Intelligent Drivesystems, Worldwide Services

GB

MI 0700

Frequency inverters

Migration Guide SK 700E to SK 5xxE

NORD DRIVESYSTEMS

Documentation

Name:		
Part No.:	608 99 02	
Series:	SK 500E and SK 700E	
Device series:	SK 500E, SK 505E, SK 510E, SK 511E, SK 515E, SK 520E, SK 530E, SK 535E, SK 540E, SK 545E SK 700E	
FI types:	**SK 5xxE-151-340-A ... SK 5xxE-163-340-A**	(1.5 - 160.0 kW, 3~ 400 V, output 3~ 400 V)
	SK 700E-151-340-A ... SK 700E-222-340-A	(1.5 - 22.0 kW, 3~ 400 V, output 3~ 400 V)
	SK 700E-151-340-A (-RS2) **... SK 700E-222-340-A** (-RS2)	(1.5 - 22.0 kW, 3~ 400 V, output 3~ 400 V)
	SK 700E-302-340-O ... SK 700E-163-340-O	(30.0 - 160.0 kW, 3~ 400 V, output 3~ 400 V)

Version list

Name of previous issues	Software version	Remarks
MI 0700 EN, September 2013 Part No. 608 9902 / 4513	SK 5xxE ≥ V 2.0 R0	First version.
MI 0700 EN, January 2014 Part No. 608 9902 / 0414		• Implementation size 11 (160 kW) • Correction of technical data

Table 1: Version list

Validity

The present Migration Guide is to assist in migrating the frequency inverter series SK 700E to the innovative next frequency inverter series SK 500E. Use the Migration Guide as planning aid in addition to the respective main manuals BU 0700 or BU 0500 and BU 0505. The present Migration Guide provides all the information needed to migrate any of the frequency inverter types. MI 0700 also contains a summarised comparison of additional and optional components necessary for basic migration/planning of drive technology applications. For more information, in particular regarding parameters, options and special functions please refer to the latest respective main manuals of the frequency inverters and applicable instructions for field bus options (such as PROFIBUS DP) or special frequency inverter functions such as POSICON).

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1 Introduction

This document serves for the migration of drive solutions with SK 700E series frequency inverters to the new model SK 500E. As well as the comparison and migration of the usual modules in the first part of the document, the middle part deals with the comparison of the connection terminals and the final part describes the dimensions of the devices.

Both series (SK 700E and SK 500E) are similar in their basic structure, however the performance and scope of functions of the new series has been considerably increased. Until the end of 2013, the SK 5xxE will also be available up to size 11 (160.0 kW) for the identical power range of the SK 700E. The comparison only covers the 3 ph ~ 400 / 480 V types of frequency inverters. The present document only describes the functions and solutions which could also be implemented with the SK 700E. In addition, in the description of possible options, only the most common have been described and listed in detail. The Migration Guide MI 0700 also compares the respective additional components.

