

Intelligent Drivesystems, Worldwide Services



SK 200E

F 3020 GB



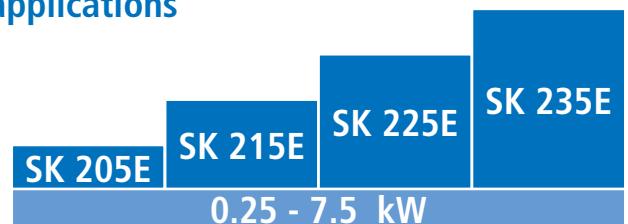
High-quality frequency inverters for high-efficiency decentralised drive solutions

New frequency inverter series SK 200E

NORD, the drive technology specialist, has been developing and producing decentralised frequency inverters for more than five years. Now it has expanded its NORDAC-DA flexible decentralised concept with a further module. The new SK 200E frequency inverter series is designed to be mounted directly on the motor terminal box to create a combined, fully integrated unit for use in the field. Similar to the SK 500E inverter series, which was launched two years ago, the new models provide a continuous range of performance and various optional features, which greatly simplify the selection of models to suit the particular application.

SK 200E inverters are available with almost the same range of functions as the SK 500E models. The spectrum ranges from simple drive functions to complex positioning control. Their low-cost design, variable equipment and compact size as well as their compatibility with various connection systems, makes them especially suitable for material handling applications. Several externally visible LED displays enable simple diagnosis directly on the device.

Integrated drive units for price-sensitive applications

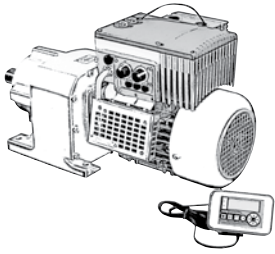


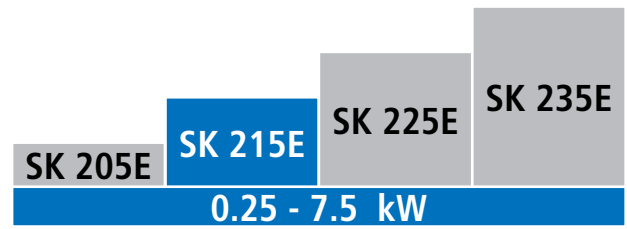
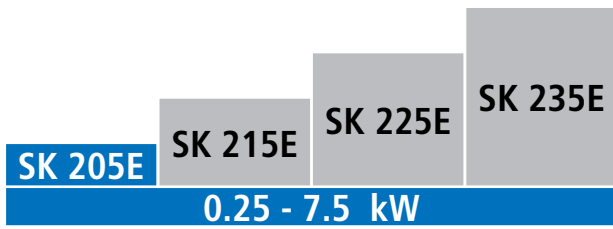
The range of performance allows users to select a compact device with exactly the features which are required for the particular application, thus ensuring an extremely efficient use of resources. All SK 200E versions have the same appearance, enabling uniform operation and handling. All devices and optional external technology units such as bus or I/O systems can be linked via an integrated system bus. This provides varied facilities for diagnosis in the entire field area.

Performance range, SK 200E:

- 1~115V 0.25 - 0.75 kW
- 1~230V 0.25 - 1.1 kW
- 3~230V 0.25 - 4 kW
- 3~400V 0.55 - 7.5 kW
- Plug-in storage module (EEPROM)
- Safety technology
- Incremental encoder input
- Positioning control
- Decentralised modules







SK 205E

SK 205E basic equipment:

- ✓ Sensorless current vector control (ISD)
- ✓ Plug-in storage module (EEPROM)
- ✓ 4x digital input, PTC input, brake control (integrated in the rectifier)
- ✓ Brake management
- ✓ Immediate-access RS 232 diagnostic interface
- ✓ Energy saving function
- ✓ Digital input status LEDs
- ✓ Immediate-access setpoint potentiometer
- ✓ Large volume connecting space, including for internal options
- ✓ Variable mounting possibilities for system connectors
- ✓ 24V external control voltage
- ✓ Incremental encoder evaluation
- ✓ POSICON Positioning control

With its comprehensive basic equipment the SK 205E can be used for a wide variety of applications. All functions are available throughout the entire product range. Operation and handling are designed to be very simple and easy to understand, to enable quick and easy commissioning.

