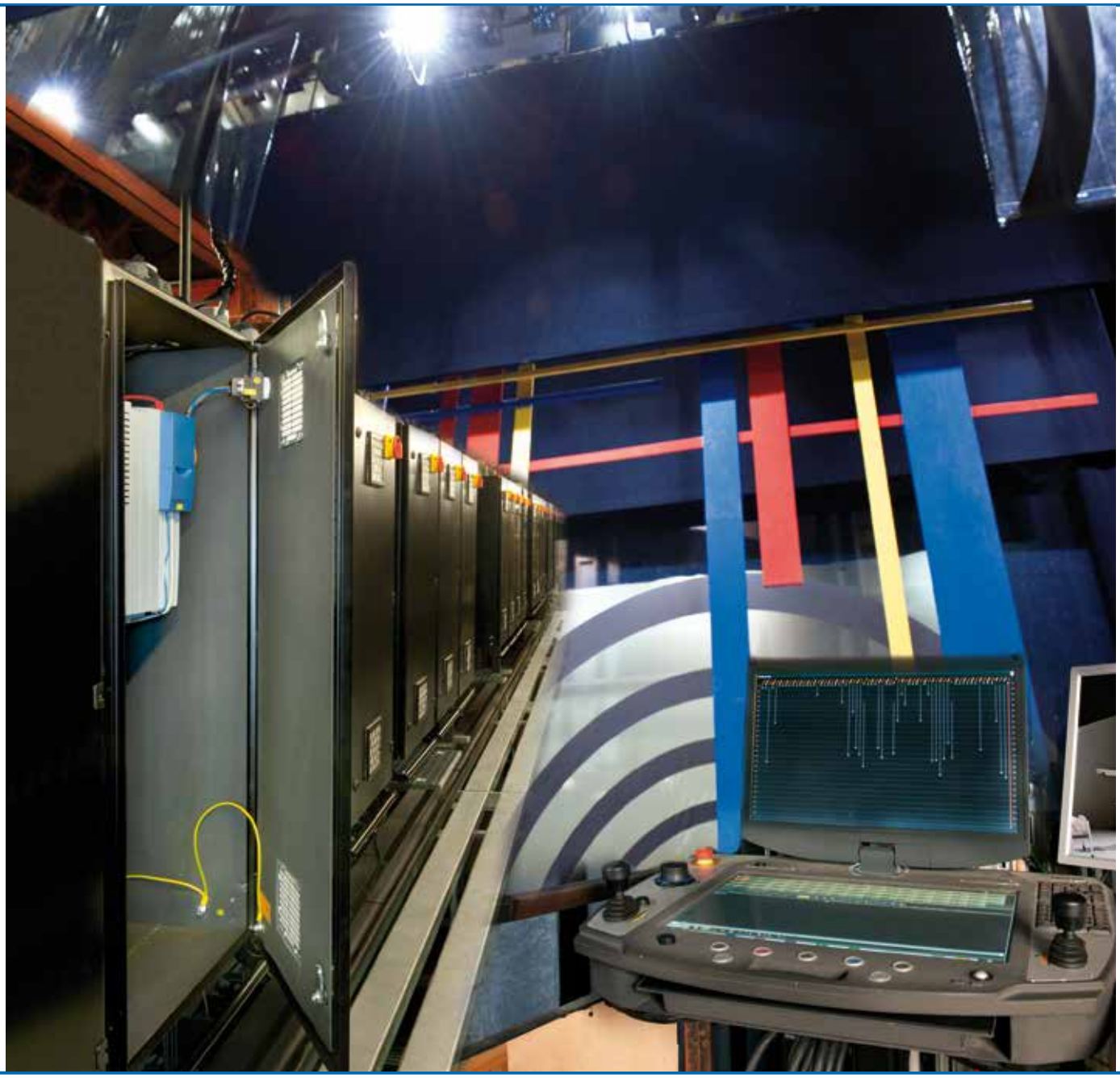
Intelligent Drivesystems, Worldwide Services

GB

SK 500E

Modular frequency inverter

NORD DRIVESYSTEMS



NORD theatre technology

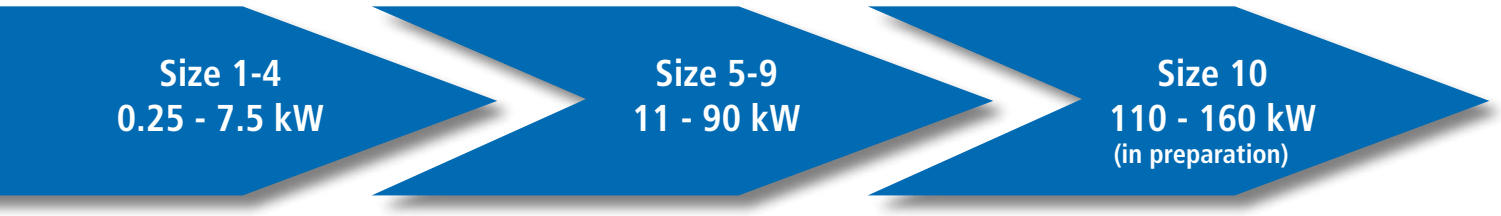
The drive technology in the Duisburg Stadttheater performs very quietly. SK 500E series frequency inverters provide perfect control of the curtains and precise positioning of the scenery.

Contents

Power range for the SK 500E product series

1~ 115V	0.25 -	0.75	kW
1~ 230V	0.25 -	2.2	kW
3~ 230V	0.25 -	15	kW
3~ 400 V	0.55 -	90	kW

The SK 500E product series



Following its introduction in the market, the SK 500E product series has become well and successfully established and now the power range has been extended to 90kW, expanding the considerable track record of these components to an even wider field of applications.

Modular compact inverter: SK 500E

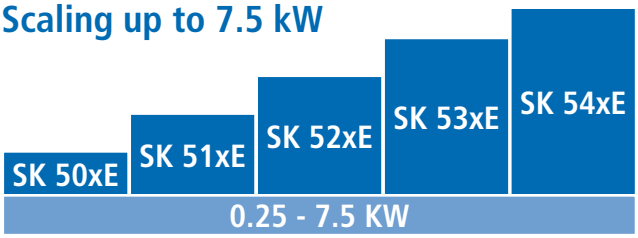
With the SK 500E series of frequency inverters, Getriebebau NORD offers intelligent and cost-effective drive solutions with scaleable equipment options, which are all fully compatible with regard to motor performance range, supply voltage and sizes. The basis for all models is a well-equipped basic unit with expansion possibilities through optional modules. SK 500E inverters are suitable for all application areas and can be easily adapted to specific requirements with plug-in technology units.

Performance grading:

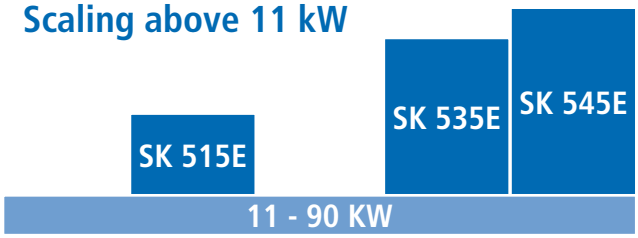
The SK 500E product series offers a wide range of features which are necessary for application-specific drive solutions. Through different configuration levels, these can be used in the same housing. The inverters include the following functions, which are state-of-the-art for industrial applications.

- "Safe Stop" (STO) according to EN ISO 13849-1 Cat.4, Performance Level e EN 61508 SIL 3
- CANopen interface on board
- Incremental encoder input (TTL) on board
- Absolute encoder via CANopen, SSi, BiSS, Hiperface, EnDat
- POSICON positioning control
- External 24V power supply for control board
- Synchronous motor operation (PMSM)
- PLC logic function

Scaling up to 7.5 kW



Scaling above 11 kW



Power and communication (e.g. CANopen or system bus)

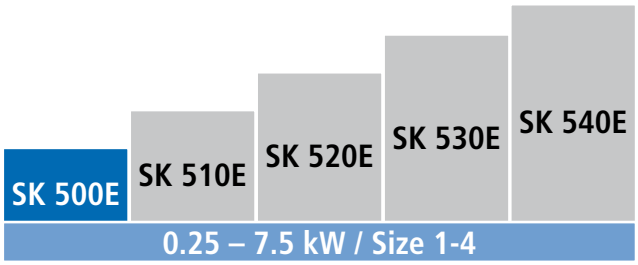
Control cabinet

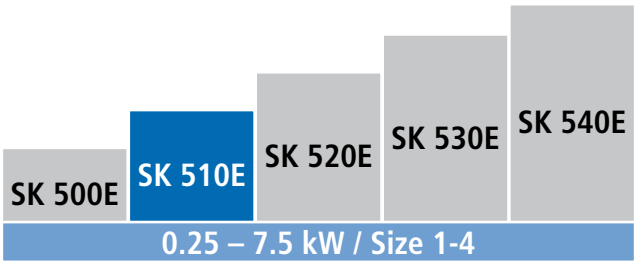
Field level

NORD provides consistency with all product series

- ✓ Same software
- ✓ Same parameter structure
- ✓ Same terminal labelling
- ✓ Same operating interface
- ✓ Same commissioning

Connection to automation systems	
	Modular technology units with bus interfaces and setting of bus address and baud rate if required
CANopen DeviceNet PROFIBUS AS-i	All common bus systems (e.g. Profibus, CANopen)
CANopen 	Low cost versions with CANopen on board
EtherCAT PROFINET	Ethernet-based bus systems (e.g. EtherCat, ProfiNet)





SK 500E with integrated mains unit
SK 505E with external 24V supply

SK 500E / SK 505E basic equipment:

- Sensorless current vector control (ISD control)
- Line filter Class C2, Class C1 up to 5 m
- Brake management, electro-mechanical motor brakes
- Brake chopper for braking resistor
- RS 232 PC diagnostic interface
- 4 switchable parameter sets
- All normal drive functions
- Automatic flux optimisation (energy saving function).
- Process controller / PID controller
- Consistent parameter structure
- Simple to operate
- All common field bus systems
- Parameters pre-set with standard values
- Scalable display values
- High quality regulation and short reaction times

With its comprehensive basic equipment the SK 500E can be used for a wide variety of applications. All functions are available throughout the entire product range. In spite of extensive equipment, special attention was paid to easy handling and control. This enables quick and simple commissioning.