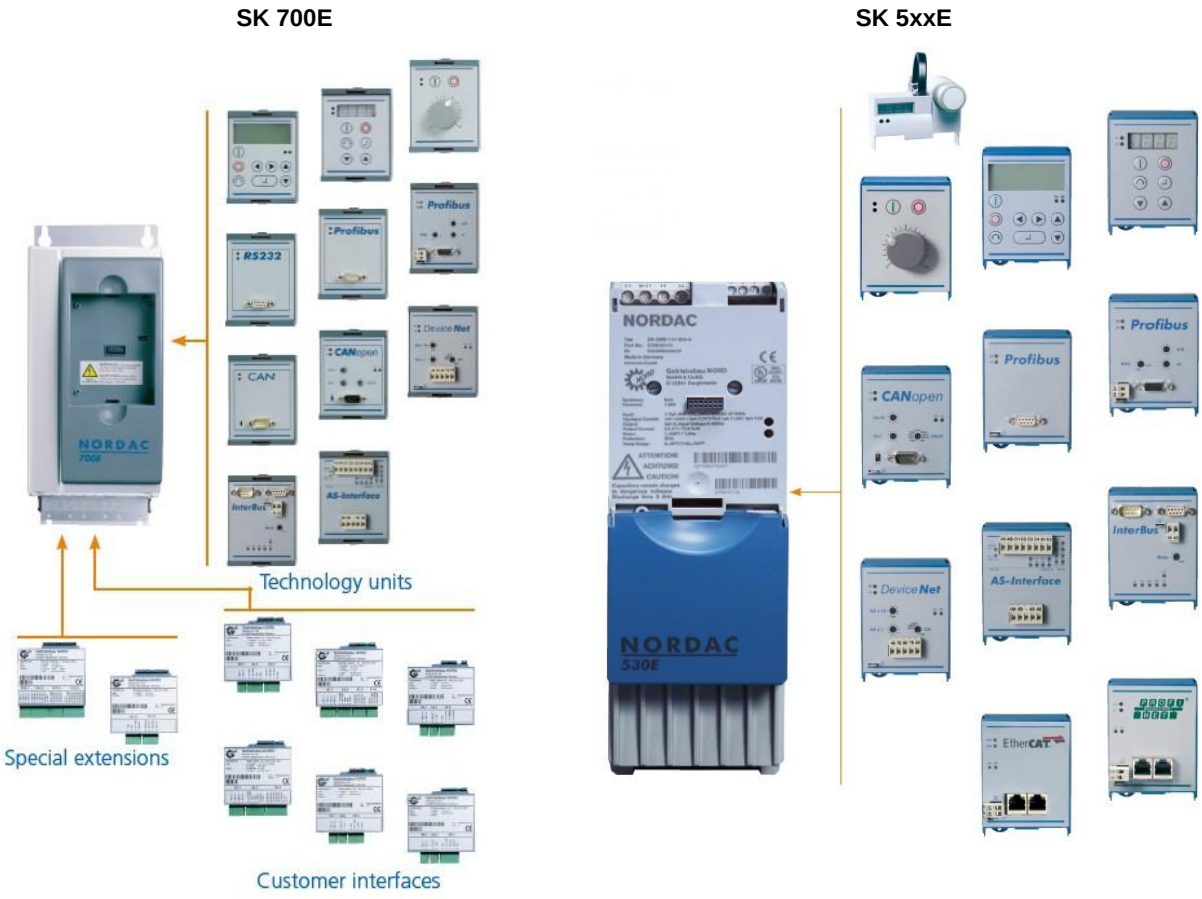


Figure 1: System Overview

1.1 Components overview

The following table lists and compares the individual components for the conversion of the two different frequency inverter series. Both frequency inverter types comply with protection class IP20. Special variants such as frequency inverters and options with coated boards are not described in detail.

SK 700E		SK 700E components / Functions	SK 5xxE	
Name	**Figure**		**Figure**	**Name**
SK 700E-xxx-340-A / -O		Frequency inverter with/without integrated mains filter		SK 5**xx**E-xxx-340-A
SK 700E-xxx-340-A-RS2		Frequency inverter with integrated RS232		SK 5**xx**E-xxx-340-A incl.
SK TU1-RS2		Technology unit RS232 interface		SK 5**xx**E-xxx-340-A incl.
SK TU1-POT		Technology unit RS232 interface		SK TU3-POT
SK TU1-**xxx**		Technology unit Field bus		SK TU3-**xxx**
SK TU1-PAR		Technology unit Parameterbox		SK TU3-PAR
SK TU1-CTR		Technology unit ControlBox		SK TU3-CTR
SK CU1-**xxx**		I/O customer units		SK 5**xx**E-xxx-xxx-A incl.
SK CU1-**xxx**		Field bus customer units		SK 5**11**E-xxx-xxx-A SK 5**15**E-xxx-xxx-A on board to integrate

SK 700E		SK 700E components / Functions	SK 5xxE	
Name	**Figure**		**Figure**	**Name**
SK XU1-ENC		Extension unit incremental encoder interface ENCODER		SK 5**20**E-xxx-xxx-A SK 5**35**E-xxx-xxx-A incl.
SK XU1-POS		Extension unit POSICON		SK 5**30**E-xxx-xxx-A SK 5**35**E-xxx-xxx-A incl.
SK XU1-POS + SSI absolute encoder		Extension unit POSICON + SSI absolute encoder		SK 5**40**E-xxx-xxx-A SK 5**45**E-xxx-xxx-A incl.
SK BR2-xxx/xxxx-C		Chassis brake chopper		SK BR2-xxx/xxxx-C
SK BR1-xxx/xxx-F		Footprint resistor		SK BR4-xxx/xxx
HLD 1xx-500/xxx SK LF1-460/xx-F		Mains filter several variants		SK HLD 110-500/xxx SK LF2-480/xxx-F SK NHD-480/xxx-F
SK CI1-460/xxx-C		Input chokes		SK CI1-480/xxx-C
SK CO1-460/xxx-C		Output chokes		SK CO1-4x0/xxx-C

Table 2: Components overview

1.2 frequency inverters overview

The assignment of the SK 700E frequency inverters dependent on function and rated power of the devices is summarised below. The overview table below shows each of the customer units SK CU1-xxx, extension units SK XU1-xxx and the two CAN or CANopen technology options SK TU1-CAN and SK TU1-CAO for the SK 700E frequency inverter.