SK 215E

SK 215E with safety function "Safe stop" as per EN 954-1

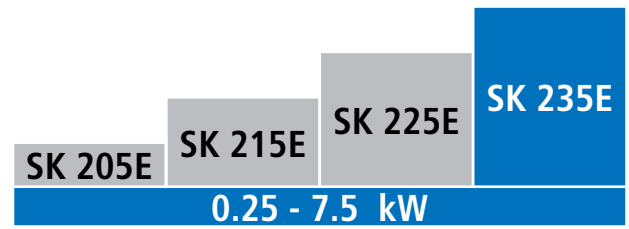
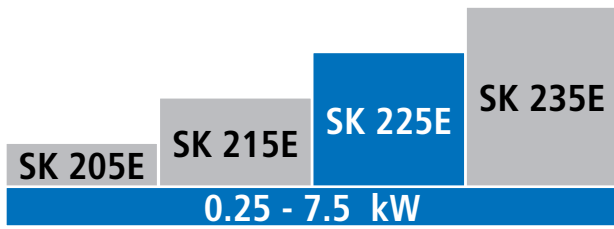
- ✓ SK 205E basic equipment
- ✓ Safety function "Safe stop"

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 10)

Integrated function "Safe stop" as per EN 954-1 or EN 13849-1 up to maximum Safety category 4
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 225E

SK 225E with efficient bus system:

- ✓ SK 205E basic equipment
- ✓ AS interface on board

SK 235E

SK 235E with safety technology and efficient bus system

- ✓ SK 205E basic equipment
- ✓ Safety function "Safe stop"
- ✓ AS interface on board

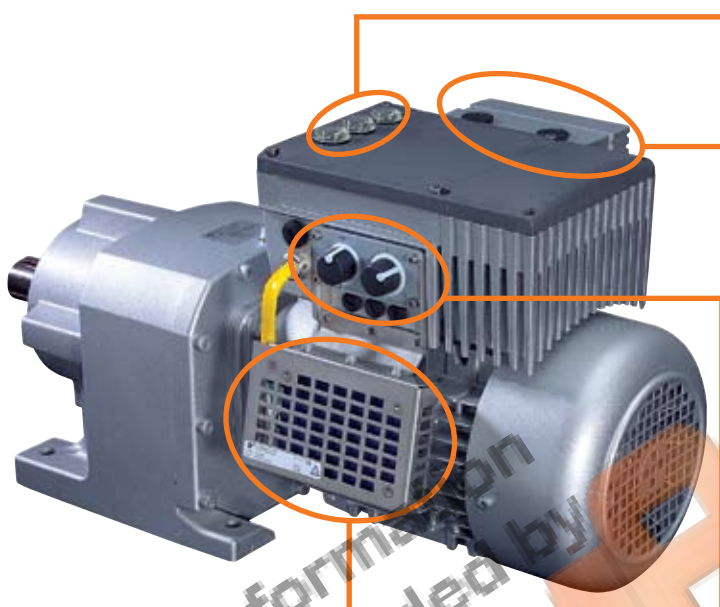
The SK 225E is equipped with an AS interface. The simplicity and low cost of this sensor/actuator bus system is especially valuable in large plant structures.

- AS interface protocol 2.4 with cyclical 4E/4A data exchange
- Status LED on device

This performance level combines the safety function "Safe stop" with the bus system AS interface. The SK 235E therefore provides the greatest range of functions within the SK 200E series.

Information provided by
EMAG
 Tel: 01902 601403
 www.emag-ltd.co.uk

System Overview



Status and diagnostic cockpit



- 1 Status-LEDs for frequency inverter AS interface and setpoint potentiometer
- 2 Status-LEDs for digital inputs and outputs and system bus
- 3 RS 232 /RS 485 diagnostic interface

Technology units



Potentiometer adapter



Braking resistors



External brake resistor



Internal brake resistor

Control units



Customer interfaces



Status and diagnostic cockpit

Direct-access to diagnostic tools

A great advantage of decentralised drive systems is the location of the frequency inverter near to the drive in large plant structures. Direct access to the drive for monitoring and diagnosis is therefore a great benefit. The diagnostic tools for the SK 200E are easily visible and accessible behind a transparent screw-on cover.



1 Status-LEDs inverter/AS interface and Setpoint potentiometer

The status of the frequency inverter (ready for operation/fault) is visible from the outside. With the integrated AS interface option, a message is also displayed here. In addition, there are two potentiometers for automatic adjustment of a setpoint (e.g. speed setpoint and associated ramp).

2 Status-LEDs digital inputs and outputs

Externally visible LEDs to display the current status. This considerably simplifies diagnosis.

3 RS 232 diagnostic interface

RJ 12 interface for a connecting cable to a SimpleBox, ParameterBox or PC/laptop (NORDCON) for control, operation, parameterisation and diagnosis.

Variable configuration of drive functions

The SK 200E provides the possibility of setting the required drive functions from parameters stored in a plug-in EEPROM, or by means of dip-switches.