SK 510E / SK 511E
with integrated mains unit
SK 515E with external 24V supply

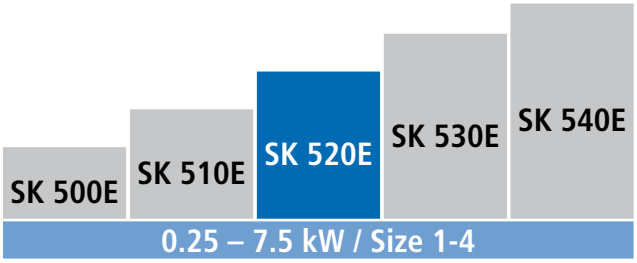
SK 510E / SK 511E / SK 515E
with "Safe stop" function

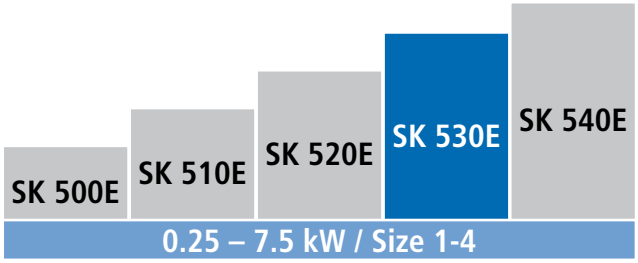
- SK 500E basic equipment
- "Safe Stop" (STO) according to EN ISO 13849-1 Cat.4, Performance Level e EN 61508 SIL 3
- CANopen on board (only SK 511E)

The safety function "Safe stop" is a very practical and efficient method of preventing a motor from restarting, as required by the relevant standards. This prevents injury to personnel working in the vicinity of the rotating drive.
("Safe stop" see page 16)

Integrated “Safe stop” safety function compliant with EN 13849-1 up to max. safety category4,
Stop category 0 and 1

- **"Safe impulse block" with ext. 24V supply**
- **Safety switching device required**
- **Safe protection against motor restart**
- **No need for disconnection of supply voltage**





SK 520E with integrated mains unit

SK 520E with speed control and efficient bus system:

- SK 500E basic equipment
- CANopen on board
- Incremental encoder input (TTL)
- Additional connections for control signals

With the incremental encoder input, accurate speed control can be achieved for high speed stability and full torque down to zero speed (e.g. lifting applications). The integral CANopen interface represents a low cost possibility of connecting with automation systems. Additional control signal connections provide extended scope for processing external inputs and outputs.

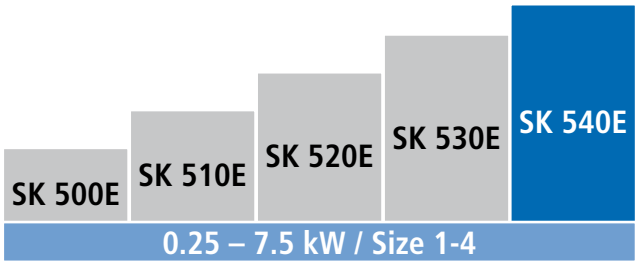
SK 530E with integrated mains unit
SK 535E with external 24V supply

SK 530E / SK 535E with "Safe stop" function and positioning control

- SK 500E basic equipment
- "Safe Stop" (STO) according to EN ISO 13849-1 Cat.4, Performance Level e EN 61508 SIL 3
- CANopen on board
- Incremental encoder input (TTL)
- POSICON positioning control
- Additional connections for control signals

The SK 530E and SK535E series provide user-friendly facilities for implementing relative or absolute positioning control with standard asynchronous motors. In addition to synchronous applications (Master / Slave), conventional coupling of several similarly equipped NORD frequency inverters also enables technology functions such as "flying saw". Commissioning with a minimum number of parameters makes this high-level functionality easily achievable.

- **Absolute value encoder via CANopen on board**
- **Direct parameterisation of up to 63 positions**
- **Binary actuation or via bus system**
- **suitable for**
  - **rotating platform functions with and without travel optimisation**
  - **Master / Slave coupling for synchronous applications (with positional synchronisation in static operation)**
  - **Flying saw (independent synchronisation of the slave drive to the master)**



SK 540E with integrated mains unit
SK 545E with external 24V supply

SK 540E / SK 545E integrated PLC functionality and universal encoder interface

- SK 500E basic equipment
- "Safe Stop" (STO) according to EN ISO 13849-1 Cat.4, Performance Level e EN 61508 SIL 3
- CANopen on board
- Incremental encoder input (TTL)
- POSICON positioning control
- Additional connections for control signals
- Integrated PLC functionality
- Universal encoder interface
- Potential isolated PTC input

An increasing number of applications require a higher quality of control for the drive units than is possible with inverter-operated three-phase asynchronous machines, however without the need for the dynamics of a conventional servo drive. This gap has now ben closed with the SK 540E / SK 545E, which are able to drive both PMSM (permanently excited synchronous motors) as well as three-phase asynchronous motors in the usual manner. Whether or not an encoder is required depends on the requirements for control quality or the suitability of the users's universal encoder interface for inverter operation.

The integrated PLC functionality further extends the range of applications of the SK 540E / SK 545E. This IL-based control function enables the implementation or management of simple drive applications and sequences via the frequency inverter. The fact that an external PLC is not required saves both space and wiring.

Synchronous motor operation (as energy-saving motor)

Synchronous technology in standard MORD housing

PMSM as energy-saving motor

- **Optimal relationship between manufacturing costs and efficiency**
- **High energy-saving potential for pump and fan/ ventilator applications**
- **Control without encoders**

PMSM and ASM for sophisticated applications

- **Single-axis applications with increased dynamics**
- **Integrated technology functions e.g. "flying saw"**

Universal encoder interface

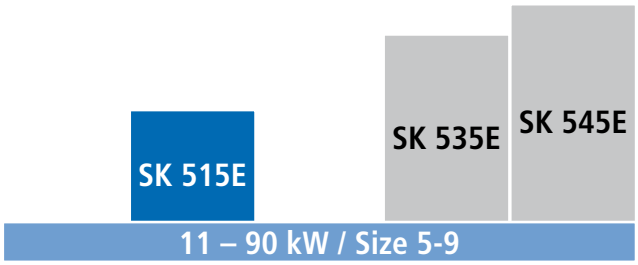
The universal encoder interface enables the connection of most common encoder systems to the frequency inverter. This absolute encoder interface is especially important for the operation of synchronous motors.

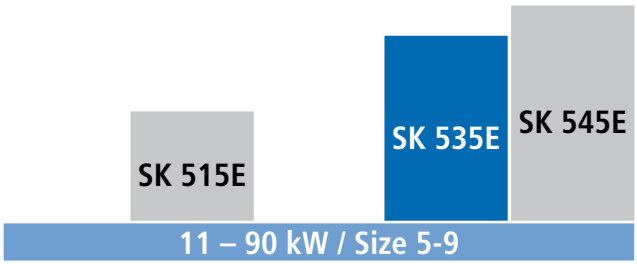
In addition to SSI encoders and BISS encoders (a further development of the SSI encoder), EnDat encoders with profile 2.1 and Hiperface encoders can also be evaluated.

PLC logic function

Implementation of sequence control in the vicinity of the drive unit.

- Logical linking of input signals
- IL programming based on IEC 61131-3
- Motion Control modules available
- Programming with NORD CON software
- Debugging possible
- Real-time capability with up to 200 IL commands per ms
- Visualisation and control via ParameterBox
- IO extension by means of Technology Units





SK 515E

SK 515E with "Safe stop" function

- SK 500E basic equipment
- "Safe Stop" (STO) according to EN ISO 13849-1 Cat.4, Performance Level e EN 61508 SIL 3
- CANopen on board
- Optional external supply voltage 24V for control board, automatic
- Potential isolated PTC input

In the high power range above 11KW (Size 5), the SK 500E product range contains includes several practical features as standard. The SK 515E has the functions "Safe Stop" compliant with EN 13849-1 and the CANopen bus system on board.
As well as this, all units of this power class provide the possibility of providing the control board with an external 24V supply. With this, it is not only possible to parameterise the frequency inverter when the power is switched off. It is also possible to implement a form of emergency operation ("evacuation run") with the aid of a suitably powerful auxiliary power source (e.g. 60V DC).

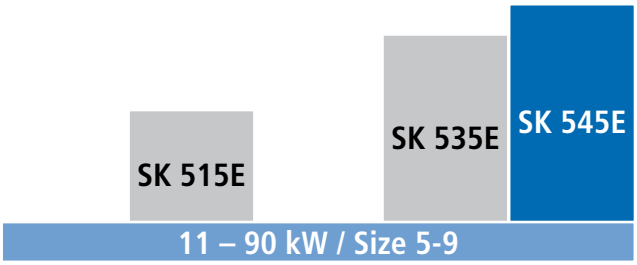
SK 535E

SK 535E with "Safe stop" function and positioning control

- SK 500E basic equipment
- "Safe Stop" (STO) according to EN ISO 13849-1 Cat.4, Performance Level e EN 61508 SIL 3
- CANopen on board
- Incremental encoder input (TTL)
- POSICON positioning control
- Optional external supply voltage 24V for control board, automatic
- Additional connections for control signals
- Potential isolated PTC input

The SK 535E (above Size 5) has all of the features of the SK 515E (above Size 5) ("Safe Stop", CANopen on board etc.) as well as additional inputs for connecting control signals and the POSICON position control. With the aid of POSICON, the SK 535E provides a user-friendly method for the implementation of a relative or absolute position control. (See also SK 530E / SK 535E on page 7).

