

Intelligent Drivesystems, Worldwide Services



SK 200E

F 3020 GB


DRIVESYSTEMS

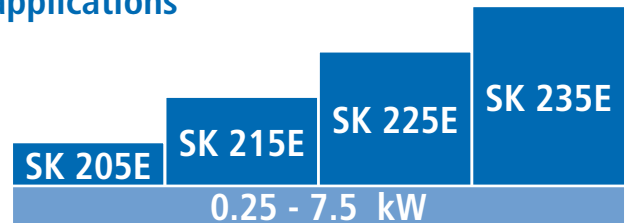
High-quality frequency inverters for high-efficiency decentralised drive solutions

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 new range. The new SK 200E frequency inverter series is designed to be mounted directly on the motor terminal box to create a combined and 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 functionality ranges from simple drive functions to complex positioning control. Their low-cost design, flexible optional 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 field 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 memory storage module (EEPROM)
- ✓ Safety technology
- ✓ Incremental encoder input
- ✓ Positioning control
- ✓ Decentralised modules



Size 1
0.25 - 2.2 kW

Size 2
3 - 4 kW

Size 3
5.5 - 7.5 kW

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



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



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

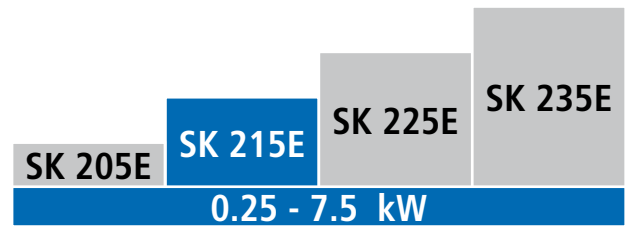
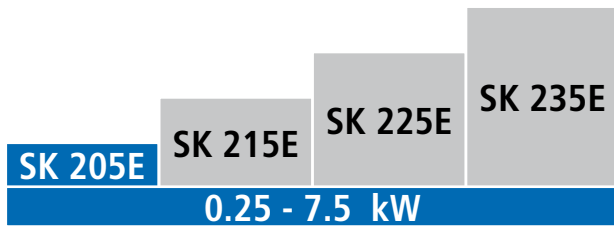
	<p>Modular technology units with bus interfaces, I/O control signals (optionally with M12) or control units</p>
	<p>Integrated modules (Customer Unit) with bus interfaces, I/O control signals or mains unit with analog input</p>
	<p>All common bus systems (e.g. Profibus, CANopen, DeviceNet), including with gateway functionality</p>
	<p>Ethernet-based bus systems (e.g. EtherCAT, Profinet → in preparation)</p>





Conveyor technology examples

- ✓ Compact design
- ✓ Plug connections for rapid replacement
- ✓ Direct diagnosis via clear status messages



SK 205E

SK 205E basic equipment:

- ✔ Sensorless current vector control (ISD) for excellent motor performance
- ✔ Plug-in memory storage module (EEPROM)
- ✔ 4x digital inputs, 1x digital output, PTC input, motor control (with integrated rectifier)
- ✔ Brake management
- ✔ Immediate-access RS 232 diagnostic interface
- ✔ Energy-saving functionality
- ✔ Status LEDs for digital inputs, PTC, etc.
- ✔ Immediate-access setpoint potentiometer
- ✔ Large connection space, with space for internal options
- ✔ Various attachment 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

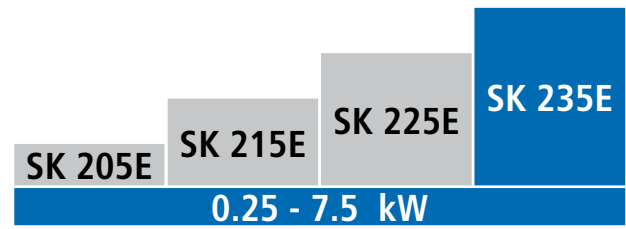
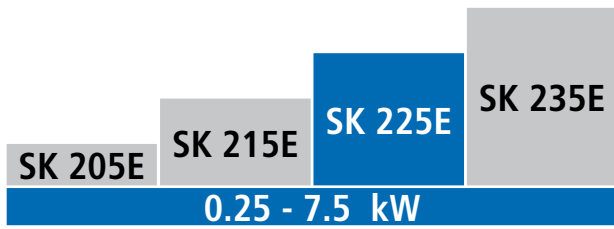
- ✔ SK 205E basic equipment
- ✔ Safety function "Safe stop"

The safety function "Safe stop" is a very practical and efficient method of preventing a motor from restarting, as required by relevant international standards. This prevents injury to personnel working in the vicinity of the rotating drive. ("Safe stop" see page 10)

Integrated safety function "Safe stop" as per EN 954-1 (EN13849) up to max. Safety category 4, Stop category 0 and 1.

