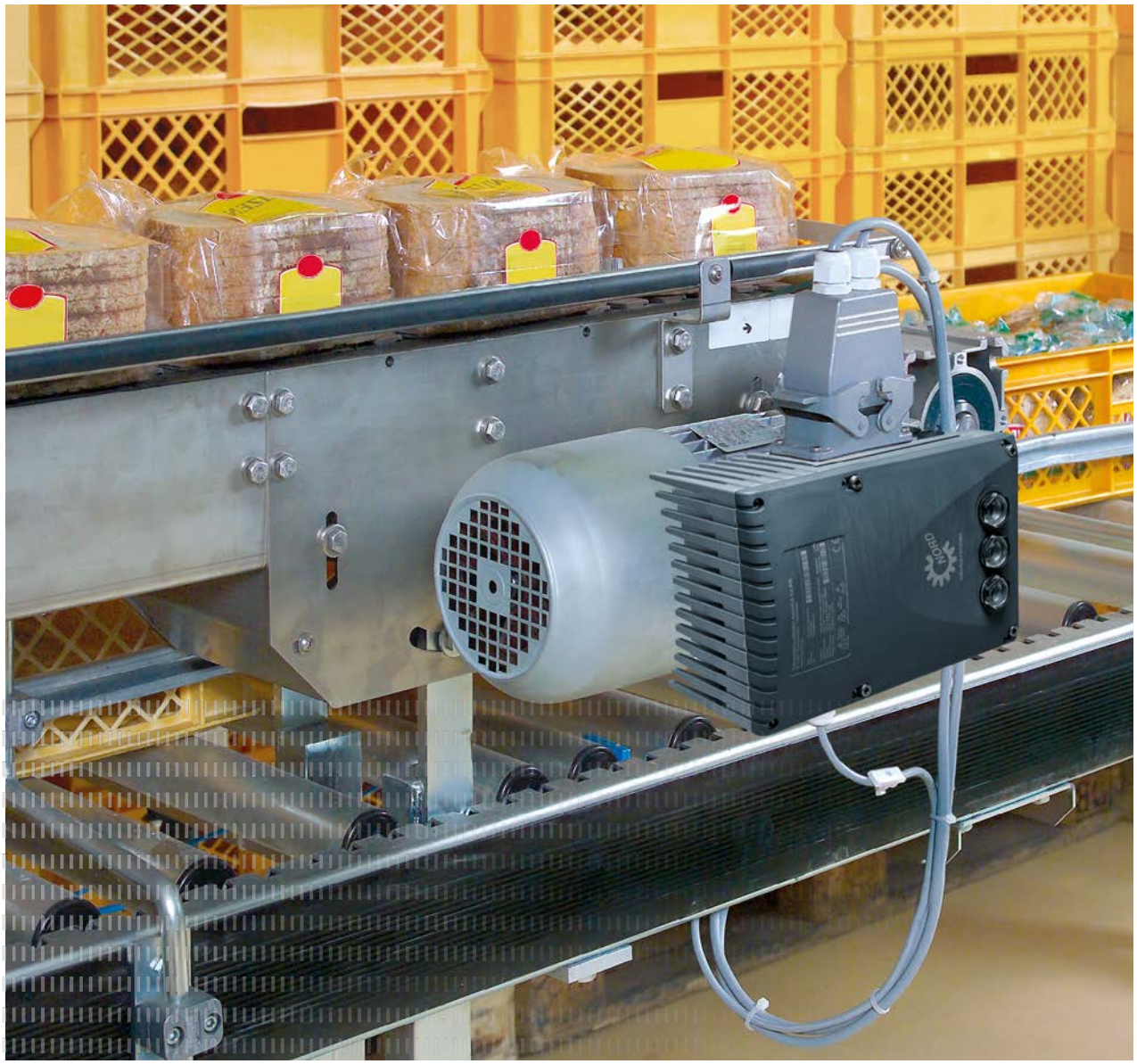
The module serves the conversion of analog (0 – 10 V) signals into equivalent current signals (0 – 20 mA).
Material no.: 278 910 315

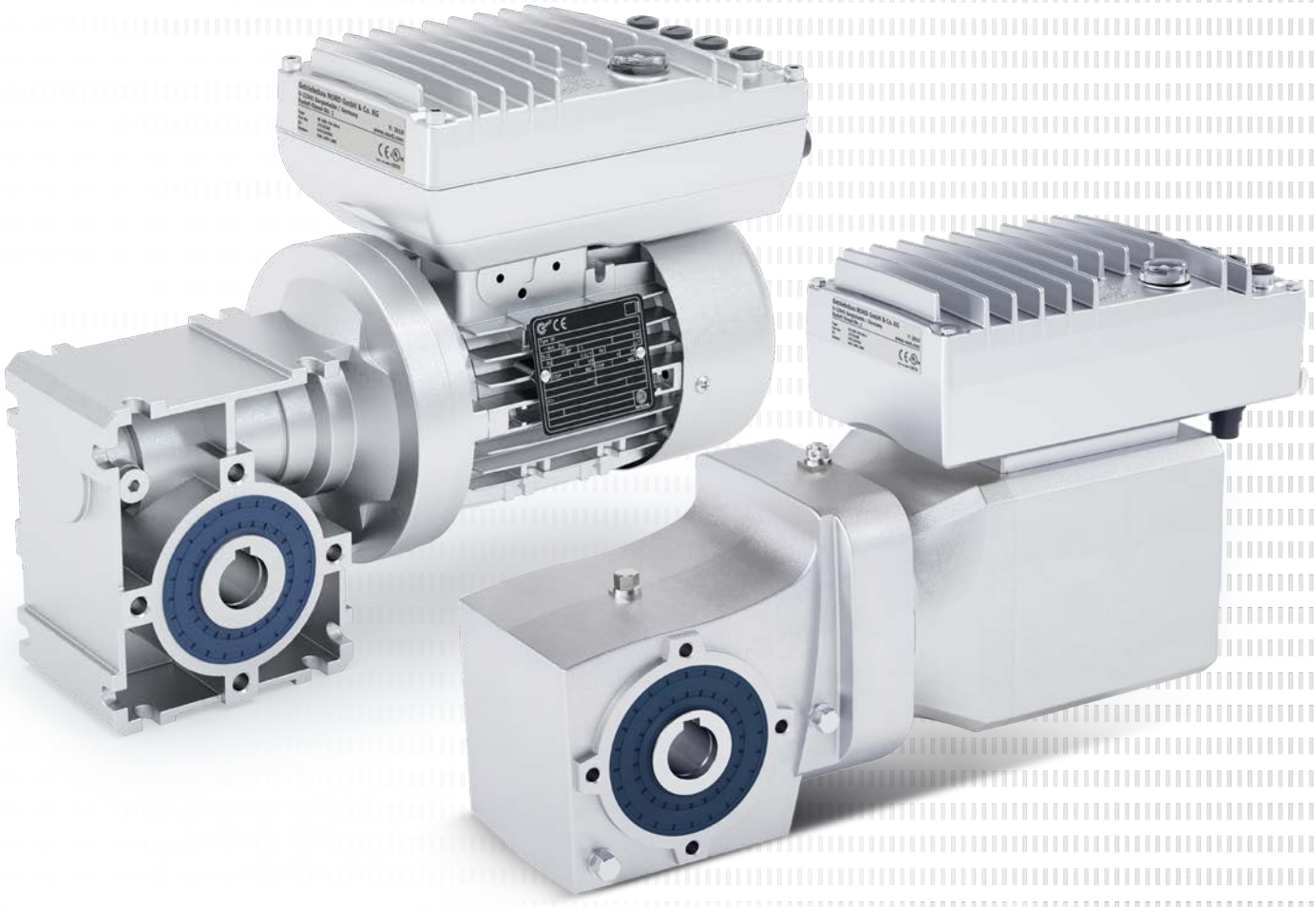


Adapter Module Level Adapter HTL – RS422

The module serves the conversion of HTL or TTL signals into complementary signals with RS422 levels, top-hat rail mounting.
Material no.: 278 910 360







Variable Frequency Drives for Horizontal Conveyor Applications

NORDAC *ON* and *ON+* SK 300P Series

NORD® DRIVESYSTEMS

Top Class VFD Technology
NORDAC *ON*, SK 300P Series

NORDAC *ON*

The NORDAC *ON* is a compact, decentralized variable frequency drive designed for dynamic conveyor technology in mechanical engineering and plant construction, as well as for combination with high-efficiency IE5+ synchronous motors (NORDAC *ON+*).

Focused

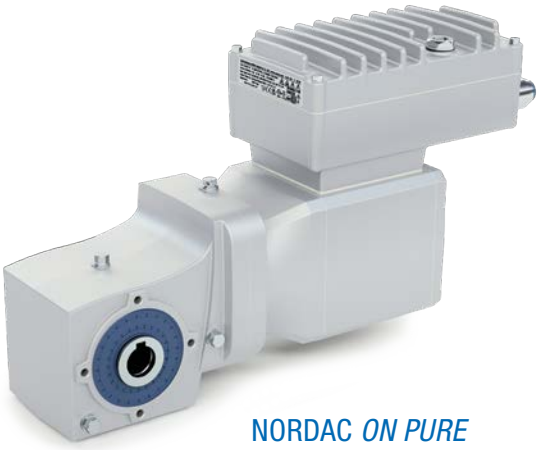
The NORDAC *ON* / *ON+* is optimized for the common range of functions in horizontal conveyor technology. The following functions are included as standard:

- Integration of sensors via digital inputs
- If required, an integrated brake chopper dissipates regenerative energy to an optional braking resistor
- Brake management for optimum control of an electromagnetic holding brake for wear-free brake actuation
- Quick, simple diagnostics via easily visible LED indicators
- The Safe Torque Off (STO) function can be optionally integrated into the VFD and is controlled via two safe inputs
- Other functional safety-related functions, for example SS2, SLS, SDI, SSM, SOS, SMS, or SSR, can also be integrated. Communication is then possible via PNS or FSoE. (In preparation)
- CFC open-loop injection control: Powerful control of synchronous motors without an encoder

Compact

The power range from 0.5 to 5.0 hp (NORDAC *ON*/ *ON+*) or to 2.0 hp (NORDAC *ON PURE*) is covered by three frame sizes. The compact designs are able to be motor- or wall-mounted based on the application and space requirements.

NORDAC *ON* is designed for use with asynchronous motors whereas NORDAC *ON+* is intended to be used with synchronous motors and supplements the NORD high-efficiency IE5+ motor portfolio.



NORDAC *ON PURE*

PURE (in preparation)

NORDAC *ON PURE* extends the application area of the compact frequency drive to applications in the Food and Beverage (F&B) Industry.

The drive housing has been specifically adjusted to the requirements in the F&B sector. All device openings have been reduced to a minimum and thanks to NXD tupH® Sealed Surface Conversion System, the drive achieves Protection Class IP69. Apart from the diagnostic opening, there are only robust M23 circular connectors for the hybrid connection of the mains/ control voltage and the Ethernet connection.

The NORDAC *ON PURE* is intended for mounting on the equally F&B-focused non-ventilated NORD IE5+ synchronous motor but can alternatively be wall-mounted. Special hygienic cables are available for the electrical connection.

NXD tupH

Digitalization

Like all NORD variable frequency drives, this member of the NORDAC family is equipped with a powerful PLC for functionality close to the drive. It can process the data from connected sensors and actuators, autonomously initiate control sequences, and communicate drive and application data to the control center, networked components, or to cloud storage.

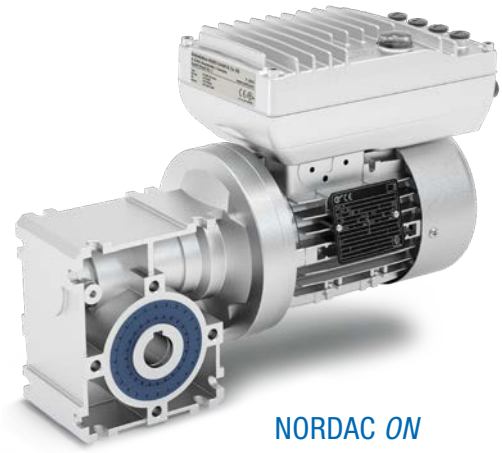
The devices feature an integrated multi-protocol Ethernet interface for easy integration into modern automation systems. Whether for ProfiNet, EtherNet/IP, or EtherCAT, the required protocol can be easily set via parameters.

100% Plug-and-Play

All connections are pluggable and ensure quick, easy, error-minimized commissioning and maintenance on site. The 24 V DC supply for control and communication is also integrated in the 3-phase 400 V supply and interfaces to the drive via a 6-pole plug connector. The daisy chain connector can be used to supply power to several drives in the series in order to optimize the required cable length.

Robust

The NORDAC *ON* series housing is made entirely from aluminum and offers a Protection Class up to IP69, enabling a durable solution for harsh environmental conditions. These variable frequency drives can additionally be operated in temperature ranges from -22 to 104°F (-30 to +40°C), making them suitable for both deep-freeze and high-heat applications.



NORDAC *ON*



NORDAC *ON*
Wall-mounted version

Standards and Approvals

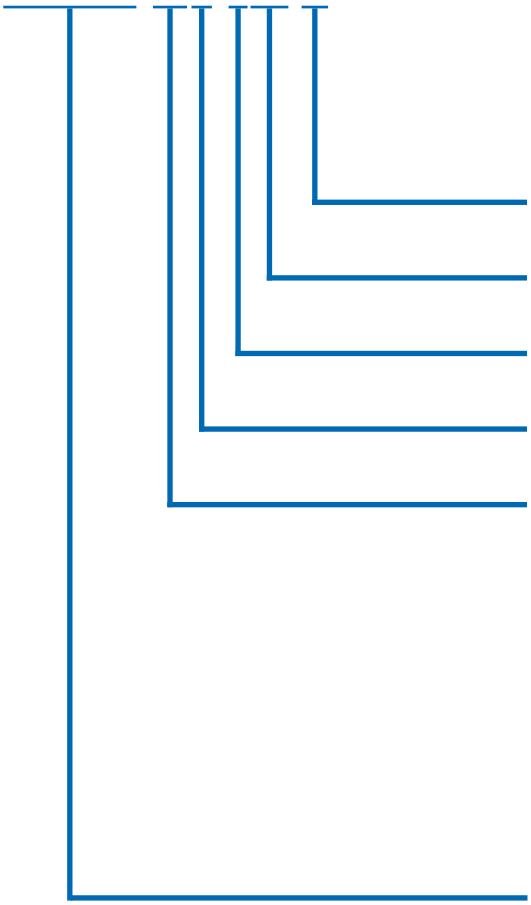
All drives across the series comply with the standards and directives listed below.

Approval	Directive		Applied Standards	Certificates	Label
CE (European Union)	Low Voltage Directive	2014/35/EU	EN 61800-5-1 EN 60529 EN 61800-3 EN 63000 EN 61800-9-1 EN 61800-9-2	C310001	
	EMC	2014/30/EU			
	RoHS	2011/65/EU			
	Delegated directive (EU)	2015/863			
	Ecodesign	2009/125/EG			
	Regulation (EU) Ecodesign	2019/1781			
UL (USA)			UL 61800-5-1	E171342	
CSA (Canada)			C22.2 No.274-13	E171342	
RCM (Australia)	F2018L00028		EN 61800-3	C310001	
EAC (Eurasia)	TR CU 004/2011, TR CU 020/2011		IEC 61800-5-1 IEC 61800-3	in preparation	
UkrSEPRO (Ukraine)			EN 61800-5-1 EN 60529 EN 61800-3 EN 63000 EN 60947-1 EN 60947-4 EN 61558-1 EN 50581	C311900	
UKCA (United Kingdom)			EN 61800-5-1 EN 60529 EN 61800-3 EN 63000 EN 61800-9-1 EN 61800-9-2	C352000	

Type Code

Variable Frequency Drive

SK 300P-360-340-A



Radio interference filter: **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, **2** = 0xx.0

Device rated power:
360 = 0.36 kW / 0.5 hp, Size 1,
450 = 0.45 kW / 0.6 hp, Size 1,
370 = 0.37 kW / 0.5 hp, Size 2,
750 = 0.75 kW / 1.0 hp, Size 2,
950 = 0.95 kW / 1.27 hp, Size 2,
111 = 1.1 kW / 1.5 hp, Size 3,
151 = 1.5 kW / 2.0 hp, Size 3,
191 = 1.9 kW / 2.5 hp, Size 3,
221 = 2.2 kW / 3.0 hp, Size 3,
301 = 3.0 kW / 4.0 hp, Size 3,
371 = 3.7 kW / 5.0 hp, Size 3

Device series: SK 300P, SK 301P, SK 302P[1], SK 310P, SK 311P, SK 312P[1], SK 350P[1]

[1] In Preparation

NORDAC *ON* / *ON+* SK 300P Series
All Versions at a Glance

	NORDAC *ON* SK 30xP	NORDAC *ON* SK 30xP	NORDAC *ON+* SK 31xP	NORDAC *ON PURE* SK 350P
Power	0.5 – 0.6 hp	0.5 – 5.0 hp	0.5 – 5.0 hp	0.5 – 2.0 hp
Size	1	2 – 3	2 – 3	2 – 3
Sensorless current vector control (ISD control)	●	●	●	●
Asynchronous motor operation (closed-loop and open-loop)	● [1]	● [1]	●	● [2]
Synchronous motor operation (PMSM) (CFC open-loop injection control)	❍	❍	●	●
Mountable on IE3 motor	●	●	●	❍
Mountable on IE5+ motor	❍	❍	●	●
RS485/RS232 diagnostic interface via RJ12	●	●	●	●
4 switchable parameter sets	●	●	●	●
All normal drive functions	●	●	●	●
Parameters pre-set with standard values	●	●	●	●
Stator resistance measurement	●	●	●	●
Energy-saving function, optimized efficiency in partial load operation	●	●	●	●
Class C2 line filter, motor-mounted or up to 5 m motor cable for wall mounting	●	●	●	●
Monitoring functions	●	●	●	●
Load monitor	●	●	●	●
POSICON	❍	❍	●	●
PLC functionality	●	●	●	●
Ethernet communication: EtherCAT, Ethernet IP, ProfiNet IO	●	●	●	●
External 24 V DC power supply for the control board	●	●	●	●
Brake management for mechanical Holding brake	❍	●	●	●
Brake chopper (braking resistor optional)	❍	●	●	●
Functional safety STO, SS1-t[3]	❍	○	○	❍
Functional safety STO, SS1-t, SS1-r, SLS, SLS-Max-Limit, SSM, SMS[4]	❍	○	○	❍
Internal braking resistors	❍	○	○	○
External braking resistors	❍	○	○	○

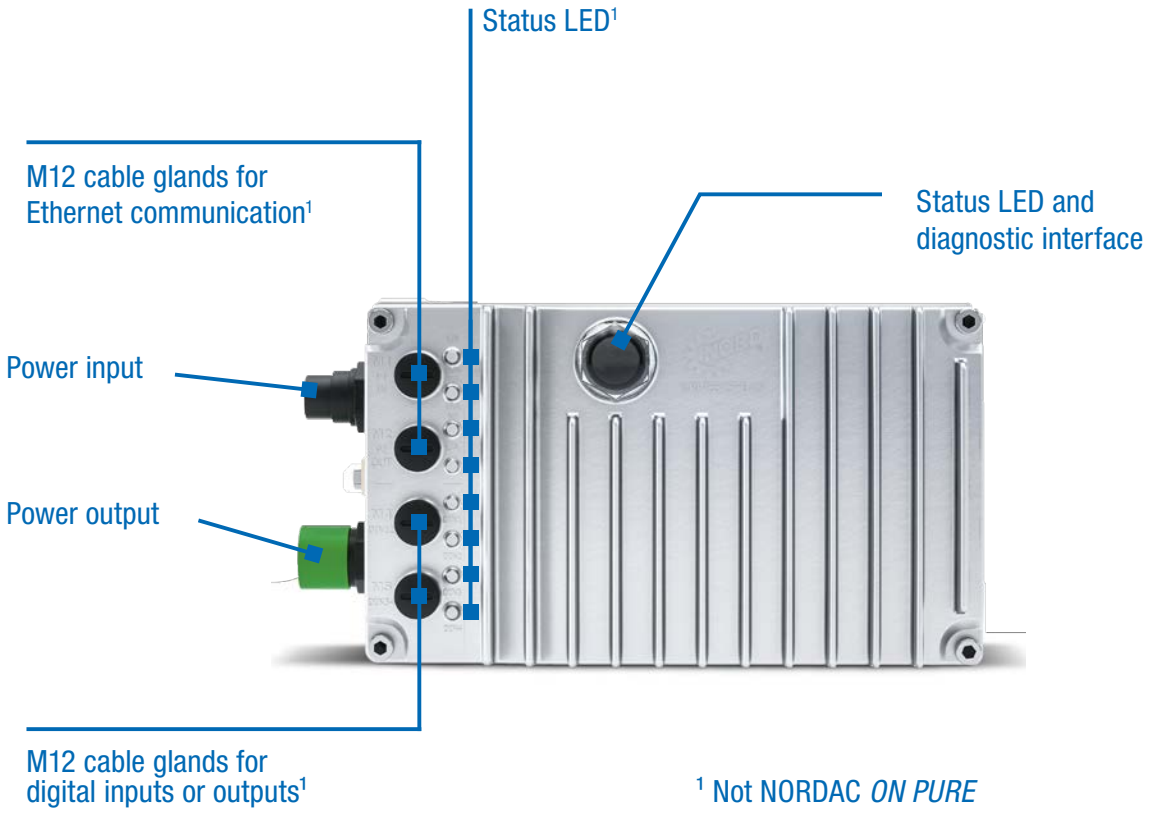
[1] Open-loop only
[2] Wall mounting only
[3] SK 301P or SK 311P version
[4] SK 302P or SK312P version, connection via M12 plug connector (in preparation)

● Available as standard
○ Optional
❍ Not available

		NORDAC *ON* SK 30xP	NORDAC *ON* SK 30xP	NORDAC *ON+* SK 31xP	NORDAC *ON PURE* SK 350P
	Power	0.5 – 0.6 hp	0.5 – 5. hp	0.5 – 5.0 hp	0.5 – 2.0 hp
	Size	1	2 – 3	2 – 3	2 – 3
Interfaces and Connections	DIN and DOUT via M12 plug	● [1]	● [2]	● [3]	❍
	Mains input (3-phase 400 V) with integrated 24 V DC via plug connector	●	●	●	●
	Mains output / daisy chain (3~ 400 V) with integrated 24 V DC via plug connector	●	●	●	●
	Thermostats (PTC)	●	●	●	●
	RS485 encoder interface	❍	❍	●	●
	RS232 diagnostic interface	●	●	●	●
	TTL encoder interface (RS422)	❍	❍	○ [4]	❍

[1] 4 digital IOs, 2 of which can be parameterized as DIN or DOUT
[2] SK 300P: 4 DIN + 2 DOUT
SK 301P / SK 302P: 4 digital IOs, 2 of which can be parameterized as DIN or DOUT
[3] SK 310P: 4 DIN + 2 DOUT
SK 311P / SK 312P: 4 digital IOs, 2 of which can be parameterized as DIN or DOUT
[4] For wall mounting version only

● Available as standard
○ Optional
❍ Not available



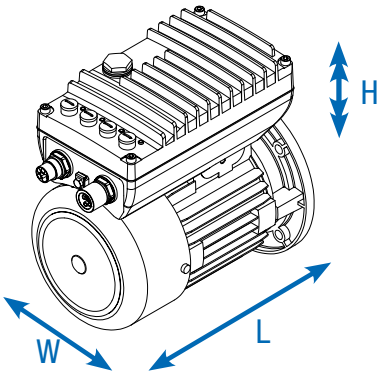
[1] Not NORDAC *ON PURE*

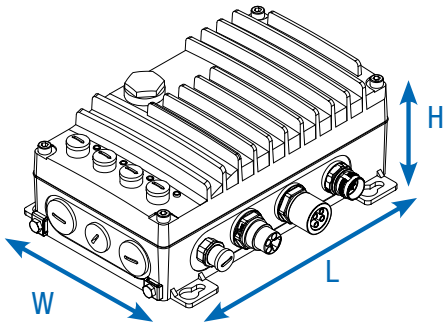
NORDAC *ON* SK 300P Variable Frequency Drive 3~400 … 480 V

Output Frequency	0.0 … 400.0 Hz
Pulse Frequency	3.0 … 16.0 kHz
Typical Overload Capacity	150% for 60 s 200% for 3.5 s 250% for 1 s, only for asynchronous motors
VFD Efficiency	approx. 95%
Ambient Temperature	-30°C … +40°C (S1) -30°C … +50°C (S3, 70% ED)
Protection Class	IP55, optional IP66 NORDAC *ON PURE* (in preparation) IP69/4X indoor use only NEMA type 1 (higher NEMA classifications on request)
Regulation and Control	Sensorless current vector control (ISD), linear V/f characteristic curve
Motor Temperature Monitoring	I^2t motor PTC / bimetallic switch
Leakage Current	< 16 mA

Variable Frequency Drive	Nominal Motor Power 400 V [kW]	Nominal Motor Power 480 V [hp]	Nominal Output Current rms [A]	Mains Voltage	Output Voltage	Size
SK 300P-360-340-A	0.37	0.50	1.2	3~ 380…480 V, -20% / +10%, 47…63 Hz	3~ 0 up to mains voltage	1
SK 3xxP-370-340-A	0.37	0.50	1.2			2
SK 300P-450-340-A	0.45	0.60	1.5			1
SK 3xxP-750-340-A	0.75	1.00	2.2			2
SK 3xxP-950-340-A	0.95	1.25	2.7			2
SK 3xxP-111-340-A	1.10	1.50	3.0			3
SK 3xxP-151-340-A	1.50	2.00	3.8			3
SK 30xP-191-340-A	1.90	2.50	4.3			3
SK 3xxP-221-340-A	2.20	3.00	5.2			3
SK 3xxP-301-340-A	3.00	4.00	7.2			3
SK 31xP-371-340-A	3.70	5.00	8.1			3







Variable Frequency Drive SK 3xxP …		Motor	Size	Weight [kg]	Weight [lbs]	Dimensions for Motor Mounting excl. Motor L x W x H	Size
SK 30xP	-360-340-A…-450-340-A	IE3	63 – 71	1.5	3.30	230 x 121 x 79 mm 9.06 x 4.76 x 3.11 in	1
	-370-340-A…-950-340-A	IE3	63 – 80	1.9	4.19	260 x 130 x 83 mm 10.24 x 5.12 x 3.27 in	2
	-111-340-A…-151-340-A	IE3	80 – 90	3.3	7.28	296 x 160 x 104 mm 11.65 x 6.30 x 4.09 in	3
	-191-340-A…-301-340-A	IE3	90 – 100	3.5	7.72	296 x 160 x 123 11.65 x 6.30 x 4.84 in	3
SK 31xP	-370-340-A…-950-340-A	IE3	63 – 80	1.9	4.19	251 x 130 x 97 9.88 x 5.12 x 3.82	2
	-370-340-A ... -950-340-A	IE5+	71	1.9	4.19	251 x 130 x 97 9.88 x 5.12 x 3.82	2
	-111-340-A ... -191-340-A	IE3	80 – 90	3.4	7.50	285 x 160 x 124 11.22 x 6.30 x 4.88	3
	-111-340-A ... -151-340-A	IE5+	90	3.4	7.50	285 x 160 x 124 11.22 x 6.30 x 4.88	3
	-221-340-A ... -371-340-A	IE3	90 – 100	3.6	7.94	304 x 160 x 144 11.97 x 6.30 x 5.67	3
	-221-340-A ... -371-340-A	IE5+	90	3.6	7.94	304 x 160 x 144 11.97 x 6.30 x 5.67	3
SK 35xP[1]	-370-340-A…-750-340-A	IE5+	71	–	–	277 x 133 x 122 10.91 x 5.24 x 4.80 in	2
	-111-340-A…-151-340-A	IE5+	90	–	–	307 x 160 x 146 12.09 x 6.30 x 5.75 in	3

Variable Frequency Drive SK 3xxP …		Weight [kg]	Weight [lbs]	Dimensions for wall mounting L x W x H	Size
SK 30xP/ SK 31xP	-360-340-A…-450-340-A	1.7	3.75	211 x 161 x 84 mm 8.31 x 6.34 x 3.31 in	1
	-370-340-A…-950-340-A	2.1	4.63	244 x 171 x 99 mm 9.61 x 6.73 x 3.90 in	2
	-111-340-A…-151-340-A	3.5	7.72	272 x 201 x 117 mm 10.71 x 7.91 x 4.61 in	3
	-191-340-A…-371-340-A	3.7	8.16	272 x 201 x 137 mm 10.71 x 7.91 x 5.39 in	3
SK 35xP[1]	-370-340-A…-750-340-A	–	–	260 x 184 x 111 mm 10.24 x 7.24 x 4.37 in	2
	-111-340-A…-151-340-A	–	–	290 x 214 x 134 mm 11.42 x 8.42 x 5.28 in	3

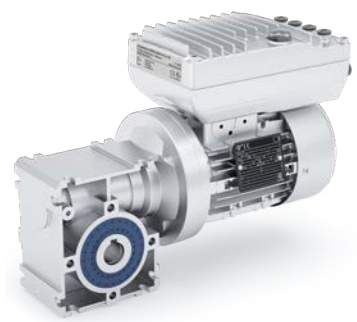
[1] In preparation

Functional Safety in Combination with Variable Frequency Drive and Motor

	PN [kW]	PN [hp]	n_N [r/min]	MN [Nm]	MN [lb-in]	System Overload 3s [%]	J [kgm²]	J [lb-ft²]	Motor	VFD Without Functional Safety
IE3 Asynchronous Motor with NORDAC *ON*	0.31	0.42	2.495	1.2	10.62	250	0.00033	0.00783	63 LP/4	SK 300P-360-340-…
	0.43	0.58	2.525	1.6	14.16	250	0.00086	0.02041	71 SP/4	SK 300P-450-340-…
	0.31	0.42	2.495	1.2	10.62	250	0.00033	0.00783	63 LP/4	SK 300P-370-340-…
	0.43	0.58	2.525	1.6	14.16	250	0.00086	0.02041	71 SP/4	SK 300P-750-340-…
	0.63	0.84	2.515	2.4	21.24	250	0.00110	0.02610	71 LP/4	SK 300P-750-340-…
	0.95	1.27	2.530	3.6	31.86	250	0.00145	0.03441	80 SP/4	SK 300P-950-340-…
	1.30	1.74	2.525	4.9	43.37	250	0.0019	0.04509	80 LP/4	SK 300P-151-340-…
	1.90	2.55	2.540	7.1	62.84	250	0.0034	0.08068	90 SP/4	SK 300P-221-340-…
	2.60	3.49	2.525	9.8	86.74	250	0.0039	0.09255	90 LP/4	SK 300P-301-340-…
	3.20	4.29	2.580	11.8	104.44	250	0.0074	0.17560	100 LP/4	SK 300P-371-340-…
IE5+ Permanent Magnet Synchronous Motor Non-Ventilated with NORDAC *ON+*	0.35	0.47	2.100	1.6	14.16	200	0.00019	0.00451	71 N1/8	SK 310P-370-340-…
	0.70	0.94	2.100	3.2	28.32	200	0.00038	0.00902	71 N2/8	SK 310P-750-340-…
	1.10	1.48	2.100	5.0	44.25	200	0.00090	0.02136	90 N1/8	SK 310P-111-340-…
	1.50	2.00	2.100	6.8	60.19	200	0.00110	0.61936	90 N2/8	SK 310P-151-340-…
IE5+ Permanent Magnet Synchronous Motor Ventilated with NORDAC *ON+*	0.50	0.67	2.400	2.0	17.70	200	0.00019	0.10702	71 F1/8	SK 310P-750-340-…
	1.00	1.34	2.400	4.0	35.40	200	0.00038	0.21405	71 F2/8	SK 310P-950-340-…
	1.50	2.00	2.400	6.0	53.10	200	0.00090	0.50688	90 F1/8	SK 310P-151-340-…
	2.20	2.95	2.400	8.8	77.89	200	0.00132	0.03132	90 F2/8	SK 310P-221-340-…
	3.00	4.00	2.400	11.9	105.32	200	0.00176	0.04177	90 F3/8	SK 310P-301-340-…
	3.70	5.00	2.400	14.7	130.11	200	0.00220	0.05221	90 F4/8	SK 310P-371-340-…
IE5+ Permanent Magnet Synchronous Motor Non-Ventilated with NORDAC *ON PURE*	0.35	0.47	2.100	1.6	14.16	200	0.00019	0.00451	71 N1/8	SK 350P-370-340-…
	0.70	0.94	2.100	3.2	28.32	200	0.00038	0.00902	71 N2/8	SK 350P-750-340-…
	1.10	1.48	2.100	5.0	44.25	200	0.00090	0.02136	90 N1/8	SK 350P-111-340-…
	1.50	2.00	2.100	6.8	60.19	200	0.00110	0.02610	90 N2/8	SK 350P-151-340-…

	PN [kW]	PN [hp]	n_N [r/min]	MN [Nm]	MN [lb-in]	System Overload 3s [%]	J [kgm²]	J [lb-ft²]	VFD With Functional Safety STO, SS1-t	VFD With Functional Safety PROFIsafe, FSoE, STO, SS1-t, SS1-r, SLS, SLS-Max-Limit, SSM, SMS
IE3 Asynchronous Motor with NORDAC *ON*	0.31	0.42	2.495	1.2	10.62	250	0.00033	0.00783	SK 301P-370-340-…	SK 302P-370-340-…
	0.43	0.58	2.525	1.6	14.16	250	0.00086	0.02041	SK 301P-750-340-…	SK 302P-750-340-…
	0.63	0.84	2.515	2.4	21.24	250	0.00110	0.02610	SK 301P-750-340-…	SK 302P-750-340-…
	0.95	1.27	2.530	3.6	31.86	250	0.00145	0.03441	SK 301P-950-340-…	SK 302P-950-340-…
	1.30	1.74	2.525	4.9	43.37	250	0.0019	0.04509	SK 301P-151-340-…	SK 302P-151-340-…
	1.90	2.55	2.540	7.1	62.84	250	0.0034	0.08068	SK 301P-221-340-…	SK 302P-221-340-…
	2.60	3.49	2.525	9.8	86.74	250	0.0039	0.09255	SK 301P-301-340-…	SK 302P-301-340-…
	3.20	4.29	2.580	11.8	104.44	250	0.0074	0.17560	SK 301P-371-340-…	SK 302P-371-340-…
IE5+ Permanent Magnet Synchronous Motor Non-Ventilated with NORDAC *ON+*	0.35	0.47	2.100	1.6	14.16	200	0.00019	0.00451	SK 311P-370-340-…	SK 312P-370-340-…
	0.70	0.94	2.100	3.2	28.32	200	0.00038	0.00902	SK 311P-750-340-…	SK 312P-750-340-…
	1.10	1.48	2.100	5.0	44.25	200	0.00090	0.02136	SK 311P-111-340-…	SK 312P-111-340-…
	1.50	2.00	2.100	6.8	60.19	200	0.00110	0.61936	SK 311P-151-340-…	SK 312P-151-340-…
IE5+ Permanent Magnet Synchronous Motor Ventilated with NORDAC *ON+*	0.50	0.67	2.400	2.0	17.70	200	0.00019	0.10702	SK 311P-750-340-…	SK 312P-750-340-…
	1.00	1.34	2.400	4.0	35.40	200	0.00038	0.21405	SK 311P-950-340-…	SK 312P-950-340-…
	1.50	2.00	2.400	6.0	53.10	200	0.00090	0.50688	SK 311P-151-340-…	SK 312P-151-340-…
	2.20	2.95	2.400	8.8	77.89	200	0.00132	0.03132	SK 311P-221-340-…	SK 312P-221-340-…
	3.00	4.00	2.400	11.9	105.32	200	0.00176	0.04177	SK 311P-301-340-…	SK 312P-301-340-…
	3.70	5.00	2.400	14.7	130.11	200	0.00220	0.05221	SK 311P-371-340-…	SK 312P-371-340-…

SK 302P and SK 312P in preparation



NORDAC *ON* SK 30xP



NORDAC *ON PURE* SK 35xP



NORDAC *ON+* SK 31xP

NORDAC *ON / ON+* Options

Internal Braking Resistors

Internal braking resistors are intended for applications in which slight, very brief braking is to be expected.