Additional functions of field bus systems or technology units (such as AS-Interface, PROFIBUS DP, DeviceNet etc.) are listed in chapter 2.2.2 Field bus and communication technology units. The I/O customer unit types SK CU1-xxx of the SK 700E series of frequency inverters are also described there in greater detail.

Where needed, these different customer units are used to connect I/O control signals.

SK 700E	**Performance levels**	**SK 5xxE**
Name		**Name**
SK 700E-xxx-340-**X** (-RS2) * optional with integrated RS232	1.5 kW … 7.5 kW / 2 hp … 10 hp	SK 500E-xxx-340-A
	11.0 kW … 160.0 KW / 15 hp … 220 hp	SK 5**15**E-xxx-340-A
SK 700E-xxx-340-**X** (-RS2) * + ENCODER SK XU1-ENC	1.5 kW … 7.5 kW / 2 hp … 10 hp	SK 5**20**E-xxx-340-A
	11.0 kW … 160.0 KW / 15 hp … 220 hp	SK 5**35**E-xxx-340-A
SK 700E-xxx-340-**X** (-RS2) * + POSICON SK XU1-POS	1.5 kW … 7.5 kW / 2 hp … 10 hp	SK 5**30**E-xxx-340-A
	11.0 kW … 160.0 KW / 15 hp … 220 hp	SK 5**35**E-xxx-340-A
SK 700E-xxx-340-**X** (-RS2) * + POSICON SK XU1-POS ± SSI absolute encoder + IO customer unit SK CU1-xxx **	1.5 kW … 7.5 kW / 2 hp … 10 hp	SK 5**40**E-xxx-340-A optional SK EBIOE-2 ***
	11.0 kW … 160.0 KW / 15 hp … 220 hp	SK 5**45**E-xxx-340-A optional SK EBIOE-2 ***
SK 700E-xxx-340-**X** (-RS2) * + CAN Bus SK CU1-CAN	1.5 kW … 7.5 kW / 2 hp … 10 hp	SK 5**11**E-xxx-340-A optional WAGO- adapter module RJ45/terminal ****
	11.0 kW … 160.0 KW / 15 hp … 220 hp	SK 5**15**E-xxx-340-A optional WAGO- adapter module RJ45/terminal ****

SK 700E Name	Performance levels	SK 5xxE Name
SK 700E-xxx-340-**X** (-RS2) * + CAN Bus SK CU1-CAN-RJ	1.5 kW … 7.5 kW / 2 hp … 10 hp	SK 5**11**E-xxx-340-A
	11.0 kW … 160.0 KW / 15 hp … 220 hp	SK 5**15**E-xxx-340-A
SK 700E-xxx-340-**X** (-RS2) * + CAN Bus SK TU1-CAN	1.5 kW … 7.5 kW / 2 hp … 10 hp	SK 5**11**E-xxx-340-A optional WAGO-adapter module RJ45/terminal ****
	11.0 kW … 160.0 KW / 15 hp … 220 hp	SK 5**15**E-xxx-340-A optional WAGO-adapter module RJ45/terminal ****
SK 700E-xxx-340-X (-RS2) * + CANopen Bus SK TU1-CAO	1.5 kW … 7.5 kW / 2 hp … 10 hp	SK 5**11**E-xxx-340-A + CANopen Bus SK TU3-CAO
	11.0 kW … 160.0 KW / 15 hp … 220 hp	SK 5**15**E-xxx-340-A + CANopen Bus SK TU3-CAO

*	(-RS2) with additional optional/integrated RS232 interface on SK 700E frequency inverters ≤ 22.0 kW. The token **X** represents **A** (with integrated mains filter) on SK 700E frequency inverters ≤ 22.0 kW **O** (without integrated mains filter) on SK 700E frequency inverters ≥ 30.0 kW
**	plus one of the customer units SK CU1-BSC, SK CU1-STD, SK CU1-MLT or SK CU1-MLT-20mA.
***	When a great number of control signals (number of used DIs and DOs of customer units SK CU1-xxx and extension units SK XU1-POS) for the SK 700E and the available DIs and DAs of the SK 5xxE are used, an additional IO extension type SK EBIOE-2 (275900210) is necessary. The IO extension Scan only be connected to SK 540E and SK 545E frequency inverters.
****	WAGO adapter module RJ45/terminal (278910300) to connect the CAN cable with an RJ45 western plug to the SK 5xxE, alternatively crimp an RJ45 plug to the CAN cable.