- "Integrated safety circuit" 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

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 4I/4O data exchange
- Status LED on device

SK 235E

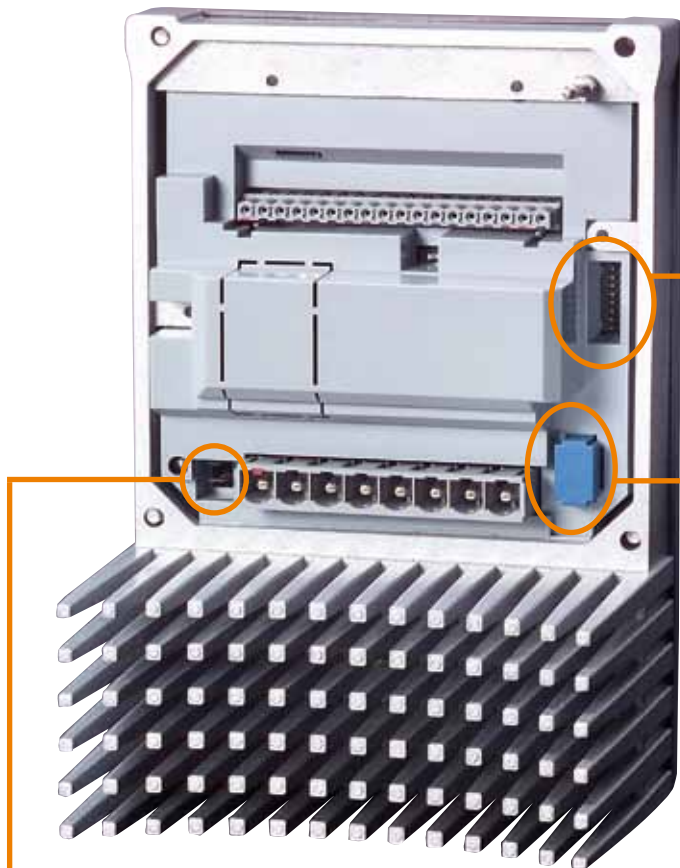
SK 235E with safety technology and efficient bus system

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

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.

Variable configuration of drive functionalities

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.



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).

Parameterisation with dip-switches

Various functions, e.g. the regulation characteristics of the frequency inverter (U/f characteristic curve/ ISD control) can be simply set by means of directly accessible DIP switches. This enables easy selection of the functions even without a parameterisation tool. The settings made via DIP switches are also active when the memory module is not plugged in. If the EEPROM is plugged in, the DIP switch settings overwrite the relevant parameters.



Plug-in EEPROM

All parameters which can be changed with the Control Box or the NORDCON software are stored in a plug-in EEPROM. This module can be easily transferred to different devices to enable rapid commissioning or quick replacement.



SK 200E system overview

		SK 205E	SK 215E	SK 225E	SK 235E
	Power range 0.25 kW - 7.5 kW (IP55)	✓	✓	✓	✓
Design	Same design	✓	✓	✓	✓
	Wall mounting option	✓	✓	✓	✓
Characteristics	All normal drive functions	✓	✓	✓	✓
	Consistent parameter structure	✓	✓	✓	✓
	Simple to operate	✓	✓	✓	✓
	All current field bus systems	✓	✓	✓	✓
Basic functions	Sensorless current vector control (ISD control)	✓	✓	✓	✓
	Plug-in memory storage module (EEPROM)	✓	✓	✓	✓
	Line filter Class A,	✓	✓	✓	✓
	Brake management for 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