Internal braking resistors cannot be retrofitted and must be accounted for in the order. For thermal reasons, the rated continuous output is limited to 25%.

Variable Frequency Drive		Wall Mounting	Motor Assembly	Resistance [Ω]	Continuous Output[1] [W]	Power Consumption[1] Emax [kWs]	Size
SK 30xP	-370-340-A to -950-340-A	●	●	400	20	0.9	2
	-111-340-A to -371-340-A	●	●	300	40	1.3	3
SK 31xP	-370-340-A to -950-340-A	●	●	400	20	0.9	2
	-111-340-A to -371-340-A	●		300	40	1.3	3
	-111-340-A to-151-340-A		●	400	20	0.9	3
	-221-340-A to -371-340-A		●	200	40	2.0	3
SK 35xP	-370-340-A to -750-340-A	●	●	400	20	0.9	2
	-111-340-A to -151-340-A	●		300	40	1.3	3
	-111-340-A to -151-340-A		●	200	20	0.9	3

[1] Permissible continuous power of the braking resistor: 25% of the nominal power
[2] Once within 10 s

External Braking Resistors

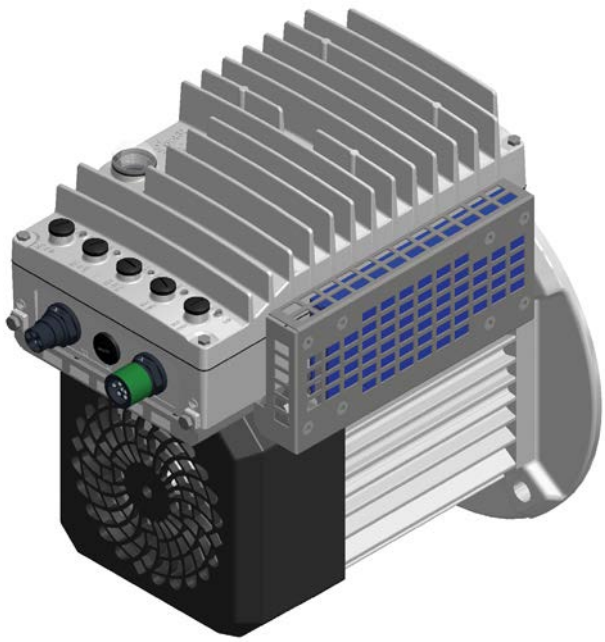
External braking resistors are intended for applications with low braking energy and feature fully available nominal continuous power. External braking resistors cannot be retrofitted and must be taken into account in the order. The attachment increases the motor width dimensions by 25 mm.

Available on request.

Variable Frequency Drive		Motor	Size	Resistance [Ω]	Continuous Output[1] [W]	Power Consumption[1] Emax [kWs]	Size
SK 30xP	-370-340-A ... -950-340-A	IE3	80	400	150	3.3	2
	-111-340-A ... -371-340-A	IE3	80/90	300	150	3.3	3
SK 31xP	-370-340-A ... -950-340-A	IE5+	71	400	150	3.3	2
	-111-340-A ... -371-340-A	IE5+	90	300	150	3.3	3

[1] Permissible continuous power of the braking resistor: 25% of the nominal power
[2] Once within 10 s





NORDAC *ON* / *ON+* Options

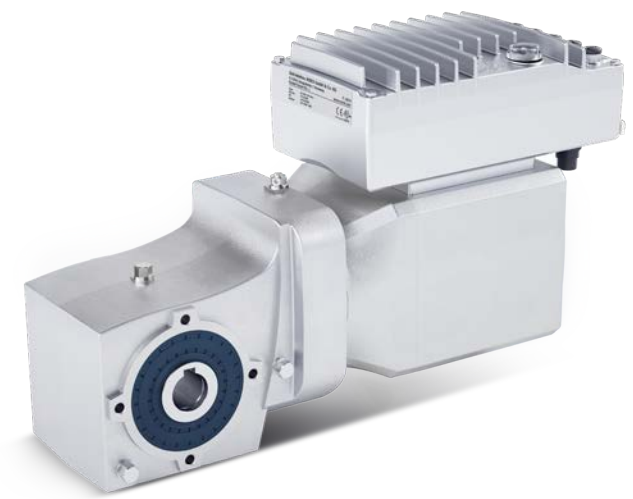
Functional Safety

NORDAC *ON* and NORDAC *ON+* VFDs in sizes 2 and 3 can be configured with the functional safety option.

Available in the following devices:
SK 301P, SK 302P[1], SK 311P, SK 312P[1]

Variable Frequency Drive	Functional Safety	IOs	Remarks
SK 301P SK 311P	Safety subfunctions (stop functions): STO - PLe / SIL 3 SS1-t - PLd / SIL 2	1 safe DIN – PL d / SIL 2	Functional safety: 2-channel connection
SK 302P SK 312P	Safety subfunctions STO – PLe / SIL 3 SS1-t – PLe / SIL 3 SS1-r – PL d / SIL 2 (Monitoring functions) SLS – PL d / SIL 2 SLS-Max-Limit – PL d / SIL 2 SSM – PL d / SIL 2 SMS – PL d / SIL 2	2 safe DINs – PL e / SIL 3 2 safe DOUTs – PL e / SIL 3	Fail-safe communication via PROFIsafe and FSoE (CIP in preparation) Functional safety: 2-channel connection

[1] In preparation



Encoderless Control

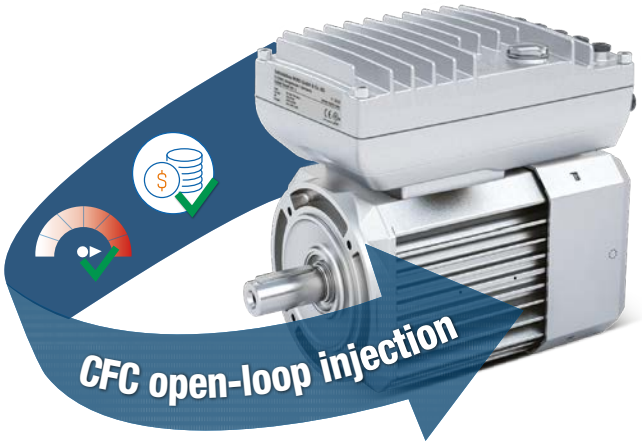
With the innovative CFC open-loop injection method, NORD offers powerful motor control for synchronous motors (PMSM) – entirely without an encoder.

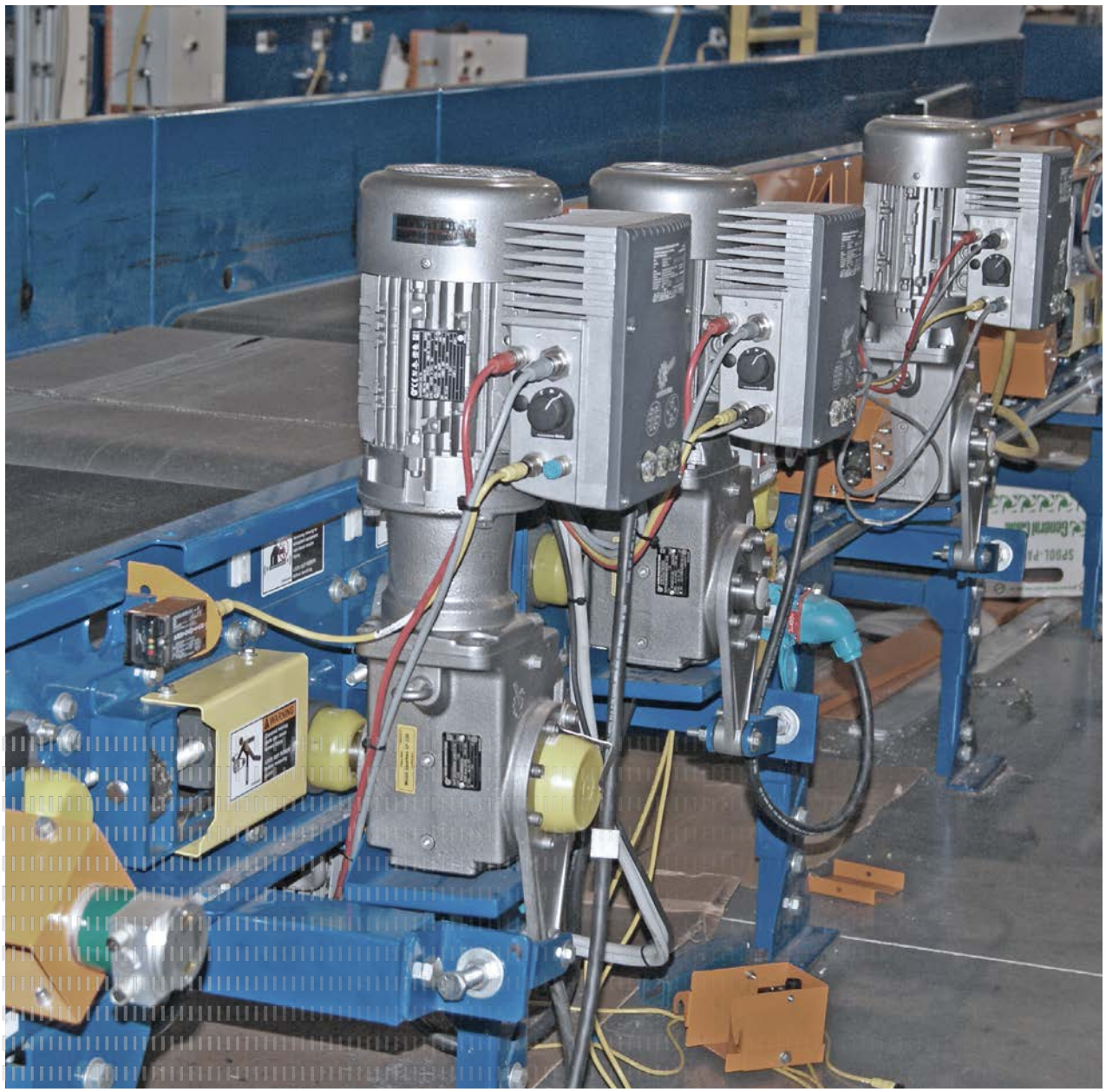
- The injection method enables performance comparable to closed-loop controls with an encoder, allowing for precise control and high efficiency without additional sensors.

Highlights

- **Reduced Costs** – Saves material and installation costs as no encoder, cable, or connection is required
- **Compact Installation Space** – Compact, low-weight design for space-saving installation
- **Simplified Installation and Commissioning** – Complete Plug-and-Play solution with minimum parameterization effort
- **Increased Robustness** – Elimination of sensitive sensors
- **More Interfaces** – As no encoder interface is provided, more connection options remain available on the device
- **Excellent Dynamics** – Ideal for applications with frequent load changes and high performance requirements such as conveyor technology, packaging, production, and more
- **Sustainability** – Maximum energy efficiency (particularly in the partial load range) and reduced use of materials

Find more information on CFC open-loop injection control







NORDAC *LINK* Field Distributor for Decentralized Applications

Variable Frequency Drive SK 250E-FDS,
Motor Starter SK 155E-FDS

NORD®
DRIVESYSTEMS

Easy Connection
NORDAC *LINK*, SK 250E-FDS and SK 155E-FDS Series

NORDAC *LINK*
Variable Frequency Drive

NORDAC *LINK*
Motor Starter



General conveyor technology and intralogistics require drive control systems that can be installed quickly and are easy to access during operation or if maintenance is required. The NORDAC *LINK* field distribution system supplements the NORD DRIVESYSTEMS product range and provides drive control that can be installed close to the motor. System costs can be significantly reduced thanks to the decentralized drive technology.

- Flexible configuration and function – freely configurable according to requirements and the application
- Available as frequency drives (up to 7.5 kW / 10.0 hp) and motor starters (up to 3.0 kW / 4.0 hp)
- Fast commissioning due to simple operation
- Simple and reliable plug-in capability
- Simplified system maintenance due to integrated maintenance switch and local manual control facility
- Can be integrated into all common bus systems







Size	Motor Starters	Variable Frequency Drives	Variable Frequency Drives
0	up to 0.75 kW / 1.0 hp	up to 0.75 kW / 1.0 hp	-
1	up to 3.0 kW / 4.0 hp	up to 3.0 kW / 4.0 hp	-
2	-	-	up to 7.5 kW / 10.0 hp

NORDAC *LINK*
Extensive Basic Equipment

▸ Monitoring of load torque depending on the output frequency ▸ Individual adaptation of load monitoring to protect the system from overload Available in all VFDs from SK 250E and higher	Load monitor
▸ High efficiency in partial load operation ▸ Reduced operating costs due to energy savings of up to 60% ▸ Simple setting Available in all VFDs from SK 250E and higher	Energy-saving function
▸ High-precision current vector control for rapid and precise load take-up ▸ Integrated brake chopper to divert generated energy to a brake resistor (braking resistor optional) ▸ Brake management for optimum control of an electro-mechanical holding brake Available in all VFDs from SK 250E and higher	Lifting gear functions
▸ Feedback and evaluation of actual values for implementation of closed circuit control e.g. flow or compensator control ▸ P and I components can be set separately Available in all VFDs from SK 250E and higher	Process controller, PI controller
▸ Control of one or more follower VFD by a master VFD ▸ Communication via USS or CANopen® with control word and setpoint values Available in all VFDs from SK 250E and higher	Master / Follower operation
▸ High-precision speed regulation ▸ Direct feedback of the actual speed characteristics to the VFD allows: ▸ Highest possible acceleration ▸ Full torque down to standstill (speed 0) ▸ Digital speed controller with wide range of settings Available in all VFDs from SK 250E and higher	Encoder feedback (Servo Mode)
▸ Simple adaptation to control systems through optional interfaces ▸ Quick and simple diagnosis via easily visible LED indicators ▸ Various control boxes available for display, operation, and parameterization ▸ Simple operation, parameterization through parameter structure and intuitive layout of control elements Available in all VFDs from SK 250E and higher	Handling and communication
▸ Bus systems – NORD supports all common bus systems to enable simple installation in the system design	Bus systems
▸ Functional safety - STO, SS1: Integrated, TÜV-certified safety functions simplify system design Available for SK 260E and SK 280E VFDs	Functional safety
▸ Functional safety in bus communication with PROFIsafe, integrated, and TÜV-certified safety functions (SLS, SSR, SDI, SOS, SSM), connection and evaluation of a fail-safe SIN/COS encoder possible, 2 safe digital inputs (SI) and outputs (SO), max. 100 Mbaud, conformance class B and C, this option cannot be integrated later and must be specified during ordering Available for SK 260E and SK 280E VFDs in combination with SK CU4-PNS	Functional safety in bus communication

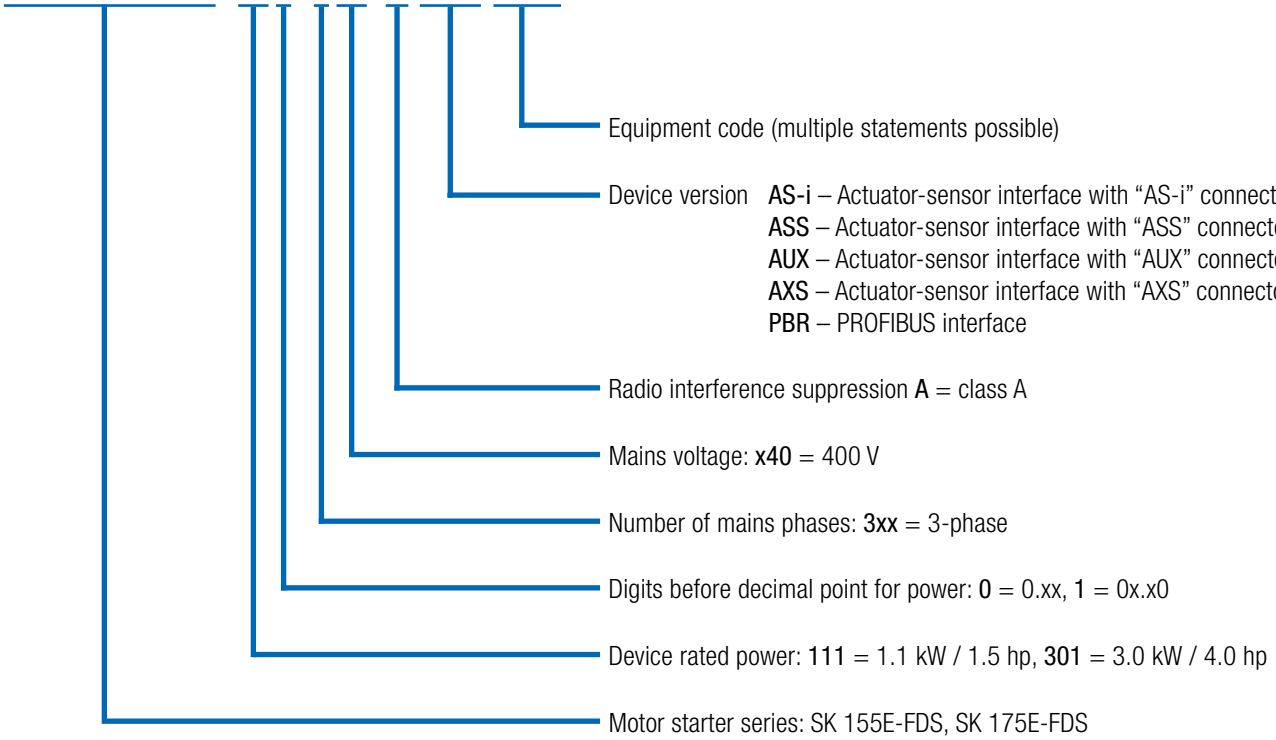
Standards and Approvals
Type Code

Motor Starter Field Distributor

All drives of the series comply with the standards and directives listed below.

Approval	Directive	Applied Standards	Certificates	Code
CE (European Union)	Low Voltage Directive 2014/35/EU EMC 2014/30/EU RoHS 2011/65/EU Delegated directive (EU) 2015/863	EN 60947-1 EN 60529 EN 60947-4-2 EN 630001	C310801	CE
UL (USA)		UL 60947-1 UL 60947-4-2	E365221	c UL us LISTED
CSA (Canada)		C22.2 No.60947-1-13 C22.2 No.60947-4-2-14	E365221	
RCM (Australia)	F2018L00028	EN 60947-1 EN 60947-4-2	133520966	
EAC (Eurasia)	TR CU 004/2011, TR CU 020/2011	IEC 60947-1 IEC 60947-4-2	ЕАЭС N RU Д-DE. HB27.B. 02731/20	EAC
UkrSEPRO (Ukraine)		EN 60947-1 EN 60529 EN 60947-4-2 EN 63000 EN 60947-1 EN 60947-4 EN 61558-1 EN 50581	C311900	
UKCA (United Kingdom)		EN 60947-1 EN 60529 EN 60947-4-2 EN 63000 EN 61800-9-1 EN 61800-9-2	C350801	UK CA

SK 175E-FDS-301-340-A-AXS(-xxx)

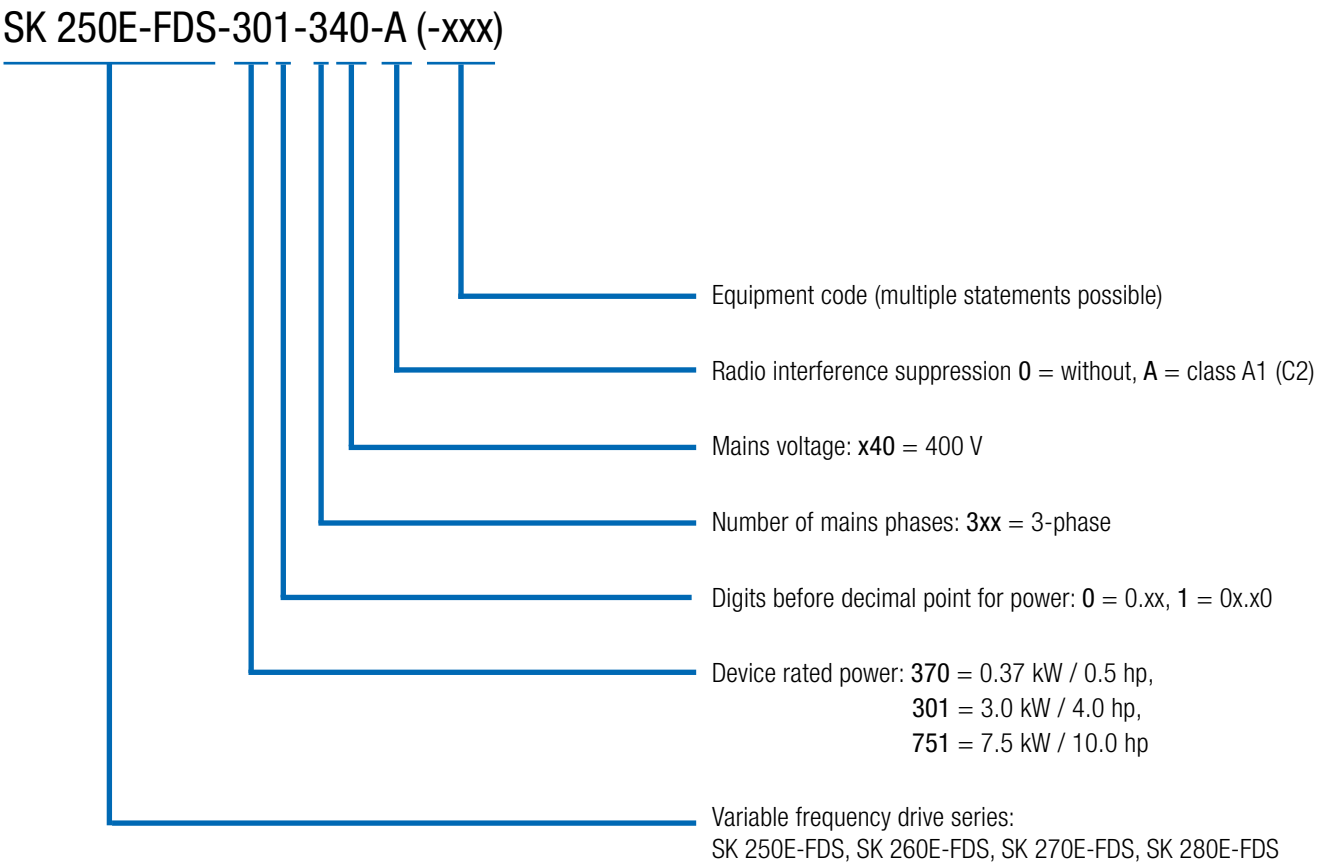


Standards and Approvals
Type Code

Field Distributor Variable Frequency Drive

All drives of the series comply with the standards and directives listed below.

Approval	Directive	Applied Standards	Certificates	Code
CE (European Union)	Low Voltage Directive 2014/35/EU EMC 2014/30/EU RoHS 2011/65/EU Delegated directive (EU) 2015/863 Ecodesign 2009/125/EG Regulation (EU) Ecodesign 2019/1781	EN 61800-5-1 EN 60529 EN 61800-3 EN 63000 EN 61800-9-1 EN 61800-9-2	C310701	CE
UL (USA)		UL 61800-5-1	E171342	c UL us LISTED
CSA (Canada)		C22.2 No274-13	E171342	
RCM (Australia)	F2018L00028	EN 61800-3	133520966	
EAC (Eurasia)	TR CU 004/2011, TR CU 020/2011	IEC 61800-5-1 IEC 61800-3	ЕАЭС N RU Д-DE. HB27.B.02725/20	EAC
UkrSEPRO (Ukraine)		EN 61800-5-1 EN 60529 EN 61800-3 EN 63000 EN 60947-1 EN 60947-4 EN 61558-1 EN 50581	C311900	
UKCA (United Kingdom)		EN 61800-5-1 EN 60529 EN 61800-3 EN 63000 EN 61800-9-1 EN 61800-9-2	C350900	UK CA


SK 250E-FDS-301-340-A (-xxx)
Equipment code (multiple statements possible)
Radio interference suppression 0 = without, 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
Device rated power: 370 = 0.37 kW / 0.5 hp,
301 = 3.0 kW / 4.0 hp,
751 = 7.5 kW / 10.0 hp
Variable frequency drive series:
SK 250E-FDS, SK 260E-FDS, SK 270E-FDS, SK 280E-FDS

AS-Interface

Modern Automation Systems

Modern automation systems have a wide range of requirements and in order to ensure efficient operation, require a specific bus system and drive components.

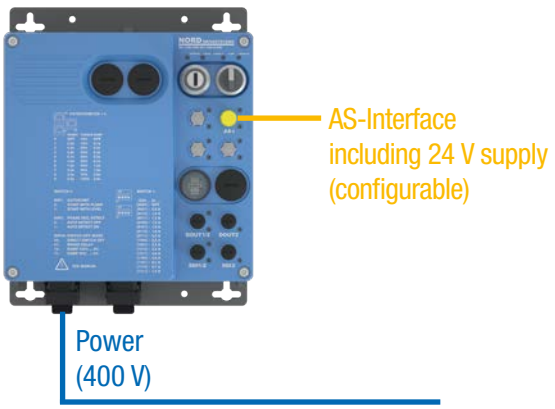
AS-Interface

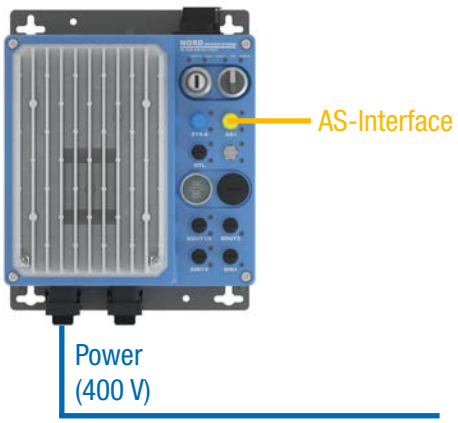
The AS-Interface is a cost-effective solution that enables the networking of binary sensors and actuators for the lower field level. NORDAC *LINK* can be configured with an AS-Interface to provide special versions for this price-sensitive area.

The drive supply voltage is connected separately via corresponding plugs and the control voltage, depending on the version of the drive, is generated either via an integrated power supply unit or supplied separately with the yellow AS-Interface cable. This eliminates the need for an additional AUX cable (black).

The type of addressing possible (standard or A/B follower) also depends on the version of the device. The “ASI” and “AUX” variants are designed as double followers with the VFD. With the double followers, there are two physical A/B followers in the device which can be configured for extended data transfer according to the CTT2 protocol. Additional IO bits (1 x BUS IN + 2 x BUS OUT) are available for the extended data transfer.

Available in the following devices:
SK 155E-FDS-...-ASI,
SK 175E-FDS-...-ASI,
SK 270E-FDS,
SK 280E-FDS





PROFIBUS DP®

This bus system allows for cyclic exchange of 4 control or 4 status bits via a process data object (with up to 12 Mbps). Addressing is performed via a rotary encoding switch. The PROFIBUS® termination resistor can be set via a standard M12 termination resistor. Connection is made with M12 plug connectors.

