

INTELLIGENT DRIVESYSTEMS, WORLDWIDE SERVICES



MI 0500 – en

**NORDAC PRO**

Migration guideline SK 5xxE to SK 5xxP







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# 1 Introduction

## 1.1 General

## 1.2 General

### 1.2.1 Documentation

Designation:	<b>MI 0500</b>	
Part no.:	<b>6089702</b>	
Series:	NORDAC PRO	
Device series:	SK 500E, SK 510E, SK 511E, SK 520E, SK 530E, SK 535E, SK 540E, SK 545E, SK 500P, SK 510P, SK 530P, SK 550P	
Device types:	SK 5xxE-250-323- ... SK 5xxE-221-323-	(0.25 - 2.2 kW, 1~ 230 V, output 3~ 230 V)
	SK 5xxE-550-340- ... SK 5xxE-551-340-	(0.55 - 5.5 kW, 3~ 400 V, output 3~ 400 V)
	SK 5xxP-250-123- ... SK 5xxP-221-123-	(0.25 - 2.2 kW, 1~ 230 V, output 3~ 230 V)
	SK 5xxP-250-340- ... SK 5xxP-551-340-	(0.25 - 5.5 kW, 3~ 400 V, output 3~ 400 V)

### 1.2.2 Document History

Edition	Order number	Software version	Remarks
MI 0500, April 2020	6089702 / 1820	V 1.0 R1	First edition, series approval of the SK 5xxP

### 1.2.3 Copyright notice

As part of the device or functionality described here, this document must be made available to the users in the appropriate form.

Any document editing or modification is forbidden.

### 1.2.4 Publisher

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## 1.2.5 About this guide

This guide is intended to assist you with the migration of a central NORDAC *PRO* SK 5xxE frequency inverter from Getriebebau NORD GmbH & Co. KG to the latest SK 5xxP product series. It is intended for qualified electricians who plan, install and set up a migration. The information in this guide assumes that the qualified electricians who are entrusted with this work are familiar with the NORDAC *PRO* technology and functionalities, the available field bus systems and modules, as well as with the used accessory components.

This guide only contains information and descriptions for NORDAC *PRO* frequency inverters, optional modules and accessories from Getriebebau NORD GmbH & Co. KG.

## 1.3 Other applicable documents

This guide is only valid in combination with the technical information for the used modules and accessory components, and the operating instructions of the used frequency inverter. Only these documents contain all the information that is required for the migration. A list of these documents can be found in  Section 4 "Additional information".

The "Technical information" (TI) of the modules and accessory components, as well as the manuals (BU) of the NORD frequency inverters can be found at [www.nord.com](http://www.nord.com).

## 1.4 Display conventions

### 1.4.1 Other information

#### Information

Indicates hints for use and especially important information to ensure reliability of operation.



### 1.4.2 Text markings

The following markings are used to differentiate between various types of information:

#### Text

Type of information	Example	Marking
Instructions	1. 2.	Instructions whose sequence must be complied with are numbered sequentially.
Bullet points	•	Bullet points are marked with a dot.
Parameters	<b>P850</b>	Parameters are indicated by a "P" prefix, a three-digit number and bold lettering.
Factory settings	{ 0.0 }	Factory settings are indicated by curly brackets.







### Symbols used

Type of information	Example	Marking
Cross-reference	 Chapter 4.3.1 "Manuals"	Internal cross-reference: A mouse click on the text calls up the stated point in the document.
	 Target link	External cross-reference
Hyperlink	<a href="http://www.nord.com/">http://www.nord.com/</a>	References to external websites are indicated in blue and underlined. A mouse click calls up the website.


### 1.4.3 Trademarks

For mentioning registered trademarks and logos within this guide, the following are listed:

#### Field bus systems

Trademark	Logo	User association
PROFIBUS DP®		PROFIBUS Nutzerorganisation e.V. (PNO) Umbrella association PROFIBUS & PROFINET International (PI)
PROFINET®		
CANopen®		CAN in Automation (CiA)
DeviceNet®		Open DeviceNet Vendors Association (ODVA®) Trade and standard development organisation
EtherNet/IP™		
EtherCAT®		EtherCAT Technology Group

#### Communication systems

Trademark	Logo	Organisation
Bluetooth®		Bluetooth Special Interest Group (SIG)

## 2 Migration

### 2.1 NORDAC PRO

This guide serves the migration of drive electronics of the NORDAC *PRO* product family. The products for the SK 5xxE control cabinet frequency inverters are compared to those of the new SK 5xxP series.

The following products, fields and topics will be considered for the migration:

- Device types and sizes
- Device functions and device characteristics
- Field bus systems and bus interfaces
- Hardware ports and interfaces
- Control and parametrisation options
- Software and options
- Accessory components

Both series basically have the same structure. Structure, performance and range of functions of the new SK 5xxP frequency inverters have been essentially enhanced. The new NORDAC *PRO* SK 5xxP is available for motors with rated powers of 0.25 kW – 5.5 kW. For series launch in March 2020, the SK 5xxP sizes 1 – 3 are available in different performance levels.

The 1 ~ 230 V and 3 ~ 400 V frequency inverter types of the most common device or configuration versions are compared. In the following, only those functions and solutions will be considered that could also be implemented through the SK 5xxE. The detailed description of available options and features only considers the most common ones.



**Figure 1: System overview of NORDAC *PRO* products**

The NORDAC *PRO* MI 0500 migration guide compares the optional accessory components for both series.

## 2.2 Device characteristics

The NORDAC PRO SK 5xxE series is available in 10 different performance levels (SK 500E, SK 505E, SK 510E, SK 511E, SK 515E, SK 520E, SK 530E, SK 535E, SK 540E, SK 545E). A differentiation is made between the SK 5x0E and SK 5x5E device types. These are subdivided into 11 sizes, and available with rated powers from 0.25 – 160 kW.

The NORDAC PRO SK 5xxP device series provides four different performance levels (SK 500P, SK 510P, SK 530P, SK 550P). The SK 5xxP devices are subdivided into three sizes, and available with rated powers from 0.25 – 5.5 kW.

Comparing both NORDAC PRO device series shows some deviations that are differentiated below.

### 2.2.1 Mains connection data

#### Mains connection and EMC line filter

Mains phases / Mains voltages		SK 5xxE										SK 5xxP			
		Device version										Device version			
		SK 500E	SK 505E	SK 510E	SK 511E		SK 520E	SK 530E	SK 535E	SK 540E	SK 545E	SK 500P	SK 510P	SK 530P	SK 550P
Connection data	1~ 115 V devices SK ...-xxx-112-0	✓	✓	✓	✓		✓	✓	✓	✓	✓				
	1~ 230 V devices SK ...-xxx-123-A	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓
	3~ 230 V devices SK ...-xxx-323-A	✓	✓	✓	✓		✓	✓	✓	✓	✓				
	3~ 400 V devices SK ...-xxx-340-A	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓

Table 1: Overview of mains connection data and EMC line filters



#### Information

For SK 5xxE, the 1~ 115 V devices are generally equipped without an integrated line filter and available with the SK 5xxE-...-...-0 identifier. Further SK 5xxE device versions are partially available as a special version without an integrated line filter.

The SK 5xxP device versions are only available with an integrated line filter and with the SK 5xxP-...-...-A identifier.

2.2.2 Characteristics and functions

Functionalities

Features / Functions	SK 5xxE										SK 5xxP			
	Device version										Device version			
	SK 500E	SK 505E	SK 510E	SK 511E		SK 520E	SK 530E	SK 535E	SK 540E	SK 545E	SK 500P	SK 510P	SK 530P	SK 550P
External heat sink technology (sizes 1 + 2) SK TH1-1 and SK TH1-2	✓	✓	✓	✓		✓	✓	✓	✓	✓				
Top-hat rail mounting (sizes 1 + 2) SK DRK1-1 and SK DRK1-2	✓	✓	✓	✓		✓	✓	✓	✓	✓				
Cold plate technology	✓	✓	✓	✓		✓	✓	✓	✓	✓				
Internal 24 V DC power supply unit	✓		✓	✓		✓	✓		✓	-	✓	✓	✓	✓
External 24 V DC supply		✓						✓		✓			✓	✓
PLC functionality						✓	✓	✓	✓	✓	✓	✓	✓	✓
POSICON							✓	✓	✓	✓	✓	✓	✓	✓
Speed control with encoder feedback CFC closed-loop						✓	✓	✓	✓	✓	✓	✓	✓	✓
Safe stop (STO, SS1)			✓	✓			✓	✓	✓	✓		✓	o <sup>1</sup>	o <sup>1</sup>
Evacuation run								✓		✓				
Universal encoder interface									✓	✓			o <sup>2</sup>	o <sup>2</sup>
TF input (electrically isolated)													✓	✓
Control unit connection Shielding plate, shielded cables	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓ <sup>3</sup>	✓ <sup>3</sup>	✓ <sup>3</sup>	✓ <sup>3</sup>
Connection EMC kit Shield angle SK EMC kit	o	o	o	o		o	o	o	o	o	o <sup>3</sup>	o <sup>3</sup>	✓ <sup>3</sup>	✓ <sup>3</sup>

✓ Standard

o Optional

<sup>1</sup> SK CU5-STO and SK CU5-MLT customer unit, STO 2-channel connection

<sup>2</sup> SK CU5-MLT customer unit

<sup>3</sup> High-quality EMC add-on kit

Table 2: Overview of characteristics and functions

### 2.2.3 Encoder type hardware

#### Interfaces and ports

Features / Types		SK 5xxE										SK 5xxP			
		Device version										Device version			
		SK 500E	SK 505E	SK 510E	SK 511E		SK 520E	SK 530E	SK 535E	SK 540E	SK 545E	SK 500P	SK 510P	SK 530P	SK 550P
Encoder interfaces	TTL RS422						✓	✓	✓	✓	✓			✓	✓
	HTL						✓ <sup>1</sup>	✓ <sup>1</sup>	✓ <sup>1</sup>	✓ <sup>1</sup>	✓ <sup>1</sup>	✓	✓	✓	✓
	SIN/COS									✓	✓			o <sup>2</sup>	o <sup>2</sup>
	SSI									✓	✓			o <sup>2</sup>	o <sup>2</sup>
	BiSS									✓	✓			o <sup>2</sup>	o <sup>2</sup>
	Hiperface									✓	✓			o <sup>2</sup>	o <sup>2</sup>
	Endat 2.1									✓	✓			o <sup>2</sup>	o <sup>2</sup>
	CANopen							✓	✓	✓	✓	✓	✓	✓	✓