)* 24V supply via AS-i

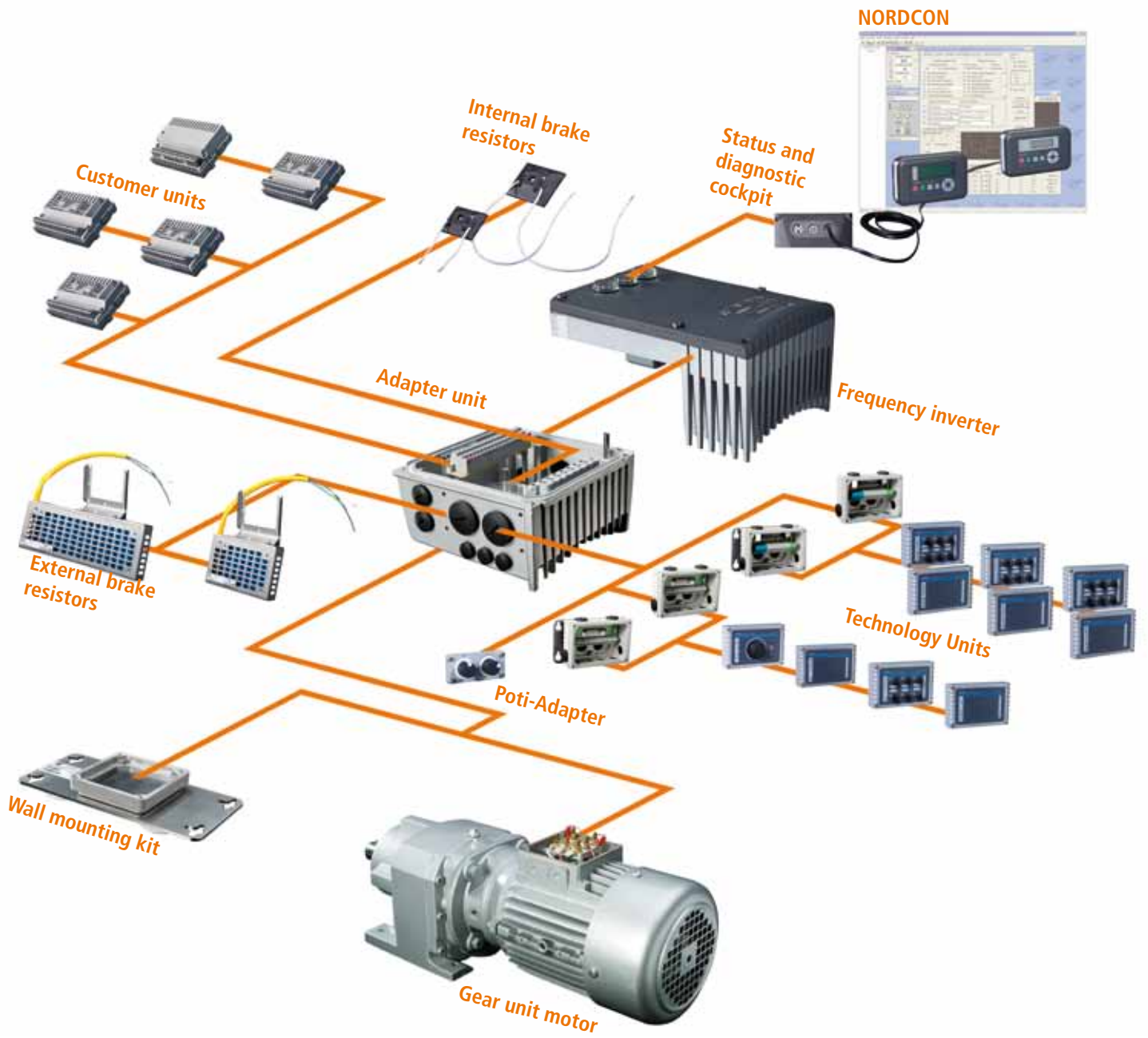


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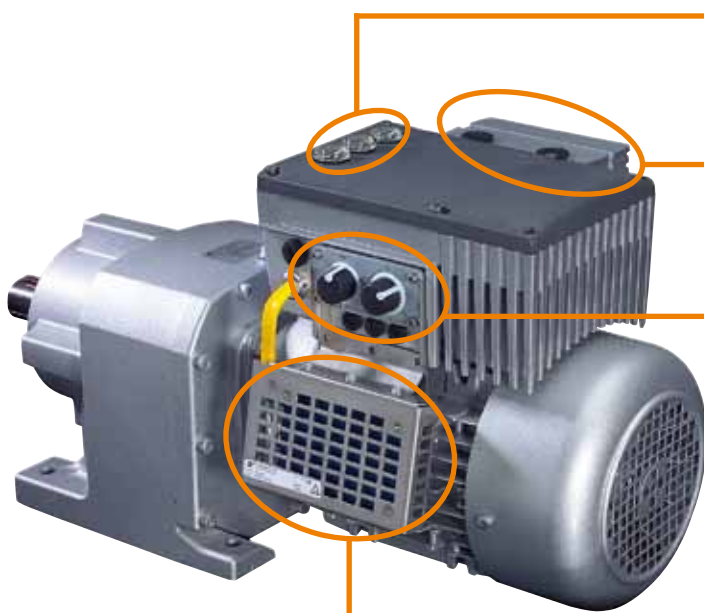
Hardware characteristics

Hardware characteristics of compact units	
	Units can be operated with all standard asynchronous motors
	3 sizes with consistent design as motor/inverter units
	Generously dimensioned connection unit for easy connection and assembly of various system connectors
	Motor or wall-mounting
	IP55 protection class as standard. Optional: <ul style="list-style-type: none"> • IP66 (components with "C" = coated) • ATEX or harsh ambient conditions
	External 24V power supply for control board necessary <ul style="list-style-type: none"> • Safety shut-down • Separate commissioning of control and power levels

Optional Features	
	ATEX compliance (Control of motors in explosion hazard areas, optional ATEX kit)
	RoHS compliance (e.g. "lead-free" soldering)
	UL certification / CSA
	C-Tick certification (Australia)



System Overview



Status and diagnostic cockpit



- 1** RS 232 / RS 485 interface
- 2** Status-LEDs for digital inputs and outputs and system bus
- 3** Potentiometers for speed setpoint and ramp status LED for inverter and AS-i

Technology units



Potentiometer Adapter



Customer units



Braking resistors



External
brake resistor



Internal
brake resistor

Control units



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 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.