Available in all SK 175E ... ASI devices

Variant	Follower Profile	Follower Type	Control Voltage	Inputs/Outputs	Configuration via Parameters
-ASI	S-7.A	A/B-Follower	Yellow AS-I cable	4I/40 + 1I/20[1]	●
-AUX	S-7.A	A/B-Follower	Black AS-I cable	4I/40 + 1I/20[1]	●
-AXS	S-7.0	Standard	Black AS-I cable	4I/40	●

[1] Additionally available I/Os for configuration of CTT2 protocol (only available with variable frequency drives)

The Entire Team
All Device Versions at a Glance

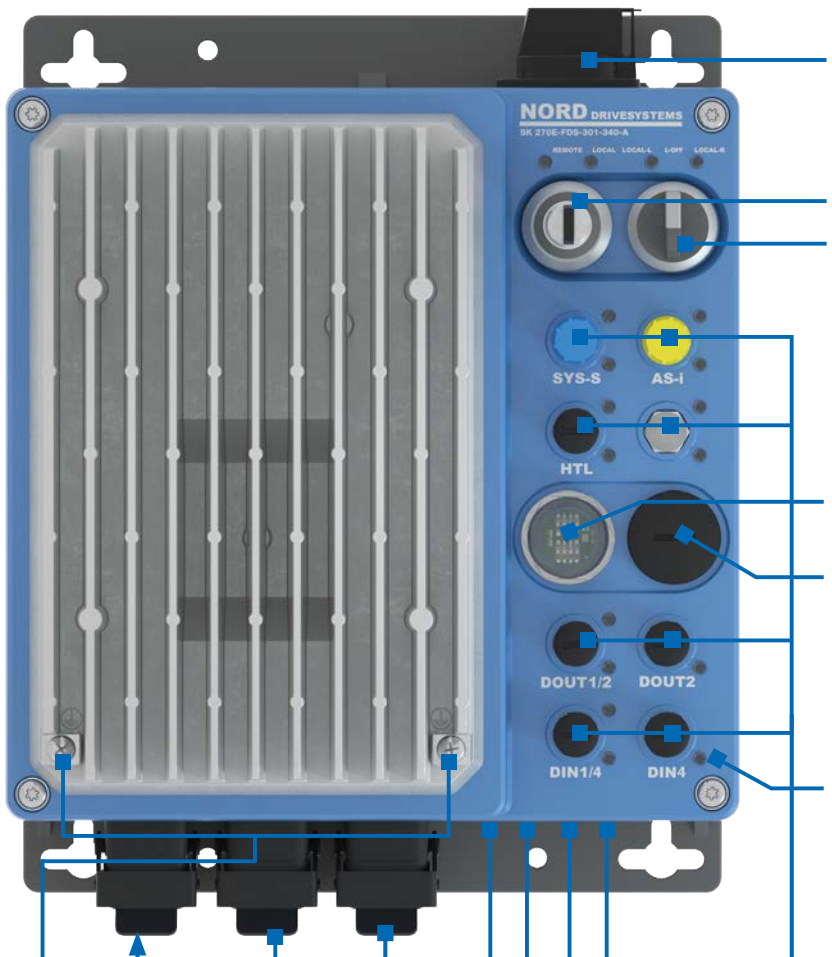
	SK 155E-FDS	SK 175E-FDS	SK 250E-FDS	SK 260E-FDS	SK 270E-FDS	SK 280E-FDS
	Motor Starters 0.1 – 4.0 hp		Variable Frequency Drives 0.5 – 10.0 hp			
Plug connection of mains, motor, and control cables	●	●	●	●	●	●
Energy bus – loop-through of mains supply cables	○	○	○	○	○	○
Repair/maintenance switch	○	○	○	○	○	○
Sensorless current vector control (ISD control)	❍	❍	●	●	●	●
Brake chopper (brake resistor optional)	❍	❍	●	●	●	●
RS-232/ RS-485 parameterization and diagnostic interface (optional USB)	●	●	●	●	●	●
4 parameter sets, which can be switched over during operation	❍	❍	●	●	●	●
Parameters pre-set with standard values	●	●	●	●	●	●
Automatic determination of motor data	❍	❍	●	●	●	●
Energy-saving function, optimized efficiency in partial load operation	❍	❍	●	●	●	●
Integrated EMC line filters	according to EN 55011: Class A up to 20 m motor cable		according to EN 61800-3: Category C2 up to 10 m[1] motor cable			
Drive unit monitoring function, including motor monitoring, motor thermistor evaluation	●	●	●	●	●	●
Reversing function	❍	●	●	●	●	●
PI controller	❍	❍	●	●	●	●
Process controller / compensator control	❍	❍	●	●	●	●
Speed control (closed loop) with incremental encoder (HTL)	❍	❍	●	●	●	●
POSICON positioning with incremental encoder (HTL) or absolute encoder (CANopen®)	❍	❍	●	●	●	●
PLC functionality	●	●	●	●	●	●
Synchronous motor operation (PMSM)	❍	❍	●	●	●	●
Modification for operation in IT network[2]	●	●	●	●	●	●
Plug-in parameter storage (EEPROM) for additional data backup	❍	❍	○	○	○	○
All common field bus systems	❍	❍	○	○	○	○
Brake management for mechanical holding brake	○	○	○	○	○	○
Lifting gear functionality	❍	❍	○	○	○	○
Safe Stop function (STO, SS1)	❍	❍	❍	●	❍	●
Torque control and limitation	❍	❍	●	●	●	●
AS-Interface on board	❍	○[3]	❍	❍	●	●
PROFIBUS DP® on board	❍	○[3]	❍	❍	❍	❍
Internal 24 V power supply unit to supply the control board	○	○	○	○	○	○
Internal / external braking resistors	❍	❍	○	○	○	○
Local control elements (e.g. switches, key switches)	○	○	○	○	○	○

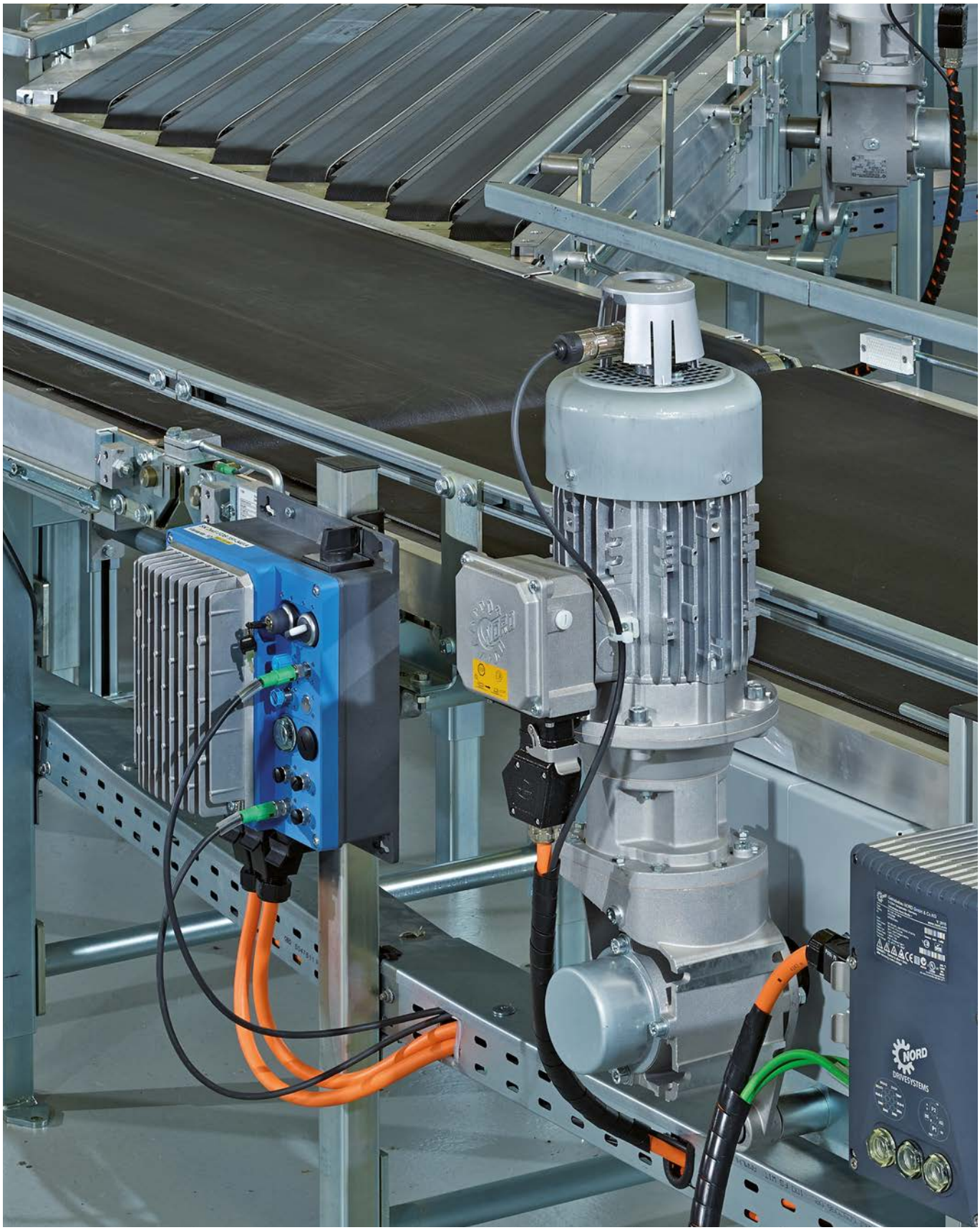
[1] Cable-bound transmission only
[2] Must be taken into account for the order
[3] Either AS-Interface or PROFIBUS® DP

● Available as standard
○ Optional
❍ Not available

		SK 155E-FDS	SK 175E-FDS	SK 250E-FDS	SK 260E-FDS	SK 270E-FDS	SK 280E-FDS
		Motor Starters 0.1 – 4.0 hp		Variable Frequency Drives 0.5 – 10.0 hp			
Interfaces and Connections	Number of digital inputs	3 (+2 sensor inputs for bus)[2]		5+2[1,2]			
	Number of analog inputs	❍	❍	2[1]	2[1]	2[1]	2[1]
	Number of digital outputs	2	2	2	2	2	2
	Temperature sensor (PTC)	1	1	1	1	1	1
	CANopen®	❍	❍	●	●	●	●
	RS485 encoder interface	❍	❍	●	●	●	●
	RS232 diagnostic interface	●	●	●	●	●	●

[1] Alternatively the analog inputs can also be used as digital inputs (not PLC-compatible)
[2] If necessary, individual inputs can be defined at the factory by the use of certain optional modules

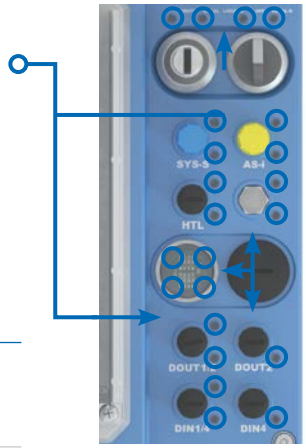



NORD
DRIVESYSTEMS

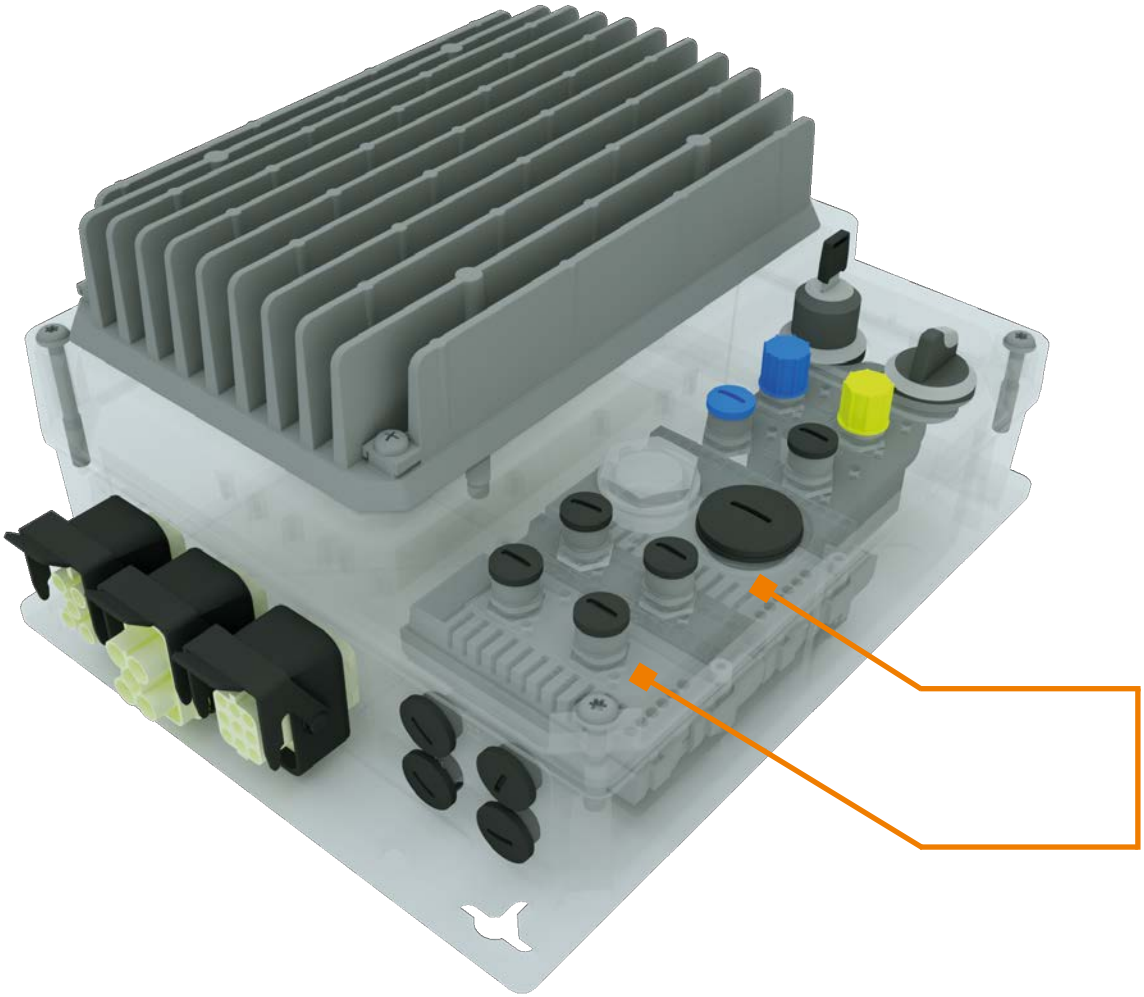
LED Status Indicators
Use / Meaning

The variable frequency drive is equipped with LED indicator lights. These are used to indicate the signal statuses of the relevant option slot.

One option slot is closed with a transparent screw cap. The LED status indicator lights, which are installed in this option slot, act as diagnostic LEDs and are always visible.



LED Indicators	Use/Meaning
Yellow - Single color - Static	Indication of the signal status (ON / OFF) or the associated function of the IOs.
Red/Green - Single or dual color - Static or dynamic	Indication of the operating statuses on the VFD or communication level.



Can be extended with a maximum of two further option modules (SK CU4)

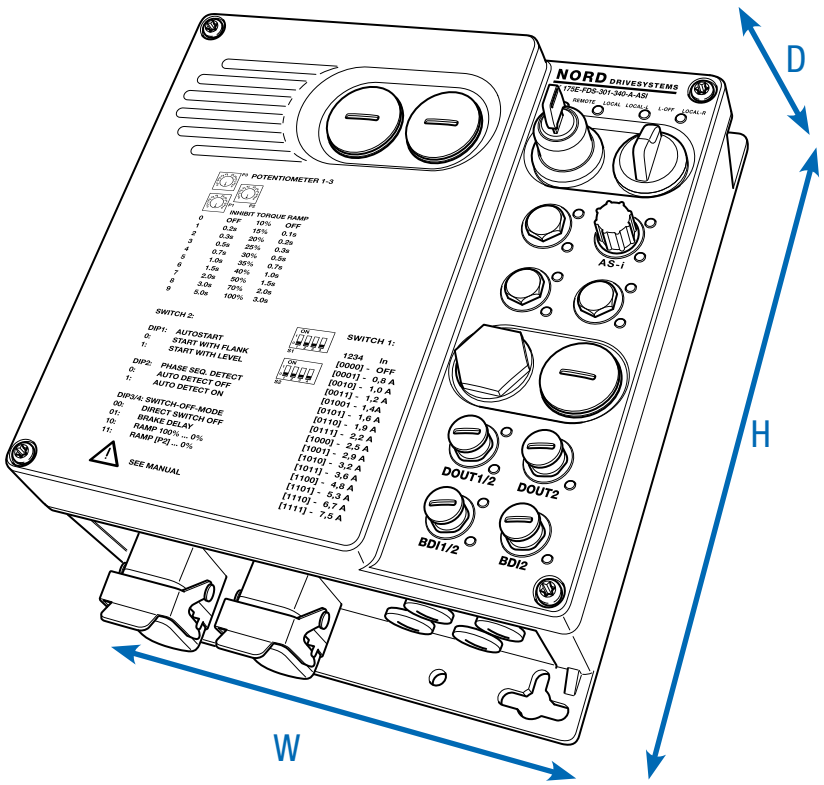
NORDAC *LINK* Motor Starter
3~ 380 ... 500 V

Typical Overload Capacity	150% for 9 s up to 170 s (adjustable (shut-down class 5, 10 A, 10))
Energy Efficiency Class	IE2
Motor Starter Efficiency	> 98%
Ambient Temperature	-25°C...+50°C (S1)
Protection Class	IP65 NEMA Type 1

Protective Measures Against	▸ Mains phase failure ▸ Motor phase failure ▸ Flux monitoring ▸ Motor over temperature (PTC) ▸ Motor overload ▸ Mains over/under voltage
Motor Temperature Monitoring	I^2t Motor PTC / bi-metal switch
Leakage Current	< 20 mA

Motor Starter SK 155E-FDS... / SK 175E-FDS...	Nominal Motor Power [kW]	[hp]	Nominal Output Current rms [A]	Line Voltage/ Output Voltage	Weight	Size	Overall Dimensions H x W x D
-111-340-B	up to 1.1	up to 1.5	3.2	3~ 380 V … 500 V, -20% / +10%, 47 ... 63 Hz	approx. 3 kg / 6.6 lbs	0	312[1] x 243 x 104[2] mm 12.28[1] x 9.56 x 4.09[2] in
-301-340-B	up to 3.0	up to 4.0	7.5		approx. 3 kg / 6.6 lbs	1	312[1] x 243 x 104[2] mm 12.28[1] x 9.56 x 4.09[2] in

[1] Without maintenance switch H=307 mm / 12.09 in
[2] With key switch and key inserted D=125 mm / 4.92 in

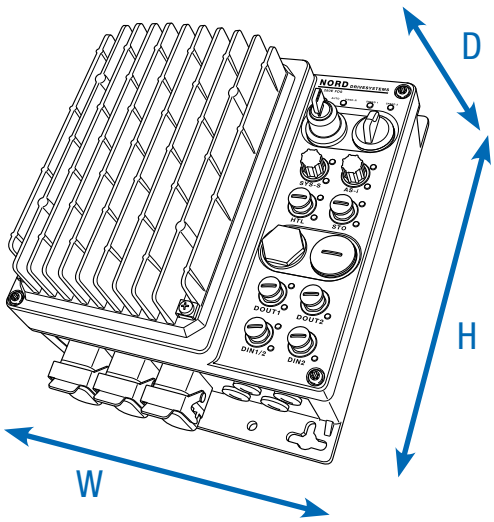


NORDAC *LINK* Variable Frequency Drive 3~ 380 ... 500 V

Output Frequency	0.0 ... 400.0 Hz
Pulse Frequency	3.0 ... 16.0 kHz
Typical Overload Capacity	150% for 60 s, 200% for 3.5 s
Energy Efficiency Class	IE2
VFD Efficiency	> 95%
Ambient Temperature	-25°C ... +40°C (S1)

Protection Class	IP65 devices up to 2.0 hp, without -FANO option (heat sink with mounted fan) IP55 devices of 3.0 hp and higher, devices <3.0 hp, with -FANO option NEMA Type 1
Regulation and Control	Sensorless current vector control (ISD), linear V/f characteristic curve
Motor Temperature Monitoring	I^2t Motor PTC / bi-metal switch
Leakage Current	< 30 mA

Variable Frequency Drives SK 2xxE-FDS...	Nominal Motor Power 400 V [kW]	480 V [hp]	Nominal Output Current rms [A]	Line Voltage/ Output Voltage	Weight [kg]	[lbs]	Overall Dimensions H x W x D	Size
-370-340-A	0.37	0.50	1.1	3 ~ 380...500 V, -20% / +10%, 47 ... 63 Hz 3 ~ AC 0 V up to mains voltage	3.8	8.4	312 x 243 x 130 mm 12.28 x 9.56 x 5.11 in	0
-550-340-A	0.55	0.75	1.7		4.6	10.1		1
-750-340-A	0.75	1.00	2.3		4.6	10.1		1
-111-340-A	1.10	1.50	3.1		4.6	10.1	312 x 243 x 175[1] mm 12.28 x 9.56 x 6.88 in	1
-151-340-A	1.50	2.00	4.0		4.6	10.1		1
-221-340-A	2.20	3.00	5.5		4.8	10.6		1
-301-340-A	3.00	4.00	7.0		4.8	10.6		1
-401-340-A	4.00	5.00	8.9		6.8	15	312 x 358 x 184 mm 12.28 x 14.09 x 7.24 in	2
-551-340-A	5.50	7.00	11.7		6.8	15		2
-751-340-A	7.50	10.0	15.0		6.8	15		2



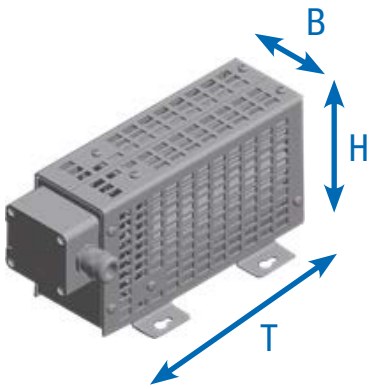
[1] Devices up to 1.5 kW / 2.0 hp power, without -FANO option (fan on heat sink) D=155

Brake Resistors for Dynamic Drive Characteristics

Chassis Braking Resistors, SK BRW5

The chassis braking resistor elements are integrated into a housing cage and must be connected to the VFD via a separate connecting cable. They must be mounted horizontally using a shielded cable that is as short as possible.

Chassis brake resistors have Protection Class IP65.



Variable Frequency Drives SK 2xxE-FDS ...	Resistor Type Material No.	Resistance [Ω]	Continuous Output [W]	Short-Term Power [kW][1]	Overall Dimensions L x W x H
0.55 … 2.2 kW 0.75 … 3.0 hp	SK BRW5-1-300-225 278 281 070	300	225	4	245 x 120 x 123 mm 9.64 x 4.72 x 4.84 in
3.0 … 7.5 kW 4.0 … 10.0 hp	SK BRW5-2-150-450 278 281 071	150	450	8	405 x 120 x 123 mm 4.13 x 4.72 x 4.84 in
Temperature monitoring for SK BRW5 resistors integrated (2 terminals 4 mm)			Bimetallic switch as opener Nominal switching temperature: 180°C		

[1] Once within 120 s, or a maximum duration of 1.2 s

External Braking Resistors

External braking resistors are intended for applications with low braking energy and offer full availability of nominal continuous power. External braking resistors cannot be retrofitted and must be taken into account when ordering. The attachment increases the frequency drive's width by 44 mm.

Available on request



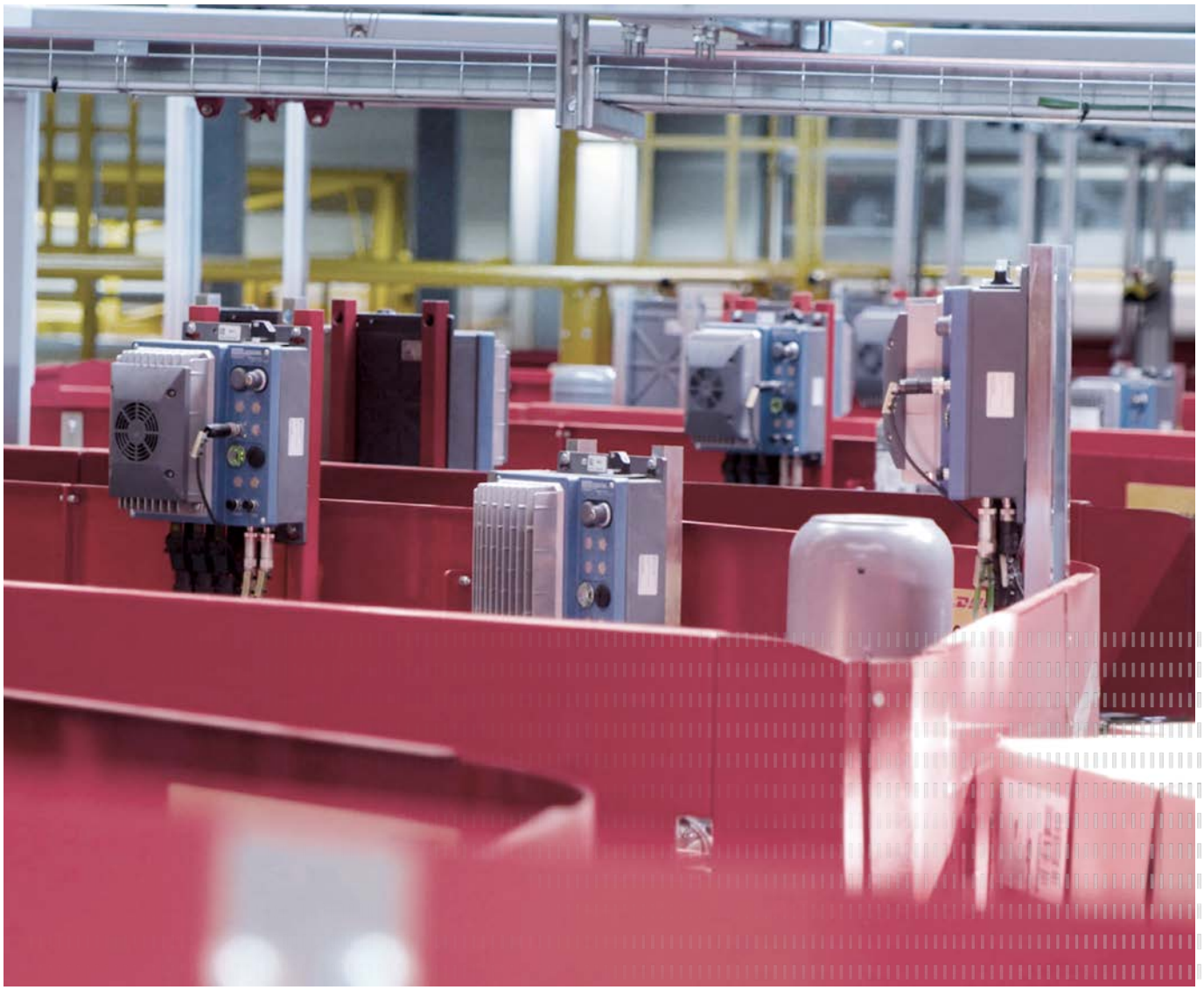
Internal Braking Resistors

Internal brake resistors are intended for applications in which slight or brief braking (e.g. continuous conveyor equipment, mixing equipment) is to be expected. They effectively enable the use of the VFD in very confined spaces or in explosive atmospheres

Internal brake resistors cannot be retrofitted and must be taken into account when ordering. For thermal reasons, the rated continuous output is limited to 25%.

Variable Frequency Drives SK 2xxE-FDS-...	Resistance [Ω]	Continuous Power Pn [W]	Power Consumption[1] Pmax [kWs]
… 750-340-	400	100	1.0
… 151-340- bis … 301-340-	400	100	1.0
… 401-340- bis … 751-340-	200	200	2.0

[1] Maximum once within 10s




F8W00610



Variable Frequency Drives for Decentralized Applications

NORDAC *FLEX* SK 200E Series

NORD®
DRIVESYSTEMS

Master of Adaptation
NORDAC *FLEX*, SK 200E Series

NORDAC *FLEX*

Variable frequency drives are essential components of electrical drive technology and are used for a wide range of automation tasks in many industry fields.

Universal

The NORDAC *FLEX* is an all-around control solution among decentralized VFDs and has established itself across many industries in almost all areas of engineering.

This is due not only to the wide power range (up to 22.0 kw / 30.0 hp), but also because of the wide selection of functions and the flexibility offered by its comprehensive range of accessories.

Economical

The NORDAC *FLEX* has been structured with various function levels in order to take efficiency and application-specific requirements into consideration. The series has been arranged into two equipment groups which cover typical conveyor, pump, and fan applications.

Energy-saving

Even for applications in which a frequency drive is not strictly necessary from a technical point of view (constant speed with 60 Hz), the NORDAC *FLEX* beats unregulated drive units with its energy-saving characteristics, particularly in partial load operation.



Basic Configuration

- Sensorless current vector control and V/f characteristic curve
- 4 switchable parameter sets for flexible use of parameter settings
- All common drive functions e.g. acceleration / braking on a ramp, PI controller
- Parameters with pre-set standard values
- POSICON for relative and absolute positioning
- Incremental encoder interface for speed feedback
- Stator resistance measurement
- PLC functionality for drive-related functions
- Operation of three-phase asynchronous motors (ASM) and permanent magnet synchronous motors (PMSM)

Optional

- Interfaces for 8 field bus systems
- Various control options (switch, potentiometer, control, and parameterization units)
- Versions with functional safety (Safe Stop)
- IO modules for additional analog and digital inputs and outputs
- System plug connectors for power connection of mains and motor cables (industrial plug connectors) as well as for control and signal cables (M12 plug connectors)
- ATEX versions for operation in zone 22-3D

Pump/Fan Applications with the SK 2x0E

- 1~ 230 V 0.25 - 0.55 kW / 0.33 - 0.5 hp
- 3~ 230 V 0.25 - 11.0 kW / 0.33 - 15.0 hp
- 3~ 400 V 0.55 - 22.0 kW / 0.5 - 30.0 hp

Typical Requirements

- Speed setpoints / process signals via analog input, e.g. pressure sensors
- Stand-alone operation of individual drive units or mobile systems, thanks to integrated control voltage
- No motor or brake control necessary



Conveyor Applications with SK 2x5E (SK 2x0E, Size 4)

- 1~ 115 V 0.25 - 0.75 kW / 0.33 - 1.0 hp
- 1~ 230 V 0.25 - 1.1 kW / 0.33 - 1.5 hp
- 3~ 230 V 0.25 - 4.0 kW / 0.33 - 5.5 hp (11.0 kW / 15.0 hp)
- 3~ 400 V 0.55 - 7.5 kW / 0.5 - 10.0 hp (22.0 KW / 30.0 hp)

Typical Requirements

- Separate voltage levels 400 V / 24 V, e.g. for separate start-up of bus system / control level and power
- Adjustable brake control with integrated rectifier
- No processing of analog values required as bus control is frequently used

Basic Configuration SK 2x0E Series

4 digital inputs
e.g. for left/right enabling, fixed frequencies or parameter set switchover

2 digital outputs
e.g. for reporting errors or various limit values

1 or 2 analog inputs
e.g. connection for speed setpoint or process signals

Integrated 24 V power supply
24 V control voltage for stand-alone operation

Basic Configuration SK 2x5E Series

4 digital inputs
e.g. for left/right enabling, fixed frequencies or parameter set switchover

1 digital output
e.g. for reporting errors or various limit values

Connection for **external 24 V power supply**
Separate voltage levels for power and control, e.g. for separate start-up or online availability when the power is switched off

Integrated brake rectifier
Application and release time optimally adjustable via parameter

BRE

If You Are Looking for A Controlled Drive Unit

NORD can supply drive solutions optimized to specific application requirements and functions. Our systems consist of modular, highly-configurable products designed to fit your precise needs. The units can be easily retrofitted with a wide range of accessories to adapt to changed conditions.