Table 3: Overview of frequency inverter functions

Information

Integrated mains filter

The SK 700E frequency inverters of power range 1.5 kW to 22.0 kW listed above come with an **integrated mains filter** of class **A** by default and are identified with abbreviation **-A** in the type code. SK 700E frequency inverters with a power ≥30.0 kW do not feature an integrated mains filter and are identified with abbreviation **-O** in the type code. All SK 5xxE frequency inverters (complete power range from 1.5 kW to 160 kW) come ex factory with an integrated Class C2 (industrial) mains filter. With motor cable lengths ≤ 5 m, the SK 5xxE frequency inverters in the power range 1.5 kW to 7.5 kW even comply with Class C1 (residential and industrial). All SK 5xxE frequency inverters feature an on board **integrated mains filter** and are identified with abbreviation **-A** in the type code.

For information on the mains filter functions of SK 700E- …-**A** or … -**O** frequency inverters with and without integrated mains filter, please refer to the respective manual (BU 0700) (www.nord.com).

Information — RS232 interface variants

The functions of SK 700E frequency inverters in the power range of 1.5 kW to 22.0 kW can also comprise an additional **RS232** interface. Frequency inverter variants with optional **RS232** are identified with abbreviation **RS2** in the type code on the type label of SK 700E devices. For the power range of 1.5 kW to 22.0 kW, the **RS232** interface variant of the SK 700E is an additional optional function. By default, SK 700E frequency inverters ≥ 30.0 kW come with an **RS232 / RJ12** interface led out.

For information on the SK 700E- …-A-RS2 frequency inverters with optional **RS232 / RJ12** interface, please refer to the respective manual (BU 0700) (www.nord.com).

RS232 / RJ12 onboard sizes 1 – 4 (optional)

RS232 / RJ12 onboard sizes 5 – 8 (Standard)

Figure 2: optional and on board RS232 / RJ12 interface with SK 700E

2 Implementation

Frequency inverters of the SK 5xxE series come 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). In general, a distinction is made between SK 5x0E and SK 5x5E devices.

Sizes 1 to 4 of the SK 700E frequency inverters (1.5 kW to 22.0 kW) always come with a shield bracket fitted to the frequency inverter housing. Shield clamps (size 8 to 35) specific to the cable cross section and size are not supplied ex factory and, if necessary, will be provided and/or mounted by persons charged with installation while fitting and setting up the SK 700E frequency inverters.

When migrating an application to the SK 5xxE series of frequency inverters **you should always** provide for an additional **EMC kit** suitable for type **SK EMC 2-**x according to the size.

SK 700E types

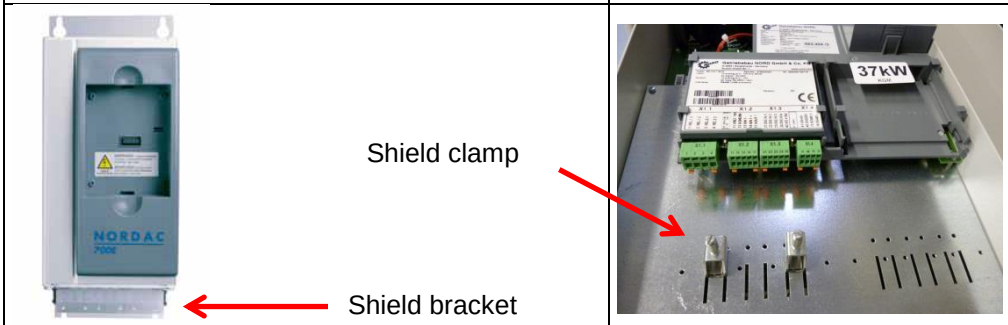
Sizes 1 – 4 or performance levels ≤ 22.0 kW with shield bracket for fitting shield clamps	Sizes ≥ 5 or ≥ performance levels 30.0 kW with shield plate and shield clamps (KGM variant only)
	

Figure 3: SK 700E: different types (with shield bracket or shield plate)

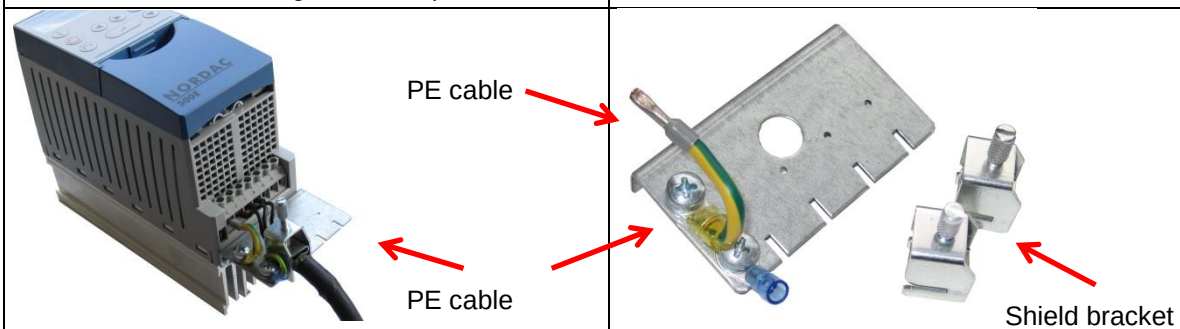
Shield bracket for mounting shield clamps	EMC kit SK EMC 2-x
	

Figure 4: SK 5xxE size-dependent EMC kits (with shield bracket, shield clamps, PE cable)

Information **EMC kits SK EMC2-x**

Chapter 2.5 provides an overview of SK EMC 2-x EMC kit available for the SK 5xxE frequency inverter series specific to size.