✓ Standard

<sup>1</sup> Signal input up to 10 kHz

o Optional

<sup>2</sup> SK CU5-MLT customer unit

Table 3: Overview of encoder type hardware

### 2.2.4 Field bus systems

#### Field bus interfaces

Features / Types		SK 5xxE										SK 5xxP					
		Device version										Device version					
		SK 500E	SK 505E	SK 510E	SK 511E		SK 520E	SK 530E	SK 535E	SK 540E	SK 545E	SK 500P	SK 510P	SK 530P	SK 550P		
Bus systems	CANopen on board				✓		✓	✓	✓	✓	✓	✓	✓	✓	✓		
	CANopen Bus interface SK TU3-CAO	o	o	o	o		o	o	o	o	o	o	o	✓ <sup>1</sup>	✓ <sup>1</sup>	✓ <sup>1</sup>	✓ <sup>1</sup>
	AS-Interface Bus interface SK TU3-AS1	o	o	o	o		o	o	o	o	o						
	PROFIBUS DP Bus interface SK TU3-PBR (-24 V)	o	o	o	o		o	o	o	o	o						
	INTERBUS Bus interface SK TU3-IBS	o	o	o	o		o	o	o	o	o						
	DeviceNet Bus interface SK TU3-DEV	o	o	o	o		o	o	o	o	o						

✓ Standard

<sup>1</sup> CANopen on board

o Optional

Table 4: Overview of the field bus interfaces

### Ethernet-based bus interfaces

Features / Types		SK 5xxE										SK 5xxP
		Device version										Device version
		SK 500E	SK 505E	SK 510E	SK 511E		SK 520E	SK 530E	SK 535E	SK 540E	SK 545E	SK 550P
Ethernet bus systems	EtherCAT Bus interface SK TU3-ECT	o	o	o	o		o	o	o	o	o	✓ <sup>1</sup>
	EtherNet / IP Bus interface SK TU3-EIP	o	o	o	o		o	o	o	o	o	✓ <sup>1</sup>
	POWERLINK Bus interface SK TU3-POL	o	o	o	o		o	o	o	o	o	✓ <sup>1</sup>
	PROFINET IO Bus interface SK TU3-PNT	o	o	o	o		o	o	o	o	o	✓ <sup>1</sup>

✓ Standard

<sup>1</sup> Ethernet interface on board, dialect can be parameterised

o Optional

**Table 5: Overview of Ethernet-based bus interfaces**

### 2.2.5 Sizes








Size	SK 5xxE	Motor nominal power Mains voltage	Size	SK 5xxP	Motor nominal power Mains voltage
Size 1		0.25 – 0.75 kW 1 / 3~ 200 ... 240 V	Size 1		0.25 – 0.75 kW 1~ 200 ... 240 V
		0.55 – 0.75 kW 3~ 380 ... 480 V			0.25 – 0.75 kW 3~ 380 ... 480 V
Size 2		1.1 – 2.2 kW 1 / 3~ 200 ... 240 V	Size 2		1.1 – 2.2 kW 1~ 200 ... 240 V
		1.1 – 2.2 kW 3~ 380 ... 480 V			1.1 – 2.2 kW 3~ 380 ... 480 V
Size 3		3.0 – 4.0 kW 3~ 200 ... 240 V	Size 3		3.0 – 5.5 kW 3~ 380 ... 480 V
		3.0 – 4.0 kW 3~ 380 ... 480 V			
Size 4		5.5 kW 3~ 380 ... 480 V	Size 4		not available
		7.5 kW 3~ 380 ... 480 V			

Table 6: NORDAC PRO sizes



2.2.6 Weights

SK 5xxE	Size	Weight [kg]	SK 5xxP	Size	Weight [kg]
...-250-323-A ...-370-323-A ...-550-323-A ...-750-323-A ...-550-340-A ...-750-340-A	Size 1	1.4	...-250-123-A ...-370-123-A ...-550-123-A ...-750-123-A ...-250-340-A ...-370-340-A ...-550-340-A ...-750-340-A	Size 1	1.2
...-111-323-A ...-151-323-A ...-221-323-A ...-111-340-A ...-151-340-A ...-221-340-A	Size 2	1.8	...-111-123-A ...-151-123-A ...-221-123-A ...-111-340-A ...-151-340-A ...-221-340-A	Size 2	1.6
...-301-323-A ...-401-323-A ...-301-340-A ...-401-340-A	Size 3	2.7	...-301-340-A ...-401-340-A ...-551-340-A	Size 3	2.6
...-551-340-A ...-751-340-A	Size 4	3.1			

Table 7: Weights NORDAC PRO

## 2.3 Modules and options

The following overview tables list the SK TU3-...(-24V) technology units of the SK 5xxE, and compare them to the functionalities or options of the SK 5xxP.

### 2.3.1 Field bus interfaces















SK 5xxE		Bus system Connection	SK 5xxP	
Designation Part no.	Product		Product	Designation Part no.
SK TU3-IBS 275 900 065		 2 x SUB-D9		not available
SK TU3-PBR 275 900 030		 1 x SUB-D9		not available
SK TU3-PBR-24V 275 900 160		 1 x SUB-D9 24 V DC		
SK TU3-CAO 275 900 075		 1 x SUB-D9		on board 275 29x xxx
SK TU3-DEV 275 900 085		 5-pole screw terminals		not available
SK TU3-AS1 275 900 170		 5-pole and 8-pole screw terminals		not available

Table 8: Technology units SK TU3-...(-24V) field bus interfaces

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 **Information**

For detailed information, please refer to the  4.3.1 "Manuals" supplementary manuals on the field bus interface.

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### 2.3.2 Ethernet-based bus interfaces

Only the SK 550P frequency inverter is equipped with an integrated bus interface for the connection of the following Ethernet-based field bus systems:






SK 5xxE		Bus system Connection	SK 550P	
Designation Part no.	Product		Product	Designation Part no.
SK TU3-ECT 275 900 180		<b>EtherCAT</b> 2 x RJ45 24 V DC		on board 275 295 xxx
SK TU3-EIP 275 900 150		<b>EtherNet/IP</b> 2 x RJ45 24 V DC		on board 275 295 xxx
SK TU3-POL 275 900 140		<b>ETHERNET POWERLINK</b> 2 x RJ45 24 V DC		on board 275 295 xxx
SK TU3-PNT 275 900 190		<b>PROFINET</b> 2 x RJ45 24 V DC		on board 275 295 xxx

Table 9: Technology units SK TU3-... Ethernet-based bus interfaces

#### Information

For the SK 550P, the field bus protocol to be used is selected via the dialect's function setting in the *Changing the bus protocol* parameter.

For detailed information, please refer to the  4.3.1 "Manuals" supplementary manuals on the bus interface.

## 2.4 Functional safety (STO, SS1)

### 2.4.1 On board functionality

For the SK 510E, SK 511E, SK 530E, SK 535E, SK 540E and SK 545E performance levels, the functional safety is integrated in the device for the 230 V and 400 V mains voltages. This integrated function variant is only available for the SK 510P.






SK 5xxE		Functions Connection	SK 5xxP	
Designation Part no.	Product		Product	Designation Part no.
SK 510E-xxx-323-A 275 71x xxx		Safe stop STO, SS1 1-channel		on board 275 291 xxx
SK 510E-xxx-340-x 275 72x xxx				
SK 511E-xxx-323-A 275 77x xxx				
SK 511E-xxx-340-x 275 78x xxx				

Table 10: Functional safety as integrated function (on board)

### Information

The functional safety (STO, SS1) is described device-specifically in supplementary manuals.

For detailed information, please refer to the  4.3.1 "Manuals" supplementary manuals on the functional safety.

### 2.4.2 Customer units (SK CU5-...)

For the SK 5xxP series, two functional extensions are available for the SK 530P and SK 550P advanced performance levels. These optional SK CU5-... customer units are available in the functions.

#### SK CU5-STO functional safety

STO, SS1  
2-channel connection

#### SK CU5-MLT encoder interface

STO, SS1  
2-channel connection  
TTL, SIN/COS, SSI,  
Hiperface, Endat, BISS



Figure 2: SK CU5-STO customer unit











SK 5xxE		SK 5xxP		Customer unit	
Designation Part no.	Product	Product	Designation Part no.	Function Option	Designation Part no.
SK 530E-xxx-323-A 275 71x xxx			SK 530P-xxx-123-A 275 293 xxx	Functional safety 	SK CU5-STO 275 298 000
SK 530E-xxx-340-x 275 72x xxx			SK 530P-xxx-340-A 275 293 xxx		
SK 535E-xxx-323-A 275 77x xxx			SK 550P-xxx-123-A 275 295 xxx		
SK 535E-xxx-340-x 275 78x xxx			SK 550P-xxx-340-A 275 295 xxx		
SK 540E-xxx-323-A 275 77x xxx			SK 530P-xxx-123-A 275 293 xxx	Encoder interface + Functional safety 	SK CU5-MLT 275 298 200
SK 540E-xxx-340-x 275 78x xxx			SK 530P-xxx-340-A 275 293 xxx		
SK 545E-xxx-323-A 275 77x xxx			SK 550P-xxx-123-A 275 295 xxx		
SK 545E-xxx-340-x 275 78x xxx			SK 550P-xxx-340-A 275 295 xxx		

Table 11: Functional extensions/SK CU5-... customer units

### Information

For the descriptions of the functional safety (STO, SS1) and the SK CU5-... customer units, please refer to the supplementary SK 5xxP manual.

For detailed information, please refer to the supplementary BU 0630  4.3.1 "Manuals" manual.

## 2.5 Control and parametrisation options

The following overview table lists the SK TU3-... technology units of the SK 5xxE, and compares them to the SK 5xxP control and parameterisation units.