If You Have:



Limited Space

- Restricted installation space in the machine



High Performance Requirements

- High-performance drive units
- High breakaway torques



A Need for High-Precision Speed Control

- Speed fluctuations are not permissible
- Perfect load take-up (lifting equipment) is required
- Compensation for fluctuating loads (conveyor belts / conveying equipment)



A Need for High-Precision Positioning

- Master / follower synchronization
- Movement to fixed positions (storage and retrieval machines)
- Movement to relative positions (endless belts in bottling plants)
- Movement of a drive unit to a changing position of a moving drive system (flying saw)



A Need for High Flexibility

- Short time frame in case service is required
- Frequent changes of machine use
- Existing motor and gear unit



A Need for Plug and Play

- For large projects or series production machinery
- Replacement devices for 1:1 exchange in case of service



A Need for Sustainability

- Resource-saving operation
- Use of products with low levels of hazardous substances

Our Solution:

Space-Saving

- A compact device designed for the smallest possible overall dimensions
- Integrable optional modules (e.g. interfaces for field bus connection)
- Wall mounting kits for installation close to the motor



Powerful

- Unbeatable power range from 0.25 kW/ 0.33 hp to 22.0 kW/ 30.0 hp
- Optimized for continuous operation in 4 matching sizes
- Usable overload reserves of up to 200% of the rated power



Fast

- Comprehensive measuring methods for recording the actual electrical data as the basis for excellent control of the drive unit
- Integrated, precise, and fast-acting current vector control for immediate adaptation to actual load conditions
- Integrated interface for connection of an incremental encoder to detect the actual motor speed (prerequisite for precise control)



Precise

- Integrated, precise, fast, and completely autonomous positioning function (POSICON)
- Integrated interface for connection of an absolute encoder to detect the actual position



Adaptable

- Integrated DIP switches for basic configuration without modification of the software
- Comprehensive selection of plug connectors for control and power cable connections
- Easily accessible exchangeable data carrier (EEPROM) for simple exchange of parameter settings between identical devices
- Devices can also be supplied individually



Configurable

- Mounted on the geared motor
- Equipped with the necessary accessories (braking resistor, bus interface, encoders, etc.)
- Pre-parameterized for the specified drive application
- Equipped with the necessary system plug connectors



Environmentally Friendly

- Low-loss use of energy
- Energy-saving function to match the power output to the actual demand in partial load operation
- Consideration of environmental protection even during manufacture (e.g. RoHS)



Standards and Approvals

All devices of the entire series comply with the standards and directives listed below.

Approval	Directive		Applied standards	Certificates	Code
CE (European Union)	Low Voltage Directive	2014/35/EU	EN 61800-5-1 EN 60529 EN 61800-3 EN 63000 EN 61800-9-1 EN 61800-9-2	C310700 C310401	CE
	EMC	2014/30/EU			
	RoHS	2011/65/EU			
	Delegated directive (EU)	2015/863			
	Ecodesign	2009/125/EG			
	Regulation (EU) Ecodesign	2019/1781 2021/341			
UL (USA)			UL 61800-5-1	E171342	c UL us LISTED
CSA (Canada)			C22.2 No. 274-13	E171342	
RCM (Australia)	F2018L00028		EN 61800-3	133520966	
EAC (Eurasia)	TR CU 004/2011, TR CU 020/2011		IEC 61800-5-1 IEC 61800-3	ЕАЭС N RU Д-DE. НВ27.В.02727/20	EAC
UkrSEPRO (Ukraine)			EN 61800-5-1 EN 60529 EN 61800-3 EN 63000 EN 60947-1 EN 60947-4 EN 61558-1 EN 50581	C311900	
UKCA (United Kingdom)			EN 61800-5-1 EN 60529 EN 61800-3 EN 63000 EN 61800-9-1 EN 61800-9-2	C350700, C350401	UK CA

Devices which are configured and approved for use in explosion hazard environments comply with the following directives and standards.

Approval	Directive		Applied standards	Certificates	Code
CE (European Union)	LATEX	2014/34/EU	EN 60079-0 EN 60079-31 EN 61800-5-1 EN 60529 EN 61800-3 EN 63000 EN 61800-9-1 EN 61800-9-2	C432410	
	Low Voltage Directive	2014/35/EU			
	EMC	2014/30/EU			
	RoHS	2011/65/EU			
	Delegated Directive (EU)	2015/863			
	Ecodesign	2009/125/EG			
	Regulation (EU) Ecodesign	2019/1781			

Type Code

Variable Frequency Drive - Basic Device

SK 205E-370-323-A (-C) (xxx)

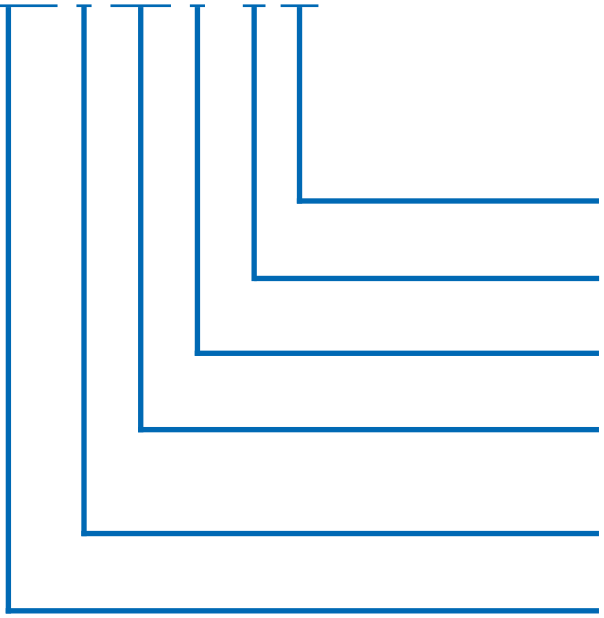
- Special Version[1]: MDB: Modbus instead of system bus
  USS: USS protocol instead of system bus
- IP Protection Class Standard = IP55, **C** = IP66
- Radio interference filter: **0** = without, **A** = Class A1 (C2)
- Mains voltage: **x12** = 115 V, **x23** = 230 V, **x40** = 400 V
- Number of mains phases: **1xx** = 1-phase, **3xx** = 3-phase
- Device rated power: **250** = 0.25 kW / 0.33 hp, **370** = 0.37 kW / 0.5 hp,
  ...**222** = 22.0 kW / 30.0 hp
- Variable frequency drive series: SK 200E, SK 205E, SK 210E, SK 215E,
  SK 220E, SK 225E, SK 230E, SK 235E

(…) Options, only implemented if required.

[1] With special versions USS and MDB, it is not possible to connect optional modules and absolute encoders.

Variable Frequency Drive - Connection Unit

SK TI4-1-205-1 (-C-EX)



ATEX

IP Protection Class: Standard = IP55, **C** = IP66

Mains connection: **1** = 1~ 115 V1 / 230 V1, 3~ 230 V1 / 400 V[1]

Suitable VFD type: SK 200E, SK 205E, SK 210E, SK 215E, SK 220E, SK 225E, SK 230E, SK 235E

Size: **1** = size 1, **2** = size 2, **3** = size 3, **4** = size 4,

Variable frequency drive series: **SK TI4** = SK TI4 connection unit

[1] The voltage level depends on the used VFD

Versatile and Sustainable
The VFD with Servo Genes

Standard Encoder Interfaces

The variable frequency drives' speed control is extremely precise thanks to sophisticated, fast measuring methods and calculation algorithms in combination with integrated high-precision current vector control.

However, there are applications where precision of a thousandth of a motor revolution and very high dynamics (maximum acceleration, cyclic operation, synchronous rotation relative to other drive units) are needed. In such cases, precise feedback from the mechanical momentary values of the motor or the drive unit is required. This feedback is provided by incremental encoders, which are normally mounted on the motor shaft and provide information about its actual position. These values enable the motor to be precisely controlled by the frequency drive so that even with large load fluctuations, an asynchronous motor can be operated with a performance similar to that of a servo motor.

Absolute encoders are used when high precision is required in drive applications such as:

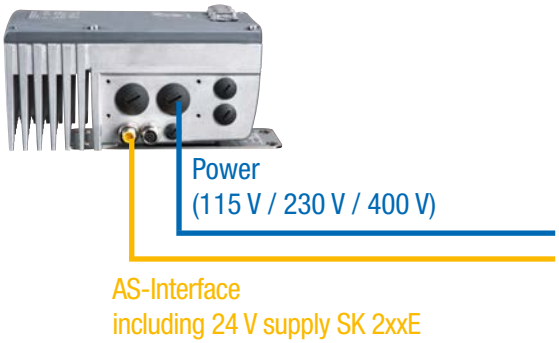
- Synchronization of multiple drive units
- Dynamic synchronization of a drive unit to a different drive unit (flying saw)
- Relative positioning tasks (cyclical drives)
- Absolute positioning tasks (automatic warehouse equipment / high-bay storage, lifting equipment with defined positions)

Each VFD is equipped with a corresponding interface.

- HTL incremental encoder interface (connection via 2 digital inputs) - primarily for speed control
- CANopen absolute encoder interface (connection via system bus) - primarily for positioning

Available in all sizes

Modern Automation Systems



Because modern automation systems have a wide range of requirements, a suitable bus system and drive components must be selected to ensure efficient implementation.

The AS-Interface is a cost-effective solution which enables the networking of binary sensors and actuators and is included in certain versions of the NORDAC *FLEX*.

The supply voltage (power) is connected separately via the corresponding terminals. Depending on the version of the device, the control voltage of the VFD is generated either via an integrated power supply unit or separately via the yellow AS-Interface cable. This eliminates the need for an additional AUX cable (black). The type of addressing possible (standard or A/B followers) also depends on the version of the device.

Device SK ...	220E/230E	225E/235E
Follower profile	S-7.A.	S-7.0.
Follower type	A/B-Follower	Standard
Control voltage	Internal power supply	Yellow AS-I cable
Inputs/Outputs	4/4	4/4
Configuration via DIP switch	●	●
Configuration via parameters	●	●

ATEX-Compliant Drive Systems, Zone 22 3D

Size 1–3 devices can be modified for operation in explosive atmospheres. This allows the operation of the variable frequency drive directly in a hazardous area (ATEX 22-3D). The advantages include:

- Compact drive unit
- No complex protective devices
- No motor cables
- Optimum EMC
- Permissible characteristic curves 50 Hz / 87 Hz
- Control range up to 100 Hz or 3000 rpm

Depending on the area of application (conductive or non-conductive dust) the modification includes, among others, replacement of the transparent diagnostic caps with a version made of aluminum and glass.

Operation of the device within the hazard area is only permitted with integrable modules (SK CU4 modules, internal brake resistors) or specially approved accessories (ATEX potentiometer SK ATX-POT).

There are exceptions for SK TU4 modules, which are described in detail in the manual for the device. Other accessories (e.g. external brake resistors, plug connectors) are not approved for use within a hazardous area.

Approval

- According to 2014/34/EU
- ATEX Zone 22 - 3D
  - Version for non-conducting dust: IP55
  - Version for conducting dust: IP66

Available in all device sizes 1 – 3



The Entire Team
All Device Versions at a Glance

	SK 200E	SK 210E	SK 220E	SK 230E	SK 205E	SK 215E	SK 225E	SK 235E
	Size 1 – 4, 0.33 – 30.0 hp				Size 1 – 3, 0.33 – 10.0 hp			
Motor and wall mounting possible [1]	●	●	●	●	●	●	●	●
Energy bus - loop-through of mains supply cables [2]	●	●	●	●	●	●	●	●
Communication bus for various devices [2]	●	●	●	●	●	●	●	●
Sensorless current vector control (ISD control)	●	●	●	●	●	●	●	●
Brake chopper (brake resistor optional)	●	●	●	●	●	●	●	●
RS-232 diagnostic interface	●	●	●	●	●	●	●	●
4 switchable parameter sets	●	●	●	●	●	●	●	●
Parameters pre-set with standard values	●	●	●	●	●	●	●	●
Automatic determination of motor data	●	●	●	●	●	●	●	●
Energy-saving function, optimized efficiency in partial load operation	●	●	●	●	●	●	●	●
Integrated EMC line filter according to EN 61800-3, Category C2 up to 5 m motor cable and for motor assembly	●	●	●	●	●	●	●	●
Extensive monitoring functions	●	●	●	●	●	●	●	●
Load monitor	●	●	●	●	●	●	●	●
PI controller	●	●	●	●	●	●	●	●
Process controller / compensator control	●	●	●	●	●	●	●	●
Plug-in memory module (EEPROM)	●	●	●	●	●	●	●	●
Incremental encoder evaluation (speed control)	●	●	●	●	●	●	●	●
POSICON positioning control	●	●	●	●	●	●	●	●
PLC functionality	●	●	●	●	●	●	●	●
Synchronous motor operation (PMSM)	●	●	●	●	●	●	●	●
Modification for operation in an IT network by means of jumpers	●	●	●	●	●	●	●	●
All common field bus systems	○	○	○	○	○	○	○	○
Brake management for mechanical holding brake	○ [3]	○ [3]	○ [3]	○ [3]	●	●	●	●
Lifting gear functionality	○	○	○	○ [3]	●	●	●	●
Safe Stop function (STO, SS1)	❍	●	❍	●	❍	●	❍	●
AS-Interface on board	❍	❍	●	●	❍	❍	●	●
Evacuation run	❍ [3]	❍ [3]	❍ [3]	❍ [3]	●	●	●	●
Internal 24 V power supply unit to supply the control board	●	●	●	●	○	○	○	○
External 24 V power supply for the control board	○ [4]	○ [4]	○ [4]	○ [4]	●	●	●	●
Internal / external braking resistors	○	○	○	○	○	○	○	○
Switch and potentiometer versions	○	○	○	○	○	○	○	○
Plug connectors for connection of control, motor and mains cables	○	○	○	○	○	○	○	○

[1] Wall mounting: wall mounting kit required
Motor mounting: an adapter for connection to the motor terminal box may be necessary
[2] Direct connection to the terminal bar or via system plug connectors
[3] Size 4: standard
[4] Size 1 – 3: no, Size 4: optional

● Available as standard
○ Optional
❍ Not available

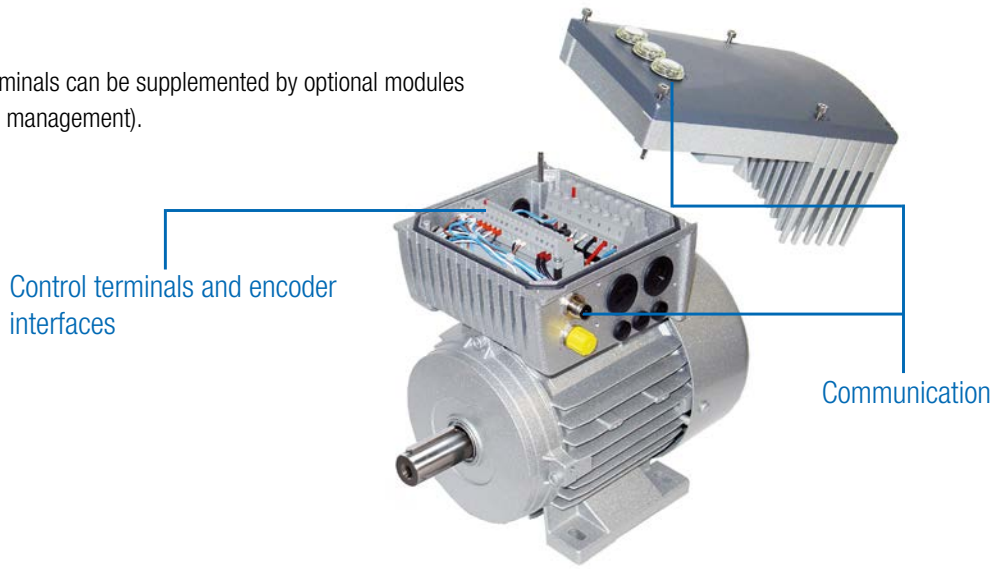
The Senses Control Connections on the VFD

		SK 200E	SK 210E	SK 220E	SK 230E	SK 200E	SK 210E	SK 220E	SK 230E	SK 205E	SK 215E	SK 225E	SK 235E
		Size 1 – 3, 0.33 – 10.0 hp				Size 4, 15.0 – 30.0 hp				Size 1 – 3, 0.33 – 10.0 hp			
Control Terminals	Number of digital inputs (DIN)	4	3	4	3	4	3	4	3	4	3	4	3
	Number of digital outputs (DOUT)	2	2	2	2	2	2	2	2	1	1	1	1
	Number of analog inputs (AIN)[1]	2	2	1	1	2	2	2	2	❍	❍	❍	❍
	Integrated brake rectifier	❍	❍	❍	❍	●	●	●	●	●	●	●	●
	Temperature sensor (PTC)	●	●	●	●	●	●	●	●	●	●	●	●
Encoder Interfaces	HTL	●	●	●	●	●	●	●	●	●	●	●	●
	CANopen® [2]	●	●	●	●	●	●	●	●	●	●	●	●
Communication	RS 485 / RS232	●	●	●	●	●	●	●	●	●	●	●	●
	AS-I	❍	❍	●	●	❍	❍	●	●	❍	❍	●	●

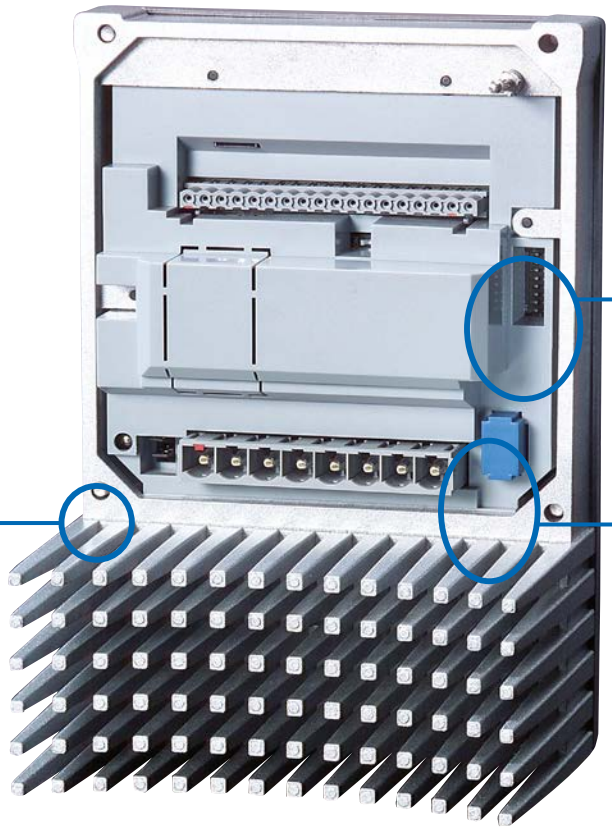
[1] 0(2) - 10 V, 0(4) - 20 mA
[2] Via system bus, -MDB and -USS special versions not available

Note

Control terminals can be supplemented by optional modules (IOs, brake management).



Configuration and Monitoring
Integrated Aids for Safe Operation



Commissioning with a Screwdriver

Various basic functions can be simply set via easily accessible DIP switches so that commissioning is possible without parameterization software. Even when an EEPROM is plugged in, the DIP switch settings have priority over the relevant parameters.



Plug-in EEPROM

The frequency drive is equipped with two EEPROMs for saving individual parameter sets of the device. The primary EEPROM is integrated into the device and the secondary EEPROM is pluggable, allowing for it to be removed/swapped.

All parameter settings are managed by the internal EEPROM and mirrored to the external EEPROM. The easy access enables data sets to be exchanged between identical drive units via the plug-in EEPROM. Optional parameterization adapter (SK EPG-3H) devices can be parameterized "in the laboratory" so that only the plug-in EEPROM needs to be transferred between the system and the "laboratory".

Jumpers for Mains Adaptation

It is possible to adapt the variable frequency drive for operation in an IT network by plugging in a jumper. However, this adaptation has a negative effect on the emission of electromagnetic interference and compliance with the specified degree of radio interference suppression can no longer be guaranteed.

Status and Diagnostic Cockpit

Depending on the version, various aids for monitoring the device or diagnostics in case of faults are located behind 3 transparent cover caps. Additional elements (e.g. DIP switches or similar) are useful for screwdriver-assisted commissioning.



Example: SK 2x0E

SK 2x0E in Sizes 1 – 3

(Size 4 as for SK 2x5E)

1 Diagnostic Interface, RS-232 and RS-485

RJ12 interface for connection of a diagnostic and parameterization tool (e.g. PC with NORDCON software, ParameterBox). Analysis, diagnostics, parameterization, and monitoring of the drive unit via software is possible during commissioning or service.

2 DIP Switches for Analog Inputs

The integrated analog inputs of the device can be configured to the signal form of set point values (current or voltage) via the DIP switches.

3 Status LED for Frequency Drive and System Bus

In addition to status and readiness indicators, the current overload level, warnings, and error messages are indicated in coded form by the LEDs.

SK 2x5E and SK 2x0E in Size 4

1 Diagnostic Interface, RS-232 and RS-485

RJ12 interface for connection of a diagnostic and parameterization tool (e.g. PC with NORDCON software, ParameterBox). Analysis, diagnostics, parameterization, and monitoring of the drive unit via software is possible during commissioning or service.

2 Status and Diagnostic LEDs

In addition to the operating status of the system bus, various signal statuses (e.g. of the digital IOs) can be read here.

3 Potentiometer and Status LEDs

The two potentiometers are used for the fixed setting of various dynamic factors (set point frequency, frequency band, acceleration time). The two diagnostic LEDs indicate the operating statuses and error messages of the device or the AS-Interface (if present).

NORDAC *FLEX* Variable Frequency Drive
1~ 110 ... 120 V and 1/3~ 200 ... 240 V

Output Frequency	0.0 ... 400.0 Hz
Pulse Frequency	3.0 ... 16.0 kHz
Typical Overload Capacity	150% for 60 s, 200% for 3.5 s
Energy Efficiency Class	IE2
Efficiency	> 95%
Ambient Temperature	-25°C ... +50°C (depending on type of operation)
Protection Class	IP55, optionally IP66, NEMA type 1 (higher NEMA classifications on request)
Regulation and Control	Sensorless current vector control (ISD), linear V/f characteristic curve
Motor Temperature Monitoring	I^2t Motor PTC / bi-metal switch
Leakage Current	<40 mA for standard configuration of integrated line filter <20 mA for configuration for "operation on IT network"

Variable Frequency Drives SK 2xxE ...	SK 2x0E	SK 2x5E	Nominal Motor Power 230 V [kW]	Nominal Motor Power 240 V [hp]	Nominal Output Current rms [A]	Mains Voltage	Output Voltage
-250-112-0 (-C)	❍	●	0.25	0.33	1.7	1~ 110 ... 120 V, +/- 10%, 47 ... 63 Hz	3~ 0 up to double the mains voltage
-370-112-0 (-C)	❍	●	0.37	0.50	2.2		
-550-112-0 (-C)	❍	●	0.55	0.75	3.0		
-750-112-0 (-C)	❍	●	0.75	1.00	4.0		

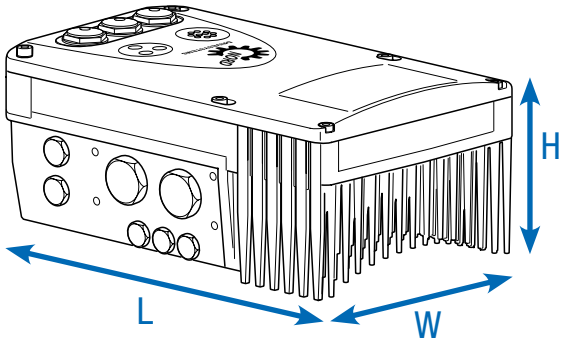
Variable Frequency Drives SK 2xxE ...	SK 2x0E	SK 2x5E	Nominal Motor Power 230 V [kW]	Nominal Motor Power 240 V [hp]	Nominal Output Current rms [A]	Mains Voltage	Output Voltage
-250-123-A (-C)	●	●	0.25	0.33	1.7	1~ 200 ... 240 V +/-10% 47 ... 63 Hz	3 AC 0 – 200 ... 240 V
-370-123-A (-C)	●	●	0.37	0.50	2.2		
-550-123-A (-C)	●	●	0.55	0.75	3.0		
-750-123-A (-C)	❍	●	0.75	1.00	4.0		
-111-123-A (-C)	❍	●	1.10	1.50	5.5		

Variable Frequency Drives SK 2xxE ...	SK 2x0E	SK 2x5E	Nominal Motor Power 230 V [kW]	Nominal Motor Power 240 V [hp]	Nominal Output Current rms [A]	Mains Voltage	Output Voltage
-250-323-A (-C)	●	●	0.25	0.33	1.7	3~ 200 ... 240 V, +/- 10%, 47 ... 63 Hz	3~ 0 up to mains voltage
-370-323-A (-C)	●	●	0.37	0.50	2.2		
-550-323-A (-C)	●	●	0.55	0.75	3.0		
-750-323-A (-C)	●	●	0.75	1.00	4.0		
-111-323-A (-C)	●	●	1.10	1.50	5.5		
-151-323-A (-C)	●	●	1.50	2.00	7.0		
-221-323-A (-C)	●	●	2.20	3.00	9.5		
-301-323-A (-C)	●	●	3.00	4.00	12.5		
-401-323-A (-C)	●	●	4.00	5.00	16.0		
-551-323-A (-C)	●	❍	5.50	7.50	23.0		
-751-323-A (-C)	●	❍	7.50	10.0	29.0		
-112-323-A (-C)	●	❍	11.0	15.0	40.0		

● Available as standard
❍ Not available

IP66 Measures

- Coated aluminum components
- Coated circuit boards
- Low-pressure test
- Diaphragm valve



Variable Frequency Drives SK 2xxE ...	SK 2x0E	SK 2x5E	Weight [kg]	Weight [lbs]	Overall Dimensions L x W x H	Size
-250-112-O (-C)	❍	●	3.0	6.6	236 x 156 x 127 mm 9.29 x 6.22 x 5 in	1
-370-112-O (-C)	❍	●	3.0	6.6		1
-550-112-O (-C)	❍	●	4.1	9.0	266 x 176 x 134 mm 10.47 x 6.93 x 5.28 in	2
-750-112-O (-C)	❍	●	4.1	9.0		2

Variable Frequency Drives SK 2xxE ...	SK 2x0E	SK 2x5E	Weight [kg]	Weight [lbs]	Overall Dimensions L x W x H	Size
-250-123-A (-C)	●	●	3.0	6.6	236 x 156 x 127 mm 9.29 x 6.14 x 5 in	1
-370-123-A (-C)	●	●	3.0	6.6		1
-550-123-A (-C)	●	●	3.0	6.6		1
-750-123-A (-C)	❍	●	4.1	9.0	266 x 176 x 134 mm 10.47 x 6.92 x 5.27 in	2
-111-123-A (-C)	❍	●	4.1	9.0		2

Variable Frequency Drives SK 2xxE ...	SK 2x0E	SK 2x5E	Weight [kg]	Weight [lbs]	Overall dimensions L x W x H	Size
-250-323-A (-C)	●	●	3.0	6.6	236 x 156 x 127 mm 9.29 x 6.14 x 5 in	1
-370-323-A (-C)	●	●	3.0	6.6		1
-550-323-A (-C)	●	●	3.0	6.6		1
-750-323-A (-C)	●	●	3.0	6.6		1
-111-323-A (-C)	●	●	3.0	6.6		1
-151-323-A (-C)	●	●	4.1	9.0	266 x 176 x 134 mm 10.47 x 6.92 x 5.27 in	2
-221-323-A (-C)	●	●	4.1	9.0		2
-301-323-A (-C)	●	●	6.9	15.2	330 x 218 x 144 mm 12.99 x 8.58 x 5.66 in	3
-401-323-A (-C)	●	●	6.9	15.2		3
-551-323-A (-C)	●	❍	17.0	37.5	480 x 305 x 160 mm 18.89 x 12 x 6.29 in	4
-751-323-A (-C)	●	❍	17.0	37.5		4
-112-323-A (-C)	●	❍	17.0	37.5		4

● Available as standard
❍ Not available

NORDAC *FLEX* Variable Frequency Drive 3~ 380 ... 500 V

Output Frequency	0.0 ... 400.0 Hz
Pulse Frequency	3.0 ... 16.0 kHz
Typical Overload Capacity	150% for 60 s, 200% for 3.5 s
	IE2
Efficiency	> 95%
Ambient Temperature	-25°C ... +50°C (depending on type of operation)

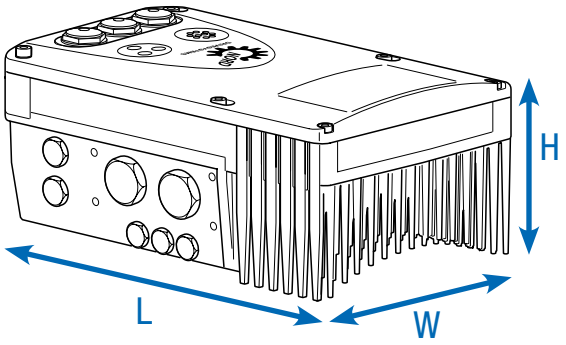
Protection Class	IP55, optionally IP66, NEMA type 1 (higher NEMA classifications on request)
Regulation and Control	Sensorless current vector control (ISD), linear V/f characteristic curve
Motor Temperature Monitoring	I^2t Motor PTC / bi-metal switch
Leakage Current	<40 mA for standard configuration of integrated line filter <20 mA for configuration for “operation on IT network”

Variable Frequency Drives SK 2xxE ...	SK 2x0E	SK 2x5E	Nominal Motor Power 400 V [kW]	Nominal Motor Power 480 V [hp]	Nominal Output Current rms [A]	Mains Voltage	Output Voltage
-550-340-A	●	●	0.55	0.75	1.7	3~ 380 ... 500 V, -20% / +10%, 47 ... 63 Hz	3~ 0 up to mains voltage
-750-340-A	●	●	0.75	1.00	2.3		
-111-340-A	●	●	1.10	1.50	3.1		
-151-340-A	●	●	1.50	2.00	4.0		
-221-340-A	●	●	2.20	3.00	5.5		
-301-340-A	●	●	3.00	4.00	7.5		
-401-340-A	●	●	4.00	5.00	9.5		
-551-340-A	●	●	5.50	7.50	12.5		
-751-340-A	●	●	7.50	10.0	16.0		
-112-340-A	●	❍	11.0	15.0	23.0		
-152-340-A	●	❍	15.0	20.0	32.0		
-182-340-A	●	❍	18.5	25.0	40.0		
-222-340-A	●	❍	22.0	30.0	46.0		

● Available as standard
❍ Not available

IP66 Measures

- Coated aluminum components
- Coated circuit boards
- Low-pressure test
- Diaphragm valve



Variable Frequency Drives SK 2xxE ...	SK 2x0E	SK 2x5E	Weight [kg]	Weight [lbs]	Overall Dimensions L x W x H	Size
-550-340-A	●	●	3.0	6.6	236 x 156 x 127 mm 9.29 x 6.14 x 5 in	1
-750-340-A	●	●	3.0	6.6		1
-111-340-A	●	●	3.0	6.6		1
-151-340-A	●	●	3.0	6.6		1
-221-340-A	●	●	3.0	6.6		1
-301-340-A	●	●	4.1	9.0	266 x 176 x 134 mm 10.47 x 6.92 x 5.27 in	2
-401-340-A	●	●	4.1	9.0		2
-551-340-A	●	●	6.9	15.2	330 x 218 x 144 mm 12.99 x 8.58 x 5.66 in	3
-751-340-A	●	●	6.9	15.2		3
-112-340-A	●	❍	17.0	37.5	480 x 305 x 160 mm 18.89 x 12 x 6.29 in	4
-152-340-A	●	❍	17.0	37.5		4
-182-340-A	●	❍	17.0	37.5		4
-222-340-A	●	❍	17.0	37.5		4

● Available as standard
❍ Not available

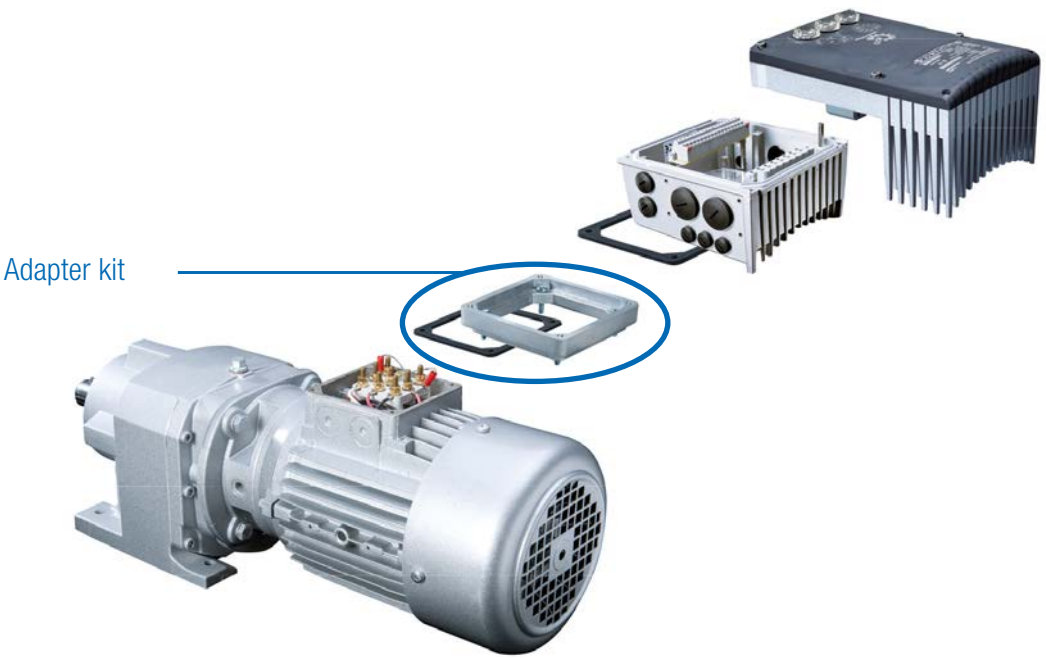
We Bring Together
What Belongs Together

The NORDAC *FLEX*

Consists of 2 elements – the actual frequency drive and a suitable connection unit. The connection unit contains all device-specific connection terminals and a space for an optional SK CU4-... module (internal control terminal).