2.1 Frequency inverter

2.1.1 Performance levels

SK 700E Name	SK 700E Features / Performance range	SK 5xxE Name
SK 700E-xxx-340-**X** (-RS2) *	Standard Performance 1.5 kW to 7.5 kW + incl. mains filter * + optional with int. RS232 interface *	SK 500E-xxx-340-A incl. mains filter Class C2 ** + RS232 interface
	Standard Performance 11.0 kW to 160.0 kW + with/without mains filter * + optional / with int. RS232 interface *	SK 5**15**E-xxx-340-A with mains filter Class C2 ** + RS232 interface
SK 700E-xxx-340-**X** (-RS2) * + ENCODER SK XU1-ENC	Standard Performance 1.5 kW to 7.5 kW + incl. mains filter * + optional with int. RS232 interface * + 1 TTL input for incremental encoder + 1 digital input	SK 5**20**E-xxx-340-A with mains filter Class C2 ** + RS232 interface
	Standard Performance 11.0 kW to 160.0 kW + with/without mains filter * + optional / with int. RS232 interface * + 1 TTL input for incremental encoder + 1 digital input	SK 5**35**E-xxx-340-A with mains filter Class C2 ** + RS232 interface

*	(**-RS2**) with additional optional/integrated RS232 interface on SK 700E frequency inverters ≤ 22.0 kW. The token **X** represents **A** (with integrated mains filter) on SK 700E frequency inverters ≤ 22.0 kW **O** (without integrated mains filter) on SK 700E frequency inverters ≥ 30.0 kW
**	The cable lengths must be taken into account because the mains filter characteristics can vary.

Table 4: Overview SK 5xxE standard and incremental encoder input

NOTICE **Encoder supply voltage**

Incremental encoders with 5 V supply voltage can be directly operated with frequency inverters of the SK 700E series. For the SK 5xxE series of frequency inverters, the connected incremental encoders must be suitable for a supply voltage range of 10 V … 30 V.

This is why the incremental encoders must be replaced or the "old" encoders must be supplied from an external power supply when migrating to SK 5xxE frequency inverters.

SK 700E Name	SK 700E Features / Performance range	SK 5xxE Name
SK 700E-xxx-340-**X** (-RS2) * + CAN Bus SK CU1-CAN	Standard Performance 1.5 kW to 7.5 kW + incl. mains filter * + optional with int. RS232 interface * + 1 digital input + 1 relay contact + CAN connecti0on via terminals alternatively with RJ45 socket	SK 5**11**E-xxx-340-A with mains filter Class C2 ** + RS232 interface optional WAGO adapter module RJ45/terminal ***
	Standard Performance 11.0 kW to 160.0 kW + with/without mains filter * + optional / with int. RS232 interface * + 1 digital input + 1 relay contact + CAN connecti0on via terminals alternatively with RJ45 socket	SK 5**15**E-xxx-340-A with mains filter Class C2 ** + RS232 interface optional WAGO adapter module RJ45/terminal ***
SK 700E-xxx-340-**X** (-RS2) * + CAN Bus SK CU1-CAN-RJ	Standard Performance 1.5 kW to 7.5 kW + incl. mains filter * + optional with int. RS232 interface * + 5 digital inputs + 1 relay contact + CAN connection with 2 x RJ45 socket	SK 5**11**E-xxx-340-A with mains filter Class C2 ** + RS232 interface
	Standard Performance 11.0 kW to 160.0 kW + with/without mains filter * + optional / with int. RS232 interface * + 5 digital inputs + 1 relay contact + CAN connection with 2 x RJ45 socket	SK 5**15**E-xxx-340-A with mains filter Class C2 ** + RS232 interface
SK 700E-xxx-340-**X** (-RS2) * + CAN Bus SK TU1-CAN	Standard Performance 1.5 kW to 7.5 kW + incl. mains filter * + optional with int. RS232 interface * + CAN connection sub-D9 socket	SK 5**11**E-xxx-340-A with mains filter Class C2 ** + RS232 interface optional WAGO adapter module RJ45/terminal ***
	Standard Performance 11.0 kW to 160.0 kW + with/without mains filter * + optional / with int. RS232 interface * + CAN connection via 9-pole sub-D socket	SK 5**15**E-xxx-340-A with mains filter Class C2 ** + RS232 interface optional WAGO adapter module RJ45/terminal ***