Parameterisation with dip-switches

The direct access to dip-switches for setting the functions provides two advantages. If the storage module for the device is not available on site, the frequency inverter can also be operated with reduced functionality by means of the dip-switch setting.

If only a low level of functionality with simple handling is required, there is no need for a storage module. The settings can be made directly, without parameterisation accessories.

Plug-in EEPROM

All parameters which can be changed with the Control Box or the NORDCON software are stored in a plug-in EEPROM. If this module is plugged in, the settings which it contains are active. This module can be easily transferred to different devices to enable rapid commissioning or quick replacement.

IT network setting

The filtering of the frequency inverter can be adjusted with this jumper. This makes it possible to use the inverter in an IT voltage network, or under low leakage current operation (ground-fault circuit).



SK 200E system overview

		SK 205E	SK 215E	SK 225E	SK 235E
Version	Power range 0.25 kW - 7.5 kW (IP55)	✓	✓	✓	✓
	Same design	✓	✓	✓	✓
	Wall mounting	✓	✓	✓	✓
Characteristics	All normal drive functions	✓	✓	✓	✓
	Comprehensive parameter structure	✓	✓	✓	✓
	Simple to operate	✓	✓	✓	✓
	All current field bus systems	✓	✓	✓	✓
Basic functions	Sensorless current vector control (ISD control)	✓	✓	✓	✓
	Plugged storage module (EEPROM)	✓	✓	✓	✓
	Line filter Class A,	✓	✓	✓	✓
	Brake management, mech. holding brake	✓	✓	✓	✓
	Brake chopper (brake resistor optional)	✓	✓	✓	✓
	Switchable parameter sets	✓	✓	✓	✓
	Process controller / PID controller	✓	✓	✓	✓
	24V control voltage	✓	✓	✓	✓
	Incremental encoder evaluation	✓	✓	✓	✓
	POSICON (positioning control)	✓	✓	✓	✓
	Automatic flux adaptation (energy saving function) NEW	✓	✓	✓	✓
Special functions	"Safe stop" function		✓		✓
	AS interface on board			✓	✓
Options	Bus modules with/without M12 plug connectors for I/Os	○	○	○	○
	I/O Modules	○	○	○	○
	Stand-alone operation (24V mains unit)	○	○	○	○
	System connectors (e.g. Harting HAN 10E)	○	○	○	○
	Internal/external brake resistors	○	○	○	○
	Potentiometer versions	○	○	○	○

- ✓ Standard
- Optional



Safety function "Safe stop"

Safety function "Safe stop"

Safety of personnel and high machine availability are essential for plant operation. 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. With asynchronous motors, this is triggered by a safe impulse block which provides standard-compliant protection against the motor restarting. 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

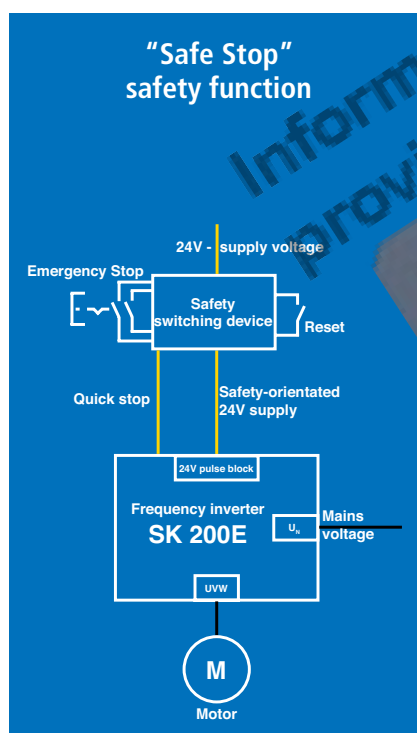
- EN 13849-1: Performance Level e
- EN 61508: SIL3
- EN 60204-1: Stop function
- pr EN 61800-5-2: Safety functions

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 safety components
- No inverter initialisation delays
- Long service life due to electronic switching (no electromechanical contacts)
- Low cost solution with compact device



Ethernet-based BUS systems



Gateway solution

Gateway RS232 / Standard Ethernet
Available since 04/2007
Access via NORDCON, e.g. remote maintenance