The NORDAC *FLEX* is typically directly mounted on a motor and can be combined with motors from various power and efficiency classes. Depending on the motor and the size and orientation of the VFD, the terminal box may require an additional mounting adapter.



Adjustments for Motor Mounting

Due to the differences in motors sizes, a terminal box adapter may be necessary. To ensure the device's maximum IPxx Protection Class for the entire unit, all elements of the drive unit (e.g. motor) must comply with the same Protection Class. NORDAC *FLEX* can also be combined with IE5+ motors as the VFD output matches the motor power.

Motor Size	Attachment SK 2xxE Size 1	Attachment SK 2xxE Size 2	Attachment SK 2xxE Size 3	Attachment SK 2xxE Size 4
63 – 71	With adapter kit I IP55: 275 119 050 IP66: 275 274 324	With adapter kit I IP55: 275 119 050 IP66: 275 274 324	Not possible	Not possible
80 – 112	Direct mounting	Direct mounting	With adapter kit II IP55: 275 274 321 IP66: 275 274 325	Not possible
132	Not possible	Not possible	Direct mounting	With adapter kit III IP55: 275 274 320 IP66: 275 274 326
160 – 180	Not possible	Not possible	Not possible	Direct mounting

Synchronous Motors up to IE5+

NORD Synchronous Motor (IE5+)	Variable Frequency Drive	Attachment
71 F1/8	SK 2xxE-550-340A	10735200
71 F2/8	SK 2xxE-111-340A	10735200
71 F3/8	SK 2xxE-151-340A	10735200
71 F4/8	SK 2xxE-221-340A	10735200
90 F1/8	SK 2xxE-151-340A	10735200
90 F2/8	SK 2xxE-221-340A	10735200
90 F3/8	SK 2xxE-301-340A	10735200
90 F4/8	SK 2xxE-401-340A	10735200
112 F1/8	SK 2xxE-401-340A	11835110
112 F2/8	SK 2xxE-551-340A	11835120
112 F3/8	SK 2xxE-751-340A	11835120

Various Installation Possibilities

Motor Assembly

The VFD can be mounted directly on the terminal box of the (geared) motor, forming an optimized complete unit. This motor-mounted format provides numerous advantages: compact overall dimensions of the drive unit, quick readiness for use after connection to the mains supply due to pre-configuration of the drive unit at the factory, and optimum EMC due to short cable lengths or elimination of a motor cable.

Wall Mounting

As an alternative to motor mounting, the device can be mounted close to the motor with the aid of a wall mounting kit. Different versions are available depending on the application.

1. Standard Version SK TIE4-WMK-1-K (-2-K or -3)

Note: If the VFD is wall-mounted, the cooling air flow from the motor is not present. This can result in power restrictions (derating) for the frequency drive.

2. Version with Fan SK TIE4-WMK-L-1 (or -L-2)

This version differs from the standard version and includes a fan - ensuring a continuous flow of cooling air over the VFD and avoiding derating due to wall mounting. As a standard, Size 4 variable frequency drives are equipped with fans and do not require a corresponding wall mounting kit.

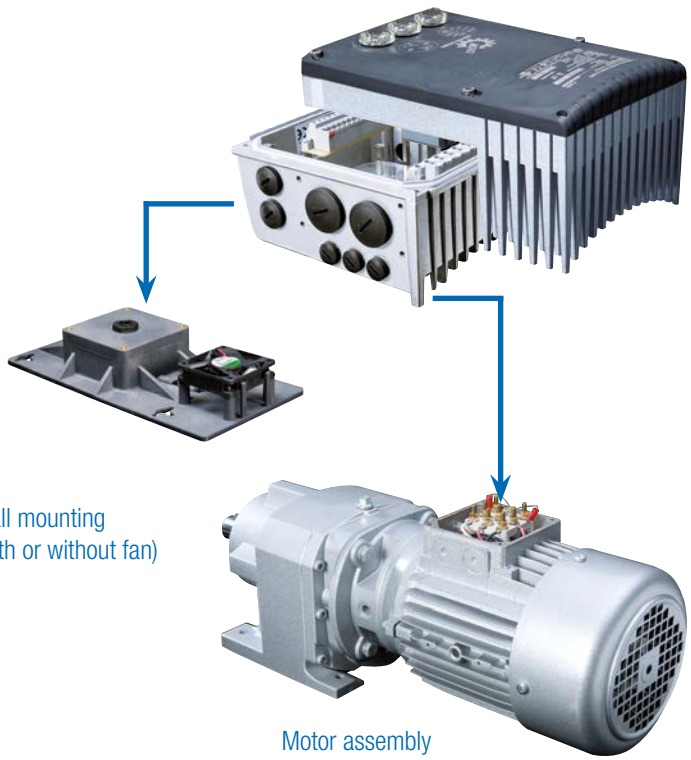
3. ATEX Version SK TIE4-WMK-1-EX (up to -2-EX)

This version is functionally comparable to the standard version and suitable for use in explosion hazard environments (ATEX Zone 22 3D).

Designation	Material No.	VFDs[1] for size FI
SK TIE4-WMK-1-K	275 274 004	1, 2
SK TIE4-WMK-2-K	275 274 015	3
SK TIE4-WMK-L-1	275 274 005	1, 2
SK TIE4-WMK-L-1-C	275 274 016	1, 2
SK TIE4-WMK-L-2	275 274 006	3
SK TIE4-WMK-1-EX	275 175 053	1, 2
SK TIE4-WMK-2-EX	275 175 054	3
SK TIE4-WMK-3	275 274 003	4
SK TIE4-WMK-TU[2]	275 274 002	Type: SK TU4-

[1] Mounting of the WMK on the connection unit of the variable frequency drive
[2] Mounting of the WMK on the connection unit of the technology unit

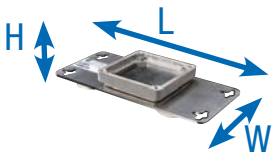
Motor-Mounted or Wall-Mounted Variable Frequency Drives



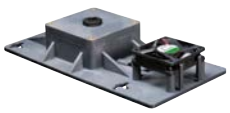
Designation	Material	Integrated Fan	Achievable Protection Class	Weight	Overall Dimensions L x W x H	Remarks
SK TIE4-WMK-1-K	Plastic	❍	IP66	0.2 kg 0.44 lbs	205 x 95 x 5 mm 8.07 x 3.74 x 0.19 in	Note: derating as necessary
SK TIE4-WMK-2-K	Plastic	❍	IP66	0.3 kg 0.66 lbs	235 x 105 x 5 mm 9.25 x 4.13 x 0.19 in	Note: derating as necessary
SK TIE4-WMK-L-1	Plastic	●	IP55	0.4 kg 0.88 lbs	255 x 130 x 24 mm 10.03 x 5.11 x 0.94 in	Fan power: 24 V DC, 1.3 W
SK TIE4-WMK-L-1-C	Plastic	●	IP66	0.4 kg 0.88 lbs	255 x 130 x 24 mm 10.03 x 5.11 x 0.94 in	Fan power: 24 V DC, 1.3 W
SK TIE4-WMK-L-2	Plastic	●	IP55	0.5 kg 1.1 lbs	300 x 150 x 30 mm 11.8 x 5.9 x 1.18 in	Note: derating as necessary
SK TIE4-WMK-1-EX	Stainless steel	❍	IP66	0.6 kg 1.32 lbs	205 x 95 x 4 mm 8.07 x 3.74 x 0.15 in	Note: derating as necessary
SK TIE4-WMK-2-EX	Stainless steel	❍	IP66	0.8 kg 1.76 lbs	235 x 105 x 10 mm 9.25 x 4.13 x 0.39 in	Note: derating as necessary
SK TIE4-WMK-3	Stainless steel	❍	IP66	2.4 kg 5.29 lbs	295 x 255 x 8 mm 11.6 x 10 x 0.31 in	
SK TIE4-WMK-TU	Stainless steel	❍	IP66	0.4 kg 0.88 lbs	155 x 85 x 3 mm 6.10 x 3.35 x 0.12 in	

[1] H = increase in the total height of the device if mounted on the wall mounting kit

● Available as standard
❍ Not available



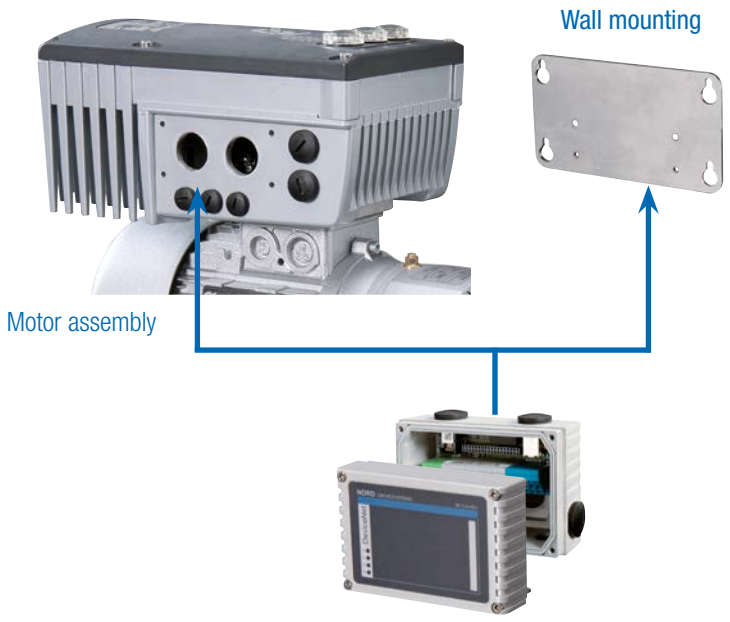
SK TIE4-WMK-1-EX


SK TIE4-WMK-L-1


SK TIE4-WMK-1-K


SK TIE4-WMK-TU

Technology Unit on NORDAC *FLEX* or Wall Mounting

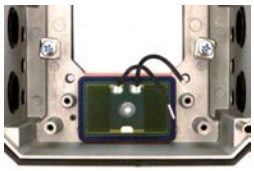


Brake Resistors
Internal Version

Internal Braking Resistors
SK BRI4

Internal braking resistors are intended for applications in which slight or only sporadic, brief braking is to be expected (e.g. continuous conveyor equipment, mixing equipment). They also enable the use of the variable frequency drive in very confined spaces or in an explosive atmosphere.

Internal brake resistors are intended for installation in the connection unit of the VFD. The devices provide space for the integration of one brake resistor or a set of 2 brake resistors (SK 2x0E, size 4). For thermal reasons, the rated continuous output is limited to 25%. A respective overload protection can be configured via DIP switch.



Variable Frequency Drives SK 2xxE ...		Resistor Type	Material No.	Resistance [Ω]	Continuous Output [W]	Power Consumption[2] [kWs]
1~ 115 V	0.25 ... 0.75 kW 0.33 ... 1.0 hp	SK BRI4-1-100-100	275 272 005	100	100 / 25%	1.0
1~ 230 V	0.25 ... 1.1 kW 0.33 ... 1.5 hp	SK BRI4-1-100-100	275 272 005	100	100 / 25%	1.0
3~ 230 V	0.25 ... 2.2 kW 0.33 ... 3.0 hp	SK BRI4-1-200-100	275 272 008	200	100 / 25%	1.0
	3.0 ... 4.0 kW 4.0 ... 5.5 hp	SK BRI4-2-100-200	275 272 105	100	200 / 25%	2.0
	5.5 ... 7.5 kW 7.0 ... 10.0 hp	SK BRI4-3-047-300	275 272 201	47	300 / 25%	3.0
	11.0 kW 15.0 hp	SK BRI4-3-023-600	275 272 800	23	600 / 25%	6.0
3~ 400 V	0.55 ... 4.0 kW 0.75 ... 5.5 hp	SK BRI4-1-400-100	275 272 012	400	100 / 25%	1.0
	5.5 ... 7.5 kW 7.5 ... 10.0 hp	SK BRI4-2-200-200	275 272 108	200	200 / 25%	2.0
	11.0 ... 15.0 kW 15.0 ... 20.0 hp	SK BRI4-3-100-300	275 272 205	100	300 / 25%	3.0
	18.5 ... 22.0 kW 25.0 ... 30.0 hp	SK BRI4-3-050-600	275 272 801	50	600 / 25%	6.0

[1] Reduction of the continuous output of the braking resistor to 25% of the rated output
[2] Permissible max. once within 10 s

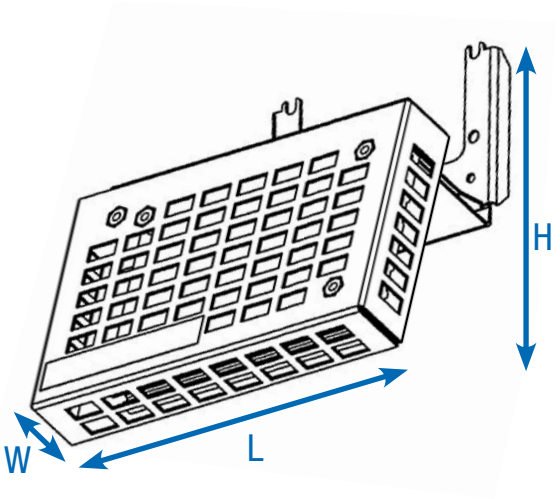
Braking Resistors
External Version

External Braking Resistors SK BRE4

External braking resistors (IP67) are intended for applications in which longer, frequent, or intensive braking is to be expected (cyclic operation/high dynamic positioning applications). They are mounted directly on the VFD and can develop high surface temperatures (>70°C), which exclude their use in an explosive atmosphere.

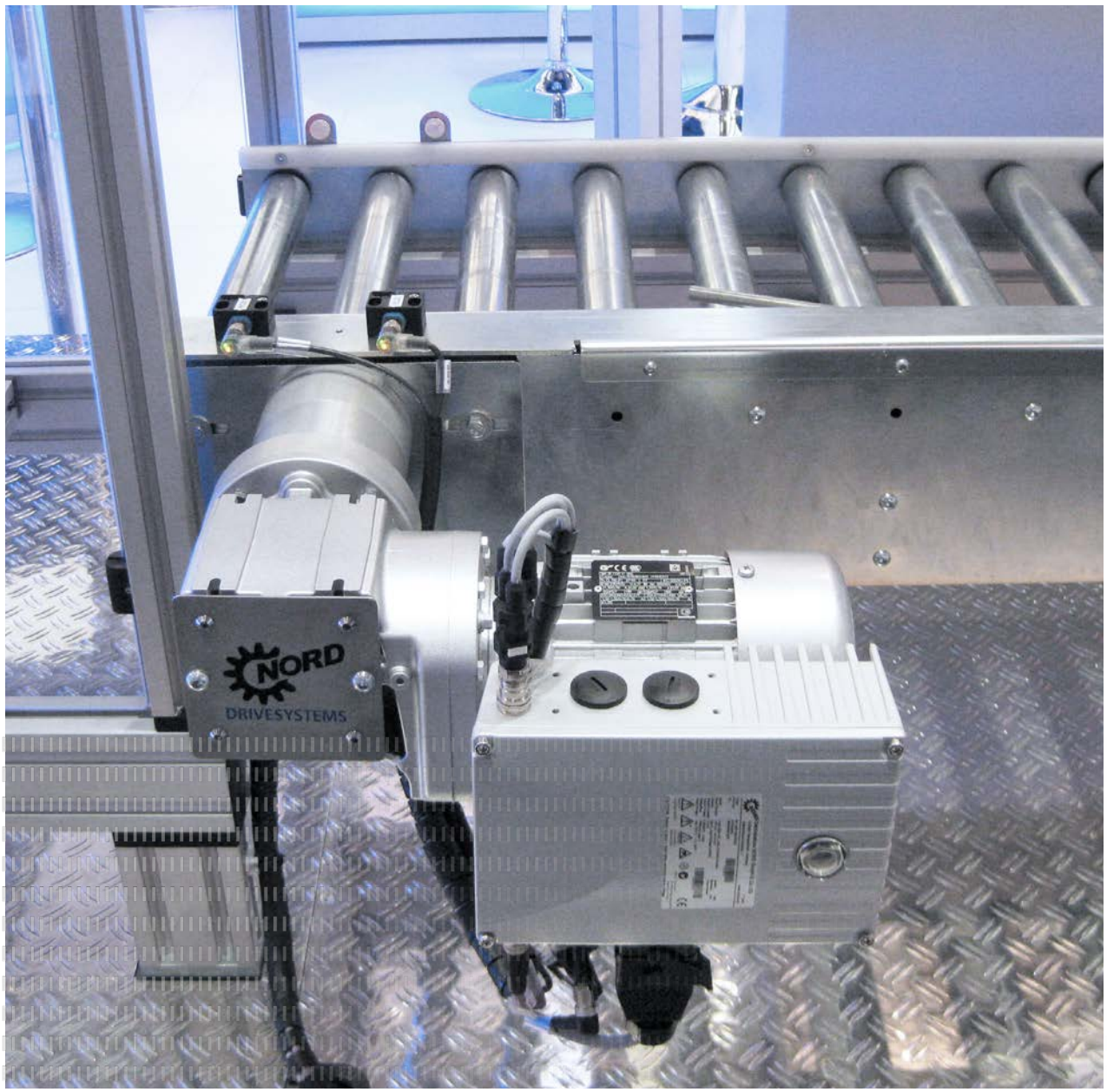
Note:

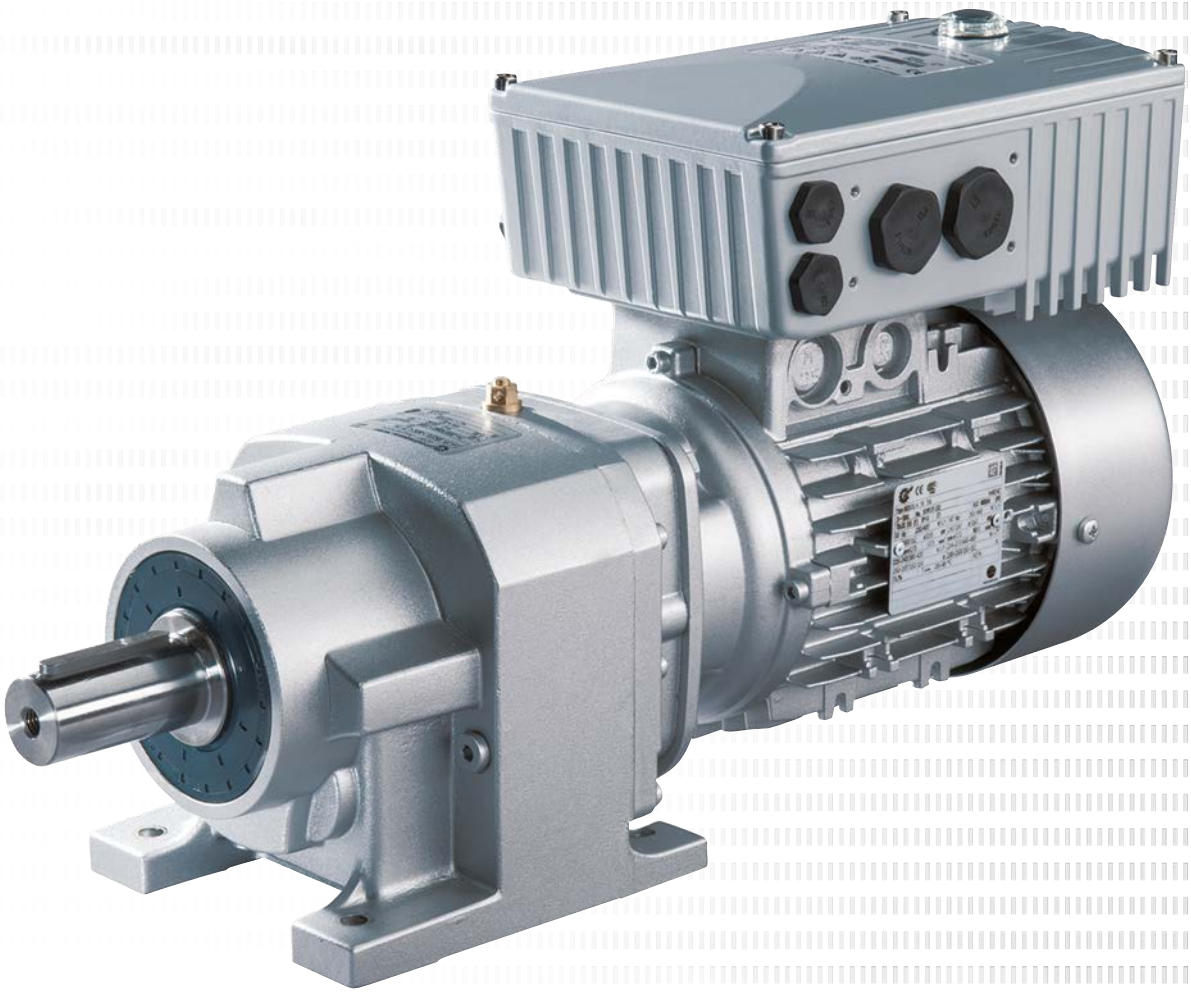
The braking resistors listed here are designed for typical applications with occasional braking. In case of doubt or for applications with higher braking power such as lifting equipment, we recommend specific planning of the necessary brake resistor and contacting NORD directly.



Variable Frequency Drives SK 2xxE ...		Resistor Type Material No.	Resistance [Ω]	Continuous Output [W]	Power Consumption[2] [kWs]	Overall Dimensions L x W x H
1~ 115 V	0.25 ... 0.75 kW 0.33 ... 1.0 hp	SK BRE4-1-100-100 275 273 005	100	100	2.2	150 x 61 x 178 mm 5.90 x 2.40 x 7 in
		Alternatively: SK BRE4-2-100-200 275 273 105	100	200	4.4	255 x 61 x 178 mm 10.03 x 2.40 x 7 in
1~ 230 V	0.25 ...1.1 kW 0.33 ... 1.5 hp	SK BRE4-1-100-100 275 273 005	100	100	2.2	150 x 61 x 178 mm 5.90 x 2.40 x 7 in
		Alternatively: SK BRE4-2-100-200 275 273 105	100	200	4.4	255 x 61 x 178 mm 10.03 x 2.40 x 7 in
3~ 230 V	0.25 ... 2.2 kW 0.33 ... 3.0 hp	SK BRE4-1-200-100 275 273 008	200	100	2.2	150 x 61 x 178 mm 5.90 x 2.40 x 7 in
		Alternatively: SK BRE4-2-200-200 275 273 108	200	200	4.4	255 x 61 x 178 mm 10.03 x 2.40 x 7 in
	3.0 ... 4.0 kW 4.0 ... 5.5 hp	SK BRE4-2-100-200 275 273 105	100	200	4.4	255 x 61 x 178 mm 10.03 x 2.40 x 7 in
	5.5 ... 11.0 kW 7.5 ... 15.0 hp	SK BRE4-3-050-450 275 273 201	50	450	3.0	355 x 245 x 318 mm 13.97 x 9.6 x 12.5 in
3~ 400 V	0.55 ... 4.0 kW 0.75 ... 5.5 hp	SK BRE4-1-400-100 275 273 012	400	100	2.2	150 x 61 x 178 mm 5.90 x 2.40 x 7 in
		Alternatively: SK BRE4-2-200-200 275 273 108	200	200	4.4	255 x 61 x 178 mm 10.03 x 2.40 x 7 in
	5.5 ... 7.5 kW 7.5 ... 10.0 hp	SK BRE4-2-200-200 275 273 108	200	200	4.4	255 x 61 x 178 mm 10.03 x 2.40 x 7 in
	11.0 ... 22.0 kW 15.0 ... 30.0 hp	SK BRE4-3-100-450 275 273 205	100	450	3.0	355 x 245 x 318 mm 13.97 x 9.6 x 12.5 in

[1] Permissible max. once within 120 s


NORD
DRIVESYSTEMS



Variable Frequency Drive for Decentralized Applications

NORDAC *BASE* SK 180E Series Product Status: Phase-Out

NORD® DRIVESYSTEMS

For Standard Requirements
NORDAC *BASE*, SK 180E Series

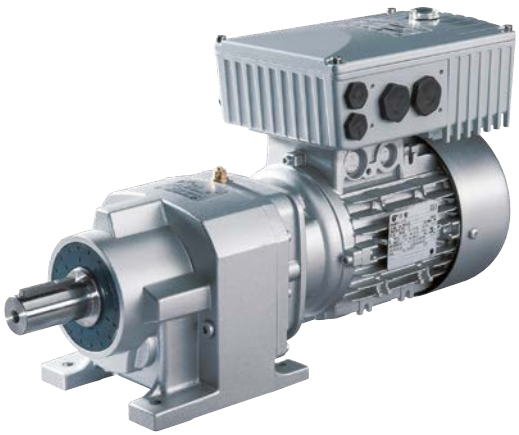
NORDAC *BASE*

NORDAC *BASE*

The advantages of using a variable frequency drive to control an electric motor are numerous. Modern VFDs offer typical basic functions such as speed control, communication with control units, precise positioning, and safety functions. However, many applications do not fully utilize the immense scope of functions of modern frequency drives.

To fill the gap which has resulted between simple motor starters and full featured VFDs, NORD has developed a compact model. The NORDAC *BASE* focuses on the essential functions for pumps and conveyor technology (PI / speed control, energy savings, communication with peripherals) and results in significant savings.

- All common drive functions
- Leakage current <16 mA
- Consistent parameter structure
- Stand-alone operation (integrated 24 V power supply)
- 3 digital inputs and 2 digital outputs
- 2 analog inputs (can optionally be used for current or voltage set points, or configured as digital inputs e.g. for sensors)
- 4 parameter sets which can be switched online
- Process controller / PI controller
- Energy saving function: Automatic flux optimization



Optional

- AS-Interface on board
- Common bus modules
- I/O modules
- System plug connectors (e.g. Harting HAN 10E)
- Variant for ATEX Zone 22 – 3D
- Various control options (switches, potentiometer or ParameterBoxes)

Energy-Saving Functions

- Automatic flux optimization for pump/fan applications
- Large energy savings
- Simple setting via parameters

EMC Line Filter Category C1 (Class B)

- All 230 V / 400 V devices have an integrated line filter
- Ideal for applications in a domestic environment, due to compliance with Category C1 (for motor mounting), or Category C2 (for wall mounting with motor cable up to 5 m long)
- Suitable for personal protection due to low leakage current (< 16 mA) for operation with universal fault current FI circuit breakers

Process Controller, PI Controller

- All NORDAC *BASE* devices feature integrated analog inputs
- P and I components can be set separately
- High precision regulation

Versatile and Sustainable For Modern Automation Systems

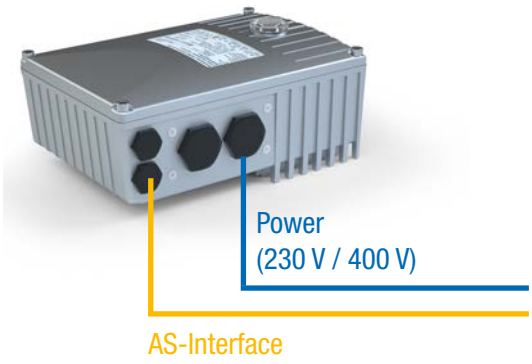
Modern automation systems have a wide range of requirements and in order to ensure reliable, efficient operation, a suitable bus system and drive components must be selected.

The AS-Interface is a cost-effective solution which enables the networking of binary sensors and actuators. It is included in certain versions of the NORDAC *BASE*.

The supply voltage (power) is connected separately via the corresponding terminals. An integrated mains unit generates the control voltage for the frequency drive, eliminating the need for an additional AUX cable (black).

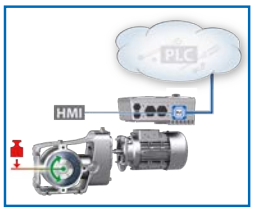
Available in SK 190E

Device SK ...	190E
Follower profile	S-7.A.
Follower type	A/B-Follower
Control voltage	Internal power supply
Inputs/Outputs	4/4
Configuration via parameters	●









Standards and Approvals

All devices of the entire series comply with the standards and directives listed below.

Approval	Directive		Applied standards	Certificates	Code
CE (European Union)	Low Voltage Directive	2014/35/EU	EN 61800-5-1 EN 60529 EN 61800-3 EN 63000 EN 61800-9-1 EN 61800-9-2	C310400 C310401	CE
	EMC	2014/30/EU			
	RoHS	2011/65/EU			
	Delegated directive (EU)	2015/863			
	Ecodesign	2009/125/EG			
	Regulation (EU) Ecodesign	2019/1781 2021/341			
UL (USA)			UL 61800-5-1	E171342	c UL us LISTED
CSA (Canada)			C22.2 No. 274-13	E171342	
RCM (Australia)	F2018L00028		EN 61800-3	133520966	
EAC (Eurasia)	TR CU 004/2011, TR CU 020/2011		IEC 61800-5-1 IEC 61800-3	ЕАЭС N RU Д-DE. НВ27.В.02730/20	
UkrSEPRO (Ukraine)			EN 61800-5-1 EN 60529 EN 61800-3 EN 63000 EN 60947-1 EN 60947-4 EN 61558-1 EN 50581	C311900	
UKCA (United Kingdom)			EN 61800-5-1 EN 60529 EN 61800-3 EN 63000 EN 61800-9-1 EN 61800-9-2	C350400, C350401	UK CA

Devices which are configured and approved for use in explosion hazard environments comply with the following directives and standards.

Approval	Directive		Applied standards	Certificates	Code
CE (European Union)	ATEX	2014/34/EU	EN 60079-0 EN 60079-31 EN 61800-5-1 EN 60529 EN 61800-3 EN 63000 EN 61800-9-1 EN 61800-9-2	C432410	CE Ex
	Low Voltage Directive	2014/35/EU			
	EMV	2014/30/EU			
	RoHS	2011/65/EU			
	Delegated directive (EU)	2015/863			
	Ecodesign	2009/125/EG			
	Regulation (EU) Ecodesign	2019/1781			

Type Code

Variable Frequency Drives

SK 180E-370-323-B (-C) (xxx)

- Special Version
- IP Protection Class: Standard = IP55, **C** = IP66
- Radio interference filter: **0** = without, **A** = Class A1 (C2), **B** = Class B (C1)
- Mains voltage: **x12** = 115 V, **x23** = 230 V, **x40** = 400 V
- Number of mains phases: **1xx** = 1-phase, **3xx** = 3-phase (with 230 V up to 1.1 kW: 1~/3~)
- Device rated power: **250** = 0.25 kW / 0.33 hp, **370** = 0.37 kW / 0.5 hp, ...**221** = 2.2 kW / 3.0 hp
- Variable frequency drive series: SK 180E, SK 190E

(…) Options, only implemented if required.