SK 700E Name	SK 700E Features / Performance range	SK 5xxE Name
SK 700E-xxx-340- **X** (-RS2) * + CANopen Bus SK TU1-CAO	Standard Performance 1.5 kW to 7.5 kW + incl. mains filter * + optional with int. RS232 interface * + CAN connection via 9-pole sub-D socket + Connection of external 24 V supply voltage + CANopen addressing with rotary coding switch + Baud rate adjustment with rotary coding switch + DIP switch termination resistor	SK 500E-xxx-340-A incl. mains filter Class C2 ** + RS232 interface + CANopen Bus SK TU3-CAO
	Standard Performance 11.0 kW to 160.0 kW + with/without mains filter * + optional / with int. RS232 interface * + CAN connection via 9-pole sub-D socket + Connection of external 24 V supply voltage + CANopen addressing with rotary coding switch + Baud rate adjustment with rotary coding switch + DIP switch termination resistor	SK 5**15**E-xxx-340-A with mains filter Class C2 ** + RS232 interface + CANopen Bus SK TU3-CAO

*	(**-RS2**) with additional optional/integrated RS232 interface on SK 700E frequency inverters ≤ 22.0 kW. The token **X** represents **A** (with integrated mains filter) on SK 700E frequency inverters ≤ 22.0 kW **O** (without integrated mains filter) on SK 700E frequency inverters ≥ 30.0 kW
**	The cable lengths must be taken into account because the mains filter characteristics can vary.
***	RJ45 WAGO adapter module (278910300) to connect the CAN cable with an RJ45 western plug to the SK 5xxE, alternatively crimp an RJ45 plug to the CAN cable.

Table 5: Overview of SK 5xxE performance levels for CAN and CANopen

SK 700E Name	SK 700E Features / Performance range	SK 5xxE Name
SK 700E-xxx-340- A (-RS2) * + POSICON SK XU1-POS + **with** or **without** SSI absolute encoder	Standard Performance 1.5 kW to 7.5 kW + incl. mains filter * + optional with int. RS232 interface * + 6 digital inputs + 1 multifunction relay + POSICON positioning control + 1 TTL input for incremental encoder + 1 SSI absolute encoder input	SK 5**30**E-xxx-340-A with mains filter Class C2 ** + RS232 interface + **without** SSI absolute encoder connection
		SK 5**40**E-xxx-340-A with mains filter Class C2 ** + RS232 interface + **with** universal encoder-interface, e.g. for SSI absolute encoder connection
	Standard Performance 11.0 kW to 22.0 kW + incl. mains filter * + optional with int. RS232 interface * + 6 digital inputs + 1 multifunction relay + POSICON positioning control + 1 TTL input for incremental encoder + 1 SSI absolute encoder input	SK 5**35**E-xxx-340-A with mains filter Class C2 ** + RS232 interface + **without** SSI absolute encoder connection
SK 700E-xxx-340-O + POSICON SK XU1-POS + **with** or **without** SSI absolute encoder	Standard Performance 30.0 kW to 160.0 kW + without mains filter * + integrated RS232 interface * + 6 digital inputs + 1 multifunction relay + POSICON positioning control + 1 TTL input for incremental encoder + 1 SSI absolute encoder input	SK 5**45**E-xxx-340-A with mains filter Class C2 ** + RS232 interface + **with** universal encoder-interface, e.g. for SSI absolute encoder connection

SK 700E Name	SK 700E Features / Performance range	SK 5xxE Name
see previous page + plus IO customer unit SK CU1-xxx ****	Standard Performance 1.5 kW to 7.5 kW + incl. mains filter * + optional with int. RS232 interface * plus I/O control connections of the respective SK CU1-xxx customer unit	SK 5**40**E-xxx-340-A with mains filter Class C2 ** + RS232 interface optional IO extension SK EBIOE-2 *****
	Standard Performance 11.0 kW to 22.0 kW + incl. mains filter * + optional with int. RS232 interface * plus I/O control connections of the respective SK CU1-xxx customer unit	SK 5**45**E-xxx-340-A with mains filter Class C2 ** + RS232 interface optional IO extension SK EBIOE-2 *****
	Standard Performance 30.0 kW to 160.0 kW + without mains filter * + integrated RS232 interface * plus I/O control connections of the respective SK CU1-xxx customer unit	

*	(**-RS2**) with additional optional/integrated RS232 interface on SK 700E frequency inverters ≤ 22.0 kW. The token **X** represents **A** (with integrated mains filter) on SK 700E frequency inverters ≤ 22.0 kW **O** (without integrated mains filter) on SK 700E frequency inverters ≥ 30.0 kW
**	The cable lengths must be taken into account because the mains filter characteristics can vary.
****	Plus one of the following IO customer units: SK CU1-BSC, SK CU1-STD, SK CU1-MLT or SK CU1-MLT-20mA.
*****	When using a great number of digital control signals (number of used (from SK 700E + option) and available (SK 5xxE) digital inputs. The IO extension SK EBIOE-2 (275900210) can only be connected to SK 540E and SK 545E frequency inverters.