EtherCAT

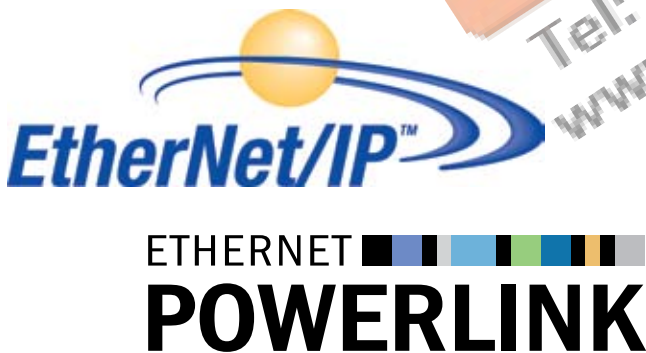
In preparation

PROFINET, Powerlink, EtherNet/IP

In preparation



EtherCAT®



NORD CON

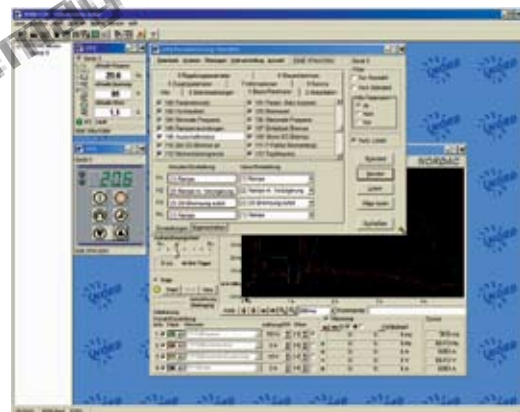
NORD CON is the free operating software for controlling, parameterisation and diagnosis of all NORD frequency inverters.

Control

The frequency inverted can be manually operated by means of a software window with all the operating elements of a ControlBox. 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

With a convenient overview, users can view and adjust each available parameter. By means of a print option complete parameter lists or lists of the changed values can be created. The finished data sets can be saved on the PC/laptop and archived for future use.



Launch of the SK 200 E series

Since 2008

As of 2009

As of 2009

S 1
0.25 - 2.2 KW

S 2
3 - 4 KW

S 3
5.5 - 7.5 KW

SK 205E / SK 215E / SK 225E / SK 235E

Decentralised drive technology components have been part of the Getriebebau NORD range of products for many years. In order to provide the optimum drive electronics for various

plant configurations directly on the motor or in the field, with the SK 200E product range NORD offers a wide range of solutions.



Control units

Convenient operation and diagnosis in all cases

According to the application, there are various methods of controlling, parameterising or diagnosing a SK 200E frequency inverter.

- ParameterBox
- SimpleBox
- PotiAdapter
- PC/laptop with NORDCON software
- Dip-switches

ParameterBox

Control panel and plain text display for text-controlled commissioning, parameterisation and control of the frequency inverter. 5 data sets can be stored. Direct connection to a PC is possible via USB.



SimpleBox

Control panel with 4-digit 7-segment display for rapid and direct parameterisation and diagnosis.



Potentiometer Adapter

As an addition to the mains unit, the PotiBox provides robust control elements for right-hand/left-hand operation and a setpoint potentiometer. This version allows direct operation of the device.



Technology Units

Variable mounting

For the decentralised SK 200E frequency inverter optional Technology Units are available, which can be mounted directly on the device or separately on the machine frame or plant component. Communication systems both with and without connection facilities for sensors, actuators and control modules are available for all current applications.

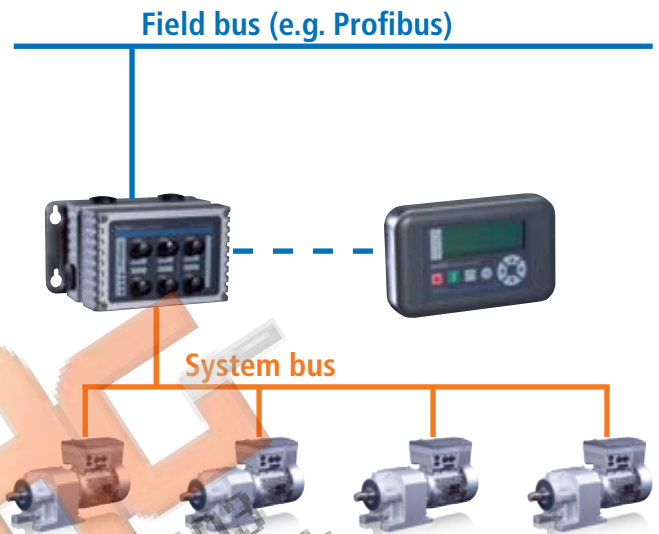


Technology Unit mounted directly on the FI



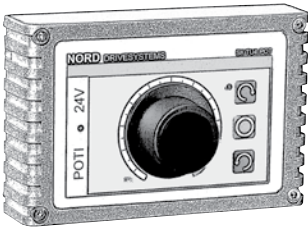
Technology Units for wall mounting

Tunneling of parameter data via the system bus



The bus Technology Unit of the SK 200E provides user-friendly and economic configuration of the drive systems in the field. With the system bus, up to 4 frequency inverters and the bus Technology Unit can be linked via the system bus, which is integrated as standard. Therefore the connection to the host bus system is made at a single point. However, all data sets can be accessed by tunneling of the parameter data. Both the Technology Unit and the data sets of each of the connected SK 200E devices can be accessed via RS 232 interface.