Explosive Environment Protection

ATEX-Compliant Drive Systems, Zone 22 3D

The NORDAC *BASE* can be modified for operation in explosive environments. This allows the operation of the frequency drive directly in a hazardous area (ATEX 22-3D). The advantages include:

- Compact drive unit
- No complex protective devices
- No motor cables
- Optimum EMC
- Permissible characteristic curves 50 Hz / 87 Hz
- Control range up to 100 Hz or 3000 rpm

Depending on the area of application (conductive or non-conductive dust) the modification also includes the replacement of the transparent diagnostic caps with a version made of aluminum and glass.

Please note that operation of the device within the hazardous area is only permitted with integrable modules (SK CU4 modules, internal braking resistors) or specially approved accessories (ATEX potentiometer SK ATX-POT).

There are exceptions for SK TU4 modules, which are described in detail in the manual for the device. Other accessories (e.g. external brake resistors, plug connectors) are not approved for use within a hazardous area.

Approval

- According to 2014/34/EU
- ATEX Zone 22 - 3D
  - Version for non-conducting dust: IP55
  - Version for conducting dust: IP66

Available in all versions



Class I - Gas Groups A, B, C, and D

- Gases, vapors, or aerosols
- NEC 500
- Divison 1 - Areas in which hazardous concentrations of flammable gases or vapors
  - Can be present under normal operating conditions
  - Can frequently occur during repair and maintenance work
  - Can occur throughout malfunctions concerning operation during which errors occuring in electrical equipment may result in a source of ignition
- Divison 2
  - Areas in which hazardous concentration of flammable gases or vapors are kept in closed containers or systems and can only be released under fault conditions

Class II - Dust Groups E, F and G

- Dusts
- NEC 500
- Division 1 - Areas in which hazardous concentration of explosive dust atmospheres
  - Can be present under normal operating conditions
  - Can occur throughout malfunctions concerning operation during which errors occurring in electrical equipment may result in a source of ignition
  - Areas with hazardous quantities of conductive dust (Group E)
- Division 2
  - Areas in which hazardous concentrations of explosive dust atmospheres can only be released under fault conditions

Class III

- Ignitable fibers and flyings
- NEC 500
- Division 1
  - Areas in which flammable fibers and lint occur or are processed
- Division 2
  - Areas in which flammable fibers are stored or handled in a different manner to that in the production process

The Entire Team
All Device Versions at a Glance

	SK 180E Size 1 – 2 0.33 – 3.0 hp	SK 190E Size 1 – 2 0.33 – 3.0 hp
Motor and wall mounting possible [1]	●	●
Energy bus - loop-through of mains supply cables [2]	●	●
Communication bus for various devices [2]	●	●
Sensorless current vector control (ISD control)	●	●
Brake chopper (braking resistor optional) (Size 2 and above)	●	●
RS-232, RS-485 diagnostic interface	●	●
4 switchable parameter sets	●	●
Parameters pre-set with standard values	●	●
Automatic determination of motor data	●	●
Energy-saving function, optimized efficiency in partial load operation	●	●
Integrated EMC line filter according to EN 61800-3, Category C2 up to 5 m motor cable Category C1 for motor assembly	●	●
Extensive monitoring functions	●	●
Load monitor	●	●
PI controller	●	●
Process controller / compensator control	●	●
PLC functionality	●	●
Synchronous motor operation (PMSM)	●	●
Modification for operation in an IT network by means of jumpers	●	●
All common field bus systems	○	○
Brake management for mechanical holding brake	○	○
Lifting gear functionality	○	○
AS-Interface on board	❍	●
Internal 24 V power supply unit to supply the control board	●	●
Internal / external brake resistors (Size 2)	○	○
Switch and potentiometer versions	○	○
Plug connectors for connection of control, motor and mains cables	○	○

[1] Wall mounting: wall mounting kit required
Motor mounting: an adapter for connection to the motor terminal box may be necessary

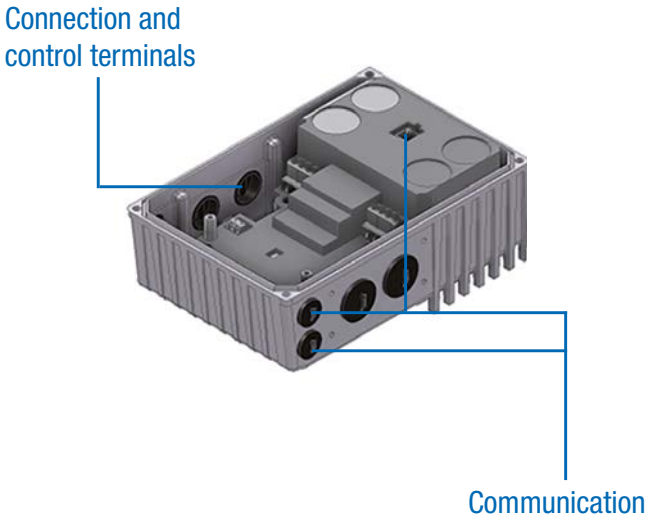
[2] Direct connection to the terminal bar or via system plug connectors

● Available as standard
○ Optional
❍ Not available

Control Connections on the Variable Frequency Drive

		SK 180E Size 1 – 2 0.33 – 3.0 hp	SK 190E Size 1 – 2 0.33 – 3.0 hp
Control Terminals	Number of digital inputs (DIN)	3	3
	Number of digital outputs (DOUT)	2	2
	Number of analog inputs (AIN) [1]	2	2
	Temperature sensor (PTC)	●	●
Communication	RS-485 / RS-232 RJ12	●	●
	AS-I terminal connection	❍	●

[1] 0(2) - 10 V, 0(4) - 20 mA



Note

Control terminals can be supplemented by optional modules (IOs, brake management).

Status and Diagnostic Cockpit

The RJ12 interface for connection of a diagnostic and parameterization tool (e.g. PC with NORDCON software, ParameterBox) is located behind the transparent cover cap. Analysis, diagnostics, parameterization, and monitoring of the drive unit via software is possible during commissioning or service.

In addition to status and readiness indicators, the current overload level, warnings and error messages are indicated in coded form by the LEDs.



NORDAC *BASE* Variable Frequency Drive
1~ 110 ... 120 V , 1 / 3~ 200 ... 240 V and 3~ 380 ... 400 V

Output Frequency	0.0 ... 400.0 Hz
Pulse Frequency	3.0 ... 16.0 kHz
Typical Overload Capacity	150% for 60 s, 200% for 3.5 s
Energy Efficiency Class	IE2
Efficiency	> 95%
Ambient Temperature	-25°C ... +40°C (S1) -25°C ... +50°C (S3, - 70% ED)
Protection Class	IP55, optional IP66, NEMA type 1
Regulation and Control	Sensorless current vector control (ISD), linear V/f characteristic curve
Motor Temperature Monitoring	I^2t Motor PTC / bi-metal switch
Leakage Current	< 16 mA

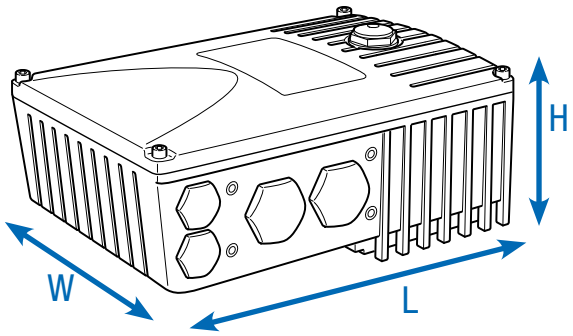
Variable Frequency Drives SK 180E...	Nominal Motor Power 230 V [kW]	Nominal Motor Power 240 V [hp]	Nominal Output Current rms [A]	Mains Voltage	Output Voltage
-250-112-0 (-C)	0.25	0.33	1.7	1 ~ 110...120 V -/+10% 47 ... 63 Hz	3 ~ AC 0 V up to double the mains voltage
-370-112-0 (-C)	0.37	0.50	2.1		
-550-112-0 (-C)	0.55	0.75	3.0		
-750-112-0 (-C)	0.75	1.00	3.7		

Variable Frequency Drives SK 180E...	Nominal Motor Power 230 V [kW]	Nominal Motor Power 240 V [hp]	Nominal Output Current rms [A]	Mains Voltage	Output Voltage
-250-323-B (-C)	0.25	0.33	1.7	1/3 ~ 200 ... 240 V, -/+ 10% 47 ... 63 Hz	3 ~ AC 0 V up to mains voltage
-370-323-B (-C)	0.37	0.50	2.2		
-550-323-B (-C)	0.55	0.75	3.0		
-750-323-B (-C)	0.75	1.00	4.0		
-111-323-B (-C)	1.10	1.50	5.5		
-151-323-B (-C)	1.50	2.00	7.0	3 ~ 200 ... 240 V, -/+ 10% 47 ... 63 Hz	3 ~ AC 0 V up to mains voltage

Variable Frequency Drives SK 180E...	Nominal Motor Power 400 V [kW]	Nominal Motor Power 480 V [hp]	Nominal Output Current rms [A]	Mains Voltage	Output Voltage
-250-340-B (-C)	0.25	0.33	1.2	3 ~ 380...480 V, -20% / +10%, 47 ... 63 Hz	3 ~ AC 0 V up to mains voltage
-370-340-B (-C)	0.37	0.50	1.5		
-550-340-B (-C)	0.55	0.75	1.7		
-750-340-B (-C)	0.75	1.00	2.3		
-111-340-B (-C)	1.10	1.50	3.1		
-151-340-B (-C)	1.50	2.00	4.0		
-221-340-B (-C)	2.20	3.00	5.5		

IP66 Measures

- Coated aluminum components
- Coated circuit boards
- Low-pressure test
- Diaphragm valve



Variable Frequency Drives SK 180E...	Weight [kg]	Weight [lbs]	Overall Dimensions L x W x H	Size
-250-112-O (-C)	2.9	6.4	221 x 154 x 101 mm 8.7 x 6.06 x 3.98 in	1
-370-112-O (-C)	2.9	6.4		1
-550-112-O (-C)	2.9	6.4		1
-750-112-O (-C)	2.9	6.4		1

Variable Frequency Drives SK 180E...	Weight [kg]	Weight [lbs]	Overall Dimensions L x W x H	Size
-250-323-B (-C)	2.9	6.4	221 x 154 x 101 mm 8.7 x 6.06 x 3.98 in	1
-370-323-B (-C)	2.9	6.4		1
-550-323-B (-C)	2.9	6.4		1
-750-323-B (-C)	4.1	9.04	254 x 165 x 123 mm 10 x 6.5 x 4.84 in	2
-111-323-B (-C)	4.1	9.04		2
-151-323-B (-C)	4.1	9.04		2

Variable Frequency Drives SK 180E...	Weight [kg]	Weight [lbs]	Overall Dimensions L x W x H	Size
-250-340-B (-C)	2.9	6.4	221 x 154 x 101mm 8.7 x 6.06 x 3.98 in	1
-370-340-B (-C)	2.9	6.4		1
-550-340-B (-C)	2.9	6.4		1
-750-340-B (-C)	2.9	6.4		1
-111-340-B (-C)	2.9	6.4		1
-151-340-B (-C)	4.1	9.04	254 x 165 x 123 mm 10 x 6.5 x 4.84 in	2
-221-340-B (-C)	4.1	9.04		2

Varied Installation Possibilities

Motor Assembly

The VFD can be mounted directly on the terminal box of the (geared) motor, forming an optimized complete unit. This motor-mounted format provides numerous advantages: compact overall dimensions of the drive unit, quick readiness for use after connection to the mains supply due to pre-configuration of the drive unit at the factory, and optimum EMC due to short cable lengths or elimination of a motor cable.

Wall Mounting

As an alternative to motor mounting, the device can be mounted close to the motor with the aid of a wall mounting kit. Different versions are available depending on the application.

1. Standard Version SK TIE4-WMK-1-K

Note: If the VFD is wall-mounted, the cooling air flow from the motor is not present. This can result in power restrictions (derating) for the frequency drive.

2. ATEX Version SK TIE4-WMK-1-EX

This version is functionally comparable to the standard version and suitable for use in explosion hazard environments (ATEX Zone 22 3D).

Designation	Material No.	VFDs[1] for size FI
SK TIE4-WMK-1-K	275 274 004	Size 1, 2
SK TIE4-WMK-1-EX	275 175 053	Size 1, 2
SK TIE4-WMK-TU[2]	275 274 002	Type: SK TU4-

[1] Mounting of the WMK underneath the motor starter
[2] Mounting of the WMK on the connection unit of the technology unit

Motor-Mounted or Wall-Mounted Variable Frequency Drives



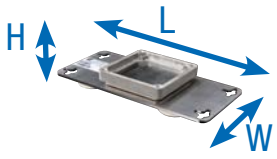
Wall mounting

Motor assembly

Designation	Material	Integrated Fan	Achievable Protection Class	Weight	Overall Dimensions L x W x H	Remarks
SK TIE4-WMK-1-K	Plastic	❍	IP66	0.2 kg 0.44 lbs	205 x 95 x 5 mm 8.07 x 3.74 x 0.2 in	Note: derating as necessary
SK TIE4-WMK-1-EX	Stainless steel	❍	IP66	0.6 kg 0.97 lbs	205 x 95 x 4 mm 8.04 x 3.74 x 0.16 in	Note: derating as necessary
SK TIE4-WMK-TU	Stainless steel	❍	IP66	0.4 kg 0.88 lbs	155 x 85 x 3 mm 6.10 x 3.35 x 0.12 in	

[1] H = Increase in the total height of the device if mounted on the wall mounting kit

Technology Unit on NORDAC *BASE* or Wall Mounting



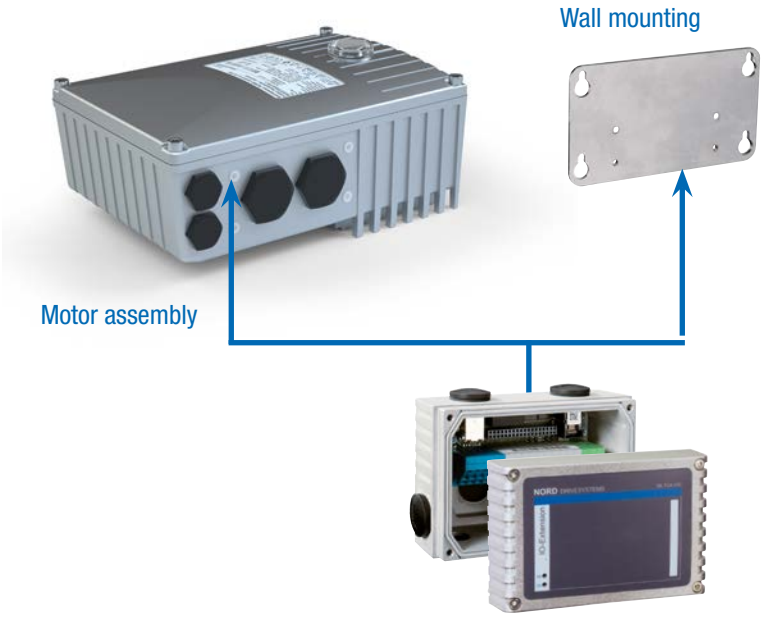
SK TIE4-WMK-1-EX



SK TIE4-WMK-1-K



SK TIE4-WMK-TU



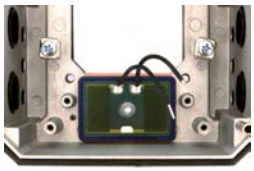
Brake Resistors (only for Size 2 devices)
Internal Versions

Internal Brake Resistors
SK BRI4

Internal brake resistors are intended for applications in which slight or only sporadic and brief braking (e.g. continuous conveyor equipment, mixing equipment) is to be expected. They enable the use of the variable frequency drive in very confined spaces or in an explosive atmosphere.

Internal brake resistors are intended for installation in the connection unit of the VFD. The units offer space for implementing one brake resistor each. For thermal reasons, the rated continuous output is limited to 25%.

Equipment with a brake resistor has to be specified when ordering as retrofitting is not possible.



Variable Frequency Drives SK 180E / SK190E		Resistor Type	Material No.	Resistance [Ω]	Continuous Output[1] [W]	Power Consumption[2] [kWs]
1/3~ 230 V	0.75 ... 1.5 kW 1.0 ... 2.0 hp	SK BRI4-1-200-100	275 272 008	200	100 / 25 %	1.0
3~ 400 V	1.5 ... 2.2 kW 2.0 ... 3.0 hp	SK BRI4-1-400-100	275 272 012	400	100 / 25 %	1.0

[1] Reduction of the continuous output of the braking resistor to 25% of the rated output
[2] Permissible max. once within 10 s

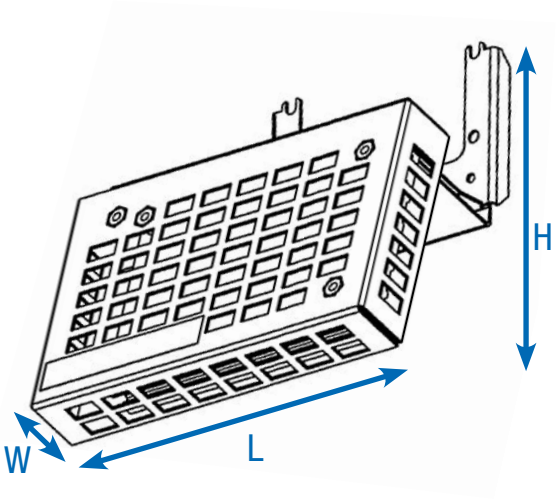
Brake Resistors (only for Size 2 devices)
External Versions

External Brake Resistors SK BRE4

External brake resistors (IP67) are intended for applications in which longer, frequent or intensive braking is to be expected (cyclic operation / highly dynamic positioning applications). They are mounted directly on the VFD and can develop high surface temperatures (>70°C), which exclude their use in an explosive atmosphere.

Note

The brake resistors listed here are designed for typical applications with occasional braking. In case of doubt or for applications with higher braking power such as lifting equipment, we recommend targeted planning of the necessary brake resistor and contacting NORD directly.



Variable Frequency Drives SK 180E / SK190E		Resistor Type Material No.	Resistance [Ω]	Continuous Output [W]	Power Consumption[1] [kWs]	Overall Dimensions L x W x H
1/3~ 230 V	0.75 ... 1.5 kW 1.0 ... 2.0 hp	SK BRE4-1-100-100 275 273 005	100	100	2.2	150 x 61 x 178 mm 5.9 x 2.4 x 7 in
		Alternatively: SK BRE4-2-100-200 275 273 105	100	200	4.4	255 x 61 x 178 mm 10.03 x 2.4 x 7 in
3~ 400 V	1.5 ... 2.2 kW 2.0 ... 3.00 hp	SK BRE4-1-200-100 275 273 008	200	100	2.2	150 x 61 x 178 mm 5.9 x 2.4 x 7 in
		Alternatively: SK BRE4-2-200-200 275 273 108	200	200	4.4	255 x 61 x 178 mm 10.03 x 2.4 x 7 in

[1] Permissible max. once within 120 s





Motor Starter for Decentralized Applications

NORDAC *START* SK 135E Series Product Status: Phase-out

NORD® DRIVESYSTEMS

Switch On and Start Working!
NORDAC *START*, SK 135E Series



NORDAC *START*

NORDAC *START*

Mains-powered electric motors are very widespread and require low installation and commissioning effort. However, disadvantages include high power consumption due to starting torque (up to 7 times the rated current for the motor), excessive mechanical loads on the gear unit, and uncontrolled starting and stopping behavior. The NORD *START* is an economical solution that provides more than simple current limiting starting for electric motors.

Functionality in a Compact Design

The NORDAC *START* combines the 3 functions of a typical electronic motor starter: starter, reversing starter, and soft starter. It includes comprehensive monitoring and protective functions (mains/motor/self-monitoring) and also eliminates the need for a motor protection switch. It also enables individual adaptations to the operating characteristics (starting / shut-down behavior) and provides optional communication interfaces. A special feature is the variable mounting options of the device in confined spaces, easily allowing the compact device to be used close to the motor.

Versatility and Protection

The NORDAC *START* is ideally suited for applications that require electronic starting and stopping of the drive units, such as those in material handling. Its versatility makes both motor starting functions and soft starting/ reversing mode possible. Extensive monitoring functions provide protection from overheating and due to the I^2t triggering characteristic, a motor protection switch is not required. Through the integrated line filter, the NORDAC *START* complies with even the most stringent EMC requirements when mounted on the motor.

Standard

- Configuration via DIP switches and potentiometers
- Integrated electronic brake rectifier
- Choice of different shut-down modes
- Leakage current <20 mA
- Consistent parameter structure
- 2 digital inputs and outputs

Optional

- Bus interface on board
  - AS-Interface (implemented as SK 175E-ASI)
  - PROFIBUS® DP (implemented as SK 175E-PBR)
- System plug connectors (e.g. Harting HAN 10E)
- Variant for ATEX Zone 22 - 3D
- Various control options (switches, ParameterBox)
- 24V mains unit

Variable Operating Characteristics

- Pre-defined shut-down modes
- Variable starting and shut-down ramps
- Boost function

EMC Line Filter Class B

- Integrated line filter
- Also ideal for applications in a domestic environment, due to compliance with Class B (for motor mounting or motor cables up to 10 m), or Class A, for wall mounting with motor cables up to 100 m long
- Suitable for personal protection due to low leakage current (<20 mA) for operation with universal fault current FI circuit breakers

Commissioning

- Commissioning via integrated DIP switches and potentiometer
- No programming skills required



Standards and Approvals

All devices of the entire series comply with the standards and directives listed below.

Approval	Directive		Applied Standards	Certificates	Code
CE (European Union)	Low Voltage Directive	2014/35/EU	EN 60947-1 EN 60529 EN 60947-4-2 EN 63000	C310800	
	EMV	2014/30/EU			
	RoHS Delegated directive (EU)	2011/65/EU 2015/863			
UL (USA)			UL 60947-1 UL 60947-4-2	E365221	
CSA (Canada)			C22.2 No. 60947-1-13 C22.2 No. 60947-4-2-14	E365221	
RCM (Australia)	F2018L00028		EN 60947-1 EN 60947-4-2	133520966	
EAC (Eurasia)	TR CU 004/2011, TR CU 020/2011		IEC 60947-1 IEC 60947-4-2	EAЭC N RU Д-DE. HB27.B.02732/20	
UkrSEPRO (Ukraine)			EN 60947-1 EN 60529 EN 60947-4-2 EN 63000 EN 60947-1 EN 60947-4 EN 61558-1 EN 50581	C311900	
UKCA (United Kingdom)			EN 60947-1 EN 60529 EN 60947-4-2 EN 63000 EN 61800-9-1 EN 61800-9-2	C350800	

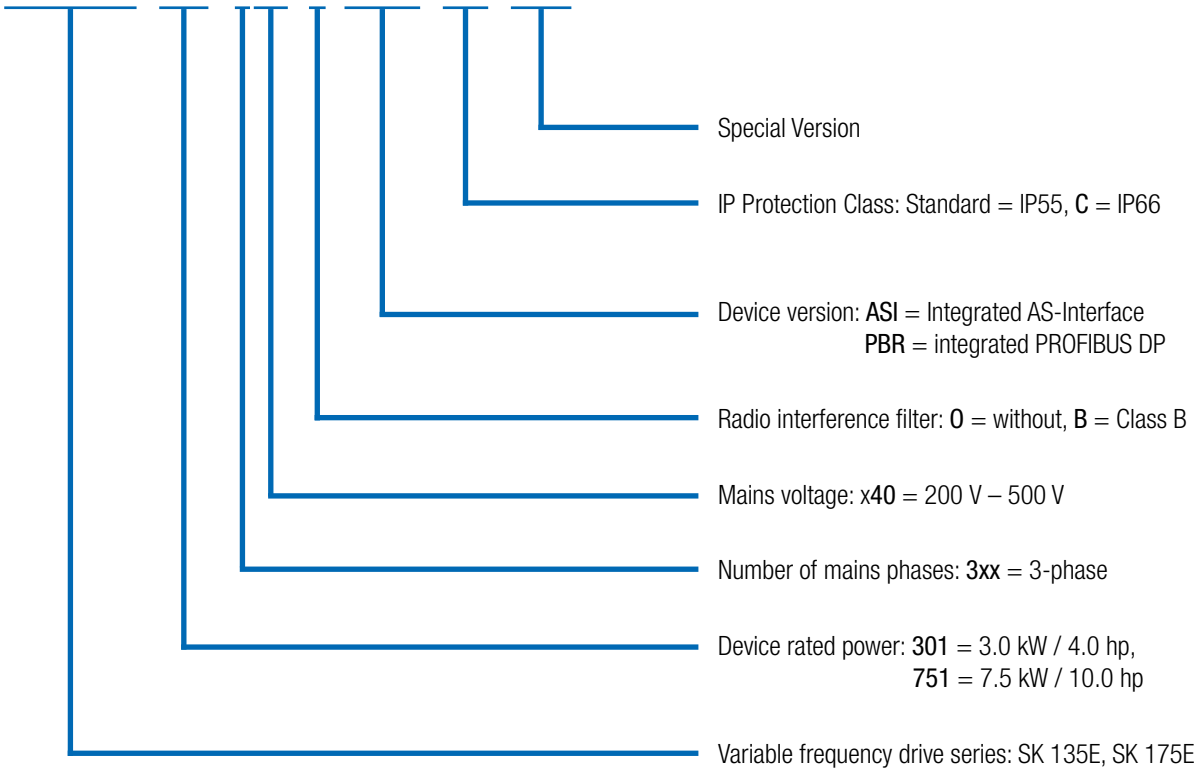
Devices which are configured and approved for use in explosion hazard environments comply with the following directives and standards.

Approval	Directive		Applied standards	Certificates	Code
CE (European Union)	ATEX	2014/34/EU	EN 60079-0 EN 60079-31 EN 63000 EN 60529 EN 60947-1 EN 60947-4-2	C432810	CE Ex
	EMV	2014/30/EU			
	RoHS Delegated directive (EU)	2011/65/EU 2015/863			

Type Code

Motor starters

SK 175E-751-340-B (-ASI) (-C) (xxx)



(…) Options, only implemented if required.

Versatile and Sustainable Communication and More

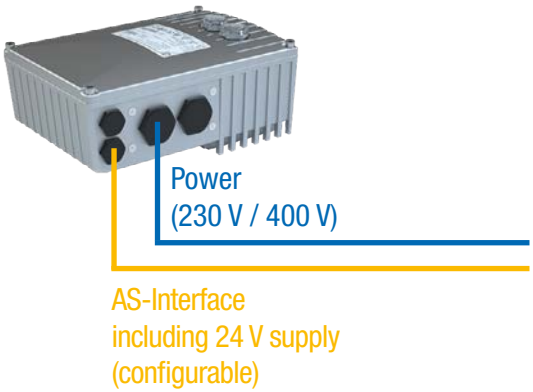
Modern automation systems have a wide range of requirements and in order to ensure reliable, efficient operation, a suitable bus system and drive components must be selected.

AS-Interface

The AS-Interface is a cost-effective solution for the lower field level which enables the networking of binary sensors and actuators and is included in certain versions of the NORDAC *START*.

The supply voltage (power) is connected separately via the corresponding terminals. Depending on the device configuration (with jumpers), the control voltage of the motor starter is supplied via the yellow AS-Interface cable or separately via the black (AUX) cable.

Available in all SK 175E ... ASI devices



PROFIBUS DP®

This bus system allows for cyclic exchange of 4 control or 4 status bits via a process data object (with up to 12 Mbps). Addressing is performed via a rotary encoding switch and the PROFIBUS terminator can be enabled with a jumper. Connection is possible with terminal strips or M12 plug connectors.

Available in all SK 175E ... ASI devices

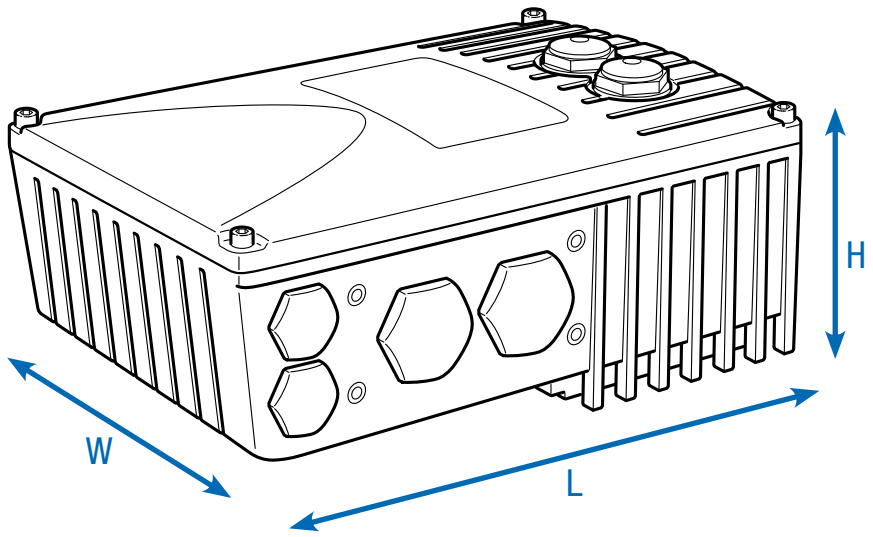


Jumper Position	AUX	ASI
Follower profile	S-7.A.	S-7.A.
Follower type	A/B-follower	A/B-follower
Control voltage	Black AS-I cable	Yellow AS-I cable
Inputs/Outputs	4/4	4/4
Configuration via DIP-switch	●	●
Configuration via parameters	●	●

Motor Starter NORDAC *START*
3~ 200 ... 500 V

Typical Overload Capacity	150% for 120 s up to 360 s (adjustable)
Motor Starter Efficiency	> 98%
Ambient Temperature	-25°C...+50°C (S1), -25°C +60°C (S3 - 70% ED)
Protection Class	IP55, optional IP66 NEMA type 1
IP66 Measures	▸ Coated aluminum components ▸ Coated circuit boards ▸ Low-pressure test
Protective Measures Against	▸ Mains phase failure ▸ Motor phase failure ▸ Flux monitoring ▸ Motor over temperature (PTC) ▸ Motor overload ▸ Mains over/under voltage
Motor Temperature Monitoring	I^2t Motor PTC / bi-metal switch
Leakage Current	< 20 mA

Motor Starters SK 135 E... / SK 175 E...	Nominal Motor Power [kW]	[hp]	Nominal Output Current rms [A]	Mains Voltage / Output Voltage	Weight	Overall Dimensions L x W x H
-301-340-B	up to 3.0	up to 4.0	7.5	3~ 200 V … 500 V, -10% / +10%, 47 ... 63 Hz	2.1 kg 4.63 lbs	221 x 154 x 101 mm 8.7 x 6.06 x 3.98 in
-751-340-B	up to 7.5	up to 10.0	16.0			



Explosive Environment Protection

ATEX-Compliant Drive Systems, Zone 22 3D

The NORDAC *START* can be modified for operation in explosive environments – allowing the operation of the motor starter directly in a hazardous area (ATEX 22-3D). Advantages include:

- Compact drive unit
- No complex protective devices
- No motor cables
- Optimum EMC

Depending on the area of application (conductive or non-conductive dust) the modification also includes the replacement of the transparent diagnostic caps with a version made of aluminum and glass.

Please note that operation of the device within the hazardous area is only permitted with integrable modules (SK CU4 modules, internal braking resistors) or specially approved accessories.

There are exceptions for SK TU4 modules which are described in detail in the manual for the device. Other accessories (e.g. external brake resistors, plug connectors) are not approved for use within a hazardous area.