### 2.5.1 Control and parameterisation units







SK 5xxE		Control unit Information	SK 5xxP	
Designation Part no.	Product		Product	Designation Part no.
SK TU3-POT 275 900 110		PotentiometerBox 0 ... 100 %		not available
SK TU3-CTR 275 900 090		ControlBox 4-digit 7-segment display		SK TU5-CTR 275 297 000
		ControlBox 5-digit LCD 7-segment display		
SK TU3-PAR 275 900 100		ParameterBox LCD screen Plain text display		SK TIE5-BT-STICK 275 900 120
		NORCON APP + NORDAC ACCESS BT		

Table 12: Technology units SK TU3-... control and parameterisation units

## 2.5.2 Accessories for the control and parameterisation units











SK 5xxE		Control unit Information	SK 5xxP	
Designation Part no.	Product		Product	Designation Part no.
SK CSX-0 275 900 095		SimpleBox 4-digit 7-segment display		SK TU5-CTR 275 297 000
		ControlBox LCD, 5-digit 7-segment display		
SK PAR-3E 275 281 414		ParameterBox Installation LCD screen Plain text display		Version 4.8R0 and higher SK PAR-3E 275 281 414
SK PAR-3H 275 281 014		ParameterBox Handheld LCD screen Plain text display		Version 4.8R0 and higher SK PAR-3H 275 281 014
SK CSX-3E 275 281 413		SimpleControlBox Installation 4-digit 7-segment display		SK CSX-3E 275 281 413
SK CSX-3H 275 281 013		SimpleControlBox Handheld 4-digit 7-segment display		SK CSX-3H 275 281 013

Table 13: Accessories for the control and parameterisation units

### Information

The SK PAR-3H and SK CSX-3H handheld consoles are equipped with the connecting cable for the connection to the frequency inverter's communication or diagnostic interfaces.





2.5.3 Accessories for the control boxes





SK 5xxE		Control unit Information	SK 5xxP	
Designation Part no.	Product		Product	Designation Part no.
SK POT1-1 278 910 120		Control box Handheld 3 m cable length 3-pole switch Potentiometer 0 ... 100%		SK POT1-1 278 910 120
SK POT1-2 278 910 140		Control box Handheld 20 m cable length 3-pole switch Potentiometer 0 ... 100%		SK POT1-2 278 910 140

Table 14: Accessories for the control boxes

## 2.6 Software

The following overview table lists the control and parameterisation software as well as the communication connection extension via Bluetooth to the NORDAC PRO.

### 2.6.1 Software and communication accessories



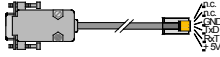
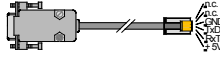









SK 5xxE		Information Connection	SK 5xxP	
Designation Part no.	Product		Product	Designation Part no.
NORDCON Software Version 2.0 and higher		Software for controlling and parameterising NORD drive technology		NORDCON Software Version 2.8.3 and higher
RJ12-SUB-D9 278 910 240		Adapter cable RS232 communication RJ12 to SUB-D9		RJ12-SUB-D9 278 910 240
SK TIE4-RS232-USB 275 274 604		Connection set RS232 communication RJ12 - SUB-D9 / USB		SK TIE4-RS232-USB 275 274 604
NORDCON APP Software Version 1.0.30 and higher		 Mobile terminal devices 		NORDCON APP Software Version 1.1.0 and higher
SK TIE5-BT-STICK 275 900 120		NORDAC ACCESS BT 		SK TIE5-BT-STICK 275 900 120

Table 15: Software and communication accessories

## 2.7 Accessory components

The following overview table lists further accessory options for a top-hat rail mounting for connection to the NORDAC PRO.

### 2.7.1 Accessory options












SK 5xxE		Option Assembly type	SK 5xxP	
Designation Part no.	Product		Product	Designation Part no.
Adapter module RJ45/terminal 278 910 300		RJ45 WAGO adapter module CANopen RJ45 ⇔ terminal		Adapter module RJ45/terminal 278 910 300
V/F converter 278 910 310		Adapter module V/F converter 0...10 V ⇔ Pulses		V/F converter 278 910 310
Setpoint converter +/- 10 V 278 910 320		Adapter module Setpoint chart +/- 10 V ⇔ 0...10 V		Setpoint converter +/- 10 V 278 910 320
HTL encoder WK 4/2/4*680 Ω 278 910 340		Adapter kit HTL encoder WK 4/2/4*680 Ω		Level adapter HTL- RS422 278 910 360
Level adapter HTL- RS422 278 910 360		Adapter module level adapter HTL ⇔ RS422		
V/I converter 278 910 315		Adapter module V/I converter 0...10 V ⇔ 20 mA		Function integrated into the device 275 29x xxx

Table 16: Adapter modules and adapter kits



SK 5xxE		Option Assembly type	SK 5xxP	
Designation Part no.	Product		Product	Designation Part no.
SK EBGR-1 electronic rectifier size 1 19 140 990		Electronic brake rectifier for holding brake control		Electronic rectifier size 1 SK EBGR-1 19 140 990

Table 17: Electronic brake rectifier SK EBGR-1



SK 540E / SK 545E		Option Assembly type	SK 530P / SK 550P	
Designation Part no.	Product		Product	Designation Part no.
IO extension SK EBIOE-2 275 900 210		External IO extension Digital and analogue inputs and outputs 5-pole		IO extension SK EBIOE-2 275 900 210

Table 18: IO extension SK EBIOE-2

### 2.7.2 Accessories for the SK 5xxP device series





SK 5xxP accessories			
Designation Part no.	Option	Type Connection	Installation
SK TIE5-CAO-... 275 xxx xxx		Adapter CANopen 2 x RJ45	
SK TIE5-CAO- WIRE-2x4P 275 292 201		Double terminal CANopen 2 x 4 terminals	

Table 19: Accessories for the NORDAC PRO SK 5xxP device series

### 2.7.3 EMC kits

Optional EMC kits are available for EMC connection of shielded cables, and the correct strain relief. These size-dependent EMC kits are installed on the NORDAC *PRO* and used to connect

- Motor cables
- Control and encoder cables
- Bus system cables

#### Motor cable



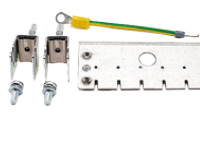

SK 5xxE			SK 5xxP		
Designation Part no.	Product	Size	Designation Part no.	Product	Size
SK EMC 2-1 275 999 011		Size 1 + Size 2	SK HE5-EMC-MS-HS12 275 292 300		Size 1 + Size 2
SK EMC 2-2 275 999 021		Size 3 + Size 4	SK HE5-EMC-MS-HS34 275 292 301		Size 3

Table 20: NORDAC *PRO* EMC kits for motor connection



Figure 3: EMC kits installed for motor connection

**Control cables**





SK 5xxE		SK 5xxP		
Device	Size	Designation Part no.	Product	Size
	Size 1	SK HE5-EMC-IS- HS1 275 292 304		Size 1
	Size 2	SK HE5-EMC-IS- HS2 275 292 305		Size 2
	Size 3	SK HE5-EMC-IS- HS3 275 292 306		Size 3
	Size 4	SK HE5-EMC-IS- HS3 275 292 306		

Table 21: SK 5xxP EMC kits for control cables



Figure 4: EMC kits installed for control cables

Encoder cables/SK TU5-... customer units





SK 5xxE		SK 5xxP		
Device	Size	Designation Part no.	Product	Size
	Size 1	SK HE5-EMC-CS- HS12 275 292 310		Size 1
	Size 2			Size 2
	Size 3	SK HE5-EMC-CS- HS3 275 292 311		Size 3
	Size 4			

Table 22: SK 5xxP EMC kits for SK TU5-... customer units

## 2.8 Accessories

### 2.8.1 Braking resistors

External braking resistors are available as accessory components for the NORDAC *PRO* series.

Both NORDAC *PRO* frequency inverter types are implemented with an integrated brake chopper for dissipating the energy feedback (generated during dynamic braking) using an external braking resistor.

For these external braking resistors used for preventing overvoltage-related frequency inverter shutdowns, a differentiation is made between two different types and designs.

#### Design

- Chassis braking resistor
- Footprint braking resistor

#### 2.8.1.1 Chassis braking resistors

In the table below, the different SK BR2-... chassis braking resistors are assigned to the individual power ranges. The chassis braking resistor types/designs are identical for both device series.

The chassis braking resistors are subdivided into types and different designs. The chassis braking resistors or the resistor elements are integrated into housing cages and can be used almost universally. For thermal protection of the chassis braking resistor, these are equipped with an integrated thermostat (bimetallic switch as opener).




**Figure 5: Versions of chassis braking resistors**

The temperature contact can be connected via two terminals (4 mm<sup>2</sup>) with one digital input of the frequency inverter and parameterised to, for example, one of the safety functions (“Disable voltage” or “Quick Stop”).

The chassis braking resistors are UL certified and can also be installed outside the control cabinet due to their IP20 protection class version and for better heat dissipation. The chassis braking resistors must be connected to the frequency inverter via a separate connection cable – a shielded cable is recommended. The connection cable should be as short as possible.



### Information

Special attention must be paid to the type of assembly (vertical or horizontal). For detailed information, please refer to the technical information  Chapter 4.3.2 "Technical information/Data sheets".

#### 400 V devices





SK 5xxE		Type Power range Data	SK 5xxP	
Designation Part no.	Product		Product	Designation Part no.
SK BR2-100/400-C 278 282 040		Chassis braking resistor 3.0 ... 4.0 kW		SK BR2-100/400-C 278 282 040
		100 Ω    100 Ω 400 W    400 W		
SK BR2-60/600-C 278 282 060		Chassis braking resistor 5.5 kW		SK BR2-60/600-C 278 282 060
		60 Ω    60 Ω 600 W    600 W		

Table 23: Chassis braking resistors for 400 V devices

### 2.8.1.2 Footprint braking resistors

In the table below, the different SK BR4-... footprint braking resistors are assigned to the individual power ranges and compared to those of type SK BRU5-.... The footprint braking resistor types/designs are different for both device series. Depending on the space available and the respective depth in the control cabinet, the footprint braking resistors for the SK 5xxE can be mounted flat or vertically (book size) next to the frequency inverter.

SK 5xxE with SK BR4-xxx/xxx




SK 5xxP with SK BRU5-x-xxx-xxx



Figure 6: Footprint braking resistor designs for size 2

Both footprint braking resistor designs are UL certified and can also be installed outside the control cabinet due to their IP40 protection class version and for better heat dissipation. The footprint braking resistors' lead-out connection cables must be lengthened accordingly.

#### Information

The connection cable lengths and short-time powers are different for the device-specific footprint braking resistor types. For detailed information, please refer to the technical information  Chapter 4.3.2 "Technical information/Data sheets".