- **Absolute value encoder via CANopen on board**
- **Direct parameterisation of up to 63 positions**
- **Binary actuation or via bus system**
- **suitable for**
  - **rotating platform functions with and without travel optimisation**
  - **Master / Slave coupling for synchronous applications (with positional synchronisation in static operation)**
  - **Flying saw (independent synchronisation of the slave drive to the master)**



SK 545E

SK 545E
integrated PLC functionality and universal encoder interface

- SK 500E basic equipment
- "Safe Stop" (STO) according to EN ISO 13849-1 Cat.4, Performance Level e EN 61508 SIL 3
- CANopen on board
- Incremental encoder input (TTL)
- POSICON positioning control
- Optional external supply voltage 24V for control board, automatic
- Additional connections for control signals
- Integrated PLC functionality
- Universal encoder interface
- Potential isolated PTC input

An increasing number of applications require a higher quality of control for the drive units than is possible with inverter-operated three-phase asynchronous machines, however without the need for the dynamics of a conventional servo drive. This gap has now been closed with the SK 545E, which is able to drive both PMSM (permanently excited synchronous motors) as well as three-phase asynchronous motors in the usual manner. Whether or not an encoder is required depends on the requirements for control quality or the suitability of the users's universal encoder interface for inverter operation.

The integrated PLC functionality further extends the range of applications of the SK 545E. This IL-based control function enables the implementation or management of simple drive applications and sequences via the frequency inverter. The fact that an external PLC is not required saves both space and wiring.

Synchronous motor operation (as energy-saving motor)

Synchronous technology in standard NORD housing

PMSM as energy-saving motor

- **Optimal relationship between manufacturing costs and efficiency**
- **High energy-saving potential for pump and fan/ventilator applications**
- **Control without encoders**

PMSM and ASM for sophisticated applications

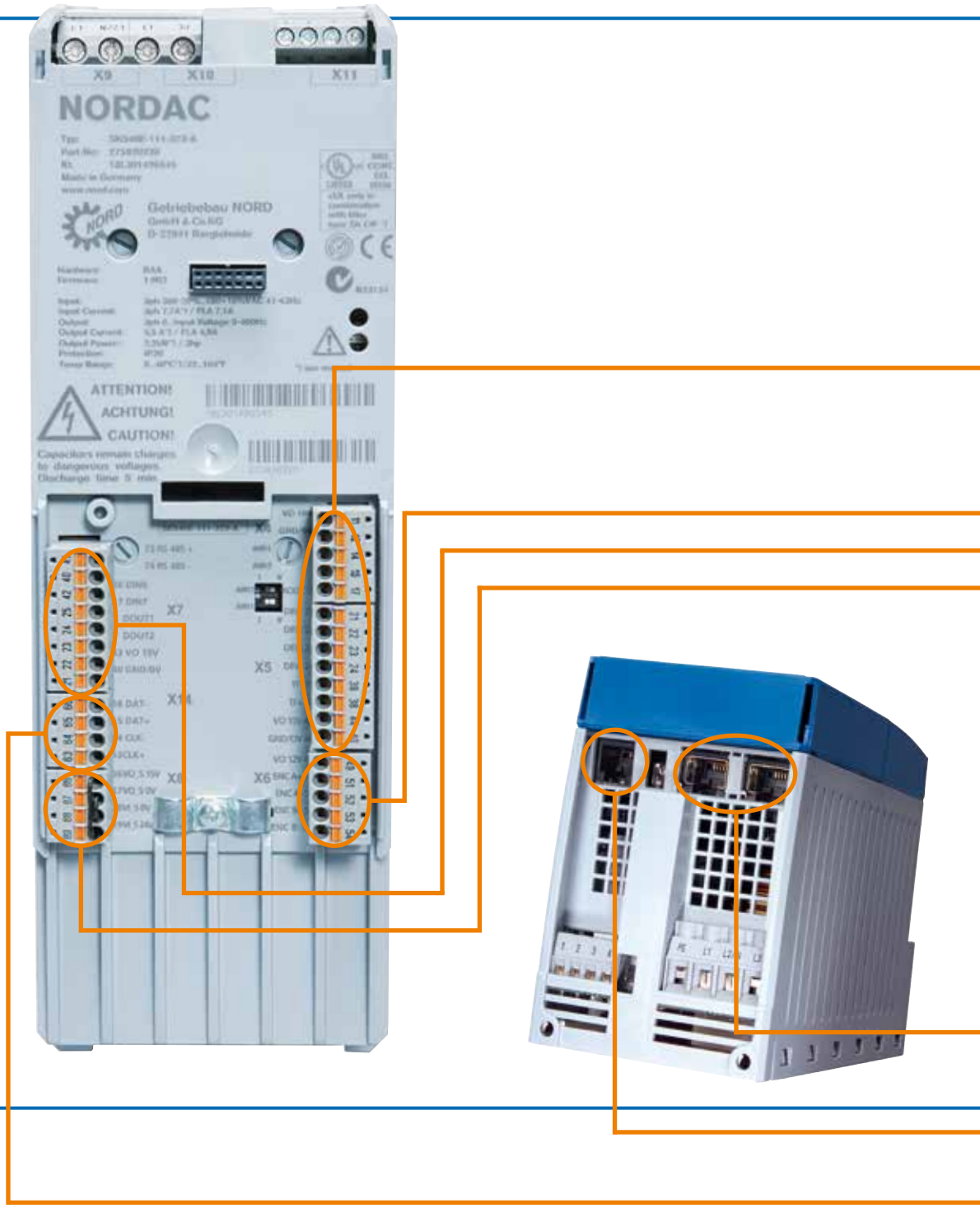
- **Single-axis applications with increased dynamics**
- **Integrated technology functions e.g. "flying saw"**

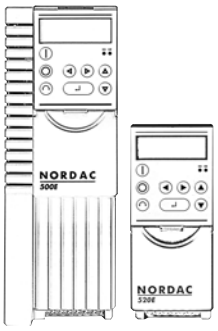

NORDAC
EtherCAT

System Overview

		SK 500E	SK 505E	SK 510E	SK 511E	SK 515E	SK 520E	SK 530E	SK 535E	SK 540E	SK 545E
Power	Power range 0.25 kW - 7.5 kW	✓	✓	✓	✓		✓	✓	✓	✓	✓
	Power range 11kW - 90kW (up to 160kW in preparation)					✓			✓		✓
Basic functions	Same design	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Coldplate up to Size 4, external heat sink technology up to Size 2	✓	✓	✓	✓		✓	✓	✓	✓	✓
Basic functions	Sensorless current vector control (ISD control)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Line filter Class C2, up to 5m motor cable Class C1 up to size 4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Brake management, mech. holding brake	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Brake chopper (brake resistor optional)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Switchable parameter sets	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	All normal drive functions	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Process controller / PID controller	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Consistent parameter structure	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Simple to operate	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	All common bus systems via Technology Units	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Automatic flux optimisation (energy saving function).	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special options	"Safe stop" function			✓	✓	✓		✓	✓	✓	✓
	CANopen on Board				✓	✓ (Size 5-7)	✓	✓	✓	✓	✓
	Incremental encoder input						✓	✓	✓	✓	✓
	Additional control inputs and outputs						✓	✓	✓	✓	✓
	POSICON (positioning control, synchronous operation, relative and absolute positioning regulation)							✓	✓	✓	✓
	24V power supply for control board (mandatory up to 7.5kW, optional above 11kW)		✓			✓			✓		✓
	PLC logic function									✓	✓
	Universal encoder interface									✓	✓
	Synchronous motor operation									✓	✓

Interfaces

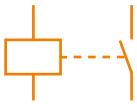

X9
X10
X11
NORDAC
Gebriebebau NORD
ATTENTION!
ACHTUNG!
CAUTION!
X7
X5
X14
X6



Interfaces	SK 500E	SK 505E	SK 510E	SK 511E	SK 515E	SK 520E	SK 530E	SK 535E	SK 540E	SK 545E
Power range 0.25 - 7.5kW	✓	✓	✓	✓		✓	✓	✓	✓	✓
Power range 11 - 90kW					✓			✓		✓
5x digital inputs 2x analog inputs (0...10V, 0/4...20mA) 1x analog output 2x multi-function relays RS 485 and RS 232 on RJ 12 socket	✓	✓	✓	✓	✓*	✓	✓	✓*	✓	✓*
									up to Size 4: One DIN implemented as potential-isolated thermistor input	
1x Incremental encoder input						✓	✓	✓	✓	✓
Additionally 2x digital inputs 2x digital outputs 1x RS 485 to terminal						✓	✓	✓	✓	✓
									One DIN can be parameterised as DOUT and one DOUT as DIN	
Additional potential-isolated thermistor input					✓ (above Size 5)			✓ (above Size 5)		✓ (above Size 5)
External 24V supply for the control board		✓			✓			✓		✓
Safety function "Safe stop"			✓	✓	✓		✓	✓	✓	✓
2x RJ 45 for CANopen In/Out				✓	✓ (above Size 5)	✓	✓	✓	✓	✓
1x RJ 12 for operation and diagnosis	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Universal encoder interface									✓	✓

* From Size 5 and above the analog inputs can also be used for +/- 10V signals

Hardware characteristics

Hardware characteristics of compact units	
	Units can be linked without derating
	Same dimensions with different functions of the various performance levels
	Coldplate (up to Size 4) / External heat sink technology (up to Size 2)
	Connections in familiar circuit breaker design (Continuous wiring)
	Plug-in terminal blocks for control signals
	External 24V power supply for control board (according to version)

If required	
	ATEX compliance (use in explosion hazard areas)
	RoHS compliance (e.g "lead-free" soldering)
	UL certification / cUL (with series-connected components)
	C-Tick certification (Australia)
	CE - Compliance with the requirements of the EMC Directive according to the EMC product standard for motor-driven systems

Stay cool

Alternative "Cold-Plate" and external heat sink technology cooling systems

In addition to the standard cooling technology designs, all SK 500E inverters are also available as Cold-Plate and external heat sink technology. In the Cold-Plate variant, the standard heat sink is replaced by a flat cooling flange. To transfer the heat from the inverter, the flange is mounted on a surface cooled by e.g. water, air or oil. Important advantages here are the reduction in installation depth of the inverter by approx. 35 mm to 119 mm and improved heat dissipation. With the external heat sink technology, a ribbed heat sink is supplied as an optional module and mounted on the Cold-Plate unit. The inverter is installed in the control cabinet with the heat sink located outside the cabinet so that a large part of the heat to be dissipated is transferred there. This reduces the internal temperature of the control cabinet – air conditioners and fans can be correspondingly smaller or omitted completely.