Communication

External Technology Boxes are available for communication within an automation system and for recording sensor and actuator signals. Connection is optionally direct to a terminal or with M12 system connectors as required.

Profibus

Bus module for the control, parameterisation and diagnosis of the frequency inverter.



- Baud rate: Max. 12 MBaud
- Protocol: DPV 0 and DPV 1
- Access of up to 4 inverters via system bus
- Provision of I/Os on the Profibus:
-4x In / 2x Out
- Diagnosis via RS 232 (RJ12 interface)
- Status LED: BG status, BG fault, DIN1, DIN2, Bus status, Bus fault

CAN open

Bus module for the control, parameterisation and diagnosis of the frequency inverter.



- Baud rate: Max. 1 MBaud
- Protocol: DS 301 and DS 402
- Access of up to 4 inverters via system bus
- Electrically isolated
- Provision of I/Os on the CANbus:
-4x In / 2x Out
- Diagnosis via RS 232
- Status LED: B6 status, B6 fault, DIN1, DIN2, Bus status, Bus fault

DeviceNet

Bus module for the control, parameterisation and diagnosis of the frequency inverter.



- Baud rate: Max. 500 kBaud
- Protocol: AC-Drive
- Access of up to 4 inverters via system bus
- Electrically isolated
- Provision of I/Os on the CANbus:
-4x In / 2x Out
- Diagnosis via RS 232
- Status LED: B6 status, B6 fault, DIN1, DIN2, module status, module fault

Technology Units

I/O Extension

With the external I/O units arbitrary sensor and actuator signals can be included in the decentralised drive structures. These are transferred to the frequency inverter via the system bus. There these can be used for a drive function or forwarded to a host bus system (e.g. Profibus).

This external I/O expansion provides a direct connection for four digital inputs (sensors) and two digital outputs (actuators). Because the design does not use connectors, the module is also suitable for harsh environments. With the M12 version, there are M12 plug connectors in the front of the module. This enables the rapid replacement of connected sensors and actuators.



- Connection via system bus
- 4x digital inputs
- 2x digital outputs
- 2x analog inputs
- 1x analog output
- Status LEDs



SK 200E as an independent system

For independent applications, the SK 200E can be equipped with options which only require a power connection (e.g. 3~ 400V). For this, a mains unit or a control element - the PotiBox - can be selected as an addition.

24V mains unit

This generates the internal control voltage (24V) from the available supply voltage (230V / 400V). A separate control cable is not necessary. An analog input is available for the specification of setpoint values.



- 1x analog input
- Can be used for 2 devices

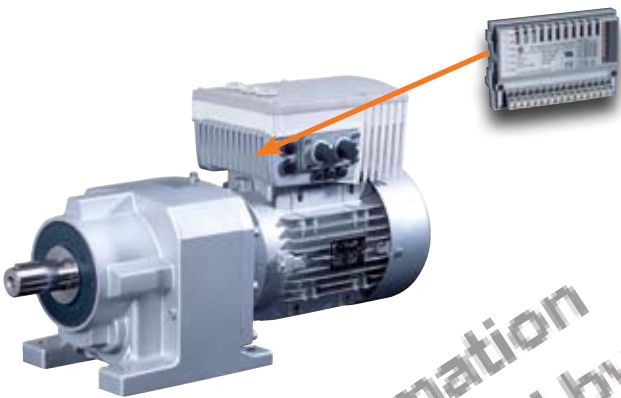
PotiBox

As an addition to the mains unit, the PotiBox provides robust control elements for right-hand/left-hand operation and a setpoint potentiometer. This version allows direct operation of the device.



Customer interfaces

Internal customer interfaces enable the expansion of the range of functions of SK 200E frequency inverters without changing the physical size. Users have access to both communication modules and an internal mains unit or an I/O expansion.



Operation

PotiAdapter

With the PotiAdapter a robust unit with switching (right-0-left) and potentiometer can be integrated. This only changes the physical size by the size of the control elements. Connection is by means of an internal 24V mains unit



Communication

Profibus

Bus module for the control, parameterisation and diagnosis of the frequency inverter via the Profibus interface.