2 Status-LEDs digital inputs and outputs

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

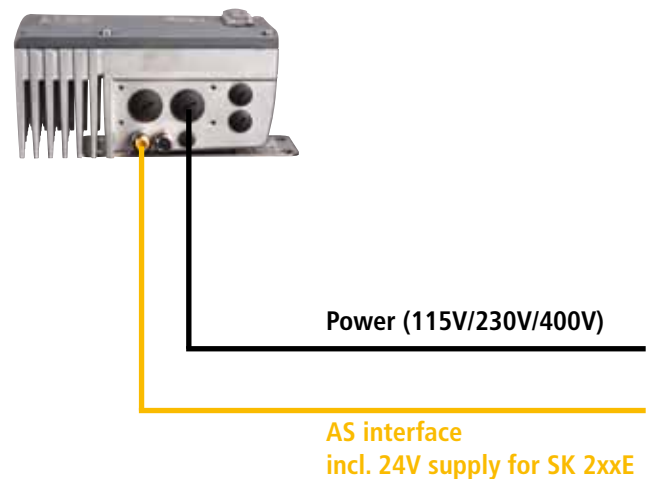
3 Potentiometers for speed setpoint and ramp status LED for inverter and AS-i

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).

AS interface connection with M12 plug connectors

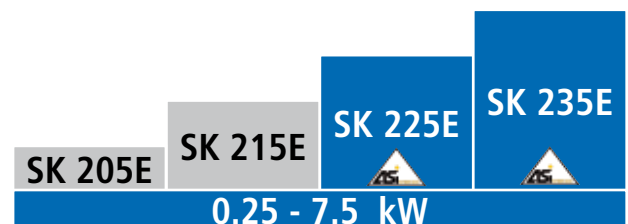
Modern automation systems have a wide range of requirements, so that a suitable bus system and drive components must be selected in order to ensure efficient implementation. For the lower field level, the AS interface is a cost-effective solution which enables the networking of binary sensors and actuators. Special versions of the SK 200E, which provide an appropriate solution by means of an AS interface, are available for this price-sensitive area.

The supply voltage (power) is via appropriate terminals according to the version (1~/3~, 115/230/400V). The control voltage of the inverter is supplied separately. For the control unit of the inverter and the AS interface, the supply is via the (yellow) AS interface cable. This eliminates the need for an additional AUX cable (black).



Versions with AS-i on board:

- ✓ SK 225E basic equipment of SK 205E + AS-Interface on board
- ✓ SK 235E basic equipment of SK 205E + AS-Interface on board + "Safe Stop"



To connect the AS-i cable and any initiators, appropriate M12 plug connectors can be provided ex-works. These are colour-coded in order to

provide a definite assignment of functionalities in the field. The following versions can be selected as options.

AS interface connection



- AS interface (24V power supply for the SK 2xxE via AS interface)
- Optional M12- plug connector (yellow) for AS-i: SK TIE4-M12-AS1 (Part No. 275274502)

Connection for AS interface and initiators



- AS interface (24V power supply for the SK 2xxE via AS interface)
- Initiators (max. 2x M12 possible, each with 2x digital inputs)
- Optional M12- plug connector (yellow) for AS-i: SK TIE4-M12-AS1 (Part No. 275274502)
- Optional M12 plug connector (black) for I/O: SK TIE4-M12-INI (Part No. 275274503)

Direct control via right-O-left switch and potentiometer

PotiAdapter

230V unit:

- SK CU4-24V-123-B (Part. No. 275271108)
- + SK CU4-POT (Part. No. 275271207)

400V unit:

- SK CU4-24V-140-B (Part. No. 275271109)
 - + SK CU4-POT (Part. No. 275271207)
- (Standard IP66)



Potentiometer Technology Unit

230V unit:

- SK TU4-POT-123-B (Part. No. 275281110)
- + SK TI4-TU-NET (Part. No. 275280100)

400V unit:

- SK TU4-POT-140-B (Part. No. 275281111)
 - + SK TI4-TU-NET (Part. No. 275280100)
- (Standard IP55, optionally IP66)



External Potentiometer Unit

230V unit:

- SK CU4-24V-123-B (Part. No. 275271108)
- + SK POT1-1 (Part. No. 278910120)

400V unit:

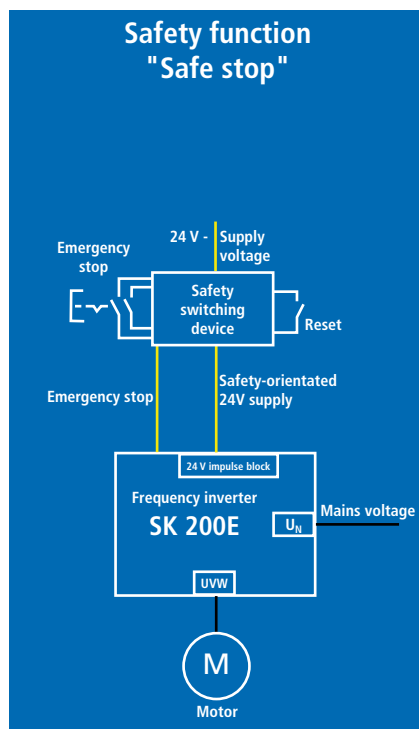
- SK CU4-24V-140-B (Part. No. 275271109)
 - + SK POT1-1 (Part. No. 278910120)
- (Standard IP66)



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 an integrated safety circuit which provides standard-compliant protection against the motor restarting. This integrated safety circuit 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

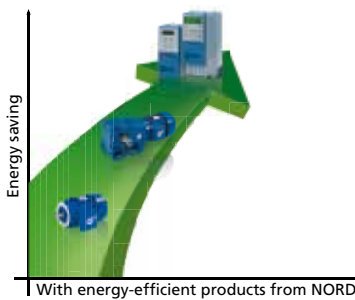
- Rotating machine tools (e.g. milling machines)
- Closed moving systems with safety doors

Advantages at a glance

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



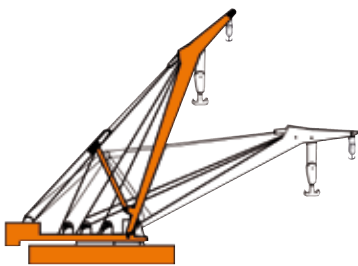
Application functions of the SK 2xxE



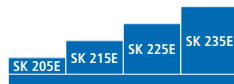
Energy-saving function



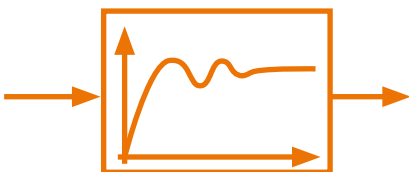
- Automatic flux optimisation for many applications
- Large energy savings possible
- Simple setting via inverter parameters



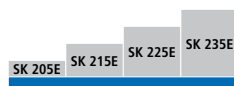
Lifting gear functions



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



PID process controller



- The basic units do not include an analog input. This is available as an option with the mains unit module or I/O extension (CU4 or TU4 resp.)
- P, I and D component can be set separately
- High precision regulation of application variables (pressure, flow, temperature, etc)

Application functions of the SK 2xxE



Safety function "Safe stop"



- Switches-off of the 24V DC power supply to the IGBT module
- Mechanical wear free solution (less mechanical parts - increased reliability)
- Component cost savings compared with contactor version



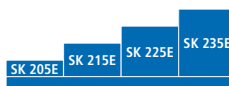
Servo mode



- High precision speed control
- Full torque down to zero speed
- Excellent dynamic response to load fluctuations



Absolute and relative positioning with POSICON



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

NORD CON software

NORD CON

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

Control

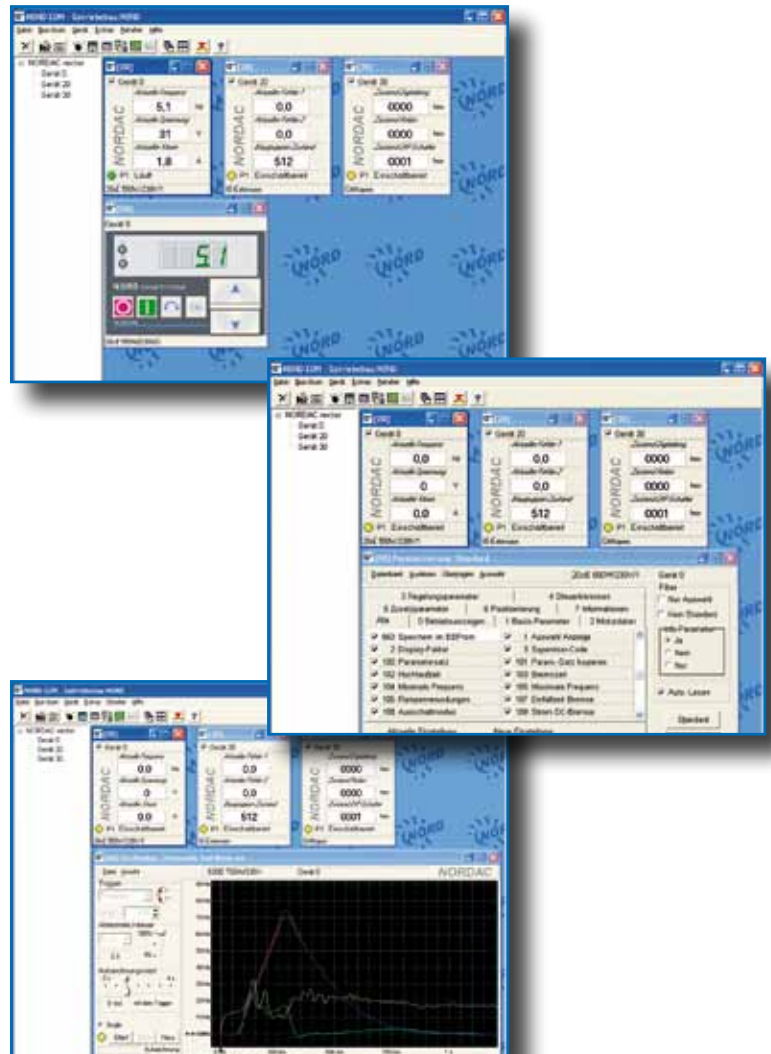
The frequency inverted can be manually operated by means of a programming window with all the operating elements of a SimpleBox. An enable signal with specification of setpoint values can be given. The parameter settings can be adjusted and read parameters (information and error messages) can be viewed. With this, the user has a commissioning support tool.