ATEX compliant drive systems for increased safety

Tested and certified combinations of SK 500E inverters and NORD motors with increased safety are available. Where in typical inverter operation, pressure-resistant encapsulated motors must be used, a combination of Exe motor and NORD SK 500E frequency inverter* can be employed. This results in a considerable cost saving. The weight and price of such a drive package is very competitive when compared to the motor performance and therefore offers an efficient solution.

Advantages at a glance:

- Up to 40% price advantage for the geared motor compared with pressure-resistant motors
- Significant weight reduction
- PTB acceptance for Zone 1 and Zone 2
- 50 Hz or 87 Hz characteristic curve possible
- Control range 5 Hz to 100 Hz
- Power range from 0.18 to 13.5 kW (Motor power)

Cold-Plate

External heat sink technology

ATEX konform

*Installation of the frequency inverter outside of the hazard area!

Cold-Plate

External heat sink technology

Safety function "Safe stop"

Safety function "Safe stop"

Personnel safety and high machine availability are the focus in system operations. After a safety circuit is actuated by opening a safety cover or door, it must be ensured that no rotating system components can lead to accidents at work. With a motor with a NORD frequency inverter, this is implemented by a safe impulse block, which provides protection against the motor restarting in compliance with the standard. This safe block includes voltage supply to the circuit breaker by means of a safety switching device. The frequency inverter is therefore immediately ready to be switched on without re-initialisation after the safety circuit is closed.

Standards

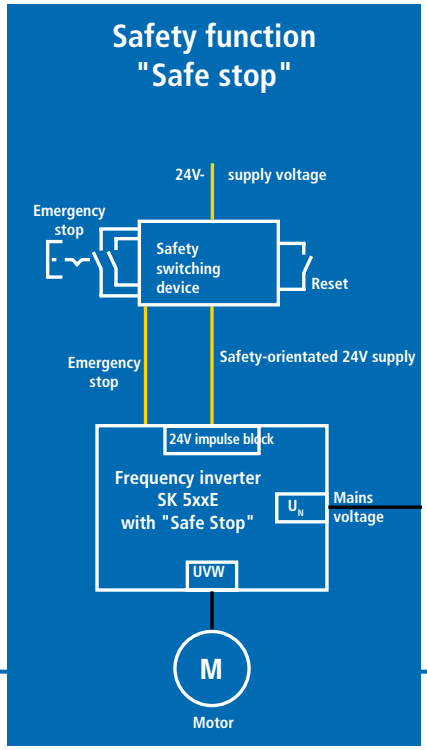
- DIN EN ISO 13849-1:Performance Level e
- DIN EN 61508: SIL3
- DIN EN 60204-1: Stop function
- DIN EN 61800-5-2: Safety functions

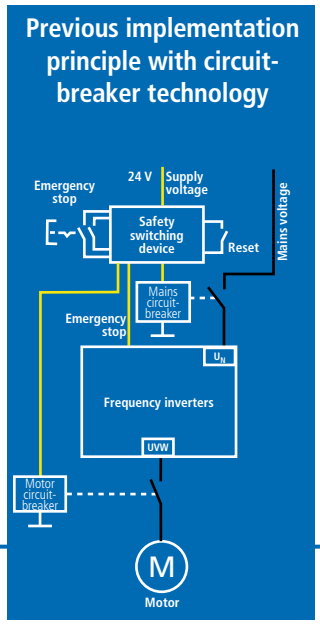
Applications

- Rotating machine tools (e.g. milling machines)
- Closed moving systems with safety doors

Advantages at a glance

- High machine availability through continuous online operation
- Reduction in circuit breaker components
- No inverter initialisation delays
- Long service life due to electronic switching (no electromechanical contacts)
- Low cost solution with compact device





POSICON and PLC

POSICON

Frequency inverters with integrated POSICON functionality are able to determine the actual position of the drive unit via appropriate interfaces. Incremental encoder inputs (TTL / HTL) or absolute encoders are available as interfaces via CANopen (from SK 540E and above SSI, BISS, EnDat 2.1 and Hiperface are also available). In addition to conventional point-to-point positioning (absolute positioning), POSICON also provides the facility for relative positioning of endless axes as well as various technology functions (rotating platform "with travel optimisation", synchronous operation and flying saw).

By means of the standard position POSICON position memory and features such as "teach in", "reference point", "reset position", "offset position", "target window positioning" and "S-ramp", the frequency inverter is able to perform a complete, independent positioning control. The tasks for the external control are therefore reduced to the starting pulse and communication of the target position (via digital I/O or at the field bus level). The frequency inverter can even undertake monitoring of the positioning process and reporting of the operating status.

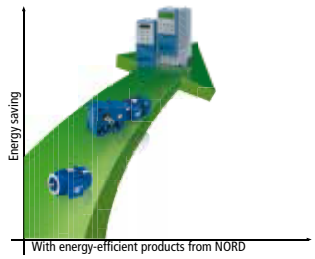
PLC

In most cases the frequency inverter is controlled by means of an overriding PLC. However, the use of an external PLC requires additional space and installation expense in order to implement communication between the PLC and the participants (e.g. frequency inverters). In many systems with relatively simple drive functions, the expense required soon becomes inacceptable.

This is where the SK 540E / SK 545E come into their own. Their integrated IL-based PLC functionality (based on IEC 61131-3) is specially designed for drive functions. With a computational performance of approx. 200 IL commands per ms and a total of 1280 commands in the program, this control unit is able to undertake many tasks in the field of the frequency inverter. Inverter inputs or information from a connected field bus can be monitored, evaluated and further processed into appropriate setpoint values for the frequency inverter. Visualisation of system statuses and the input of special customer parameters is possible by means of optional equipment (ParameterBox, NORDCON software).

Integrated functions for a wide range of applications

Application functions of the SK 5xxE

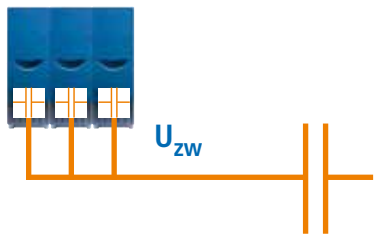


Energy-saving function

SK 500E SK 510E SK 520E SK 530E SK 540E

SK 505E SK 511E SK 515E SK 535E SK 545E

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

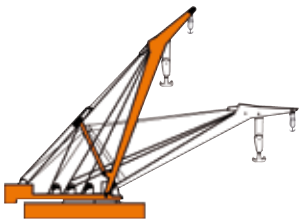


Link circuit coupling

SK 500E SK 510E SK 520E SK 530E SK 540E

SK 505E SK 511E SK 515E SK 535E SK 545E

- Link circuit via terminals for all versions
- Energy saving effect with balanced motor and generator operation
- Possibility of eliminating a brake resistor

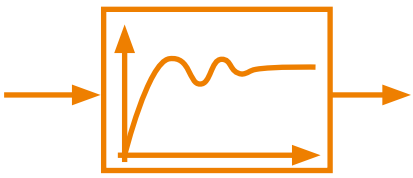


Lifting gear functions

SK 500E SK 510E SK 520E SK 530E SK 540E

SK 505E SK 511E SK 515E SK 535E SK 545E

- High precision sensorless current vector control (ISD control)
- Integrated brake chopper to divert generated energy to a brake resistor (optional)
- Optimised operation with only a few parameter settings



PID process controller

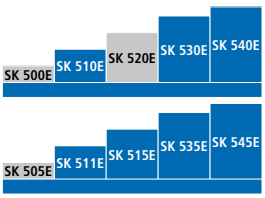
SK 500E SK 510E SK 520E SK 530E SK 540E

SK 505E SK 511E SK 515E SK 535E SK 545E

- PID regulator included in all versions
- P, I and D component can be set separately
- High precision regulation

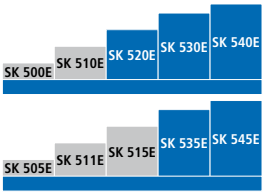
Application functions of the SK 5xxE

Safety function "Safe stop"



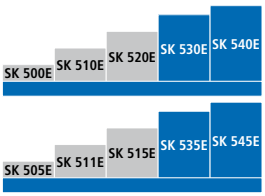
- Switch-off of the 24V DC power supply to the IGBT module
- Wear-free solution
- Cost savings compared with circuit breaker version

Servo mode



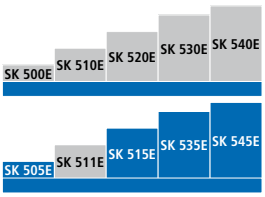
- High precision speed control possible
- Full torque down to standstill (speed 0)
- Digital speed controller with settings relevant to the application

Absolute and relative positioning with POSICON

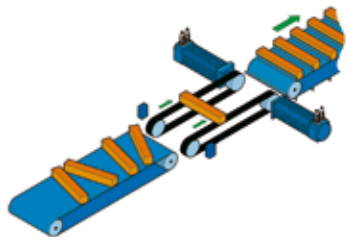


- Absolute positioning to move to fixed values, e.g. on a finite axis
- Relative positioning for stepped operation
- Simple implementation by setting only a few parameters