## 230 V devices

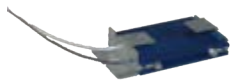

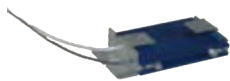



SK 5xxE		Type Power range Data	SK 5xxP		
Designation Part no.	Product		Product	Designation Part no.	
SK BR4-240/100 275 991 110		Footprint braking resistor 0.25 ... 0.37 kW	240 Ω	240 Ω	 SK BRU5-1-240-050 275 299 004
			100 W	50 W	
SK BR4-150/100 275 991 115		Footprint braking resistor 0.55 ... 0.75 kW	150 Ω	240 Ω	
			100 W	50 W	
SK BR4-75/200 275 991 120		Footprint braking resistor 1.1 ... 2.2 kW	75 Ω	75 Ω	 SK BRU5-2-075-200 275 299 210
			200 W	200 W	
SK BR4-35/400 275 991 140		Footprint braking resistor 3.0 ... 4.0 kW	35 Ω		not available
			400 W		

Table 24: Footprint braking resistors for 230 V devices

400 V devices









SK 5xxE		Type Power range Data	SK 5xxP			
Designation Part no.	Product		Product	Designation Part no.		
SK BR4-400/100 275 991 210		Footprint braking resistor 0.55 ... 0.75 kW	400 Ω	400 Ω		SK BRU5-1-400-100 275 299 101
			100 W	100 W		
SK BR4-220/200 275 991 220		Footprint braking resistor 1.1 ... 2.2 kW	220 Ω	220 Ω		SK BRU5-2-220-200 275 299 205
			200 W	200 W		
SK BR4-100/400 275 991 240		Footprint braking resistor 3.0 ... 4.0 kW	100 Ω	100 Ω		SK BRU5-3-100-300 275 299 309
			400 W	300 W		
SK BR4-60/600 275 991 260		Footprint braking resistor 5.5 kW	60 Ω	100Ω		not available
			600 W	300 W		
		Footprint braking resistor 7.5 kW	60 Ω			
		600 W				

Table 25: Footprint braking resistors for 400 V devices

### Temperature monitoring accessories

For thermal protection of the SK BR4-... footprint braking resistor, a thermostat (bimetallic switch/opener contact) can be optionally installed on the braking resistor. The type selection depends on the footprint braking resistor's assembly type.




SK 5xxE		Assembly type Data	SK 5xxP	
Designation Part no.	Product		Product	Designation Part no.
SK BR4-... temperature monitoring 275 991 100		Book size 180 °C 2.5 A		SK BR4-... temperature monitoring 275 991 100
SK BR4-... temperature monitoring 275 991 200		Footprint 100 °C 1.6 A		

Table 26: SK BR4-... temperature monitoring accessories

## 2.8.2 Line filter

Both NORDAC *PRO* series are equipped with an integrated EMC line filter. The compliance with standards for limit values of class A1/category C2 is guaranteed for shielded motor cable lengths < 20 m. For shielded motor cable lengths < 5 m, the class B/category C1 limit values are observed.

### Information

For the following SK 5xxP device types, the compliance with the declared class B1/category C1 limit values cannot be guaranteed.

- SK 5xxP-250-123-A ... SK 5xxP-550-123-A
- SK 5xxP-250-340-A ... SK 5xxP-550-340-A

For applications with longer motor cables or for compliance with the class B limit values, external line filters are available as accessory components.

For these external line filters used for reducing the emission of electromagnetic interferences, a differentiation is made between two different types and designs.

#### Design

- Chassis line filter
- Footprint line filter

#### 2.8.2.1 Chassis line filters

In the table below, the different SK HLD ... chassis line filters are assigned to the individual power ranges for the SK 5xxE.

### Information


Optional chassis line filters for the entire SK 5xxP power range are available via the Getriebebau NORD sales department **only on request**.



**Figure 7: NORDAC PRO SK 5xxE chassis line filter**

The SK HLD ... chassis line filters are UL certified and can also be installed outside the control cabinet due to their IP20 protection class version and for better heat dissipation. The chassis line filters must be connected to the mains connection and the frequency inverter via a separate connection cable – a shielded cable is recommended. The connection cables should be as short as possible.

### Information

Compliance with the wiring guidelines must be ensured when connecting. In the additional parameters, the pulse frequency should be set to the factory setting (6 kHz). For detailed information, please refer to the technical information  Chapter 4.3.2 "Technical information/Data sheets".

#### 400 V devices



SK 5xxE		Type Power range Data	SK 5xxP	
Designation Part no.	Product		Product	Designation Part no.
SK HLD 110-500/8 278 272 008		Chassis line filter 0.55 ... 2.2 kW	not available	on request
		8.0 A 20/190 mA		
SK HLD 110-500/16 278 272 016		Chassis line filter 3.0 ... 5.5 kW	not available	on request
		16.0 A 21/205 mA		

Table 27: Chassis line filters for 400 V devices

### 2.8.2.2 Footprint line filter

In the table below, the different SK LF2-... footprint line filters are assigned to the individual power ranges for the SK 5xxE. Footprint line filters are only available for a 3-phase mains connection. Depending on the space available and the respective depth in the control cabinet, the footprint line filters can be mounted flat or vertically (book size) next to the frequency inverter.

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#### Information

Optional footprint line filters for the entire SK 5xxP power range are available via the Getriebebau NORD sales department **only on request**.

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Figure 8: NORDAC PRO SK 5xxE footprint line filter

The SK LF2-... footprint line filters are UL certified and can only be installed in the control cabinet due to their IP00 protection class version. The connection cable for the mains connection must be provided and should be as short as possible. The mains cable is connected using screw terminals. The footprint line filters must be connected to the frequency inverter's mains connection on the outgoing circuit side using the pre-assembled connection cables.

---

#### Information

Compliance with the wiring guidelines must be ensured when connecting. In the additional parameters, the pulse frequency should be set to the factory setting (6 kHz). For detailed information, please refer to the technical information  Chapter 4.3.2 "Technical information/Data sheets".

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### 400 V devices

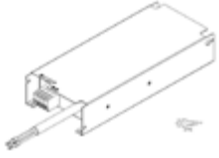



SK 5xxE		Type Power range Data	SK 5xxP	
Designation Part no.	Product		Product	Designation Part no.
SK LF2-480/2-F 278 273 002		Footprint line filter 0.55 ... 0.75 kW	not available	on request
		2.3 A 6.4 / 61.5 mA		
SK LF2-480/5-F 278 273 005		Footprint line filter 1.1 ... 2.2 kW	not available	on request
		5.5 A 7.7 / 74.3 mA		
SK LF2-480/9-F 278 273 009		Footprint line filter 3.0 ... 4.0 kW	not available	on request
		9.5 A 19.5 / 187.0 mA		
SK LF2-480/15-F 278 273 015		Footprint line filter 5.5 ... 7.5 kW	not available	on request
		16.0 A 20.2 / 193.0 mA		

Table 28: Footprint line filters for 400 V devices

### 2.8.2.3 Footprint combined line filter

This combination of line filter with integrated mains choke in one housing is only available for a 3-phase mains connection. In the table below, the different SK NHD-... footprint combined line filters are assigned to the individual power ranges for the SK 5xxE. Depending on the space available and the respective depth in the control cabinet, the footprint combined line filters can be mounted flat or vertically (book size) next to the frequency inverter.

#### Information


Optional footprint combined line filters for the entire SK 5xxP power range are available via the Getriebbau NORD sales department **only on request**.



Figure 9: Footprint combined line filter NORDAC PRO SK 5xxE

The SK NHD-... footprint combined line filters are UL certified and can be installed in the control cabinet due to their IP20 protection class version. The connection cable for the mains connection must be provided and should be as short as possible. The main cable is connected using screw terminals. The footprint combined line filters must be connected to the frequency inverter's mains connection on the outgoing circuit side using the pre-assembled connection cables.

**i Information**

Compliance with the wiring guidelines must be ensured when connecting. In the additional parameters, the pulse frequency should be set to the factory setting (6 kHz). For detailed information, please refer to the technical information  Chapter 4.3.2 "Technical information/Data sheets".

**400 V devices**





SK 5xxE		Type Power range Data	SK 5xxP	
Designation Part no.	Product		Product	Designation Part no.
SK NHD-480/3-F 278 273 003		Footprint combined line filter 0.55 ... 0.75 kW	not available	on request
		2.3 A 4.3/40.0 mA		
SK NHD-480/6-F 278 273 006		Footprint combined line filter 1.1 ... 2.2 kW	not available	on request
		5.5 A 7.7/74.4 mA		
SK NHD-480/10-F 278 273 010		Footprint combined line filter 3.0 ... 4.0 kW	not available	on request
		9.5 A 15.0/144.0 mA		
SK NHD-480/16-F 278 273 016		Footprint combined line filter 5.5 ... 7.5 kW	not available	on request
		16.0 A 21.5/206.5 mA		

Table 29: Footprint combined line filters for 400 V devices

## 2.8.3 Chokes

### 2.8.3.1 Mains chokes

The mains chokes are located upstream from the frequency inverters and limit the input current to approximately the level of the NORDAC *PRO* output current.

In the following tables, the different mains chokes are assigned to the individual power ranges of both device series and compared to them.

**SK CI1-xxx/xxx-C for SK 5xxE**



**SK CI5-xxx/xxx-C for SK 5xxP**



**Figure 10: NORDAC *PRO* mains chokes**


To reduce dangerous mains current peaks or mains voltage fluctuations, adaptive mains chokes may be used depending on the system. Mains feedback and the proportion of current harmonics will be considerably reduced.

SK CI1-... mains chokes are specified for a maximum supply voltage of 230 V or 480 V at 50/60 Hz.

SK CI5-... mains chokes are specified for a maximum supply voltage of 230 V or 500 V at 50/60 Hz.

Both types of mains chokes are UL certified and should always be installed in the control cabinet due to their IP00 protection class version. The mains chokes are connected using screw terminals.

### **Information**

For detailed information, please refer to the technical information  Chapter 4.3.2 "Technical information/Data sheets".