Parameterisation

By means of a GUI the user can view and adjust each available parameter. A printing option allows parameter lists to be saved to a convenient printer either completely or with amended values. The finished data sets can be saved on the PC/laptop and archived for future use.

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.



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.



PotiAdapter

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.

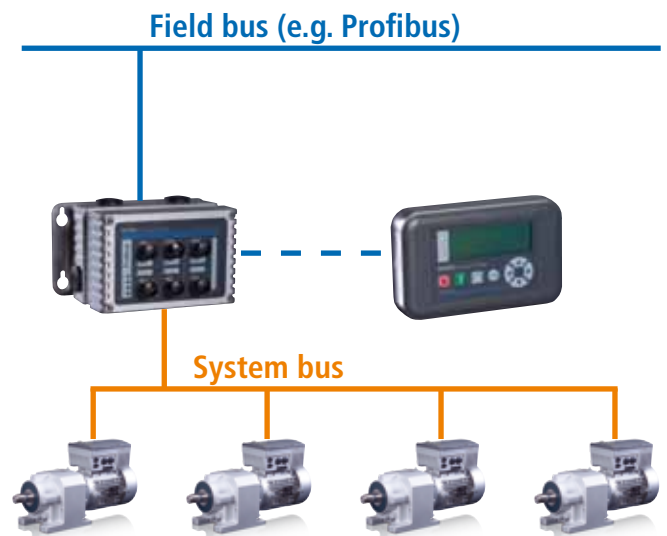


Technology Unit mounted directly on the inverter



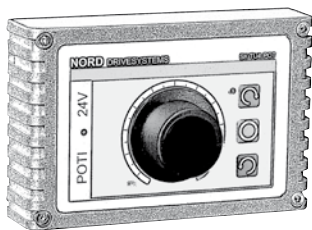
Technology Units for wall mounting

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. Up to 4 frequency inverters and the bus Technology Unit can be linked with the standard integrated system bus. 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 direct to terminals or optionally with M12 system connectors as required.

Profibus

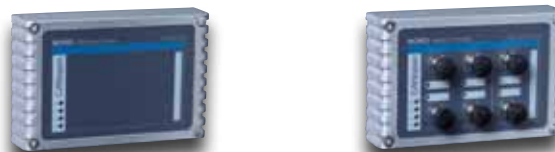
Bus module for the control, parameterisation and diagnosis of the frequency inverter.



- 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

CANopen

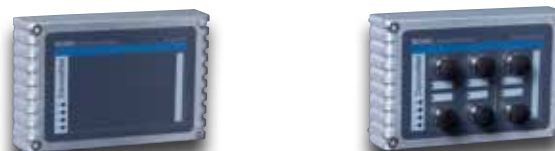
Bus module for the control, parameterisation and diagnosis of the frequency inverter.



- 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 DeviceNet:
4x In / 2x Out
- Diagnosis via RS 232
- Status LED: BG status, BG 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 (115V / 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

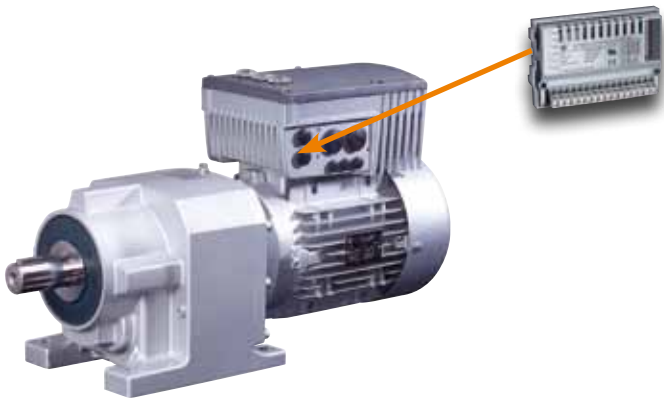
PotiBox

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 units

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. Protection class IP66.