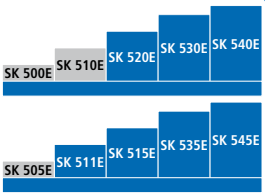
Evacuation runs



- Evacuation run possible if the main supply fails
- Emergency operation with low DC voltage from external power supply (e.g. battery) possible
- Versions with external 24V power supply for control board



Master / Slave operation



- Control of one or more slave inverters by a master inverter
- Communication via USS, CAN or CAN-open with control word and setpoint values
- Speed or synchronised positioning possible according to performance level

NORD CON software

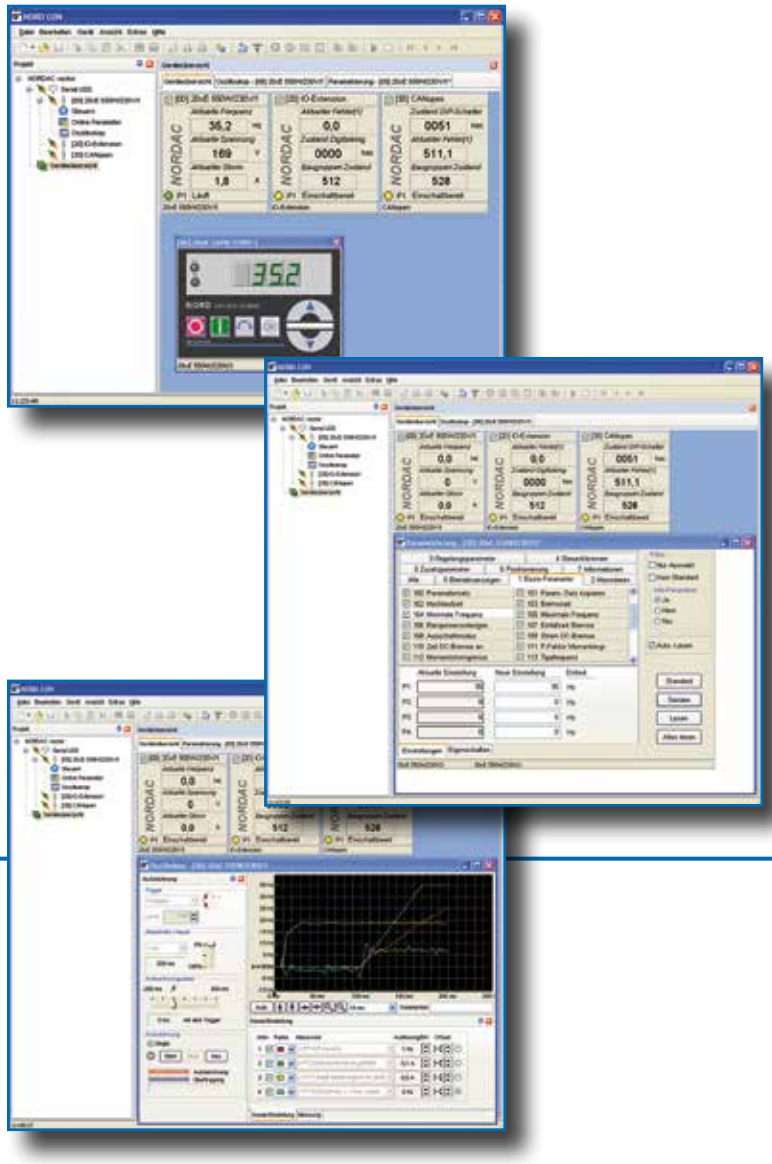
NORD CON
NORD CON is a free software which can run on Microsoft® Windows™ (2000/XP/Vista/7) PCs to control, parameterise and diagnose all NORD frequency inverters.

Controller
The frequency inverted can be manually operated by means of a software window with all the operating elements of a SimpleBox. An enable signal with specification of setpoint values can be given. The parameter settings can be adjusted and read parameters (information and error messages) can be viewed. Users therefore have a supporting aid for each commissioning.

Parameterisation
By means of a convenient overview the user can view and adjust each available parameter. By means of am appropriate printing option, parameter lists are generated in printed form either completely or with amended values. The finished data sets can be saved on the PC/laptop and archived for future use.

Programming of the PLC (SK 540E and above)
A PLC editor is available for creating, editing and managing a PLC program. The PLC programs can also be tested (debugged) with this editor and communicated to the frequency inverter.

Diagnosis
The NORD CON oscilloscope function is a simple but very useful instrument for the optimal adjustment of drive systems. By means of line graphs, all drive characteristics (current, torque, etc.) can be recorded and analysed. With these results, application-relevant settings can be fine-tuned to enable optimum operation. This is useful, e.g. for regulating the brake control or for lifting gear functions.



Technology Units

Technology units as optional extensions

Each SK 5xxE is equipped with a modular slot, which is covered when the unit is delivered. Here, a technology unit can be added to operate the unit or to access the bus.

Laser-engraved type plate with all details specific to the device

- Type designation and part number
- ID number and serial number
- Technical data and certifications
- Barcodes for rapid recording

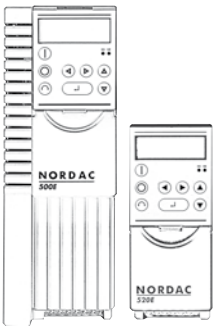
Flexible through modular design

SK TU3-PBR Part No.: 275 900 030	Bus interface PROFIBUS
Version	Connector: SUB-D 9-pin Status LEDs Bus address can be set via parameters
Baud rate	Max. 1.5 MBit/s
Protocol	DPV 0

SK TU3-PBR-24V Part No.: 275 900 160	PROFIBUS bus interface with external 24V supply
Version	Connector: SUB-D 9-pin Status LEDs Rotary coding switch for bus address and PPO type
Baud rate	Max. 12 MBit/s
Protocol	DPV 0

SK TU3-CAO Part No.: 275 900 075	Bus interface CANopen
Version	Connector: SUB-D 9-pin Status LEDs Rotary coding switch for bus address and baud rate
Baud rate	Max. 1 MBit/s
Protocol	DS 301 and DS 402

SK TU3-DEV Part No.: 275 900 085	Bus interface DeviceNet
Version	Connector: 5 pin terminal Status LEDs Rotary coding switch for bus address and baud rate
Baud rate	Max. 500 kBit/s
Protocol	AC-Drive



InterBus

SK TU3-IBS Part No.: 275 900 065	Bus interface InterBus
Version	Connector: 2 x SUB-D 9, 9-pin Status LEDs 2 pin terminal for ext. 24V
Baud rate	Max. 500 kBit/s (optional 2MBit/s)
Protocol	DRIVECOM 21 profile adjustable

EtherCAT

SK TU3-ECT Part No.: 275 900 180	Ethernet-based EtherCAT bus system
Version	Connector: 2x RJ45 for Bus In/Out Status LEDs 2-pole terminal for external 24V
Baud rate	Max. 100 MBit/s
Protocol	CoE

AS-Interface

SK TU3-AS1 Part No.: 275 900 170	AS interface BUS interface
Version	Connection terminals for max. 4 sensors, 2 actuators
Protocol	Slave profile S-7.4 (standard- slaves) with cyclic 4 Bit I/O data. String transfer possible.

PROFINET

SK TU3-PNT Part No.: 275 900 190	Ethernet-based PROFINET bus system
Version	Connector: 2x RJ45 compliant with AIDA specification Status LEDs 2-pole terminal for external 24V
Baud rate	Max. 100 MBit/s
Protocol	PROFINET IO Conformance Class B

SimpleBox

SK CSX-0 Part No.: 275 900 095	Control panel to plug in to a bus technology unit
Version	7-segment display Button/rotating knob Connection to diagnostic RJ12
Languages	–
Memory	No data sets can be stored

ControlBox

SK TU3-CTR Part No.: 275 900 090	Control panel for fast and direct parameterisation and diagnosis
Version	7-segment display Film keypad for control Status LEDs
Languages	–
Memory	1 data set can be stored

ParameterBox

SK TU3-PAR Part No.: 275 900 100	Control panel for text-controlled commissioning. Parameterisation and control of the frequency inverter
Version	Plain text display Film keypad for control Status LEDs
Languages	DE, GB, FR, SE, NL, ES, PL
Memory	5 data sets can be stored

Potentiometer Box

SK TU3-POT Part No.: 275 900 110	Control panel with On/Off switch and setpoint potentiometer
Version	Compact potentiometer 0-100% Foil keypad
Languages	–
Memory	No data sets can be stored

Control and Diagnosis

Convenient operation and diagnostics with electronic boxes

Various aids are available for the control, parameterisation and diagnosis of the SK 500E frequency inverter.

- ParameterBox
- SimpleBox
- PC/laptop with NORD CON software

SimpleBox

SK CSX-3H Handheld Part No.: 275 281 013 SK CSX - 3E Control cabinet installation Part No.: 275 281 413	Operating panel for easy and fast operation.
Display	4-digit, 7-segment display

ParameterBox

SK PAR-3H Handheld Part No.: 275 281 014 SK PAR - 3E Control cabinet installation Part No.: 275 281 414	Convenient control panel for text-controlled commissioning, parameterisation and control of the frequency inverter. 5 data sets can be saved. Direct connection to a PC is possible via USB with the handheld version.
Display	Plain text display

Accessories

EMC Kit

EMC Kit: SK EMC 2- …
For EMC-compliant connection of shielded cables, versions available for all sizes of inverter.