Approval

- According to 2014/34/EU
- ATEX Zone 22 - 3D
  - Version for non-conducting dust: IP55
  - Version for conducting dust: IP66

Available in all versions



Class I - Gas Groups A, B, C, and D

- Gases, vapors, or aerosols
- NEC 500
- Divison 1 - Areas in which hazardous concentrations of flammable gases or vapors
  - Can be present under normal operating conditions
  - Can frequently occur during repair and maintenance work
  - Can occur throughout malfunctions concerning operation during which errors occuring in electrical equipment may result in a source of ignition
- Divison 2
  - Areas in which hazardous concentration of flammable gases or vapors are kept in closed containers or systems and can only be released under fault conditions

Class II - Dust Groups E, F and G

- Dusts
- NEC 500
- Division 1 - Areas in which hazardous concentration of explosive dust atmospheres
  - Can be present under normal operating conditions
  - Can occur throughout malfunctions concerning operation during which errors occurring in electrical equipment may result in a source of ignition
  - Areas with hazardous quantities of conductive dust (Group E)
- Division 2
  - Areas in which hazardous concentrations of explosive dust atmospheres can only be released under fault conditions

Class III

- Ignitable fibers and flyings
- NEC 500
- Division 1
  - Areas in which flammable fibers and lint occur or are processed
- Division 2
  - Areas in which flammable fibers are stored or handled in a different manner to that in the production process

The Entire Team
All Device Versions at a Glance

	SK 135E 0.33 – 10.0 hp	SK 175E - ASI 0.33 – 10.0 hp	SK 175E - PBR 0.33 – 10.0 hp
Soft start function	●	●	●
Reversing function	●	●	●
Motor and wall mounting possible [1]	●	●	●
Energy bus - loop-through of mains supply cables [2]	●	●	●
RS-232 diagnostic interface	●	●	●
Parameters pre-set with standard values	●	●	●
Integrated EMC line filter according to EN 60947-4-2, Class B up to 10 m motor cable and for motor assembly	●	●	●
Integrated EMC line filter according to EN 60947-4-2, Class A up to 100 m motor cable and for motor assembly	●	●	●
Extensive monitoring functions	●	●	●
Brake management for mechanical holding brake	●	●	●
AS-Interface on board	❍	●	❍
PROFIBUS DP® on board	❍	❍	●
External 24 V power supply for the control board	○	○	○
Switch variants	○	○	○
Plug connectors for connection of control, motor and mains cables	○	○	○

[1] Wall mounting: wall mounting kit required
Motor mounting: an adapter for connection to the motor terminal box may be necessary
[2] Direct connection to the terminal bar or via system plug connectors

● Available as standard
○ Optional
❍ Not available

Control Connections on the Motor Starter

		SK 135E 0.33 – 10.0 hp	SK 175E - ASI 0.33 – 10.0 hp	SK 175E - PBR 0.33 – 10.0 hp
Control Terminals	Number of digital inputs (DIN)	2	2 (+2 sensor inputs for Bus)	2 (+2 sensor inputs for Bus)
	Number of digital outputs (DOUT)	2	2	2
	Brake control	●	●	●
	Temperature sensor (PTC)	●	●	●
Communication	RS-232 RJ12	●	●	●
	AS-I terminal connection	❍	●	❍
	PROFIBUS DP® terminal connection	❍	❍	●

Note
Control terminals can be added with optional modules (IOs, device protection).

● Available as standard
❍ Not available



Configuration and Monitoring
Integrated Aids for Safe Operation



Commissioning with a Screwdriver

Commissioning of the device is possible without parameter adaptation, i.e. without programming aids. For this purpose, DIP switches and several 10 step potentiometers are available. These are accessible via the diagnostic opening in the center or by removing the cover. The status LEDs of the device are also located behind this diagnostic opening.

The following parameters can be adjusted:

- Rated motor current
- Locking time
- Start-up torque
- Start-up and run-down time
- Switch-off mode
- Phase sequence detection
- Automatic start
- PROFIBUS DP® addressing (only SK 175E-...-PBR)

Jumpers for Configuration

The communication interface can be configured by changing the jumper position.

- SK 175E-...-ASI: Communication mode
  - ASI (supply for interface and device via yellow cable) or
  - AUX (supply for interface via yellow cable and for device via black cable)
- SK 175E-...-PBR: Interface terminator

Available in all SK 175E devices

Status and Diagnostic Cockpit

Depending on the type of device, various aids for monitoring the device or for diagnosis in case of faults, are located behind two transparent cover caps. There are further elements (e.g. potentiometers or similar) which are useful for “screwdriver-assisted commissioning.



1. Status LEDs and Potentiometers

In addition to status and readiness indicators, the actual overload level, warnings, and error messages of the integrated bus system (SK 175E) are indicated in coded form by the LEDs.

Operational settings of the motor starter can be set with the potentiometers.

2. Diagnostic Interface, RS-232

RJ12 interface for connection of a diagnostic and parameterization tool (e.g. PC with NORDCON software and ParameterBox[1]). Analysis, diagnostics, parameterization, and monitoring of the drive unit via software is possible during commissioning or service.

[1] Use of a parameterization unit also requires the use of a signal converter. (SK TIE4-RS-485-RS-232, material no. 275 274 603)

Various Installation Possibilities

Motor Assembly

The motor starter can be mounted directly on the terminal box base of the (geared) motor, forming a complete unit consisting of the drive and control technology. This motor-mounted format makes full use of its numerous advantages: compact overall dimensions of the drive unit, quick readiness for use after connection to the mains supply due to the pre-configuration of the drive unit at the factory, and optimum EMC due to short cable lengths - or elimination of a motor cable.

Wall Mounting

As an alternative to motor mounting, the device can be mounted close to the motor with the aid of an optional wall mounting kit. Different versions can be selected depending on the application.

1. Standard Version SK TIE4-WMK-1-K

2. ATEX Version SK TIE4-WMK-1-EX

This version is functionally comparable to the standard version and suitable for use in explosion hazard environments (ATEX Zone 22 3D).

Designation	Material No.	Variable Frequency Drives[1] for Size FI
SK TIE4-WMK-1-K	275 274 004	Size 1
SK TIE4-WMK-2-K	275 274 015	Size 2
SK TIE4-WMK-1-EX	275 175 053	Size 1
SK TIE4-WMK-2-EX	275 175 054	Size 2
SK TIE4-WMK-TU[2]	275 274 002	Type: SK TU4-

[1] Mounting of the WMK underneath the motor starter
[2] Mounting of the WMK on the connection unit of the technology unit

Motor-Mounted or Wall-Mounted Motor Starters

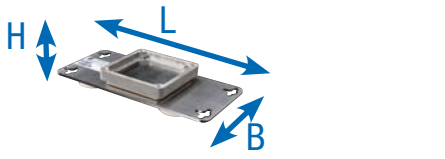


Wall mounting

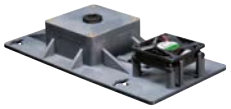
Motor assembly

Designation	Material	Integrated Fan	Achievable Protection Class	Weight	Overall Dimensions L x W x H
SK TIE4-WMK-1-K	Plastic	-	IP66	0.2 kg 0.44 lbs	205 x 95 x 5 mm 8.07 x 3.7 x 0.19 in
SK TIE4-WMK-2-K	Plastic	-	IP66	0.3 kg 0.66 lbs	235 x 105 x 5 mm 9.25 x 4.13 x 0.19 in
SK TIE4-WMK-1-EX	Stainless steel	-	IP66	0.6 kg 1.32 lbs	205 x 95 x 4 mm 8.07 x 3.7 x 0.15 in
SK TIE4-WMK-2-EX	Stainless steel	-	IP66	0.8 kg 1.76 lbs	235 x 105 x 10 mm 9.25 x 4.13 x 0.39 in
SK TIE4-WMK-TU	Stainless steel	-	IP66	0.4 kg 0.88 lbs	155 x 85 x 3 mm 6.1 x 3.34 x 0.11 in

[1] H = Increase in the total height of the device if mounted on the wall mounting kit



SK TIE4-WMK-1-EX



SK TIE4-WMK-L-1

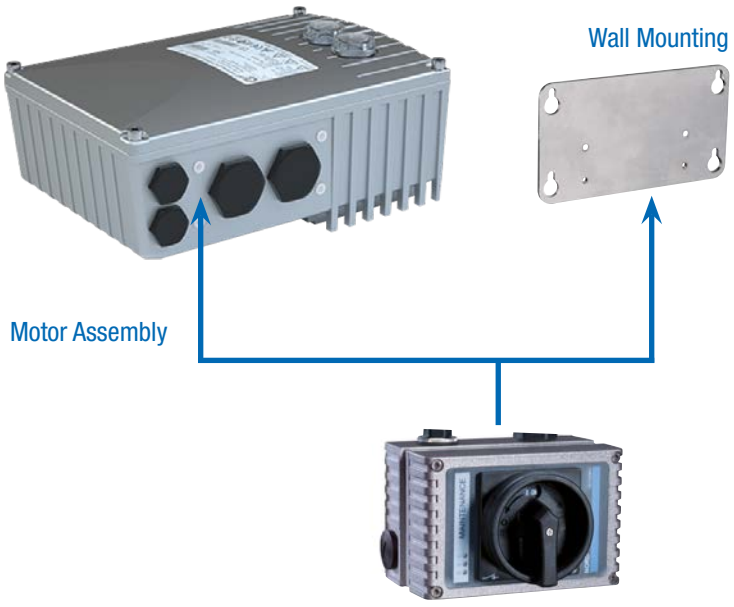


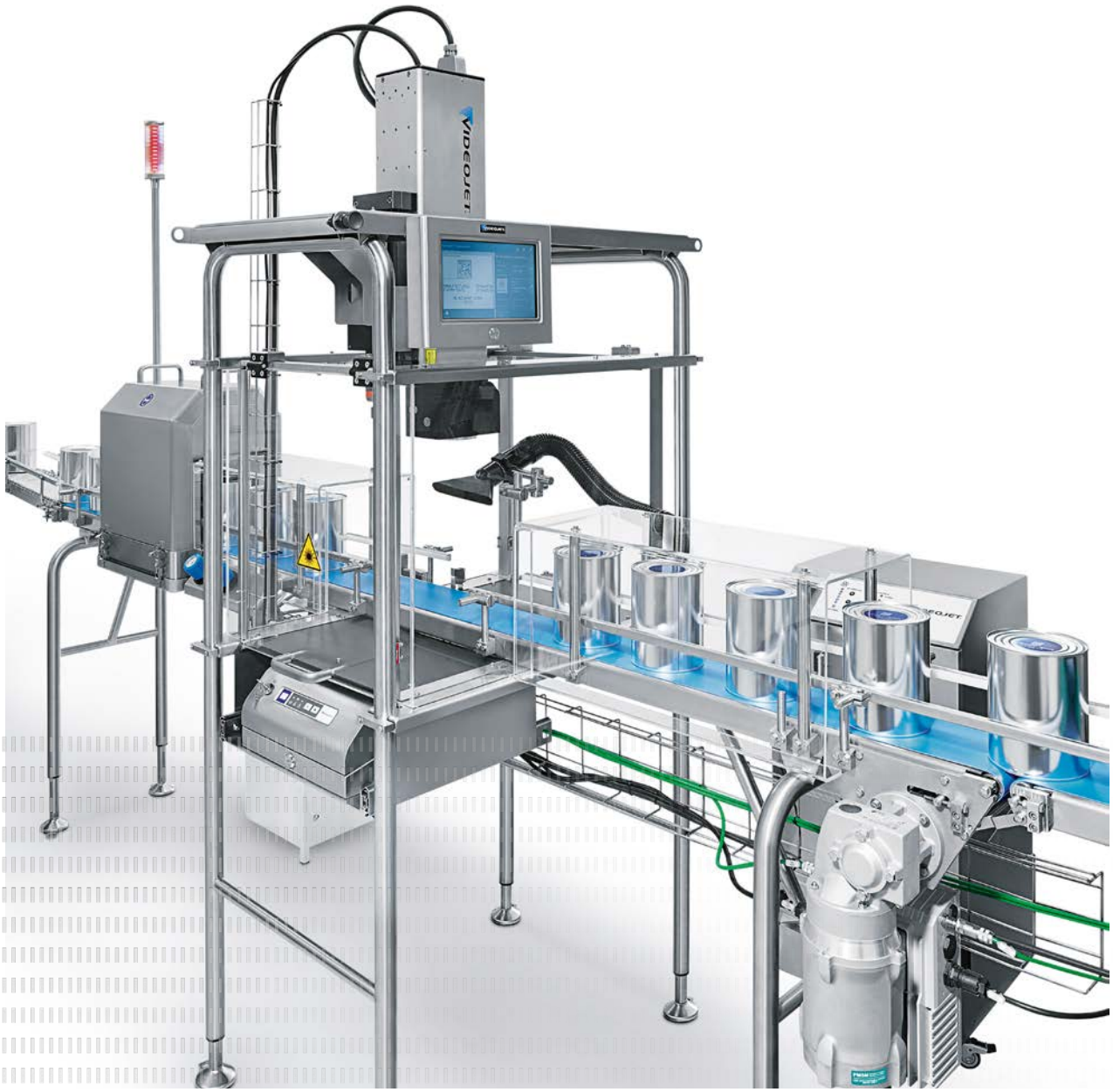
SK TIE4-WMK-1-K



SK TIE4-WMK-TU

Technology Unit on NORDAC *START* or Wall Mounting



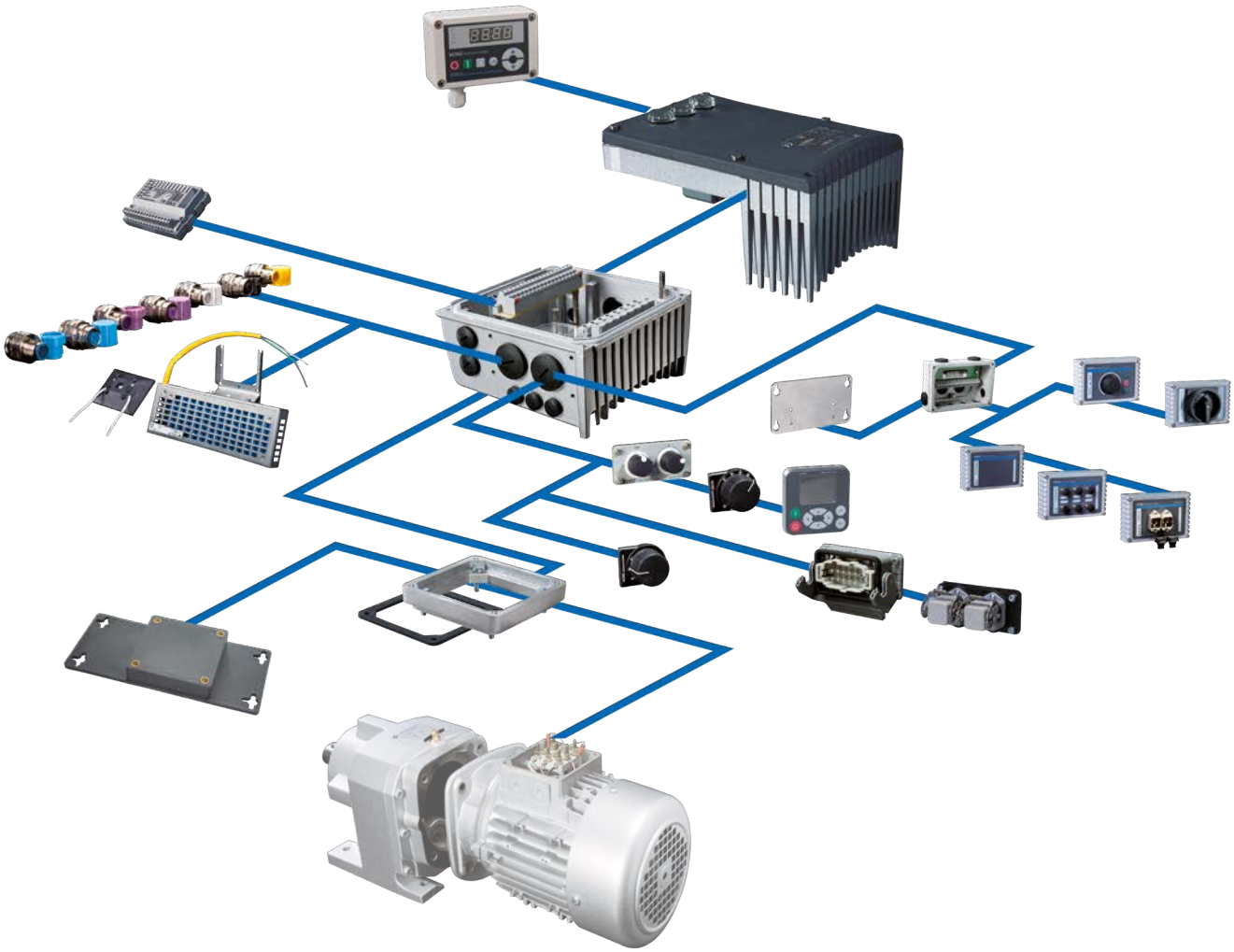




Accessories for VFDs and Motor Starters

NORD®
DRIVESYSTEMS

Accessories



The full range of accessories below that can be used for various series. This primarily applies to our decentralized devices of the NORDAC *LINK*, NORDAC *ON*, NORDAC *FLEX*, NORDAC *BASE,* and NORDAC *START* series.

Operation
and Parameterization
Page 168



Interfaces
for Communication
Page 172



24 V Power Supply Units,
Potentiometers, Switches, Signal
Converters, and More
Page 178



System Connectors for
Power and Control Connections
Page 182



Connection Technology
Cables
Page 188



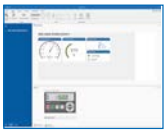
Operation and Parameterization
Control and Parameterization Units / Software

	Designation Material No.	Description
	Parameter box SK PAR-5H 275281614	Control and parameterization, LCD screen (illuminated), plain text display in 14 languages, direct control of up to five devices, memory for five device data sets, convenient control keypad, communication via RS-485, including 1.5 m connection cable. Handheld, suitable for installation in a control cabinet door. IP54.
	ParameterBox SK PAR-5A 275281714	Suitable for control and parameterization, LCD screen (illuminated), plain text display in 14 languages, direct control of up to 5 devices, memory for 5 device data sets, convenient control keypad, for mounting to a variable frequency drive.
	SimpleControlBox SK CSX-3H 275 281 013	Control and parameterization, 4-digit, 7-segment display, direct control of a device, convenient control keypad, including 2 m connection cable. Handheld, IP54.
	SimpleControlBox SK CSX-3E 275 281 413	Suitable for control and parameterization, 4-digit, 7-segment display, direct control of a device, convenient control keypad, for installation in control cabinet doors.
	NORDAC CONTROL I/O SK TIE5-CIO 278910150	Suitable for testing analog and digital IOs. Handheld, IP20
	Control Box SK POT1-1 278 910 120	Potentiometer 0 … 100% (0…10 V), switch Left|AUS|Right, including 3 m connection cable. Handheld, wall mounting, IP66.
	Control Box SK POT1-2 278 910 140	Suitable for control, potentiometer 0…100% (0…10 V), switch Left|AUS|Right, including 20 m connection cable. Handheld, wall mounting, IP66.
	Simple setpoint box SK SSX-3A 271 281 513	Suitable for control and parameterization, 4-digit, 7-segment display, direct control of a device, 3 operating modes, convenient control keypad. Handheld, wall mounting, IP54.
	SK TIE4-SSX-3A 275 274 910	Adapter for fitting the SK SSX-3A to the NORDAC *FLEX*.
	Programming Adapter SK EPG-3H 275 281 026	Suitable for parameterization of the external EEPROM (memory module) of an SK 2xxE, independent of the presence of a variable frequency drive. Handheld, IP20.

Remarks	NORDAC *PRO*	NORDAC *LINK*	NORDAC *ON*	NORDAC *FLEX*	NORDAC *BASE*	NORDAC *START*
Connection for data exchange with NORDCON *STUDIO* to a PC (USB 2.0), (standard USB-C connection cable required, e.g. material number: 275292100) Power supply, e.g. directly via the variable frequency drive or PC	●	●	●	●	●	●
Power supply, e.g. directly via variable frequency drive or PC mounting to variable frequency drive	❍	❍	❍	●	❍	❍
Electrical data: 4.5 … 30 V DC / 1.3 W, supply e.g. directly via the variable frequency drive	❍	❍	❍	●	❍	❍
Electrical data: 4.5 … 30 V DC / 1.3 W, supply e.g. directly via the variable frequency drive, control cabinet installation	●	❍	❍	❍	❍	❍
	●	●	●	●	●	●
	●	❍	❍	●	●	❍
	●	❍	❍	●	●	❍
Electrical data: 19.2 … 28.8 V DC, 35 mA, supply e.g. directly via the variable frequency drive, communication via RS-485 or IO link	●	❍	❍	●	●	❍
	❍	❍	❍	●	❍	❍
	❍	❍	❍	●	❍	❍

● Available as standard
❍ Not available

Operation and Parameterization
Control and Parameterization Units / Software

	Designation Material No.	Description
	Adapter Cable RJ12-SUB-D9 278 910 240	To connect the variable frequency drive to the serial interface of a PC via SUB-D9
	Connection Set SK TIE4-RS232-USB 275 274 604	To connect the variable frequency drive to the serial interface of a PC via USB 2.0
	Adapter Cable SK CE-USB-C- USB-PC-USB-3M 275 292 100	To connect the variable frequency drive to a PC via USB
	Control and parameterization software NORDCON	Software for control and parameterization as well as commissioning assistance and fault analysis of NORD electronic drive technology. Parameter names in 14 languages.
	NORDAC *ACCESS BT* Bluetooth-Stick SK TIE5-BT-STICK 275 900 120	Interface for wireless connection to a mobile terminal device (e.g. tablet or smartphone) via Bluetooth. With the aid of the NORDCON *APP*, the NORDCON software for mobile terminal devices, enables smart operation and parameterization as well as commissioning assistance and fault analysis of NORD electronic drive technology.

[1] Only for NORDAC *PRO*, SK 530P + SK 550P series

Remarks	NORDAC *PRO*	NORDAC *LINK*	NORDAC *ON*	NORDAC *FLEX*	NORDAC *BASE*	NORDAC *START*
Length: approx. 3 m	●	●	●	●	●	●
Consisting of adapter cable RJ12-SUB-D9 and RS-232 to USB VFD, Length: approx. 3 m + 0.5 m	●	●	●	●	●	●
Length: approx. 3 m	●[1]	❍	❍	❍	❍	❍
Free download at: www.nord.com	●	●	●	●	●	●
NORDCON *APP* available free of charge for Android and iOS.	●	●	●	●	●	●

● Available as standard
❍ Not available

Communication Interfaces
Field Bus Extensions

Variant	Designation Material No.	Installation	Attached / Separate	Protection Class	Number of Inputs / Outputs	Description	Remarks	NORDAC *LINK*	NORDAC *FLEX*	NORDAC *BASE*
PROFIBUS DP® – Product Satus: Phase-Out	SK CU4-PBR 275 271 000	●	❍	IP20	2 digital inputs	Interface as gateway for direct connection of up to four devices to a PROFIBUS DP® field bus. Digital signals can alternatively be connected via the front M12 round plug connector (only M12 modules)	Baud rate: maximum 12 MBd Protocol: DPV 0 and DPV 1 SK TU4 modules plus matching SK TI4-TU-BUS / SK TI4-TU-BUS-C connection unit	●	●	●
	SK CU4-PBR-C[1] 275 271 500	●	❍	IP20				●	●	●
	SK TU4-PBR 275 281 100	❍	●	IP55	4 digital inputs 2 digital outputs			❍	●	●
	SK TU4-PBR-C 275 281 150	❍	●	IP66				❍	●	●
	SK TU4-PBR-M12 275 281 200	❍	●	IP55				❍	●	●
	SK TU4-PBR-M12-C 275 281 250	❍	●	IP66				❍	●	●
CANopen®	SK CU4-CAO 275 271 001	●	❍	IP20	2 digital inputs	Interface as gateway for direct connection of up to four devices to a CANopen® field bus. Digital signals can alternatively be connected via the front M12 round plug connector (only M12 modules)	Baud rate: maximum 1 MBaud Protocol: DS 301 and DS 402 SK TU4 modules plus matching SK TI4-TU-BUS / SK TI4-TU-BUS-C connection unit	●	●	●
	SK CU4-CAO-C[1] 275 271 501	●	❍	IP20				●	●	●
	SK TU4-CAO 275 281 101	❍	●	IP55	4 digital inputs 2 digital outputs			❍	●	●
	SK TU4-CAO-C 275 281 151	❍	●	IP66				❍	●	●
	SK TU4-CAO-M12 275 281 201	❍	●	IP55				❍	●	●
	SK TU4-CAO-M12-C 275 281 251	❍	●	IP66				❍	●	●

[1] Version with varnished circuit boards for applications in IP6X devices

● Available as standard
❍ Not available



Variant	Designation Material No.	Installation	Attached / Separate	Protection Class	Number of Inputs / Outputs	Description	Remarks	NORDAC LINK	NORDAC FLEX	NORDAC BASE
DeviceNet® – Product Satus: Phase-Out	SK CU4-DEV 275 271 002	●	❍	IP20	2 digital inputs	Interface as gateway for direct connection of up to four devices to a DeviceNet® field bus. Digital signals can alternatively be connected via the front M12 round plug connector (only M12 modules)		●	●	●
	SK CU4-DEV-C[1] 275 271 502	●	❍	IP20			Baud rate: maximum 500 kBaud	●	●	●
	SK TU4-DEV 275 281 102	❍	●	IP55	4 digital inputs 2 digital outputs		Profile: AC-Drive and NORD-AC	❍	●	●
	SK TU4-DEV-C 275 281 152	❍	●	IP66			SK TU4 modules plus matching SK TI4-TU-BUS / SK TI4-TU-BUS-C connection unit	❍	●	●
	SK TU4-DEV-M12 275 281 202	❍	●	IP55				❍	●	●
	SK TU4-DEV-M12-C 275 281 252	❍	●	IP66				❍	●	●

[1] Version with varnished circuit boards for applications in IP6X devices

● Available as standard
❍ Not available



Communication Interfaces
Industrial Ethernet Extensions

Variant		Designation Material No.	Installation	Attached / Separate	Protection Class	Number of Inputs / Outputs
Industrial Ethernet		SK CU4-ETH 275271027	●	❍	IP20	2 digital inputs
		SK CU4-ETH-C 275271527	●	❍	IP20	
		SK TU4-ETH 275281132	❍	●	IP55	8 digital inputs 2 digital outputs
		SK TU4-ETH-C 275281182	❍	●	IP66	
		SK TU4-ETH-M12 275281233	❍	●	IP55	
		SK TU4-ETH-M12-C 275281283	❍	●	IP66	
PROFIsafe Product Status: Phase Out		SK TU4-PNS 275 281 116	❍	●	IP55	2 safe digital inputs (SI), 3 safe digital outputs (SO)
		SK TU4-PNS-C 275 281 166	❍	●	IP66	
		SK TU4-PNS-M12 275 281 216	❍	●	IP55	
		SK TU4-PNS-M12-C 275 281 266	❍	●	IP66	

Description	Remarks	NORDAC *LINK*	NORDAC *FLEX*	NORDAC *BASE*
Interface as gateway for direct connection of up to four devices to the Industrial Ethernet. Parameterization may be used with a choice between the following dialects: EtherCAT, EtherNet/IP, PROFINET IO. Connection of the bus cable via the front RJ45 or M12 circular connectors (only TU4 modules).	Baud rate: max. 100 Mbaud, EtherCAT: CoE, PROFINET IO: Conformance class B and C	●	●	●
		●	●	●
		❍	●	●
		❍	●	●
		❍	●	●
		❍	●	●
Interface as gateway for direct connection of up to four devices to a PROFIsafe field bus. Connection of the bus cable via the front RJ45 or M12 round plug connector (only TU4 modules).	Baud rate: maximum 100 MBaud, Conformance class B and C SK TU4 modules plus matching SK TI4-TU4-SAFE / SK TI4-TU4-SAFE-C connection unit	❍	●	❍
		❍	●	❍
		❍	●	❍
		❍	●	❍

● Available as standard
❍ Not available

Communication Interfaces and Connection Units

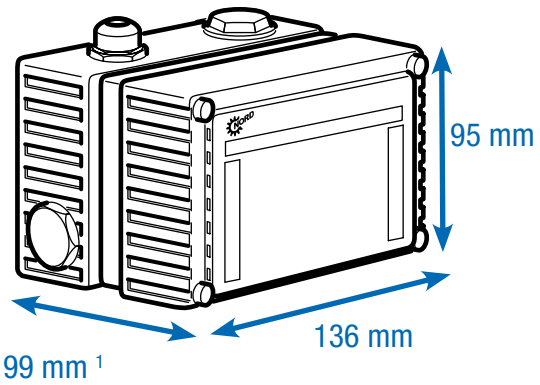
Variant		Designation Material No.	Installation	Attached / Separate	Protection Class	Number of Inputs / Outputs	Description	Remarks	NORDAC *FLEX*	NORDAC *BASE*	NORDAC *START*
IO Extensions	Product Status: Phase Out 	SK CU4-IOE2 275 271 007	●	❍	IP20	2[2] digital and 2[3] analog inputs, 2 analog outputs	Sensor and actuator signal processing, connection via terminal bar Alternative connection of digital signals via front M12 round plug connector (only M12 modules)	Analog signals: IN / OUT: 0(2) ... +10 V or 0(4) ... 20 mA	●	●	●
		SK CU4-IOE2-C[1] 275 271 507	●	❍	IP20				●	●	●
		SK CU4-IOE 275 271 006	●	❍	IP20	2 digital and 2[3] analog inputs, 1 analog output			●	●	●
		SK CU4-IOE-C[1] 275 271 506	●	❍	IP20			Analog signals: IN: -10 V ... +10 V or 0(4) ... 20 mA	●	●	●
		SK TU4-IOE 275 281 106	❍	●	IP55	4 digital and 2 analog inputs, 2 digital and 1 analog output		OUT: 0(2) ... +10 V or 0(4) ... 20 mA	❍	●	●
		SK TU4-IOE-C 275 281 156	❍	●	IP66			SK TU4 modules plus matching SK TI4-TU-BUS / SK TI4-TU-BUS-C connection unit	❍	●	●
		SK TU4-IOE-M12 275 281 206	❍	●	IP55				❍	●	●
		SK TU4-IOE-M12-C 275 281 256	❍	●	IP66				❍	●	●

[1] Version with varnished circuit boards for applications in IP6X devices
[2] Digital inputs can optionally be used as digital inputs or outputs
[3] Analog inputs can optionally be used as analog or digital inputs

● Available as standard
❍ Not available

Variant		Designation Material No.	Installation	Attached / Separate	Protection Class	Description	NORDAC *LINK*	 *FLEX*	 *BASE*
Connection Units Product Status: Phase Out		SK TI4-TU-BUS 275 280 000	❍	●	IP55	Connection unit for SK TU4-.... bus interfaces or IO - extensions (IP55), including RS-232 diagnostic interface (RJ12 port)	❍	●	●
		SK TI4-TU-BUS-C 275 280 500	❍	●	IP66	Connection unit for SK TU4-.... bus interfaces or IO - extensions (IP66), including RS-232 diagnostic interface (RJ12 port)	❍	●	●
		SK TI4-TU-SAFE 275 280 300	❍	●	IP55	Connection unit for safe bus interface SK TU4-PNS-… (IP55), including RS-232 diagnostic interface (RJ12 port)	❍	●	❍
		SK TI4-TU-SAFE-C 275 280 800	❍	●	IP66	Connection unit for safe bus interface SK TU4-PNS-…-C (IP66), including RS-232 diagnostic interface (RJ12 port)	❍	●	❍
		SK TIE4-WMK-TU 275 274 002	❍	●	IP66	For separate mounting of SK TU4... modules with SK TI4-TU-…	❍	●	●

● Available as standard
❍ Not available



[1] Depth varies for versions with connections on the front side.