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 units

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

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

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).



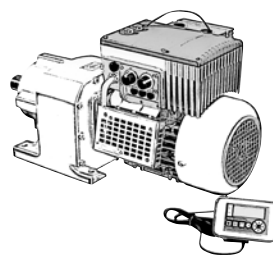
- 2x digital inputs
- 2x analog inputs
- 1x analog output
- Status LEDs: Bus status, bus fault

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) for SK 2xxE



Technical data

Function	Specification
Power / Voltage	1 ~ 100...120V -/+10% 0.25 - 0.75 kW 1 ~ 200...240V -/+10% 0.25 - 1.1 kW 3 ~ 200...240V -/+10% 0.25 - 4 kW 3 ~ 380...500V -20%/+10% 0.55 - 7.5 kW
Standard	<ul style="list-style-type: none"> • 4 digital inputs, PTC input, brake resistor control • 1 Digital output • RS 232 (RJ12) diagnostic interface • Status LEDs • Setpoint potentiometer (speed and ramp)
Output frequency	0,0 ... 400.0 Hz
Rated overload capacity	200% for 3.5s, 150% for 60s
Protection measures	overtemperature, short circuit, earth fault, over/under-voltage, overload, underload
Regulation and control	Sensorless current vector control (ISD), linear V/f characteristic curve, automatic flux adaptation (energy-saving function)
Motor temperature monitoring	Temperature sensor (PTC), temperature monitor (bimetal), I ² t- motor
Standard interfaces	RS 485 (USS), RS 232 (commissioning and diagnosis), system bus, AS interface (Only SK 225E and SK 235E)
Ambient temperature	-25°C...+40°C (S1- 100% ED), -25°C... +50°C (S3 - 75% ED 15min)*
Version	Motor-mounted, wall mounted
Protection class	IP55, (optional IP66) IP 66 measures: <ul style="list-style-type: none"> • Coated aluminium components • Coated PCBs • Low pressure test • Membrane valve

)* note the technical data for wall mounting!

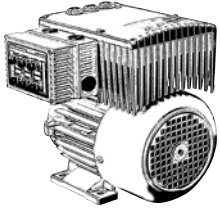
	Inverter type SK 2xxE...	Size	Mains voltage	Output voltage	Nominal motor power 230V [kW]
1 ~ 100 ... 120V	-250-112-O (-C)	1	1 ~ 100...120V -/+10% 47...63Hz	3 AC 0-200...240V	0,25
	-370-112-O (-C)	1			0,37
	-550-112-O (-C)	2			0,55
	750-112-O (-C)	2			0,75

	Inverter type SK 2xxE...	Size	Mains voltage	Output voltage	Nominal motor power 230 V [kW]
1 ~ 200 ... 240V	-250-123-A (-C)	1	1 ~ 200...240V -/+10% 47...63Hz	3 AC 0-200...240V	0,25
	-370-123-A (-C)	1			0,37
	-550-123-A (-C)	1			0,55
	-750-123-A (-C)	2			0,75
	-111-123-A (-C)	2			1,1

Standard protection class IP55

(-C) = Protection class IP66





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

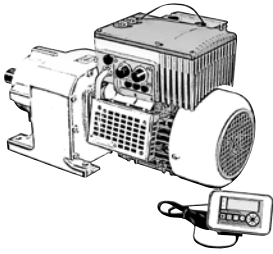
	Inverter type SK 2xxE...	Size	Mains voltage	Nominal motor power 230V [kW]
3 ~ 200 ... 240V	-250-323-A (-C)	1	3 ~ 200...240V -/+10% 47...63Hz	0,25
	-370-323-A (-C)	1		0,37
	-550-323-A (-C)	1		0,55
	-750-323-A (-C)	1		0,75
	-111-323-A (-C)	1		1,1
	-151-323-A (-C)	2		1,5
	-221-323-A (-C)	2		2,2
	-301-323-A (-C)	3		3
	-401-323-A (-C)	3		4

	Inverter type SK 2xxE...	Size	Mains voltage	Nominal motor power 400V [kW]
3 ~ 380...500V	-550-340-A (-C)	1	3 ~ 380...500V -20%/+10% 47...63Hz	0,55
	-750-340-A (-C)	1		0,75
	-111-340-A (-C)	1		1,1
	-151-340-A (-C)	1		1,5
	-221-340-A (-C)	1		2,2
	-301-340-A (-C)	2		3,0
	-401-340-A (-C)	2		4,0
	-551-340-A (-C)	3		5,5
	-751-340-A (-C)	3		7,5