230 V devices

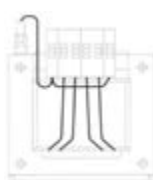


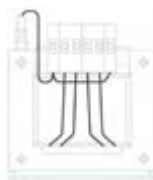

SK 5xxE		Type Power range Data	SK 5xxP	
Designation Part no.	Product		Product	Designation Part no.
SK CI1-230/8-C 278 999 030		Mains choke 0.25 ... 0.37 kW		SK CI5-230/006-C 276 993 005
		8.0 A      6.0 A 2 x 1.0 mH    2 x 4.88 mH		
		Mains choke 0.55 ... 0.75 kW		SK CI5-230/010-C 276 993 009
		8.0 A      10.0 A 2 x 1.0 mH    2 x 2.93 mH		
SK CI1-230/20-C 278 999 040		Mains choke 1.1 ... 2.2 kW		SK CI5-230/025-C 276 993 024
		20.0 A      25.0 A 2 x 0.4 mH    2 x 1.17 mH		

Table 30: Mains chokes for 230 V devices

## 400 V devices







SK 5xxE		Type Power range Data	SK 5xxP		
Designation Part no.	Product		Product	Designation Part no.	
SK CI1-480/6-C 276 993 006		Mains choke 0.55 ... 0.75 kW			SK CI5-500/004-C 276 993 004
		6.0 A 3 x 4.88 mH	4.0 A 3 x 7.35 mH		
		Mains choke 1.1 ... 2.2 kW			SK CI5-500/008-C 276 993 008
		6.0 A 3 x 4.88 mH	8.0 A 3 x 3.68 mH		
SK CI1-480/11-C 276 993 011		Mains choke 3.0 ... 4.0 kW			SK CI5-500/016-C 276 993 016
		11.0 A 3 x 2.93 mH	16.0 A 3 x 1.84mH		
SK CI1-480/20-C 276 993 020		Mains choke 5.5 kW			
		20.0 A 3 x 1.47 mH	16.0 A 3 x 1.84 mH		

Table 31: Mains chokes for 400 V devices

### 2.8.3.2 Motor chokes

In case of long motor cables, motor chokes are installed between the frequency inverter and the motor for improving the EMC characteristics and the device protection. They reduce the motor cable's interference signals, or the cable compensation in case of longer motor cables.

In the following tables, the different motor chokes are assigned to the individual power ranges of both device series and compared to them.

SK CO1-xxx/xxx-C for SK 5xxE



SK CO5-xxx/xxx-C for SK 5xxP

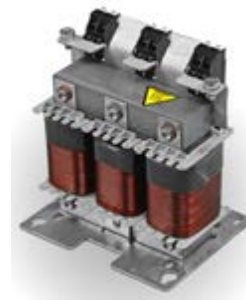



Figure 11: NORDAC PRO motor chokes

The SK CO1-... motor chokes are specified for a maximum supply voltage of 460 V at 50/60 Hz. The SK CO5-... motor chokes are specified for a maximum supply voltage of 500 V at 50/60 Hz.

Both types of motor chokes are UL certified and should always be installed in the control cabinet due to their IP00 protection class version. The motor chokes are connected using screw terminals.

#### Information

All available motor chokes are only rated for a pulse frequency of 3 to 6 KHz and an output frequency of 0 to 120 Hz. The parameterisation is done under the additional parameters in the frequency inverter.

For detailed information, please refer to the technical information  Chapter 4.3.2 "Technical information/Data sheets" and the 4.3.1 "Manuals" manuals.

## 230 V and 400 V devices

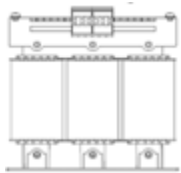


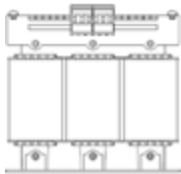

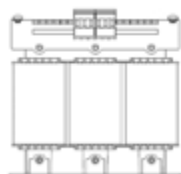
SK 5xxE		Type Power range Data	SK 5xxP	
Designation Part no.	Product		Product	Designation Part no.
SK CO1-460/4-C 276 996 004		Motor choke 0.25 ... 0.75 kW		SK CO5-500/002-C 276 992 002
		4.0 A 3 x 3.5 mH		
		Motor choke 1.1 ... 1.5 kW		SK CO5-500/006-C 276 992 006
		4.0 A 3 x 3.5 mH		
SK CO1-460/9-C 276 996 009		Motor choke 2.2 kW		SK CO5-500/012-C 276 992 012
		9.0 A 3 x 2.5 mH		
		Motor choke 3.0 ... 4.0 kW		
		9.0 A 3 x 2.5 mH		
SK CO1-460/17-C 276 996 017		Motor choke 5.5 kW		
		17.0 A 3 x 1.2 mH		

Table 32: Motor chokes for 230 V and 400 V devices

### 2.8.3.3 Link circuit chokes

The link circuit chokes are connected to the frequency inverter's DC link circuit and reduce the frequency inverter's network loads inherent to its functional principle.

The SK DCL-... link circuit chokes are only available for the SK 5xxE from power size  $\geq 45$  kW.

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#### Information

Optional link circuit chokes for the entire SK 5xxP power range are currently **not** available from Getriebebau NORD.

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Figure 12: SK DCL-950/xxx-C NORDAC PRO SK 5xxE link circuit chokes

The SK DCL-... link circuit chokes are UL certified and should always be installed in the control cabinet due to their IP00 protection class version. The link circuit chokes are connected on both sides using ring cable lugs.



## 3 Dimensions

### Information

In the Dimensions chapter, only those products, options and accessory components are listed that can be used differently with the NORDAC *PRO* product series.

### 3.1 NORDAC *PRO*

In contrast to the SK 5xxE that must be installed using two supplied wall-mounting brackets for the sizes 1 - 4, the SK 5xxP frequency inverters are installed directly on the back in a control cabinet.



Figure 13: NORDAC *PRO*

## 3.2 Frequency inverter

### Dimensioning

The following table and figure compares the dimensions [mm] of both device series regarding their power sizes.

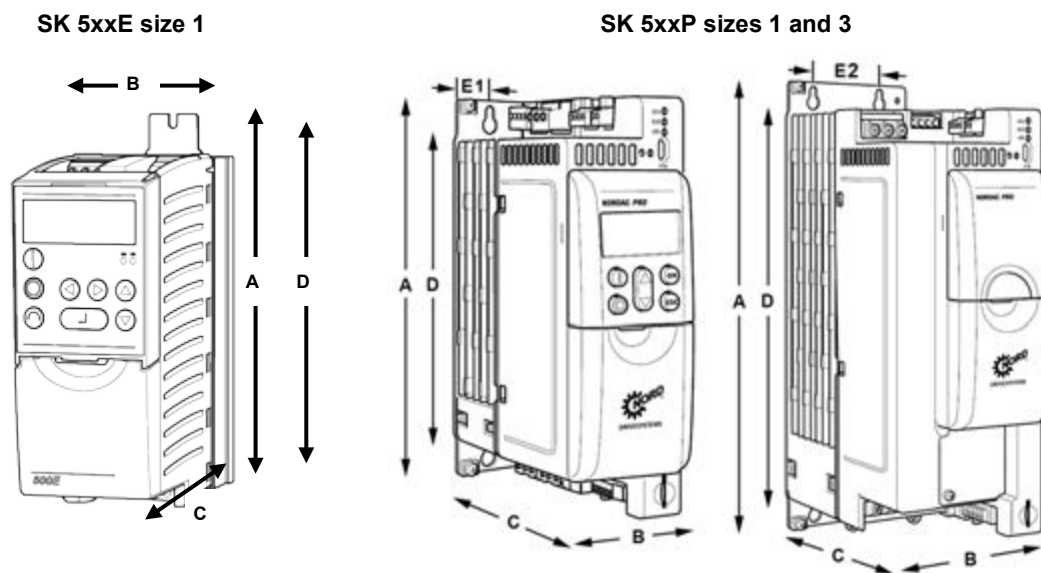


Figure 14: Dimensioning of NORDAC PRO SK 5xxE and SK 5xxP

#### Dimensioning legend

<b>A</b>	Total height <sup>1)</sup>
<b>B</b>	Total width <sup>1)</sup>
<b>C</b>	Total depth <sup>1)</sup>
<b>D</b>	Hole spacing length <sup>2)</sup>
<b>E1/E2</b>	Hole spacing width <sup>2)</sup>

<sup>1)</sup> Delivery state

<sup>2)</sup> Fixing dimensions

**3.2.1 NORDAC PRO device series**

Device types		SK 5xxP-...					
		Size 1		Size 2		Size 3	
		-250-123-A	-111-123-A			-301-340-A	
		-250-340-A	-111-340-A			-401-340-A	
		-370-123-A	-151-123-A			-551-340-A	
		-370-340-A	-151-340-A				
		-550-123-A	-221-123-A <sup>1</sup>				
		-550-340-A	-221-340-A				
		-750-123-A					
		-750-340-A					
SK 5xxE-...	Dimensioning	[mm]		[mm]		[mm]	
-250-323-A -370-323-A -550-323-A -550-340-A -750-323-A -750-340-A	Size 1	A	220	200			
	B	74	66				
	C	153	141				
	D	210	180				
	E	-	22				
-111-323-A -111-340-A -151-323-A -151-340-A -221-323-A -221-340-A	Size 2	A			260	240/255 <sup>1</sup>	
	B				74	66	
	C				153	141	
	D				250	220	
	E				-	22	
-301-340-A -401-340-A	Size 3	A					275
	B						286
	C						98
	D						181
	E						175
-551-340-A	Size 4	A					265
	B						266
	C						-
	D						50
	E						320
		A					286
		B					98
		C					181
		D					175
		E					310
							266
							-
							50

<sup>1</sup> Due to the protruding connection terminal, the second declaration of value applies for the SK 5xxP-221-123-A device type.