EMC Kit

Size of frequency inverter	EMC Kit	Part Number
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

Electronic brake rectifier SK EBGR-1

For direct control of electromechanical DC holding brakes, including feedback and monitoring function for the brake coil. Snap-on mounting.
Part. No.: 19 140 990

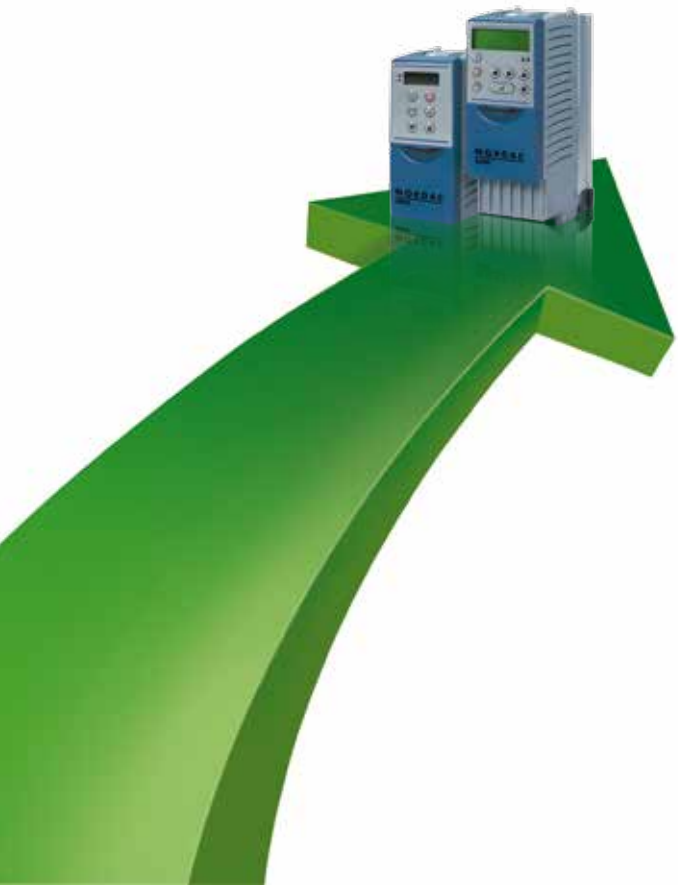
Connection kit HTL encoder WK 4/2/4*680 OHM

For connection of an HTL encoder to the TTL encoder input of the frequency inverter. Snap-on mounting. Part. No.: 278 910 340

Setpoint converter +/- 10V

For connection of a bipolar analog signal to the unipolar input of a frequency inverter (up to Size 4). Snap-on mounting. Part. No.: 278 910 320

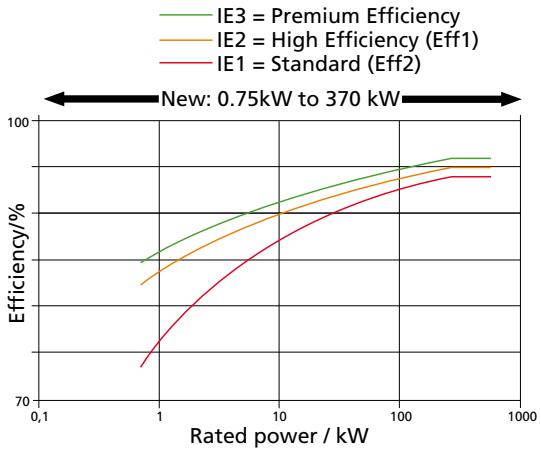
Skilled use of energy



NORD drive electronics

Open up an especially large energy saving potential in the partial load range by means of energy-saving functions (e.g. automatic flux optimisation).

Consistent use of NORD drive technology with energy-optimised gear units, motors and frequency inverter control provides potential energy savings of up to 40%.



IE1 standard motor with aluminium in the rotor

IE2 energy saving motor with aluminium in the rotor

IE3 energy-saving motor with copper in the rotor

Energy savings with NORD frequency inverters

- ✔ Higher efficiency with DC networks
- ✔ Current vector control
- ✔ Automatic flux optimisation
- ✔ 87 Hz operation

Technical data

Function	Specification
Power / Voltage	1~ 115V 0.25 - 0.75 kW (no line filter) 1/3~ 230V 0.25 - 2.2 kW 3~ 230V 3.0 kW- 15 kW 3~ 400V 0.55 - 90 kW (110-160 kW in preparation)
Standard	• Class C2 integrated line filter (industrial), Class C1 up to motor cable length 5m up to Size 4 • Consistent and user-friendly parameter structure • Adaptable for operation in IT network or low leakage current operation • Automatic motor parameter identification
Output frequency	0,0 ... 400.0 Hz
Rated overload capacity	200% for 3.5s, 150% for 60s
Protective measures against	Overtemperature, short-circuit, earthing, overvoltage/undervoltage, overload
Regulation and control	Sensorless current vector control (ISD), linear V/f characteristic curve, automatic flux optimisation (energy-saving function)
Motor temperature monitoring	Temperature sensor (PTC), temperature monitor (bimetal), temperature sensor (KTY84) I^2t motor
Standard interfaces	RS 485 (USS), RS 232 (commissioning and diagnosis), CANopen (SK 511E and higher)
Ambient temperature	0°C...+40°C (S1- 100% ED), 0°C... +50°C(S3 - 75% ED 15min)
Cooling system	Convection up to 1.1 kW (0.75kW at 230V) Temperature-controlled fan above 1.5kW (1.1kW at 230V) Alternatives: Coldplate (up to Size 4) / External heat sink technology (up to Size 2)
Protection class	IP20

Function	Specification
Safety function "Safe stop"	Frequency inverter with safe impulse block STO – Safe Torque Off → Torque safely switched off SS1 – Safe Stop 1 → Controlled shut-down of motor DIN EN ISO 13849-1 / DIN EN 61508 / DIN EN 60204-1
POSICON positioning control	• Up to 63 positions can be binary controlled, almost unlimited number with bus control • Time-optimised and safe travel up to the target position by means of path calculation. • Movement in steps for relative positioning • Synchronous drive functionality possible via RS 485 or CANopen • Round axis function (module axes) e.g. for rotating platform applications • TTL incremental encoder on terminal • Absolute value encoder via CANopen, SSI, BiSS, EnDat, Hiperface • Combined encoder (incremental and absolute encoder), and encoders for special ambient conditions on request
PLC logic function	• Instruction List (IL) • Wide range of operators and function block library • Optimised for drive units • Based on IEC 61131-3 • Visualisation and programming with NORDCON software • Visualisation and parameterisation via ParameterBox • PLC computing capacity: approx. 200 IL – commands / ms • PLC program length: approx. 1280 commands

Option	Description
Technology Units	Clip-on box for control unit or bus system
Connection cables	Connecting cable between SK 500E and PC (RJ12/SUB-D)
Braking resistors	For use with integrated brake chopper when generated braking energy is fed back into the frequency inverter
Input / output chokes	Input choke: For fluctuations of mains voltage or reduction of harmonics Output choke: For long motor cables (>30m)
EMC Kit	For EMC-compliant shielding of connected cables

SK 5xxE 1 ~ 110 ... 120V and 1/3 ~ 200 ... 240V

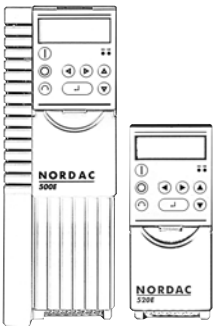
Inverter ID SK 5xxE...	Mains voltage	Output voltage	Nominal motor power 230 V [kW]	Nominal motor pow 240 V [hp]
-250-112-O	1 ~ 110...120V, -/+10%, 47..0.63Hz	3 ~ 0 - 2x mains voltage	0.25	1/3
-370-112-O			0.37	1/2
-550-112-O			0.55	3/4
-750-112-O			0.75	1

Inverter ID SK 5xxE...	Mains voltage	Nominal motor power 230 V [kW]	Nominal motor powe 240 V [hp]
-250-323-A	1/3 ~ 200...240V. -/+10%. 47..0.63Hz	0.25	1/3
-370-323-A		0.37	1/2
-550-323-A		0.55	3/4
-750-323-A		0.75	1
-111-323-A		1.1	1 1/2
-151-323-A		1.5	2
-221-323-A		2.2	3
-301-323-A	3 ~ 200...240V. -/+10%. 47..0.63Hz	3.0	4
-401-323-A		4.0	5
-551-323-A		5.5	7 1/2
-751-323-A		7.5	10
-112-323-A		11	15
-152-323-A		15	20


Size 1


Size 2


Size 3



er	Nominal output current rms[A]	Typical input current rms[A]	Dimensions L x W x D [mm]
	1.7	8	Size 1: 186 x 74 x 153
	2.2	10	
	3.0	13	
	4.0	18	

r	Nominal output current rms[A]	Typical input current rms[A]	Dimensions L x W x D [mm]
	1.7	3.7 / 2.4	Size 1: 186 x 74 x 153
	2.2	4.8 / 3.1	
	3.0	6.5 / 4.2	
	4.0	8.7 / 5.6	
	5.5	12.0 / 7.7	Size 2: 226 x 74 x 153
	7.0	15.2 / 9.8	
	9.5	19.6 / 13.3	
	12.5	17.5	Size 3: 241 x 98 x 181
	16.0	22.4	
	22	30.8	Size 5: 324 x 157 x 224
	28	39.2	
	46	64.4	Size 6: 364 x 183 x 234
	60	84	Size 7: 456 x 210 x 236


Size 4

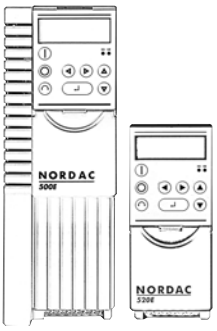

Size 5

SK 5xxE 3 ~ 380 ... 480V

Inverter ID SK 5xxE...	Mains voltage	Nominal motor power 400 V [kW]	Nominal motor powe 480 V [hp]
-550-340-A	3 ~ 380...480V, -20%/+10%, 47..0.63Hz	0.55	$\frac{3}{4}$
-750-340-A		0.75	1
-111-340-A		1.1	$1\frac{1}{2}$
-151-340-A		1.5	2
-221-340-A		2.2	3
-301-340-A		3.0	4
-401-340-A		4.0	5
-551-340-A		5.5	$7\frac{1}{2}$
-751-340-A		7.5	10
-112-340-A		11.0	15
-152-340-A		15.0	20
-182-340-A		18.5	25
-222-340-A		22.0	30
-302-340-A		30.0	40
-372-340-A		37.0	50
-452-340-A		45.0	60
-552-340-A		55.0	75
-752-340-A		75.0	100
-902-340-A		90.0	125