Standard protection class IP55

(-C) = Protection class IP66





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	Connection unit for SK TU4
Operation		PotentiometerBox SK TU4-POT-123 (-C) SK TU4-POT-140 (-C)	SK TI4-TU-NET (-C)
Mains		24V mains unit SK TU4-24V-123-B (-C) SK TU4-24V-140-B (-C)	SK TI4-TU-NET (-C)
Communication		Profibus SK TU4-PBR (-C)	SK TI4-TU-BUS (-C)
		Profibus M12 SK TU4-PBR-M12 (-C)	SK TI4-TU-BUS (-C)
		DeviceNet SK TU4-DEV (-C)	SK TI4-TU-BUS (-C)
		DeviceNet M12 SK TU4-DEV-M12 (-C)	SK TI4-TU-BUS (-C)
		CANopen SK TU4-CAO (-C)	SK TI4-TU-BUS (-C)
		CANopen M12 SK TU4-CAO-M12 (-C)	SK TI4-TU-BUS (-C)
I/O extension		I/O extension SK TU4-IOE (-C)	SK TI4-TU-BUS (-C)
		I/O extension with M12 SK TU4-IOE-M12 (-C)	SK TI4-TU-BUS (-C)



Standard protection class IP55
(-C) = Protection class IP66



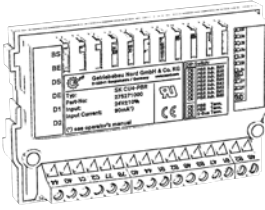
Description	Data
<p>PotentiometerBox for direct control on the device. Robust control elements enable the drive to be switched on in both directions and speed control.</p>	<p>3 buttons, Right/Left/Off Potentiometer</p>
<p>This generates the internal control voltage (24V) from the available supply voltage (115V / 230V / 400V).</p>	<p>Mains unit 1~ 115V/230V →24V, 1~ 400V →24V, 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 inputs, 2x digital outputs</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 outputs to M12, 2x Digital outputs 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 inputs, 2x digital outputs</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 outputs to M12, 2x Digital outputs 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 inputs, 2x digital outputs</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 outputs to M12, 2x Digital outputs 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 to M12 2x analog inputs / 1x analog output</p>



	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-3H
	SimpleBox SK CSX-3H





Description	Data
This generates the internal control voltage (24V) from the available supply voltage (115V / 230V / 400V).	Mains unit 1~ 115V/230V →24V, 1~ 400V →24V, 1x analog input for SK 2xxE
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

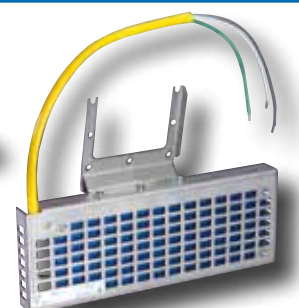
Inverter type SK 2xxE...		Resistor type	Part number
1~ 115V	... -250-112-O to ... -750-112-O	SK BRI 4- 1-100-100	275272005
1~ 230V	... -250-123-A to ... -111-123-A	SK BRI 4- 1-100-100	275272005
3~230V	... -250-323-A to ... -221-323-A	SK BRI 4- 1-200-100	275272008
	... -301-323-A to ... -401-323-A	SK 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

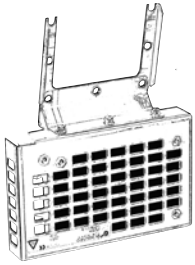
Inverter type SK 2xxE		Resistor type	Part number
1~ 115V	... -250-112-O to ... -750-112-O	SK BRE 4- 1-100-100	275273005
1~ 230V	... -250-123-A to ... -111-123-A	SK BRE 4- 1-100-100	275273005
3~230V	... -250-323-A to ... -221-323-A	SK BRE 4- 1-200-100	275273008
	... -301-323-A to ... -401-323-A	SK BRE 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]
	100	100	1,0
	100	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.

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.



High speed SMD assembly plant

The production process is divided into two main stages. The first is the production of PCBs where carefully sourced electronic components are mounted, soldered and subjected to a functional inspection. These PCBs are then used in the second stage where they are assembled into complete products, with comprehensive final test and inspection. Finished products are then ready for dispatch. The strategy of such a complete production process, coupled with modern and efficient production methods has a great influence on delivery performance, which at present is 98%. Standard frequency inverters are supplied from stock.



Automatic assembly of circuit boards



"One Piece flow" in 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





Central drive technology

NORD offers a wide range of application-orientated frequency inverter series for the field of switching cabinet technology. These range from the compact SK 500E unit with adequate performance rating, up to the flexible SK 700E with great modular capability.



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 200E, SK 300E up to 7.5kW, SK 750E up to 22kW) can be 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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