**Table 33: Dimensions of NORDAC PRO product series**

### 3.3 Modules and options

#### 3.3.1 SK 5xxE EMC kits

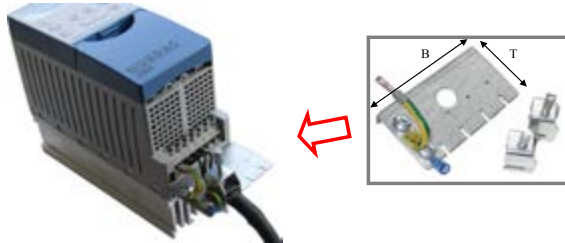


Figure 15: Dimensioning of SK EMC 2-x EMC kits


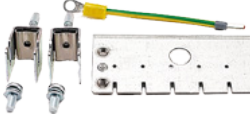


Designation Part no.	Product	Width x Depth [mm]
SK EMC 2-1 275 999 011		73 x 42
SK EMC 2-2 275 999 021		98 x 42

Table 34: Dimensions of SK EMC 2-x EMC kits

3.3.2 SK 5xxP EMC kits



Figure 16: Dimensioning of SK HE5-EMC-... EMC kits

Designation Part no.	Product	Height x Width x Depth [mm]
SK HE5-EMC-MS-HS12 275 292 300		109 x 32 x ???
SK HE5-EMC-MS-HS34 275 292 301		35 x 67 x ??? 32 x 139 x ???
SK HE5-EMC-IS-HS1 275 292 304	In preparation	73 x 35 x ??? 139 x 32 x ???
SK HE5-EMC-IS-HS2 275 292 305	In preparation	??? x ??? x ??? ??? x ??? x ???
SK HE5-EMC-IS-HS3 275 292 306	In preparation	??? x ??? x ??? ??? x ??? x ???

Designation Part no.	Product	Height x Width x Depth [mm]
SK HE5-EMC-CS-HS12 275 292 310	In preparation	??? x ??? x ???
SK HE5-EMC-CS-HS3 275 292 311	In preparation	??? x ??? x ???

Table 35: Dimensions of SK HE5-EMC-... EMC kits

#### 3.3.3 Functional SK CU5-... extensions

Designation Part no.	Product	Width x Height x Depth [mm]
SK CU5-MLT 275 298 200		65.0 x 145.0 x 23.0
SK CU5-STO 275 298 000		65.0 x 145.0 x 23.0

Table 36: Dimensions of SK CU5-MLT und SK CU5-STO

#### 3.4 Control and parametrisation options

##### 3.4.1 Control and parametrisation options


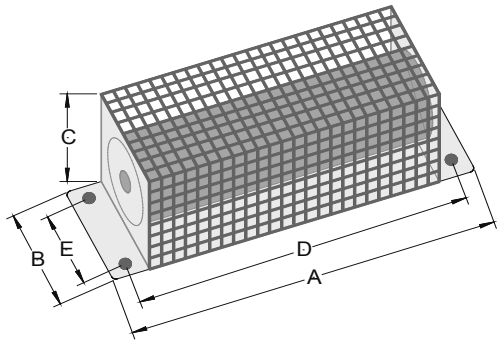
Designation Part no.	Product	Width x Height x Depth [mm]
SK TU5-CTR 275 297 000		65.0 x 72.5 x 17.1

Table 37: Dimensions of SK TU5-CTR ControlBox

### 3.5 Accessories

#### 3.5.1 NORDAC PRO chassis braking resistors

##### Dimensioning



SK BR2-...  
 (Prinzipielle Darstellung, Bauform  
 variiert je nach Leistung)  
 stehend bzw. liegend

Figure 17: Dimensioning of SK BR2-...

Resistor type	Overall dimensions [mm]			Fixing dimensions [mm]		
	A	B	C	D	E	Ø
SK BR2-100/400-C <sup>1</sup>	178	100	252	150	90	4.3
SK BR2-60/600-C <sup>2</sup>	385	92	120	330	64	6.5

<sup>1</sup> vertical

<sup>2</sup> horizontal

Table 38: Dimensions of BR SK BR2-... chassis braking resistors



#### 3.5.2 SK 5xxE footprint braking resistors

##### Dimensioning

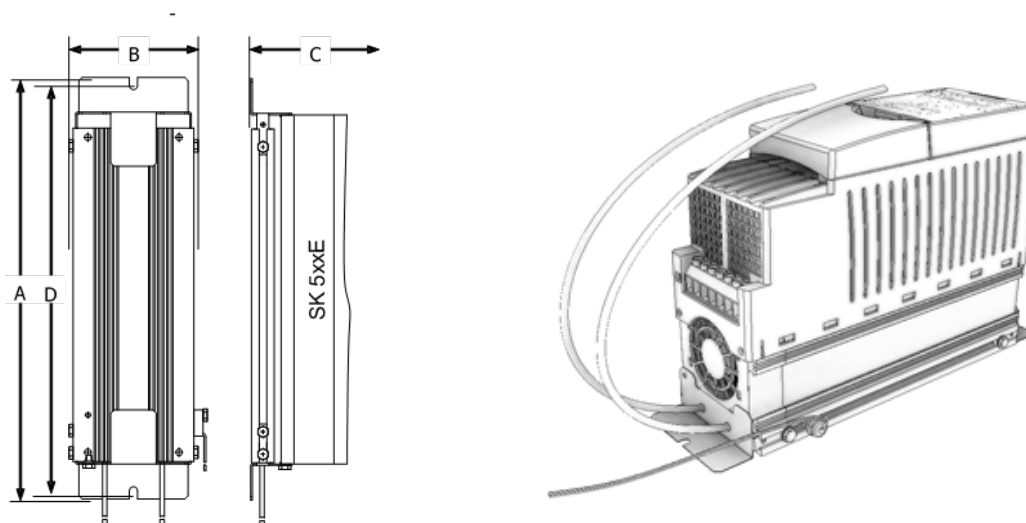


Figure 18: Dimensioning and assembly of SK BR4-... on SK 5xxE

Resistor type	Size	Overall dimensions [mm]			Fixing dimensions [mm]	
		A	B	C <sup>1</sup>	D	Ø
SK BR4-240/100 SK BR4-150/100 SK BR4-400/100	Size 1	230	88	175	220	5.5
SK BR4-75/200 SK BR4-220/200	Size 2	270	88	175	260	5.5
SK BR4-35/400 SK BR4-100/400	Size 3	285	98	239	275	5.5
SK BR4-60/600	Size 4	330	98	239	320	5.5

<sup>1</sup> C = Installation depth of the SK 5xxE frequency inverter + SK BR4

Table 39: Dimensions of SK BR4 footprint braking resistor

### 3.5.3 SK 5xxP footprint braking resistors

#### Dimensioning

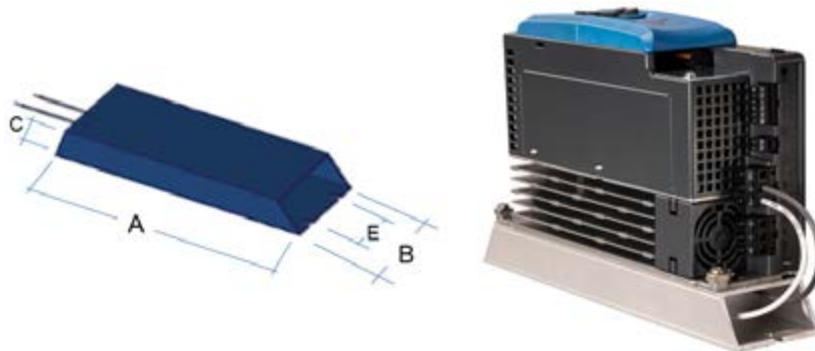


Figure 19: Dimensioning and assembly of SK BRU5-... on SK 5xxP

Resistor type	Size	Overall dimensions [mm]			Fixing dimensions [mm]	
		A	B	C	E <sup>1</sup>	∅
SK BRU5-1-240-050 SK BRU5-1-400-100	Size 1	240	66	40	-	5.5
SK BRU5-2-220-200 SK BRU5-2-075-200	Size 2	280	66	40	-	5.5
SK BRU5-3-100-300	Size 3	340	91	50	50	5.5

<sup>1</sup> Size 1 and Size 2: 2 x 1 Attachment point  
Size 3: 2 x 2 Attachment points

All dimensions are provisional values

Table 40: Dimensions of SK BRU5-... footprint braking resistor

### 3.5.4 NORDAC *PRO* line filters

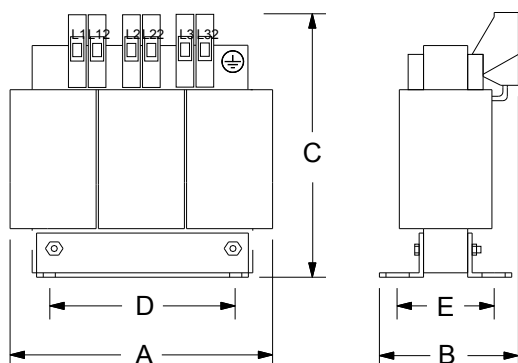
#### **Information**

Line filters for the NORDAC *PRO* SK 5xxP device series are only verified on request.

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### 3.5.5 SK 5xxE mains chokes

#### Dimensioning



1~ 230 V chokes are similar to figure

Figure 20: Dimensioning of SK CI1 mains chokes

Choke type	Overall dimensions [mm]			Fixing dimensions [mm]		
	A	B	C	D	E	Ø
SK CI1-230/8-C	78	65	89	56	40	4.8
SK CI1-230/20-C	96	90	106	84	65	4.8

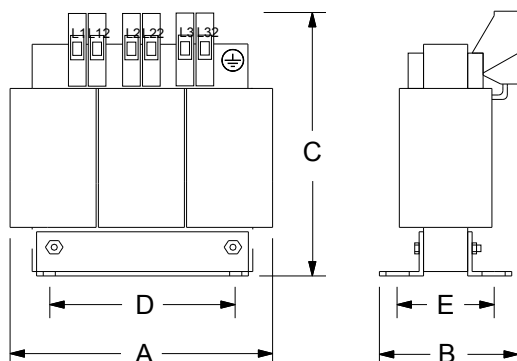
Table 41: Dimensions of 1~ 230 V SK CI1 mains chokes

Choke type	Overall dimensions [mm]			Fixing dimensions [mm]		
	A	B	C	D	E	Ø
SK CI1-480/6-C	96	60	117	71	45	4.8
SK CI1-480/11-C	120	85	140	105	70	4.8
SK CI1-480/20-C	155	110	177	135	95	5.8

Table 42: Dimensions of 3~ 400 V SK CI1 mains chokes

#### 3.5.6 SK 5xxP mains chokes

##### Dimensioning



1~ 230 V chokes are similar to figure

Figure 21: Dimensioning of SK CI5 mains chokes

Choke type	Overall dimensions [mm]			Fixing dimensions [mm]		
	A	B	C	D	E	Ø
SK CI5-230/006-C	60	66	68	44	39	M3
SK CI5-230/010-C	84	78	96	64	52	M4
SK CI5-230/025-C	84	87	96	64	52	M4