Supply and Control
24 V Power Supply Units, Potentiometer and Switches

Variant		Designation Material No.	Installation	Attached / Separate	Protection Class	Description	Remarks	NORDAC FLEX	NORDAC BASE	NORDAC START
Power Supplies		SK CU4-24V-123-B 275 271 108	●	❍	IP20	Output: 24 V DC, 420 mA	For connection to 115 V/230 V devices, including AD converter for evaluation of a 10 kΩ - potentiometer	●	●	●
		SK CU4-24V-123-B-C[1] 275 271 608	●	❍	IP20	Output: 24 V DC, 420 mA		●	●	●
		SK CU4-24V-140-B 275 271 109	●	❍	IP20	Output: 24 V DC, 420 mA	For connection to 400 V/500 V devices, including AD converter for evaluation of a 10 kΩ - potentiometer	●	●	●
		SK CU4-24V-140-B-C[1] 275 271 609	●	❍	IP20	Output: 24 V DC, 420 mA		●	●	●
		SK TU4-24V-123-B 275 281 108	❍	●	IP55	Output: 24 V DC, 420 mA	For connection to 115 V/230 V devices, including AD converter for evaluation of a 10 kΩ - potentiometer plus suitable connection unit SK TI4-TU-NET/ SK TI4-TU-NET-C	●	●	●
		SK TU4-24V-123-B-C 275 281 158	❍	●	IP66	Output: 24 V DC, 420 mA		●	●	●
		SK TU4-24V-140-B 275 281 109	❍	●	IP55	Output: 24 V DC, 420 mA	For connection to 400 V/500 V devices, including AD converter for evaluation of a 10 kΩ potentiometer plus suitable connection unit SK TI4-TU-NET/SK TI4-TU-NET-C	●	●	●
		SK TU4-24V-140-B- 275 281 159	❍	●	IP66	Output: 24 V DC, 420 mA		●	●	●

[1] Version with varnished circuit boards for applications in IP6X devices

● Available as standard
❍ Not available

Variant		Designation Material No.	Installation	Attached / Separate	Protection Class	Description	Remarks	NORDAC *FLEX*	NORDAC *BASE*	NORDAC *START*
Power Supplies with Control Unit		SK TU4-POT-123-B 275 281 110	❍	●	IP55	Output: 24 V DC, 420 mA	For connection to 115 V / 230 V devices, including setpoint adjuster 0% … 100% and keys "ON R" - "OFF" - "ON L" plus suitable SK TI4-TU-NET/SK TI4-TU-NET-C connection unit	●	●	❍
		SK TU4-POT-123-B-C 275 281 160	❍	●	IP66	Output: 24 V DC, 420 mA		●	●	❍
		SK TU4-POT-140-B 275 281 111	❍	●	IP55	Output: 24 V DC, 420 mA	For connection to 400 V / 500 V devices, including setpoint adjuster 0% … 100% and keys "ON R" - "OFF" - "ON L" plus suitable SK TI4-TU-NET/SK TI4-TU-NET-C connection unit	●	●	❍
		SK TU4-POT-140-B-C 275 281 161	❍	●	IP66	Output: 24 V DC, 420 mA		●	●	❍
Connection Units		SK TI4-TU-NET 275 280 100	❍	●	IP55		SK TU4-... connection unit for power supply units (IP55)	●	●	●
		SK TI4-TU-NET-C 275 280 600	❍	●	IP66		SK TU4-... connection unit for power supply units (IP66)	●	●	●
		SK TIE4-WMK-TU 275 274 002	❍	❍	IP66		For separate mounting of SK TU4... modules with SK TI4-TU-…	●	●	●

● Available as standard
❍ Not available

Supply and Control
Signal Converters and More

Variant		Designation Material No.	Installation	Attached / Separate	Protection Class	Description	Remarks	NORDAC *FLEX*	NORDAC *BASE*	NORDAC *START*
Control Elements		SK CU4-POT 275 271 207	❍	●	IP66	Switches and potentiometers	Switches: "ON R" - "OFF" - "ON L", 10 - kΩ potentiometer	●	●	❍
		SK TIE4-SWT 275 274 701	❍	●	IP66	Switch	"ON R" - "OFF" - "ON L"	●	●	●
		SK TIE4-POT 275 274 700	❍	●	IP66	Potentiometer	10 kΩ potentiometer	●	●	❍
		SK ATX-POT 275 142 000	❍	●	IP66	Potentiometer	10 kΩ - potentiometer, approved for use in ATEX Zone 22 3D	●	●	❍
Signal Converter and Relay		SK CU4-REL 275 271 011	●	❍	IP20	2x AIN / AOUT, 2 DIN / relay	Converter for analog signals -10 … +10 V to 0 … 10 V, 2 x changeover relay outputs 1 A (≤ 30 V), controlled via a digital input	●	●	❍
		SK CU4-REL-C[1] 275 271 511	●	❍	IP20			●	●	❍
		SK CU4-REL-POW 275 271 012	●	❍	IP20	2x AIN / AOUT, 2 DIN / relay	Converter for analog signals -10 … +10 V to 0 … 10 V, 2 x changeover relay outputs 8 A (≤ 30 V), controlled via a digital input	●	●	❍
		SK CU4-REL-POW-C[1] 275 271 512	●	❍	IP20			●	●	❍
		SK CU4-MBR 275 271 010	●	❍	IP20	230 V / 400 V, max. 0.5 A	For direct control and supply of an electromagnetic holding brake	●	●	❍
		SK CU4-MBR-C[1] 275 271 510	●	❍	IP20			●	●	❍
		SK CU4-SSR 275 271 124	●	❍	IP20	2x DIN / relay	Relay outputs (NO), suitable for AC / DC (max. 277 V AC, 850 mA / 24 V DC +/- 25%, 850 mA), control either synchronously via a digital input or individually via one digital input each	●	●	❍
		SK CU4-SSR-C[1] 275 271 624	●	❍	IP20			●	●	❍
		SK CU4-SSR -400 275 271 128	●	❍	IP20	2x DIN / relay	Relay outputs (NO), suitable for AC (480 V AC +10%, max. 300 mA), control either synchronously via a digital input or individually via one digital input each	●	●	❍
		SK CU4-SSR-400-C[1] 275 271 628	●	❍	IP20			●	●	❍

[1] Version with varnished circuit boards for applications in IP6X devices

● Available as standard
❍ Not available

Variant		Designation Material No.	Installation	Attached / Separate	Protection Class	Description	Remarks	NORDAC *FLEX*	NORDAC *BASE*	NORDAC *START*
Residual Voltage Discharge		SK CU4-PD1 275 271 025	●	❍	IP20	Module for residual voltage dissipation	Load resistance 3 x 470 kOhm, ≤ 550 V AC/DC, ≤ 20 A	●	❍	❍
		SK CU4-PD1-C[1] 275 271 525	●	❍	IP20			●	❍	❍
		SK CU4-PD2 275 271 026	●	❍	IP20	Module for residual voltage dissipation	Load resistance 3 x 160 kOhm, ≤ 550 V AC/DC, ≤ 20 A	❍	●	❍
		SK CU4-PD2-C[1] 275 271 526	●	❍	IP20			❍	●	❍
Switch		SK TU4-MSW 275 281 123	❍	●	IP55	1~ 100 - 240 V / 3~ 200 - 500 V, 16 A	Switch to disconnect the device from the power supply, black twist grip plus suitable SK TI4-TU-MSW/SK TI4-TU-MSW-C connection unit	●	●	●
		SK TU4-MSW-C 275 281 173	❍	●	IP66	1~ 100 - 240 V / 3~ 200 - 500 V, 16 A		●	●	●
Connection Units		SK TI4-TU-MSW 275 280 200	❍	●	IP55		SK TU4-... connection unit for maintenance switches (IP55)	●	●	●
		SK TI4-TU-MSW-C 275 280 700	❍	●	IP66		SK TU4-... connection unit for maintenance switches (IP66)	●	●	●
		SK TIE4-WMK-TU 275 274 002	❍	❍	IP66		For separate mounting of SK TU4... modules with SK TI4-TU-…	●	●	●

[1] Version with varnished circuit boards for applications in IP6X devices

● Available as standard
❍ Not available

Perfect Connections with System Plug Connectors



Plug Connectors for Power Connections

Available plug connectors for power and control connections make it possible to replace the drive unit with minimal downtime if service is required and also reduce the danger of installation errors when connecting the device.

Plug connectors from various manufacturers are available for the motor or mains connection for rated currents of up to 20A.

Type	Data	Designation	Material No.	NORDAC FLEX	NORDAC BASE	NORDAC START
Input (power and control voltage)	400 V, 16 A + 24 V, 4 A	SK TIE4-HANQ4-M-LE-MX	275 274 113	●	●	●
Input (power and control voltage)	400 V, 16 A + 24 V, 10 A	SK TIE4-NQ16-K-LE	275 274 133	●	●	❍
Input and output (power and control voltage)	400 V, 32 A + 24 V, 4 A	SK TIE4-2HANQ4-M-LE-LA	275 274 112	●	●	●
Input and output (power and control voltage)	400 V, 40 A + 24 V, 6 A	SK TIE4-2HANQ4-M-LE-LA-6mm	275 274 119	●	●	●
Power input	500 V, 16 A	SK TIE4-HAN10E-M1B-LE	275 135 070	●	●	●
Power input	500 V, 16 A	SK TIE4-HAN10E-M2B-LE	275 135 000	●	●	●
Power input	500 V, 16 A	SK TIE4-HANQ8-K-LE-MX	275 135 030	●	●	●
Power input	690 V, 20 A	SK TIE4-QPD4SPM	275 274 185	●	●	●
Power output	500 V, 16 A	SK TIE4-HAN10E-M2B-LA	275 135 010	●	●	●
Power output	500 V, 16 A	SK TIE4-HANQ8-K-LA-MX	275 135 040	●	●	●
Motor output	500 V, 16 A	SK TIE4-HAN10E-M2B-MA	275 135 020	●	●	●
Motor output	500 V, 16 A	SK TIE4-HANQ8-K-MA-MX	275 135 050	●	●	●
Power input + motor or power output	400 V, 16 A	SK TIE4-2HANQ5-K-LE-LA	275 274 110	●	●	●

● Available as standard
❍ Not available



Plug Connectors for Control Connections



Various M12 round plug connectors are available as flanged plugs or flanged sockets. The plug connectors are intended for installation in an M16 screw fitting on the device and can be oriented in any direction. The Protection Class (IP67) of the plug connector only applies in the screwed state. The cover caps correspond to the color version as does the plastic body of the plug connector. Expansion and reducer adapters are available for installation in an M12 or M20 screw fitting.

Type	Version	Designation	Material No.	NORDAC FLEX	NORDAC BASE	NORDAC START
System bus IN	Plug connectors	SK TIE4-M12-SYSS	275 274 506	●	●	❍
System bus OUT	Bushing	SK TIE4-M12-SYSM	275 274 505	●	●	❍
Power supply	Plug connectors	SK TIE4-M12-POW	275 274 507	●	●	●
Sensors/actuators	Bushing	SK TIE4-M12-INI	275 274 503	●	●	●
Sensors/actuators	Plug connectors	SK TIE4-M12-INP	275 274 516	●	●	●
Analog signal	Bushing	SK TIE4-M12-ANA	275 274 508	●	●	❍
HTL encoder	Bushing	SK TIE4-M12-HTL	275 274 512	●	❍	❍
HTL encoder	Bushing	SK TIE4-M12-HTL-A0	275 274 522	●	❍	❍
Safe stop	Plug connectors	SK TIE4-M12-SH-IN	275 274 519	●	❍	❍
Safe stop	Bushing	SK TIE4-M12-SH	275 274 509	●	❍	❍
Safe inputs	Bushing	SK TIE4-M12-INS	275 274 531	●	❍	❍
Safe encoder	Bushing	SK TIE4-M12-SENC	275 274 533	●	❍	❍
AS-Interface	Plug connectors	SK TIE4-M12-ASI	275 274 502	●	●	●
AS-Interface – Aux	Plug connectors	SK TIE4-M12-ASI-AUX	275 274 513	●	●	●
CANopen® / DeviceNet® IN	Plug connectors	SK TIE4-M12-CAO	275 274 501	●	●	❍
CANopen® / DeviceNet® OUT	Bushing	SK TIE4-M12-CAO-OUT	275 274 515	●	●	❍
Ethernet	Bushing	SK TIE4-M12-ETH	275 274 514	●	●	❍
PROFIBUS® (IN + OUT)	Connector + socket	SK TIE4-M12-PBR	275 274 500	●	●	●
Connection extension	M12 – M16	SK TIE4-M12-M16	275 274 510	●	●	●
Connection reduction	M20 – M16	SK TIE4-M20-M16	275 274 511	●	●	●

● Available as standard
❍ Not available

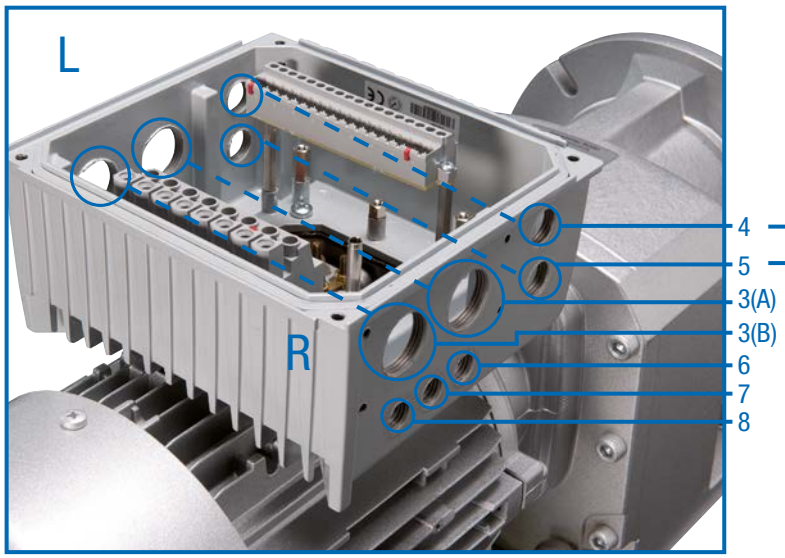


Installation Locations for System Connectors

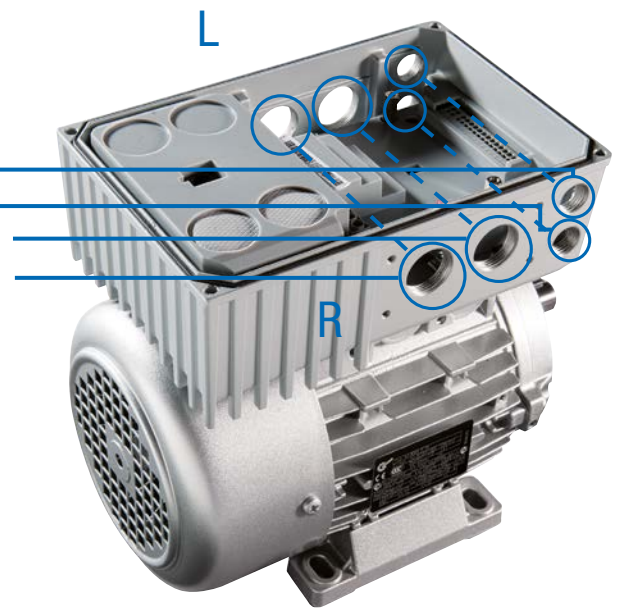
System Connectors

Various screw fittings are available for the installation of cable glands or system connections. Screw-in reduction or expansion adapters enable the connection of additional cable cross sections as required.

NORDAC *FLEX* (SK TI4-...)



NORDAC *BASE* and NORDAC *START*



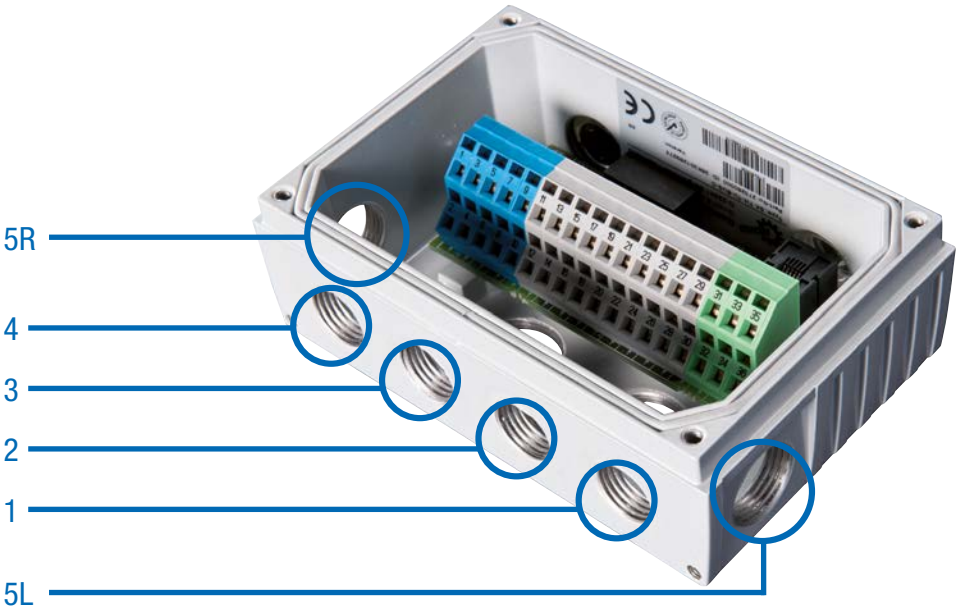
Option Locations
(R or L assignment, view towards the motor fan)

3	L/R	2 x	M25 screw fitting (A/B)
4	L/R		M16 screw fitting
5	L/R		M16 screw fitting
6	L/R		M12 screw fitting, BG 4 ➔ M16 (only NORDAC *FLEX*)
7	L/R		M12 screw fitting, BG 4 ➔ M16 (only NORDAC *FLEX*)
8	L/R		M12 screw fitting, BG 4 ➔ M16 (only NORDAC *FLEX*)

Size 4 — Additional screw fitting L/R: M32 (only NORDAC *FLEX*)

The plug connectors for the power connection are installed at position 3 (R or L).

Connection Unit - Technology Unit



Optional Slots of the SK TI4-TU-...

1	M16 screw fitting
2	M16 screw fitting
3	M16 screw fitting
4	M16 screw fitting
5 L/R	M20 screw fitting



Not to be Underestimated – the Correct Connection Method

With the NORDAC *LINK*, *FLEX*, *BASE,* and *START* variable freqeuncey drives and motor starters, NORD provides an ideal motor control solution for decentralized drive technology applications. Advantages include short motor cables, improved EMC filtering, and installation without the need of a control cabinet.

Connection of decentralized components (motor and electronics) can be made either with a hard-wired connection[1] or using quick disconnect plug connectors. The full advantages of decentralized drive technology are only achieved with the selection of plug-in connectors.

- Quick and simple electrical connection
- Minimized connection errors
- Minimum time for installation, maintenance, and servicing
- Reduced downtime in case of replacement

NORD 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, IO signals).

Connection and control cables are supplied pre-assembled. They are available in various lengths and can optionally be provided with open ends or plug connectors. Connection cables are certified for global use according to the relevant IEC and UL standards. Typically, all cables[2] are shielded.

[1] Not for NORDAC *LINK* or NORDAC *ON*

[2] Except for mains connection / daisy chain cables

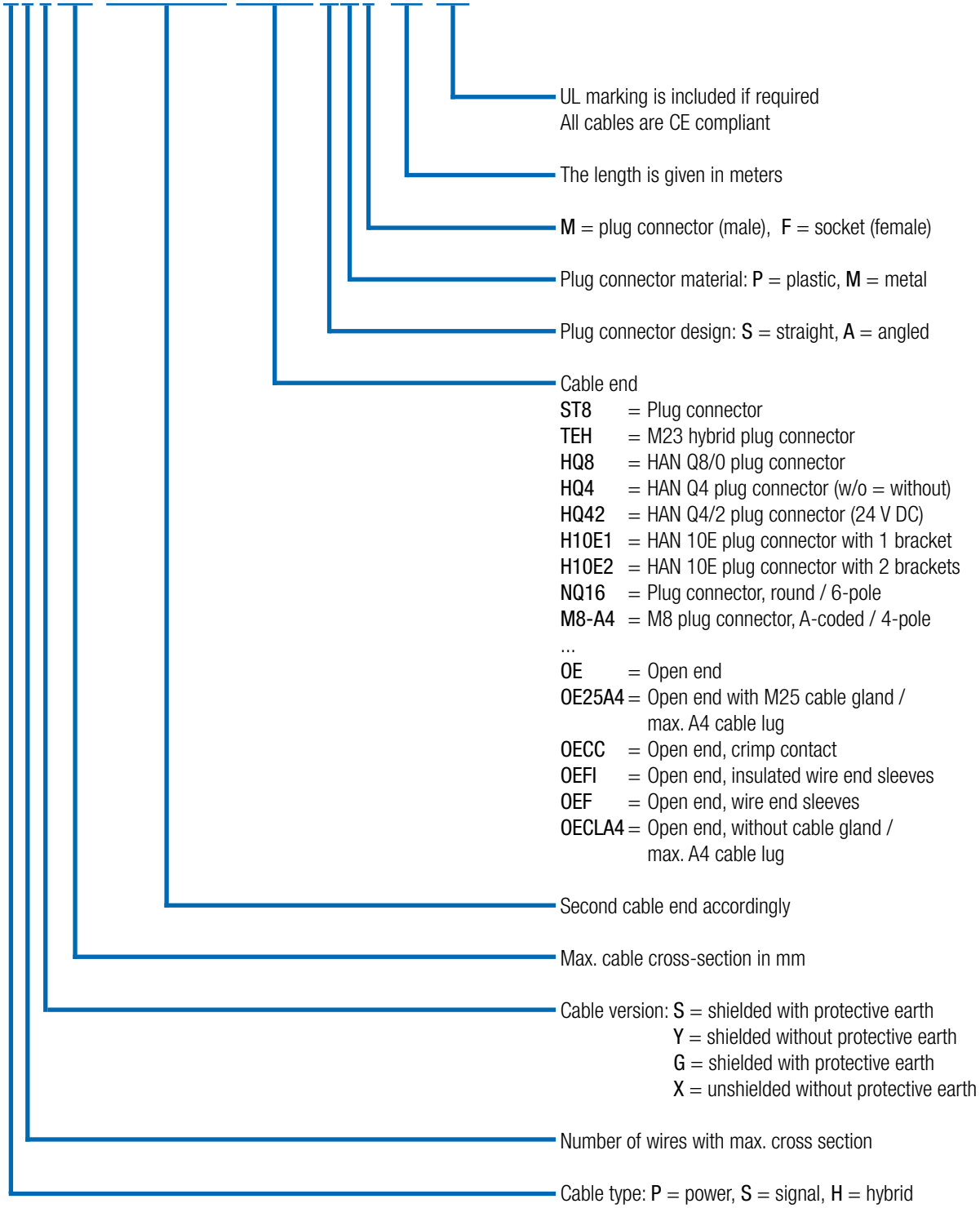


Designation of Pre-Assembled Cables

Pre-Assembled Cables

- Cables for motor and variable frequency drive connection
- Mains connection and signal cables
- Customized plug connectors and cable lengths

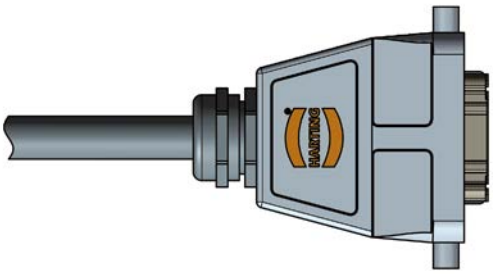
SC H4G2.5 HQ8SMM H10E1SMF 1.5 UL



Technical Data
Cables

Cable design depends on the ambient conditions and the type of installation as specified by the customer.
All options can be requested from NORD according to the specific project.

Feature	Standard	Options
Conductor material	Copper	-
Installation type	Permanent installation	-
Cable insulation	Polyvinyl chloride (PVC)	Polyurethane (PUR)
Protective sleeve	No	On request
Cable length	Motor cables: 1.5 m – 3.0 m – 5.0 m Mains cables: 1.5 m – 3.0 m – 5.0 m Daisy chain cables: 1.5 m – 3.0 m – 5.0 m Encoder cables: 1.5 m – 3.0 m – 5.0 m Brake resistor cables: 2.0 m – 3.0 m	On request

VFD/Motor Starter Connection	Motor Connection	Required Motor Option[1]
	 Open ends	ZKK
		MS31 or MS31E

[1] For further information about motor options please refer to motor catalog M7000.

Motor Cables

Product Overview – Motor Cables

Depending on the motor, the following shielded motor connection cables are available.

NORDAC *LINK*, *FLEX*, *BASE*, and *START*

Designation	Motor Power	Certification	Part Number for Length [m] 1.5	3	5
SC H4S2.5 HQ8SPM OE20A4 UL	0.12 – 0.37 kW 0.16 – 0.50 hp	EU / UL	275 274 800	275 274 801	275 274 802
SC H4S2.5 HQ8SPM OE25A4 UL	0.55 – 1.50 kW 0.75 – 2.00 hp	EU / UL	275 274 805	275 274 806	275 274 807
SC H4S2.5 HQ8SPM OE32A4 UL	2.20 – 3.00 kW 3.00 – 4.00 hp	EU / UL	275 274 825	275 274 826	275 274 827
SC H4S2.5 HQ8SPM OE32A5 UL	4.00 kW 5.50 hp	EU / UL	275 274 830	275 274 831	275 274 832
SC H4S4 HQ8SPM OE32A6 UL	5.50 – 9.20 kW 7.50 – 12.50 hp	EU / UL	275 274 835	275 274 836	275 274 837
SC H4S2.5 HQ8SPM H10E1SMF	0.12 – 4.00 kW 0.16 – 5.50 hp	EU	275 274 810	275 274 811	275 274 812
SC H4S2.5 HQ8SPM HQ8SMF	0.12 – 4.00 kW 0.16 – 5.50 hp	UL	278 599 405	278 599 406	278 599 407
SC H4S2.5 HQ8SPM HQ8AMF	0.12 – 4.00 kW 0.16 – 5.50 hp	UL	278 599 409	278 599 410	278 599 135
RKM 44-2M/S4000[1]	0.12 – 5.00 kW 0.16 – 7.50 hp	UL	185 516 20 [2m]	185 516 30 [5m]	185 516 40 [10m]

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Designation	Motor Power		Certification	Part Number for Length [m] 1.5	3	5
SC H4S1 ST8SMM OE20A4 UL	0.31 – 0.43 kW 0.42 – 0.58 hp	IE3	EU / UL	275 274 690	275 274 691	275 274 692
SC H4S1 ST8SMM OE20A4 UL WOB[2]	0.31 – 0.43 kW 0.42 – 0.58 hp	IE3	EU / UL	275 274 617	275 274 618	275 274 619
SC H4S1 ST8SMM OE25A4 UL	0.95 – 2.60 kW 1.27 – 3.49 hp	IE3	EU / UL	275 274 695	275 274 696	275 274 697
	0.35 – 0.70 kW 0.47 – 0.94 hp	IE5+				
SC H4S1 ST8SMM OE25A4 UL WOB[2]	0.95 – 2.60 kW 1.27 – 3.49 hp	IE3	EU / UL	275 274 621	275 274 622	275 274 623
	0.35 – 0.70 0.47 – 0.94 hp	IE5+				
SC H4S1 ST8SMM HQ8SMF UL	MS21 motor plug		EU / UL	275 274 685	275 274 686	275 274 687
SC H4S1.5 TEH51SVM TEH51SVF MBE[3]			EU / UL		278 599 527	278 599 529

[1] NORDAC *FLEX*, *BASE*, and *START* only
[2] Cable without braking power (WOB = without brake)
[3] NORDAC *ON PURE* in preparation

Mains Cables / Daisy Chain Cables

Product Overview – Mains Cable

The following unshielded mains cables are available. A simple plug-in connection for VFDs can be achieved with the HQ4 variant. With a second variant (HQ42), a 24 V DC supply can also be implemented.

Designation	24 V DC Supply	Certification	Part Number for Length [m] 1.5	3	5	10	20
SC P4G2.5 HQ4SPF OE	no	EU	275 274 840	275 274 841	275 274 842		
SC P4GA14 HQ4SPF OE UL	no	UL		275 274 241	275 274 242		
SC H4G4 HQ42SPF OE	yes	EU	275 274 845	275 274 846	275 274 847		
SC H4GA12 HQ42SPF OE UL	yes	UL		275 274 246	275 274 247		
SC H6G2.5 NQ16SPF OE UL[1]	yes	UL	275 274 218	275 274 219	275 274 220		
SC H4S2.5 TEH51SVF OE PCE[2]	yes	EU				278 599 568	278 599 569
RKM 44-2M/S4000[3]	no	UL	185 516 20 [2m]		185 516 30	185 516 40	

[1] NORDAC *ON* only
[2] NORD *ON PURE* in preparation
[3] NORDAC *FLEX*, *BASE*, and *START* only

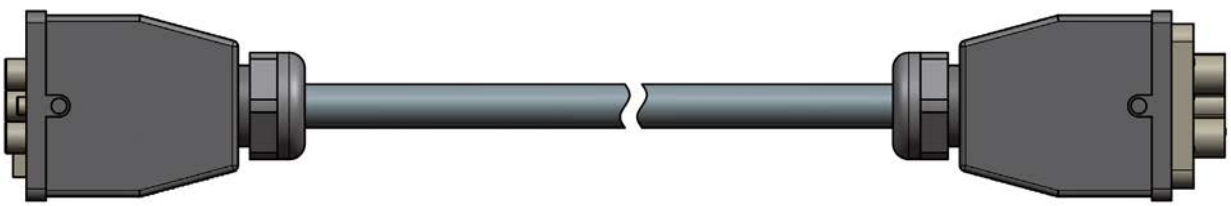


Product Overview – Daisy Chain Cables

A daisy chain cable is designed for looping the mains connection (plug connections on both sides) from one VFD to the next. The same variants used for mains cables are available. These cables are also unshielded.

Designation	24 V DC Supply	Certification	Part Number for Length [m] 1.5	3	5	10	20
SC P4G4 HQ4SPM HQ4SPF	no	EU	275 274 850	275 274 851	275 274 852		
SC P4GA12 HQ4SPM HQ4SPF UL	no	UL		275 274 251	275 274 252		
SC H4G4 HQ42SPM HQ42SPF	yes	EU	275 274 855	275 274 856	275 274 857		
SC H4GA12 HQ42SPM HQ42SPF UL	yes	UL		275 274 256	275 274 257		
SC H6G2.5 NQ16SPM NQ16SPF UL[1]	yes	UL	275 274 288	275 274 289	275 274 290		
SC H4S2.5 TEH51SVM TEH51SVF PCE[2]	yes	EU				278 599 588	278 599 589

[1] NORDAC *ON* only
[2] NORD *ON PURE* in preparation

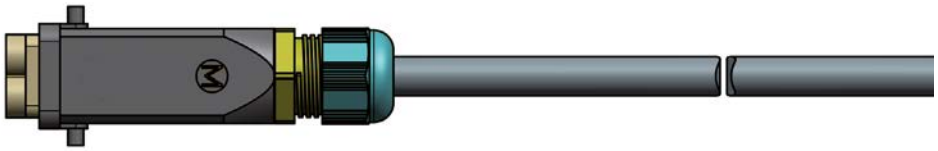


Brake Resistor Cable / Control Cables

Product Overview – Braking Resistor Cables

The following shielded cables are available for connecting an external brake resistor.

Designation	Certification	Part Number for Length [m] 2	3
SC P3S2.5 HQ2SPM OE	EU	275 274 881	275 274 899
SC P3SA14 HQ2SPM OE UL	UL	275 274 280	275 274 281



Product Overview – Control Cables

Control cables for connection to an encoder are typically connected with M12 plug connectors. The following system solutions are available for encoder connection.

Designation	Motors IE1-3	IE4	IE5+	Encoders[1]	Cable Type	Control Cable Length - Part No.
SC S4Y0.25 M12-B4MM M12-A8SMF	●	❍	❍	IG12P - 19 651 501 IG22P - 19 651 511 IG42P - 19 651 521	HTL without zero track	1.5 m - 275 274 675 3.0 m - 275 274 676 5.0 m - 275 274 677
SC S5S0.25 M12-A5SPM M12-A5SPF	❍	●	❍	IG22P5 - 19 651 910	HTL with zero track	1.5 m - 275 274 874 3.0 m - 275 274 876
	❍	❍	●	IG62P5 - 19 605 002		
SC S5Y0.25 M12-A5SMM M12-A8SMF	❍	●	❍	IG22P8 - 19 651 911	HTL with zero track	1.5 m - 275 274 645 3.0 m - 275 274 646 5.0 m - 275 274 647

[1] Further information about encoders can be obtained from motor catalog M7000.

● Available as standard
❍ Not available

Notes