Table 6: Overview of SK 5xxE performance levels for POSICON positioning control

NOTICE **Encoder supply voltage**

Incremental encoders with 5 V supply voltage can be directly operated with frequency inverters of the SK 700E series. For the SK 5xxE series of frequency inverters, the connected incremental encoders must be suitable for a supply voltage range of 10 V … 30 V.

This is why the incremental encoders must be replaced or the "old" encoders must be supplied from an external power supply when migrating to SK 5xxE frequency inverters.

2.1.2 Customer units and extension units

To connect I/O control signals to the SK 700E frequency inverters, additional **SK CU1-xxx** IO customer units are required. In contrast, the SK 5xxE series of frequency inverters by default comes with respective onboard terminals to connect the standard I/O control signals.

When migrating to an SK 500E frequency inverter, you should provide for a performance level ≥ SK 511E with integrated onboard CAN / CANopen interface for SK 700E field bus customer units of SK CU1-CAN and SK CU1-CAN-RJ types.

Information **CAN / CANopen 24 V supply**

When using the onboard CAN / CANopen interface of ≥ SK 511E frequency inverters, it is mandatory to connect an **additional 24 V power supply for the CAN / CANopen Bus** to the RJ45 sockets.

For easier cabling and connection of functions (for 24 V supply and CAN / CANopen bus connection cables), the WAGO adapter module RJ45/terminal (see chapter 2.1.3 Additional options for the functions) can be used with conventional patch cables.

For the SK 5xxE series of frequency inverters, only one of the two PROFIBUS DP technology units type SK TU3-PBR or …-24V can be planned in connection with a SK 700E PROFIBUS DP field bus customer unit type SK CU1-PBR.

Special extensions ENCODER / incremental encoder input type SK XU1-ENC and the POSICON positioning control SK XU1-POS of the SK 700E frequency inverter are migrated to the SK 5xxE series of frequency inverters with different performance levels such as the SK 52xE (with ENCODER / incremental encoder input) or the SK 53xE (with POSICON / positioning control) series.

The sub-chapters to follow list some differences in function of the two series of frequency inverters that must be heeded under all circumstances which must be taken into account when migrating from the SK 700E to the SK 5xxE series or when migrating applications:

Customer unit SK CU1-xxx Part number	SK 700E IO customer unit data	Frequency inverter SK 5xxE + additional options	Frequency inverter SK 54xE + / or additional options
Basic IO SK CU1-BSC 278200000	**Basic customer unit** 1 x multifunction relay 3 x digital inputs 1 x analogue input 0…10 V	all SK 5**xx**E * onboard	
Standard IO SK CU1-STD 278200020	**Standard customer unit** 2 x multifunction relays 4 x digital inputs 1 x analogue input 0…10 V, 0/4…20 mA 1 x analogue output, 0…10 V 1 x RS485 interface	all SK 5**xx**E * onboard	
*	All frequency inverters, except SK 515E (available ≥ size 5 only).		