Size 6

Size 7



er	Nominal output current rms[A]	Typical input current rms[A]	Dimensions L x W x D [mm]
	1.7	2.4	Size 1: 186 x 74 x 153
	2.3	3.2	
	3.1	4.3	Size 2: 226 x 74 x 153
	4.0	5.6	
	5.5	7.7	
	7.5	10.5	Size 3: 241 x 98 x 174
	9.5	13.3	
	12.5	17.5	Size 4: 286 x 98 x 174
	16	22.4	
	24	33.6	Size 5: 324 x 157 x 224
	31	43.4	
	38	53.2	Size 6: 364 x 183 x 234
	45	64.4	
	60	84.0	Size 7: 456 x 210 x 236
	75	105.0	
	90	125.0	Size 8: 598 x 265 x 286
	110	145.0	
	150	200.0	Size 9: 636 x 265 x 286
	180	230.0	


Size 8


Size 9

Line filter

Footprint combined line filter

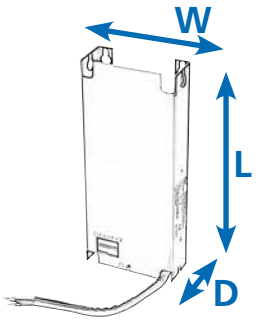
Inverter ID SK 5xxE...		Line filter type IP20	Part Number	Continuous current [A]
3~ 230V	0.25 - 0.75 kW	SK NHD-480/6-F	278 273 006	5.5
	1.1 - 2.2 kW	SK NHD-480/10-F	278 273 010	9.5
	3.0 - 4.0 kW	SK NHD-480/16-F	278 273 016	16
3~ 400V	0.55 - 0.75 kW	SK NHD-480/3-F	278 273 003	2.3
	1.1 - 2.2 kW	SK NHD-480/6-F	278 273 006	5.5
	3.0 - 4.0 kW	SK NHD-480/10-F	278 273 010	9.5
	5.5 - 7.5 kW	SK NHD-480/16-F	278 273 016	16

Footprint line filter

Inverter ID SK 5xxE...		Line filter type IP20	Part Number	Continuous current [A]
3~ 230V	5.5 - 7.5 kW	SK LF2-480/45-F	278 273 045	45
	11 kW	SK LF2-480/66-F	278 273 066	66
3~ 400V	11 - 15 kW	SK LF2-480/45-F	278 273 045	45
	18.5 - 22 kW	SK LF2-480/66-F	278 273 066	66
	30... 37 kW	SK LF2-480/105-F	278 273 105	105

General information

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



Footprint line filter

Inductance [mH]	Leakage current* [mA]	L [mm]	W [mm]	D [mm]
3 x 6.4	1 / 10	290	88	74
3 x 3.7	12 / 120	305	115	98
3 x 2.2	12 / 120	350	140	98
3 x 15.3	1 / 10	250	75	60
3 x 6.4	1 / 10	290	88	74
3 x 3.7	12 / 120	305	115	98
3 x 2.2	12 / 120	350	140	98

Leakage current* [mA]	L [mm]	W [mm]	D [mm]
12 / 120	380	164	75
12 / 120	428	182	75
12 / 120	380	164	75
12 / 120	428	182	75
12 / 120	525	210	95

* 1. Value: rated according to max. permissible fluctuation of input voltage according to IEC 38 + 10%

2. Value: Calculated with max. input voltage and failure of 2 phases (typically at 50Hz)

Footprint line filter, combination filter SK NHD (IP20)

Four sizes for frequency inverter powers of up to 7.5 kW (400V) are available. The line filter can be mounted flat underneath the frequency inverter. This reduces space requirements. These combination filters combine the advantages of a line filter and a line choke in a single housing and enable interference suppression Class C1 with max. 50 m shielded motor cable and Class C2 with max. 100 m cable.

Footprint line filter, SK LF2 (IP20)

Three sizes are available for frequency inverter powers of up to 37 kW (400V). The line filter can be mounted flat underneath the frequency inverter. This reduces space requirements. These line filters enable interference suppression Class C1 with max. 50 m shielded motor cable and Class C2 with max. 100 m cable.

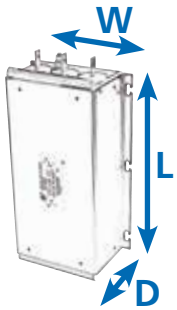
Line filter

Chassis line filter

Inverter ID SK 5xxE...		Line filter type IP20	Part Number	Continuous current [A]
3~ 230V	0.25 - 1.1 kW	SK HLD 110-500/8	278 272 008	8
	1.5 - 2.2 kW	SK HLD 110-500/16	278 272 016	16
	3.0 - 5.5 kW	SK HLD 110-500/30	278 272 030	30
	7.5 kW	SK HLD 110-500/42	278 272 042	42
	11 kW	SK HLD 110-500/75	278 272 075	75
	15 kW	SK HLD 110-500/100	278 272 100	100
3~ 400V	0.55 - 2.2 kW	SK HLD 110-500/8	278 272 008	8
	3.0 - 5.5 kW	SK HLD 110-500/16	278 272 016	16
	7.5 kW	SK HLD 110-500/30	278 272 030	30
	11 kW	SK HLD 110-500/42	278 272 042	42
	18.5 kW	SK HLD 110-500/55	278 272 055	55
	22 kW	SK HLD 110-500/75	278 272 075	75
	30 - 37 kW	SK HLD 110-500/130	278 272 130	130
	45... 55 kW	SK HLD 110-500/180	278 272 180	180
	75 - 90 kW	SK HLD 110-500/250	278 272 250	250

Chassis line filter, SK HLD (IP20)

These are available in various sizes for all SK 500 E series frequency inverters. The line filters are mounted separately from the frequency inverter. These line filters enable interference suppression Class C1 with max. 25 m shielded motor cable and Class C2 with max. 50 m cable.



Chassis line filter

Leakage current[1] [mA]	L [mm]	W [mm]	D [mm]
20 / 190	190	45	75
21 / 205	250	45	75
29 / 280	270	55	95
20 / 290	310	55	95
22 / 210	270	85	135
30 / 290	270	95	150
20 / 190	190	45	75
21 / 205	250	45	75
29 / 280	270	55	95
20 / 290	310	55	95
30 / 290	270	85	95
22 / 210	270	85	135
22 / 210	270	95	150
31 / 300	380	130	181
37 / 355	450	155	220

[1] Leakage current 1st value: Rated according to max. permissible fluctuation of input voltage according to IEC 38 + 10%
Leakage current 2nd value: Calculated with max. input voltage and failure of 2 phases (typically at 50Hz)

Line filter

Overvoltage filter

Inverter ID SK 5xxE...		Line filter type IP20	Part Number
3~ 230V	0.25 - 3.0 kW	SK CIF-323-20	276 997 070
	4.0 - 11 kW	SK CIF-323-40	276 997 071
3~ 400V	0.55 - 7.5 kW	SK CIF-340-30	276 997 080
	11 - 22 kW	SK CIF-340-60	276 997 081

Overvoltage filter, SK CIF (IP20)

In order to comply with the requirements of cUL (Canadian market) the use of a suitable overvoltage filter is mandatory.

In addition. for 230V devices, operation of the frequency inverter with a suitable overvoltage filter is only permissible if a line choke is also used.

Note: For devices of Size 7 and above, no overvoltage filters are necessary in order to fulfil the requirements of cUL. The devices fulfil these requirements without further additions.

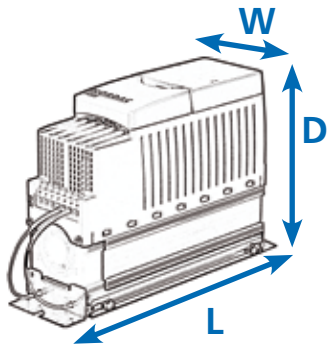
Continuous current [A]	L[1] [mm]	W[1] [mm]	T[1] [mm]
20	180.5/204.5	126/126	76.5/62.5
40	180.5/204.5	126/126	76.5/62.5
30	180.5/204.5	126/126	71/57
60	180.5/204.5	126/126	71/57

[1] Dimensions, 1st value: snap-on mounting
Dimensions, 2nd value: wall-mounting

Braking resistors

Footprint resistors

Inverter ID SK 5xxE...		Resistor type	Part Number	Resistance [Ω]
230V / 115V	0.25 - 0.37 kW	SK BR4-240/100	275 991 110	240
	0.55 - 0.75 kW	SK BR4-150/100	275 991 115	150
	1.1 - 2.2 kW	SK BR4-75/200	275 991 120	75
	3.0 - 4.0 kW	SK BR4-35/400	275 991 140	35
400V	0.55 - 0.75 kW	SK BR4-400/100	275 991 210	400
	1.1 - 2.2 kW	SK BR4-220/200	275 991 220	220
	3.0 - 4.0 kW	SK BR4-100/400	275 991 240	100
	5.5 - 7.5 kW	SK BR4-60/600	275 991 260	60
	Temperature monitoring for BR4 resistors		275 991 100	Bimetal switch as opener



Footprint resistor (BR4)

Continuous rating [W]	Energy consumption* [kWs]	L [mm]	W [mm]	D [mm]
100	1.0	230	88	175
100	1.0	230	88	175
200	3.0	270	88	175
400	6.0	285	98	239
100	1.0	230	88	175
200	3.0	270	88	175
400	7.0	285	98	239
600	12.0	330	98	239
		Wide brake resistor +10mm (one side) The dimensions apply to the frequency inverter, including the braking resistor		

* Max. once for 1.2s within 120s

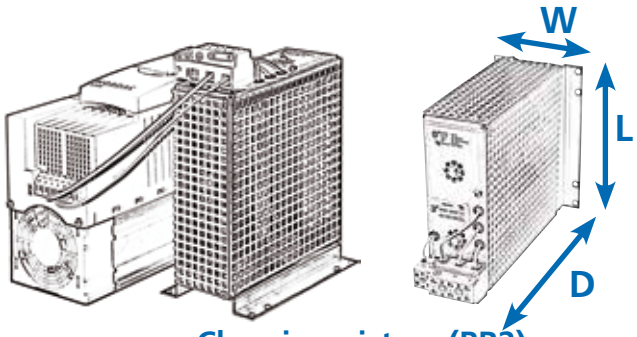
Footprint resistors SK BR4 (IP40)

Four sizes for frequency inverter powers of up to 7.5 kW (400V) are available. This braking resistor can be mounted flat or vertically, next to the frequency inverter. This reduces space requirements. The specified resistance values are electrically matched to standard applications.