Table 43: Dimensions of 1~ 230 V SK CI5 mains chokes

Choke type	Overall dimensions [mm]			Fixing dimensions [mm]		
	A	B	C	D	E	Ø
SK CI5-500/004-C	80	60	116	56 / 71	38 / 45	M4
SK CI5-500/008-C	120	85	135	90 / 105	39 / 70	M4
SK CI5-500/016-C	120	95	135	90 / 105	49 / 80	M4

Table 44: Dimensions of 3~ 400 V SK CI5 mains chokes

### 3.5.7 SK 5xxE motor chokes

#### Dimensioning

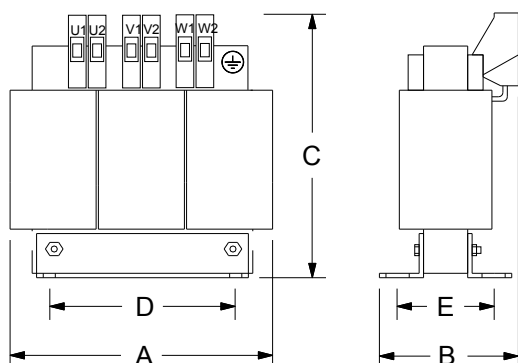


Figure 22: Dimensioning of SK CO1 motor chokes

Choke type	Overall dimensions [mm]			Fixing dimensions [mm]		
	A	B	C	D	E	Ø
SK CO1-460/4-C	120	104	140	84	75	6.5
SK CO1-460/9-C	155	110	160	130	71.5	6.5
SK CO1-460/17-C	185	102	201	170	57	8

Table 45: Dimensions of 230 V and 400 V SK CO1 motor chokes

#### 3.5.8 SK 5xxP motor chokes

##### Dimensioning

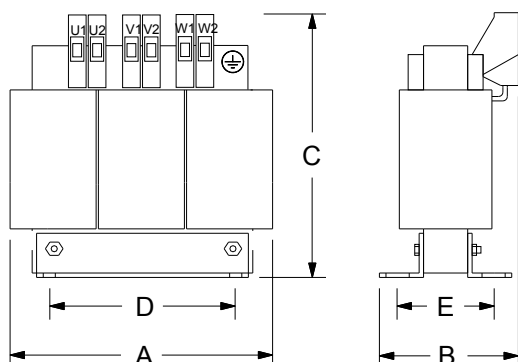


Figure 23: Dimensioning of SK CO5 motor chokes

Choke type	Overall dimensions [mm]			Fixing dimensions [mm]		
	A	B	C	D	E	Ø
SK CO5-500/002-C	120	85	140	90 / 105	39 / 70	4.8
SK CO5-500/006-C	120	95	160	90 / 105	49 / 80	4.8
SK CO5-500/012-C	155	95	165	113 / 135	50 / 80	5.8

Table 46: Dimensions of 230 V and 400 V SK CO5 motor chokes

### 3.5.9 NORDAC *PRO* link circuit chokes

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 **Information**

Link circuit chokes for the NORDAC *PRO* SK 5xxP device series are not available.

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## 4 Additional information

### 4.1 Software

The below-mentioned software products are available free of charge on the homepage at [Software](#) (Main page -> Documentation -> Software).

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#### **Information**

Getriebebau NORD GmbH & Co. KG does not accept any warranty for the installation and usage of the software products.

- NORDCON, NORDCON *APP*
  - NORDAC options
  - Device master data for field bus systems
  - NORD TIA Portal standard modules
  - NORD S7 Siemens standard modules
  - NORD SISTEMA libraries
  - ePLAN MACROS
-

### 4.1.1 NORDCON

For programming and operation of NORDAC electronic drive technology, computer-based software is available for download at [www.nord.com](http://www.nord.com).

The NORDCON software comprises the parametrisation of starters, frequency inverters as well as technology and customer units.

For further information, please refer to the link listed below.



Software	Description	Version
<a href="#">NORDCON</a>	The NORDCON software is a program for computer applications for controlling and parameterising frequency inverters from Getriebebau NORD GmbH & Co. KG. The communication with electronic drive technology devices is realised via the computer's serial SUB-D9 interface or a normal USB adapter via the USB interface.	≥ 2.7

Table 47: NORDCON software

### 4.1.2 NORDCON APP

For the mobile commissioning and service solution of NORDAC electronic drive technology devices, a software app for mobile terminal devices is available for download at [www.nord.com](http://www.nord.com).

NORDCON APP (available for iOS and Android) is a dashboard-based visualisation

- for drive monitoring and fault diagnosis
- Parameterisation with help function + rapid access to parameters
- Oscilloscope function for drive analysis
- Backup and recovery function for simple handling of drive parameters

For further information, please refer to the links listed below.



Software	Description	Version
<a href="#">NORDCON APP</a>	NORDCON APP software is an application for mobile terminal devices for commissioning and service analysis of NORDAC devices from Getriebebau NORD GmbH & Co. KG. The communication with electronic drive technology devices is realised with NORDAC ACCESS BT via a wireless Bluetooth connection. <a href="#">📖 QUICK-START (S9090)</a>	≥ 1.0

Table 48: NORDCON APP

### 4.1.3 NORDAC ACCESS BT

NORDAC ACCESS BT is the mobile Bluetooth access for electronic drive technology devices from Getriebbau NORD GmbH & Co. KG. It is used for wireless connection of devices to a mobile terminal device.

Monitoring, parameterisation and analysis of the connected device can be carried out using the free NORDCON APP software.

Furthermore, NORDAC ACCESS BT can be used to exchange parameter data

- between 2 identical devices
- via an USB port to a computer



For further information, please refer to the links listed below.


Product	Description	Version
<a href="#">NORDCON APP</a>	<p>Monitoring, parameterisation and analysis of NORD electronic drive technology devices via Bluetooth (mobile terminal device with NORDCON APP software required)</p> <ul style="list-style-type: none"> <li>• Integrated data storage for parameter data exchange</li> <li>• Mechanical switch to activate write protection (LOCK)</li> <li>• RJ12 plug connector for connection to the device (RS485 communication)</li> <li>• USB Type A plug connector for connection to a computer</li> <li>• 3 multi-colour LEDs as status and operation indicators</li> <li>• 2 operating keys (data transfer, upload and download)</li> </ul> <p> <a href="#">QUICK-START (S9090)</a></p>	≥ V1.0R1

Table 49: NORDAC ACCESS BT

#### 4.1.4 Field bus files

For planning and programming the different field bus systems and bus interfaces, several software files for integration into different automation systems are available for download for the NORDAC PRO device series at [www.nord.com](http://www.nord.com).

The NORDAC options comprise the manufacturer and device-specific information and parameters required for connecting the NORD products' bus system-specific field bus systems and bus interfaces to the respective used bus system.

For further information, please refer to the link listed below or to the assigned "readme" text files.



Software	Description	Version
<a href="#">Field bus files</a>	<p>NORDAC field bus files are software files including software files assigned to bus systems (PROFIBUS DP – GSD, CANopen – EDS, EtherCAT – XML, etc.) for planning system-specific automation projects with frequency inverters from Getriebebau NORD GmbH &amp; Co. KG.</p> <p>The software files are assigned to the available field bus systems of the different device series.</p> <p>The implementation of the software files is done via integration into the control or automation software of the respective bus system manufacturer.</p>	Software- and system-dependent

#### 4.2 ePLAN macros

For the planning and creation of circuit diagrams, the respective ePLAN macros are available for download at [www.nord.com](http://www.nord.com) for NORDAC electronic drive technology products. The macros allow an easy integration of frequency inverters and options into your circuit and wiring diagrams. The macros contain files in EDZ format. In ePLAN, these can be converted into DXF or PDF files.

For further information, please refer to the link listed below.



Software	Description	Version
<a href="#">NORD ePLAN macros</a>	<p>NORD ePLAN macros are available for planning and documentation of electronic automation projects for frequency inverters from Getriebebau NORD GmbH &amp; Co. KG.</p>	ePLAN P8

### 4.3 Further documentation

Further documentations on the products mentioned in this document are available as a supplement to this migration guide.

#### 4.3.1 Manuals

For basic information on NORDAC *PRO*, please refer to the respective main manual of the current device series (e.g. BU 0500 for SK 500E).

For further information on field-specific Ethernet-based bus systems (e.g. PROFINET IO), please refer to the respective supplementary manuals (e.g. BU 2400 for PROFINET IO).

For further information on control and parameterisation units (e.g. SK TU3-PAR or SK PAR-3E), please refer to the BU 0040 manual for control and parameterisation units.

Document	Designation
<a href="#">BU 0000</a>	NORDCON software manual
<a href="#">BU 0040</a>	Control and parameterisation units manual
<a href="#">BU 0050</a>	USS protocol and MODBUS RTU manual
<a href="#">BU 0070</a>	InterBus manual
<a href="#">BU 0090</a>	AS-Interface manual
<a href="#">BU 0500</a>	SK 5xxE (SK 500E ... SK 535E) manual
<a href="#">BU 0505</a>	SK 54xE (SK 540E und SK 545E) manual
<a href="#">BU 0510</a>	POSCON positioning control (SK 530E ... SK 545E) manual
<a href="#">BU 0530</a>	Functional Safety (SK 51xE and $\geq$ SK 530E) manual
<a href="#">BU 0540</a>	Brief instructions SK 5xxE (SK 500E ... SK 545E) manual
<a href="#">BU 0550</a>	Supplementary PLC NORDAC (all device series) manual
<a href="#">BU 0600</a>	NORDAC <i>PRO</i> SK 500P (SK 500P ... SK 550P) manual
<a href="#">BU 0610</a>	POSCON positioning (SK 500P ... SK 550P) manual
<a href="#">BU 0620</a>	Supplementary NORDAC <i>PRO</i> Industrial Ethernet (SK 550P) manual
<a href="#">BU 0630</a>	Functional safety (SK 510P, SK 530P, SK 550P und SK CU5-...) manual
<a href="#">BU 0940</a>	NORD S7 standard modules manual
<a href="#">BU 0950</a>	TIA standard modules manual
<a href="#">BU 0960</a>	NORDAC <i>ACCESS BT</i> , SK TIE5-BT-STICK manual
<a href="#">BU 2100</a>	Supplementary EtherNet/IP bus interface manual
<a href="#">BU 2200</a>	POWERLINK bus interface manual
<a href="#">BU 2300</a>	EtherCAT bus interface manual
<a href="#">BU 2400</a>	Supplementary PROFINET IO bus interface manual
<a href="#">BU 2500</a>	CANopen bus interface manual
<a href="#">BU 2600</a>	DeviceNet bus interface manual
<a href="#">BU 2700</a>	Supplementary PROFIBUS DP bus interface manual
<a href="#">BU 2800</a>	Supplementary PROFIsafe bus interface manual

### 4.3.2 Technical information/Data sheets

Basic information on some additional components, e.g. braking resistors and EMC line filters, or adapter and connecting cables – used for the mentioned frequency inverter series – are documented in separate technical information/data sheets (e.g. TI 275900210 for the IO extension SK EBIOE-2).