- Baud rate: Max. 12 MBaud
- Protocol: DPV 0 and DPV 1
- 2x digital inputs
- Address and baud rate via dip-switch
- Automatic PPO detection
- Status LED: BG status, BG fault, DIN1, DIN2, Bus status, Bus fault

Customer interfaces

CANopen

Bus module for the control, parameterisation and diagnosis of the frequency inverter via the CANopen interface.



- Baud rate: Max. 1 MBaud
- Protocol: DS301 and DS402
- 2x digital inputs
- Address and baud rate via dip-switch
- Status LED: BG status, BG fault, DIN1, DIN2, Bus status, bus fault

I/O Extension

The internal I/O units can record sensor and actuator signals. These can be used for a drive function or forwarded to a host bus system (e.g. Profibus).



- 2x digital inputs
- 2x analog inputs
- 1x analog output
- Status LEDs: Bus status, bus fault

DeviceNet

Bus module for the control, parameterisation and diagnosis of the frequency inverter via the DeviceNet interface.



- Baud rate: Max. 500 kBaud
- Protocol: AC-Drive
- 2x digital inputs
- Address and baud rate via dip-switch
- Status LED: BG status, BG fault, DIN1, DIN2, Bus status, bus fault

24V mains unit

This generates the internal control voltage (24V) from the available supply voltage (230V / 400V). A separate control cable is not necessary. An analog input is available for connecting the PotiAdapter.



- Mains unit for 100V-240V and 380-500V
- 1x analog input (e.g. PotiAdapter)
- 1x analog output

NORD Electronic DRIVESYSTEMS

Drive electronics from Aurich

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.



Automatic assembly of circuit boards



High speed SMD assembly plant



"One Piece flow" in the modern assembly line

The production process is divided into two main sections. The first is the production of PCBs. Electronic components are mounted on a board/PCB, soldered and subjected to a functional inspection. With this the starting material for the second stage, the final assembly, is complete. The final assembly ends with the corresponding inspection of the device. Then the finished products are sent for dispatch.

The strategy of great depth of production, coupled with modern and efficient production methods has a great influence on the delivery performance, which at present is 98%. Standard frequency inverters are supplied from stock.



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

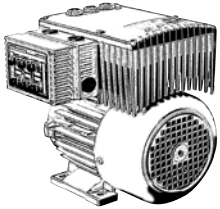


SK 200E 1 ~ 100 ... 120V and 1 ~ 200 ... 240V

	Inverter type SK 2xxE...	Mains voltage	Output voltage	Nominal motor power 230V [kW]
1 ~ 100 ... 120V	-250-112-O	1 ~ 100...120V -/+10% 47...63Hz	3 AC 0-200...240V	0.25
	-370-112-O			0.37
	-550-112-O			0.55
	750-112-O			0.75

	Inverter type SK 2xxE...	Mains voltage	Output voltage	Nominal motor power 230 V [kW]
1 ~ 200 ... 240V	-250-123-A	1 ~ 200...240V -/+10% 47...63Hz	3 AC 0-200...240V	0.25
	-370-123-A			0.37
	-550-123-A			0.55
	-750-123-A			0.75
	-111-123-A			1.1





Nominal motor power 230V [hp]	Nominal output current rms[A]	Typical input current rms[A]
$\frac{1}{3}$	1.7	8.9
$\frac{1}{2}$	2.2	11
$\frac{3}{4}$	3.0	13.1
1	4.0	20.1

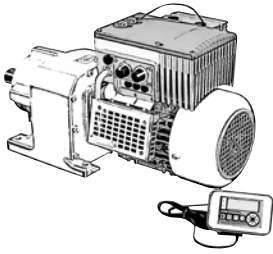
Nominal motor power 230 V [hp]	Nominal output current rms[A]	Typical input current rms[A]
$\frac{1}{3}$	1.7	3.9
$\frac{1}{2}$	2.2	5.8
$\frac{3}{4}$	3.0	7.3
1	4.0	10.2
$1\frac{1}{2}$	5.5	14.7

SK 200E 3 ~ 200 ... 240V and 3 ~ 380 ... 500V

	Inverter type SK 2xxE...	Mains voltage	Nominal motor power 230V [kW]
3 ~ 200 ... 240V	-250-323-A	3 ~ 200...240V -/+10% 47...63Hz	0.25
	-370-323-A		0.37
	-550-323-A		0.55
	-750-323-A		0.75
	-111-323-A		1.1
	-151-323-A		1.5
	-221-323-A		2.2
	-301-323-A		3
	-401-323-A		4