Braking resistors

Chassis resistors

Inverter ID SK 5xxE		Resistor type	Part Number	Resistance [Ω]
230V	3.0 - 4.0 kW	SK BR2-35/400-C	278 282 045	35
	5.5 - 7.5 kW	SK BR2-22/600-C	278 282 065	22
	11 kW	SK BR2-12/1500-C	278 282 155	12
	15 kW	SK BR2-12/2200-C	278 282 155	9
400V	3.0 ... 4.0 kW	SK BR2-100/400-C	278 282 040	100
	5.5 ... 7.5 kW	SK BR2-60/600-C	278 282 060	60
	11 ... 15 kW	SK BR2-30/1500-C	278 282 150	30
	18.5 ... 22 kW	SK BR2-22/2200-C	278 282 220	22
	30 ... 37 kW	SK BR2-12/4000-C	278 282 400	12
	45 ... 55 kW	SK BR2-8/6000-C	278 282 600	8
	75 ... 90 kW	SK BR2-6/7500-C	278 282 750	6
	Temperature monitoring for BR2 resistors integrated (2 terminals 4mm²)			Bimetal switch as opener



Chassis resistors (BR2)

Continuous rating [W]	Energy consumption*) [kWs]	L [mm]	W [mm]	D [mm]
400	6.0	170	100	240
600	7.5	350	92	120
1500	20.0	560	185	120
2200	28.0	460	270	120
400	6.0	170	100	240
600	7.5	350	92	120
1500	20.0	560	185	120
2200	28.0	460	270	120
4000	52.0	560	270	240
6000	78.0	470	600	300
7500	104.0	570	600	300

* Max. once for 1.2s within 120s

Chassis - brake resistors, SK BR2 (IP20)
These can be used universally. The resistor elements are integrated into a housing grating and must be connected to the particular frequency inverter via a separate connecting cable. For this, a shielded cable should be used, which is as short as possible. These resistors must be protected from heavy soiling and moisture.

Input chokes

1~ 230V

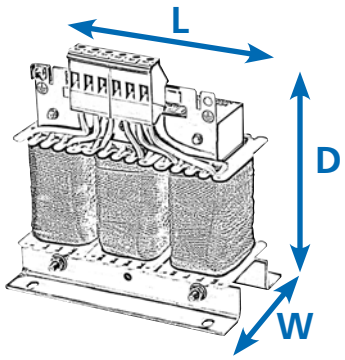
Inverter ID SK 5xxE	Choke type IP 00	Part Number	Continuous current [A]
0.25 - 0.75 kW	SK CI1-230/8-C	278 999 030	8
1.1 - 2.2 kW	SK CI1-230/20-C	278 999 040	20

3~ 230V

Inverter ID SK 5xxE	Choke type IP 00	Part Number	Continuous current [A]
0.25 - 0.75 kW	SK CI1-480/6-C	276 993 006	6
1.1 - 1.5 kW	SK CI1-480/11-C	276 993 011	11
2.2 - 3.0 kW	SK CI1-480/20-C	276 993 020	20
4.0 - 7.5 kW	SK CI1-480/40-C	276 993 040	40
11... 15 kW	SK CI1-480/70-C	276 993 070	70

3~ 400V

Inverter ID SK 5xxE	Choke type IP 00	Part Number	Continuous current [A]
0.55 - 2.2 kW	SK CI1-480/6-C	276 993 006	6
3.0 - 4.0 kW	SK CI1-480/11-C	276 993 011	11
5.5 - 7.5 kW	SK CI1-480/20-C	276 993 020	20
11 - 15 kW	SK CI1-480/40-C	276 993 040	40
18.5 - 30 kW	SK CI1-480/70-C	276 993 070	70
37... 45 kW	SK CI1-480/100-C	276 993 100	100
55 - 75 kW	SK CI1-480/160-C	276 993 160	160
90 kW	SK CI1-480/280-C	276 993 280	280



Inductance [mH]	L [mm]	W [mm]	D [mm]
2 x 1.0	65	78	89
2 x 0.4	90	96	106

Inductance [mH]	L [mm]	W [mm]	D [mm]
3 x 4.88	96	60	117
3 x 2.93	120	85	140
3 x 1.47	155	110	177
3 x 0.73	155	115	172
3 x 0.47	185	122	220

Inductance [mH]	L [mm]	W [mm]	D [mm]
3 x 4.88	96	60	117
3 x 2.93	120	85	140
3 x 1.47	155	110	177
3 x 0.73	155	115	172
3 x 0.47	185	122	220
3 x 0.29	240	148	263
3 x 0.18	352	140	268
3 x 0.10	352	169	268

General information

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

It is recommended that an input choke is always used for frequency inverters with a power of more than 45KW. This also positively influences the device safety and EMC behaviour. All chokes have protection class IP00 and are UL certified.

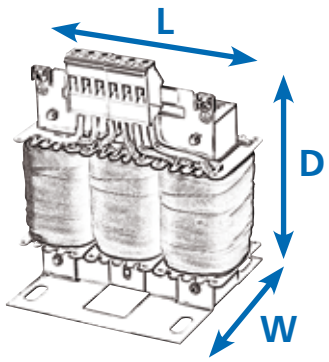
Output chokes

3~ 230V

Inverter ID SK 5xxE	Choke type IP 00	Part Number	Continuous current [A]
0.25 - 0.75 kW	SK CO1-460/4-C	276 996 004	4
1.1 - 1.5 kW	SK CO1-460/9-C	276 996 009	9
2.2 - 4.0 kW	SK CO1-460/17-C	276 996 017	17
5.5 - 7.5 kW	SK CO1-460/33-C	276 996 033	33
11... 15 kW	SK CO1-480/60-C	276 992 060	60

3~ 400V

Inverter ID SK 5xxE	Choke type IP 00	Part Number	Continuous current [A]
0.55 - 1.5 kW	SK CO1-460/4-C	276 996 004	4
2.2 - 4.0 kW	SK CO1-460/9-C	276 996 009	9
5.5 - 7.5 kW	SK CO1-460/17-C	276 996 017	17
11 - 15 kW	SK CO1-460/33-C	276 996 033	33
18.5 - 30 kW	SK CO1-480/60-C	276 992 060	60
37... 45 kW	SK CO1-460/90-C	276 996 090	90
55 - 75 kW	SK CO1-460/170-C	276 993 170	170
90 kW	SK CO1-460/240-C	276 996 240	240



Inductance [mH]	L [mm]	W [mm]	D [mm]
3 x 3.5	120	104	140
3 x 2.5	155	110	160
3 x 1.2	185	102	201
3 x 0.6	185	122	201
3 x 0.33	185	112	210

Inductance [mH]	L [mm]	W [mm]	D [mm]
3 x 3.5	120	104	140
3 x 2.5	155	110	160
3 x 1.2	185	102	201
3 x 0.6	185	122	201
3 x 0.33	185	112	210
3 x 0.22	352	144	325
3 x 0.13	412	200	320
3 x 0.07	412	225	320

General information

Long motor cable lengths (cable capacity) often require the use of additional output chokes on the frequency inverter output.
This has a positive effect on device protection and the EMC properties. In addition, the protection of the device and the EMC characteristics are positively influenced by the use of input chokes.

The output chokes specified in the tables are rated for a frequency inverter pulse frequency of 3 to 6 kHz and an output frequency of 0 to 120Hz. All chokes have protection class IP00 and are UL certified.

NORD Electronic DRIVESYSTEMS

Drive electronics produced in-house

NORD Electronic DRIVESYSTEMS, a subsidiary of Getriebebau NORD in Bargteheide, has had a production facility in Aurich since 1984. At the end of 2005 the new factory in Aurich / Schirum started operation. Here, 110 employees produce drive electronics such as frequency inverters, decentralised drive technology and servo controllers. The products are produced for sale throughout the world by Getriebebau NORD

High speed SMD assembly plant

The production process is divided into two main sections. One section is PCB production. Here, electronic components are positioned on a printed circuit board, soldered and subjected to a function test. In the second stage, the devices are assembled. This stage is completed with a quality inspection. Then the finished products are sent for dispatch.
In combination with modern, efficient production technology, the strategy of great depth of production ensures a high delivery performance. Standard frequency inverters are supplied from stock.

Automatic assembly of circuit boards

"One Piece flow" on the modern assembly line

Automatic high voltage testing system

1984: Start of in-house development and production of frequency inverters

1992 Mixed product range based on cooperations and in-house production

1997 Philosophy: Only in-house products

2005 Opening of NORD Electronic DRIVESYSTEMS

NORD DRIVESYSTEMS GROUP

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