#### Options and modules

Document	Designation
<a href="#">TI 275900210</a>	Tech. information/data sheet SK EBIOE-2 IO extension
<a href="#">TI 275900085</a>	Tech. information/data sheet DeviceNet SK TU3-DEV
<a href="#">TI 275900030</a>	Tech. information/data sheet PROFIBUS DP SK TU3-PBR
<a href="#">TI 275900160</a>	Tech. information/data sheet PROFIBUS DP SK TU3-PBR-24V
<a href="#">TI 275900180</a>	Tech. information/data sheet EtherCAT SK TU3-ECT
<a href="#">TI 275900150</a>	Tech. information/data sheet ETHERNET IP SK TU3-EIP
<a href="#">TI 275900140</a>	Tech. information/data sheet POWERLINK SK TU3-POL
<a href="#">TI 275900190</a>	Tech. information/data sheet PROFINET IO SK TU3-PNT
<a href="#">TI 275999011</a>	Tech. information/data sheet EMC kit SK EMC2-1
<a href="#">TI 275999021</a>	Tech. information/data sheet EMC kit SK EMC2-2
<a href="#">TI 278910120</a>	Tech. information/data sheet Handheld control box SK POT1-1
<a href="#">TI 278910140</a>	Tech. information/data sheet Handheld control box SK POT1-2
<a href="#">TI 278910310</a>	Tech. information/data sheet Signal converter 0-10 V → Frequency signal
<a href="#">TI 278910315</a>	Tech. information/data sheet Signal converter 0-10 V → 0-20 mA
<a href="#">TI 278910320</a>	Tech. information/data sheet Signal converter -10... +10 V → 0-10 V
<a href="#">TI 278910360</a>	Tech. information/data sheet Adapter module Level adapter HTL - RS422
<a href="#">TI 275274603</a>	Tech. information/data sheet Signal converter RS485 – RS232, IP20
<a href="#">TI 275274604</a>	Tech. information/data sheet Signal converter RS232-USB, IP20
<a href="#">TI 278910340</a>	Tech. information/data sheet Connection kit HTL encoder WK 4/2/4*680 Ω
<a href="#">TI051_275274601</a>	Tech. information/data sheet Connecting cable SK TIE4-RJ12-RJ12
<a href="#">TI059_19140990</a>	Tech. information/data sheet Electronic brake rectifier SK EBGR 1
<a href="#">TI 80-0011</a>	Tech. information EMC - Installation of NORD components
<a href="#">TI 80-0019</a>	Tech. information Dimensioning of the protective conductor
<a href="#">TI 80-0020</a>	Tech. Information Climate classes
<a href="#">TI 80-0030</a>	Tech. information STO for NORDAC PRO
<a href="#">TI 80-0031</a>	Tech. information POSICON for NORDAC PRO
TI 275292100 in prep.	Tech. information/data sheet USB cable 3 m SK CE-USB-C-PC-USB-3M (275292100)

### Accessories

Document	Designation
Collective TI in prep.	Tech. information/data sheet EMC kits SK HE5-EMC-...
Collective TI in prep.	Tech. information/data sheet Footprint braking resistor SK BRU5-...
Collective TI in prep.	Tech. information/data sheet Mains chokes SK CI5-...
Collective TI in prep.	Tech. information/data sheet Motor chokes SK CO5-...
TI 278282040	Tech. information/data sheet Chassis braking resistor SK BR2-100/400-C
TI 278282060	Tech. information/data sheet Chassis braking resistor SK BR2-60/600-C
TI 275991110	Tech. information/data sheet Footprint braking resistor SK BR4-240/100
TI 275991115	Tech. information/data sheet Footprint braking resistor SK BR4-150/100
TI 275991120	Tech. information/data sheet Footprint braking resistor SK BR4-75/200
TI 275991140	Tech. information/data sheet Footprint braking resistor SK BR4-35/400
TI 275991210	Tech. information/data sheet Footprint braking resistor SK BR4-400/100
TI 275991220	Tech. information/data sheet Footprint braking resistor SK BR4-220/200
TI 275991240	Tech. information/data sheet Footprint braking resistor SK BR4-100/400
TI 275991260	Tech. information/data sheet Footprint braking resistor SK BR4-60/900
<a href="#">TI 278272008</a>	Tech. information/data sheet Chassis line filter SK HLD 110-500/8
<a href="#">TI 278272016</a>	Tech. information/data sheet Chassis line filter SK HLD 110-500/16
<a href="#">TI 278272030</a>	Tech. information/data sheet Chassis line filter SK HLD 110-500/30
<a href="#">TI 278273003</a>	Tech. information/data sheet Footprint combined line filter SK NHD-480/3-F
<a href="#">TI 278273006</a>	Tech. information/data sheet Footprint combined line filter SK NHD-480/6-F
<a href="#">TI 278273010</a>	Tech. information/data sheet Footprint combined line filter SK NHD-480/10-F
<a href="#">TI 278273016</a>	Tech. information/data sheet Footprint combined line filter SK NHD-480/16-F
<a href="#">TI 278273002</a>	Tech. information/data sheet Footprint line filter SK LF2-480/2-F
<a href="#">TI 278273005</a>	Tech. information/data sheet Footprint line filter SK LF2-480/5-F
<a href="#">TI 278273009</a>	Tech. information/data sheet Footprint line filter SK LF2-480/9-F
<a href="#">TI 278273015</a>	Tech. information/data sheet Footprint line filter SK LF2-480/15-F
<a href="#">TI 278273045</a>	Tech. information/data sheet Footprint line filter SK LF2-480/45-F

For further information on the accessory components, e.g. chokes, braking resistors and line filters, please refer to the NORDAC *PRO* manuals (BU 0500, BU 0505 and BU 0600).

If you require further information on the additional components, please contact the Getriebbau NORD GmbH & Co. KG service/technical support.

Further manufacturer-specific data sheets may be provided on request.

### 4.3.3 Product flyers/brochures

For summarised product information on the NORDAC *PRO* SK 5xxE and SK 5xxP frequency inverters, the different bus interfaces, options and the corresponding accessory components (e.g. chokes, braking resistors or line filters), please refer to the assigned product flyers.

Document	Designation
<a href="#">E 3000</a>	Catalogue NORDAC electronic drive technology
<a href="#">F 3050</a>	Flyer NORDAC <i>PRO</i> SK 500E control cabinet inverter
<a href="#">F 3060</a>	Flyer NORDAC <i>PRO</i> SK 500P control cabinet inverter
<a href="#">Technical information</a>	Technical information Training manual

## 4.4 Product configurator

Among others, the product configurator is available for planning and migration of the NORDAC product components. Please find the planning aids using the configurator on our homepage at

[NORD - Product configurator](#).

The product configurator can be used to generate the available drawings and CAD files in different formats.

- 3D models
- Outline drawings
- Dimensioned drawings

## 4.5 CAD data

### 4.5.1 3D model

The STEP 3D models of the frequency inverters and some additional components can be automatically generated via the homepage on the CAD data tab. Different formats like .dxf, .igs, .obj, .sat or .stp are available for download.

In case of any queries, please contact the Getriebebau NORD GmbH & Co. KG service/technical support.

### 4.5.2 Outline drawings

The products' outline drawings are available for download in .dxf format.

### 4.5.3 Dimensioned drawings

The products' dimensioned drawings are available for download in .pdf and .dxf formats.



### 4.6 Certificates

The certificates of the below-mentioned categories are available on the homepage at [Certificates](#) (Main page -> Documentation -> Certificates).



#### Information

You can gain fastest access to the certificates via the rapid access and the selection of the respective category:

- Electronic drive technology
  - Declaration of Conformity
  - Safe function
  - ATEX
  - CE
  - UL
  - CSA
  - RoHS
-

## 5 Appendix

### 5.1 List of abbreviations

Abbreviations used in this guide:

Abbreviation	Meaning
3E	Installation
3H	Handheld
AG	Absolute encoder
AIN	Analogue input
AOUT	Analogue output
AS (AS1)	AS-Interface
BT	Bluetooth stick
BW	Braking resistor
CAD	Computer-aided drafting
CAN	Controller Area Network
CAO	Controller Area Network, higher protocol
CI	Mains choke type/designation
CO	Motor choke type/designation
CSX	SimpleControlBox
CTR	ControlBox
CU	Customer unit
DCL	Link circuit choke type/designation
DEV	DeviceNet
ECT	EtherCAT
EIP	EtherNet/IP
EMC	Electromagnetic compatibility
FI	Frequency inverter
HLD	Chassis line filter type/designation
HTL	High-Threshold Logic
IBS	InterBus
IP	Internet protocol
IP	Protection class
I/O	Input, Output
LCD	Liquid-crystal display
LED	Light-emitting diode
LF2	Line filter type/designation
NHD	Footprint line filter type/designation combined filter
PAR	ParameterBox
PBR	PROFIBUS DP
PNT	PROFINET IO
POL	POWERLINK
POS	POSSICON
POT	PotentiometerBox
RS232	Serial 232 interface

Abbreviation	Meaning
RS422	Serial 422 interface
RS485	Serial 485 interface
SH	Safe stop
SK	Schlicht & Küchenmeister
SIN/COS	Sine/Cosine encoder type
SS1	Safe Stop 1 time-controlled
SSI	Synchronous Serial Interface
STO	Safe Torque Off
TI	Technical information/Data sheet
TTL	Transistor–transistor logic
TU	Technology unit
UB	Footprint
UL	Certification
USB	Universal serial bus
USS	Universal serial interface

## 5.2 Technical support

For further information on these documents or other potential applications, please contact the Getriebebau NORD GmbH & Co. KG [Electronic Service](#).

Further required information or software files (e.g. special software versions or firmware for software updates) may be provided to the user on request after technical consultation.

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