	Inverter type SK 2xxE...	Mains voltage	Nominal motor power 400V [kW]
3 ~ 380 ... 500V	-550-340-A	3 ~ 380...500V -20%/+10% 47...63Hz	0.55
	-750-340-A		0.75
	-111-340-A		1.1
	-151-340-A		1.5
	-221-340-A		2.2
	-301-340-A		3.0
	-401-340-A		4.0
	-551-340-A		5.5
	-751-340-A		7.5














Nominal motor power 230V [hp]	Nominal output current rms[A]	Typical input current rms[A]
$\frac{1}{3}$	1.7	1.4
$\frac{1}{2}$	2.2	1.9
$\frac{3}{4}$	3.0	2.6
1	4.0	3.5
$1\frac{1}{2}$	5.5	5.1
2	7.0	6.6
3	9.5	9.1
4	12.5	11.8
5	16	15.1

Nominal motor power 460V [hp]	Nominal output current rms[A]	Typical input current rms[A]
$\frac{3}{4}$	1.7	1.6
1	2.3	2.2
$1\frac{1}{2}$	3.1	2.9
2	4.0	3.7
3	5.5	5.7
4	7.5	7.0
5	9.5	8.3
$7\frac{1}{2}$	12.5	11.7
10	16	15.0

Technology Units

	Technology Units	Option Type
Operation		PotentiometerBox SK TU4-POT-123 SK TU4-POT-140
Mains		24V mains unit SK TU4-24V-123-B SK TU4-24V-140-B
Communication		Profibus SK TU4-PBR
		Profibus M12 SK TU4-PBR-M12
		DeviceNET SK TU4-DEV
		DeviceNET M12 SK TU4-DEV-M12
		CANopen SK TU4-CAO
		CANopen M12 SK TU4-CAO-M12
I/O Extension		I/O Extension SK TU4-IOE
		I/O extension with M12 SK TU4-IOE-M12





Description	Data
<p>PotentiometerBox for direct control on the device. Robust control elements enable the drive to be switched on in both directions and speed control.</p>	<p>3 buttons, Right/Left/Off Potentiometer</p>
<p>This generates the internal control voltage (24V) from the available supply voltage (230V / 400V).</p>	<p>Mains unit 1~ 230V \square24V, 1~ 400V \square24V, 1x analog input Can also be used for 2 devices</p>
<p>Bus module for the control, parameterisation and diagnosis of the frequency inverter via ProfiBus.</p>	<p>Baud rate: Max. 12 MBaud Protocol: DPV 0 and DPV 1 4x digital In, 2x digital Out</p>
<p>Bus module for the control, parameterisation and diagnosis of the frequency inverter via ProfiBus. M12 plug connector for connecting sensors and actuators.</p>	<p>Baud rate: Max. 12 MBaud Protocol: DPV 0 and DPV 1 4x digital In, 2x digital Out to M12</p>
<p>Bus module for the control, parameterisation and diagnosis of the frequency inverter via DeviceNET.</p>	<p>Baud rate: Max. 500 kBaud Protocol: AC-Drive 4x digital In, 2x digital Out</p>
<p>Bus module for the control, parameterisation and diagnosis of the frequency inverter via DeviceNET. M12 plug connector for connecting sensors and actuators.</p>	<p>Baud rate: Max. 500 kBaud Protocol: AC-Drive 4x digital In, 2x digital Out to M12</p>
<p>Bus module for the control, parameterisation and diagnosis of the frequency inverter via CANopen.</p>	<p>Baud rate: Max. 1 MBaud Protocol: DS 301 and DS 402 4x digital In, 2x digital Out</p>
<p>Bus module for the control, parameterisation and diagnosis of the frequency inverter via CANopen. M12 plug connector for connecting sensors and actuators.</p>	<p>Baud rate: Max. 1 MBaud Protocol: DS 301 and DS 402 4x digital In, 2x digital Out to M12</p>
<p>I/O module for the provision of digital inputs and outputs in the field. Connection via system bus</p>	<p>4x digital inputs / 2x digital outputs 2x analog inputs / 1x analog output</p>
<p>I/O module for the provision of digital inputs and outputs in the field. Connection via system bus M12 plug connector for connecting sensors and actuators.</p>	<p>4x digital inputs / 2x digital outputs 2x analog inputs / 1x analog output to M12</p>

Customer interfaces

	Technology Units	Option Type
Mains		24V mains unit SK CU4-24V-123-B SK CU4-24V-140-B
Communication		ProfiBus SK CU4-PBR
		DeviceNET SK CU4-DEV
		CANopen SK CU4-CAO
I/O extension		I/O extension SK CU4-IOE
Poti-Adapter		Poti-Adapter SK CU4-POT

Control units	Option Type
	ParameterBox SK PAR-2H
	SimpleBox SK CSX-3H





Description	Data
This generates the internal control voltage (24V) from the available supply voltage (230V / 400V).	Mains unit 1~ 230V →24V, 1~ 400V →24V, 1x analog input 1x analog output
Bus module for the control, parameterisation and diagnosis of the frequency inverter via ProfiBus.	Baud rate: Max. 12 Mbaud Protocol: DPV 0 and DPV 1 2x digital inputs
Bus module for the control, parameterisation and diagnosis of the frequency inverter via DeviceNET.	Baud rate: Max. 500 kbaud Protocol: AC-Drive 2x digital inputs
Bus module for the control, parameterisation and diagnosis of the frequency inverter via CANopen.	Baud rate: Max. 1 Mbaud Protocol: DS 301 and DS 402 2x digital inputs
I/O module for the provision of digital inputs and outputs in the field.	2x digital inputs 2x analog inputs / 1x analog output
For the inclusion of switching/potentiometer control elements directly to the SK 200E. Connection to internal 24V mains unit	1x switch, Left/Off/Right 1x continuously variable potentiometer 0-100%

Description	Data
Control panel and plain text display for text-controlled commissioning, parameterisation and control of the frequency inverter.	Plain text display 6 languages 5 data sets can be stored
Control panel with 4-digit 7-segment display for rapid and direct parameterisation and diagnosis.	4-digit, 7-segment display No data sets can be stored

Braking resistors

Internal brake resistors

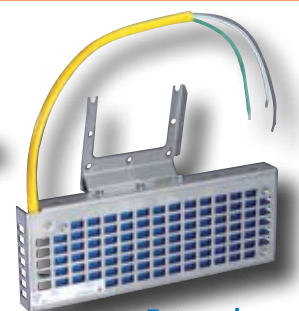
Inverter type SK 2xxE...		Resistor type	Material number
110V	... -250-112-O to ... -750-112O	SK BRI 4- 1-100-100	275272005
1~ 230V	... -250-123-A to ... -111-123-A	SK BRI 4- 1-100-100	275272005
3~230V	... -250-323-A to ... -221-323-A	SK BRI 4- 1-200-100	275272008
	... -301-323-A to ... -401-323-A	SK BRI 4- 2-100-200	275272105
3~400V	... -550-340-A to ... -401-340-A	SK BRI 4- 1-400-100	275272012
	... -551-340-A to ... -751-340-A	SK BRI 4- 2-200-200	275272108

External brake resistors

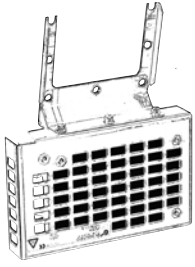
Inverter type SK 2xxE		Resistor type	Material number
110V	... -250-112-O to ... -750-112-O	SK BRE 4- 1-100-100	275273005
1~ 230V	... -250-123-A to ... -111-123-A	SK BRE 4- 1-100-100	275273005
3~230V	... -250-323-A to ... -221-323-A	SK BRE 4- 1-200-100	275273008
	... -301-323-A to ... -401-323-A	SK BRE 4- 2-100-200	275273105
3~400V	... -550-340-A to ... -401-340-A	SK BRE 4- 1-400-100	275273012
	... -551-340-A to ... -751-340-A	SK BRE 4- 2-200-200	275273108



Internal
brake resistor



External
brake resistor



Resistance [Ω]	Continuous rating [W]	Energy consumption*) [kWs]
1000	100	1.0
1000	100	1.0
200	100	1.0
100	200	2.0
400	100	1.0
200	200	2.0

Resistance [Ω]	Continuous rating [W]	Energy consumption*) [kWs]
100	100	2.2
100	100	2.2
200	100	2.2
100	200	4.4
400	100	2.2
200	200	4.4

*) Permissible max. once within 120 sec.

The wide range of mechanical and electronic drive technology from NORD



Central drive technology

NORD offers a wide range of application-orientated frequency inverter series for the field of switching cabinet technology. From the compact SK 500E with good performance levels to the adaptable SK 700E with great modularity. The SK 1000E implements even the very highest dynamics and functionality for servo technology.



Decentralised drive technology

NORD covers a wide spectrum for the decentralisation of frequency inverters. Both simple motor starter applications - with the SK 100E series -, as well as full frequency inverter functionality (SK 300E up to 4kW, SK 750E up to 22kW) can be variably selected for economic decentralisation.

NORD in general

Through many years of core competence in the field of drive technology, NORD offers consistent product series for mechanics and electronics from a single source NORD is a dependable partner for ideal drive technology solutions and their implementation.

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