Customer unit SK CU1-xxx Part number	SK 700E IO customer unit data	Frequency inverter SK 5xxE + additional options	Frequency inverter SK 54xE + / or additional options
Multi IO SK CU1-MLT 278200010	**Multi customer unit** 2 x multifunction relays 6 x digital inputs 2 x analogue inputs -10…+10 V, 0/4…20 mA 2 x analogue outputs, 0…10 V	1.5 kW…7.5 kW	
		SK 5**20**E, SK 5**30**E, SK 5**35**E onboard *only 1st analogue output, 0…10 V*	SK 5**40**E, SK 5**45**E onboard *only 1st analogue output, 0…10 V*
		optional setpoint converter ±10 V ** for analogue inputs	IO extension SK EBIOE-2 *** *for 2nd analogue output, 0…10 V*
		11.0 kW…160.0 kW	
		SK 5**35**E onboard *1st analogue output only, 0…10 V*	SK 5**45**E onboard *1st analogue output only, 0…10 V*
			IO extension SK EBIOE-2 *** *for 2nd analogue output, 0…10 V*
Multi IO SK CU1-MLT-20mA 278200015	**Customer unit Multi 20mA analogue outputs** 2 x multifunction relays 6 x digital inputs 2 x analogue inputs -10…+10 V, 0/4…20 mA 2 x analogue outputs, 0…20 mA	1.5 kW…7.5 kW	
		SK 5**20**E, SK 5**30**E, SK 5**35**E onboard *only 1st analogue output, 0…10 V*	SK 5**40**E, SK 5**45**E onboard *only 1st analogue output, 0…10 V*
		optional setpoint converter ±10 V ** for analogue inputs	IO extension SK EBIOE-2 *** *for 2nd analogue output, 0…10 V*
		optional external signal converter **** *for 1st analogue output,, 0/4…20 mA*	
		11.0 kW…160.0 kW	
		SK 5**35**E onboard *1st analogue output only, 0…10 V*	SK 5**45**E onboard *1st analogue output only, 0…10 V*
			IO extension SK EBIOE-2 *** *for 2nd analogue output, 0…10 V*
		optional external signal converter **** *for 1st analogue output,, 0/4…20 mA*	

**	The setpoint converter ±10 V (278910320) is only needed for sizes 1 to 4 (1.5 kW to 7.5 kW) of all SK 5xxE frequency inverters.
***	The IO extension SK EBIOE-2 (275900210) can be used to connect the 2nd analogue output (0…10 V) and the two analogue inputs (-10 V…+10 V). Thus, additional ±10 V setpoint converters (278910320) are not needed.
****	The analogue 0…10 V output signal of SK 5xxE frequency inverters must be converted to 0/4…20 mA with a commercially external signal converter.

Table 7: Overview and assignment of SK 700E IO customer units SK CU1-xxx

Customer unit SK CU1-xxx Part number	SK 700E Field bus customer unit data	Frequency inverter SK 5xxE + Additional options Part number
PROFIBUS DP SK CU1-PBR 278200030	**PROFIBUS DP customer unit** 1 x multifunction relay 1 x digital input 1 x PROFIBUS DP *****	all SK 5**xx**E * onboard + plus technology option PROFIBUS DP SK TU3-PBR ***** 275900030
CAN Bus SK CU1-CAN 278200050	**CAN customer unit** 1 x multifunction relay 5 x digital inputs 2 x CAN bus	all ≥ SK 5**11**E * onboard optional WAGO RJ45 adapter module/terminal ****** 278910300
CAN Bus SK CU1-CAN-RJ 278200052	**CAN customer unit** **with RJ45 sockets** 1 x multifunction relay 5 x digital inputs 2 x RJ45 CAN bus sockets	all ≥ SK 5**11**E * onboard optional WAGO RJ45 adapter module/terminal ****** 278910300
USS bus SK CU1-USS 278200040	**USS Customer Interface** 1 x multifunction relay 1 x digital input 1 x RS485 interface *******	all SK 5**xx**E * onboard

*	All frequency inverters, except SK 515E (available ≥ size 5 only).
*****	If next to the PROFIBUS DP customer unit SK CU1-PBR an operation and diagnostic technology unit is also used with the SK 700E application, a SimpleBox SK CSX-0 or a handheld control box SK PAR-3H or SK CSX-3H should be planned for SK 5xxE application, in addition to the technology unit SK TU3-PBR for frequency inverter operation. The connection types of the two different PROFIBUS DP field bus options also differ. PROFIBUS DP connection to the SK CU1-PBR customer unit occurs via spring loaded terminals. PROFIBUS DP connection to the technology unit SK TU3-PBR or SK TU3-PBR-24V occurs at the front with a 9-pole SUB-D connector (must be provided separately). For more information refer to the PROFIBUS DP Supplementary Operating Instructions BU 0020 (see www.nord.com).
******	The WAGO adapter module RJ45 / terminal (278910300) and commercially available pre-assembled RJ45 patch cables allow for easy connection of the additional external 24 V power supply for the CAN bus and the CAN connection cables.
*******	All frequency inverters ≥ SK 520E feature the RS485 interface next to the RJ12 on connector block X11 and also on terminal block X7 or terminals 74 and 75.

Table 8: Overview and assignment of field bus customer units SK CU1-xxx

Customer unit SK XU1-xxx Part number	SK 700E Extension unit Data	Frequency inverter SK 5xxE + additional options
Incremental encoder-input / ENCODER SK XU1-ENC 278200120	**ENCODER** 1 x digital input 1 x incremental encoder input TTL, RS422 5 / 15 V power supply for rotary encoder	all ≥ SK 5**20**E onboard --- optional external 5 V power supply for rotary encoder
Positioning / POSICON SK XU1-POS 278200130	**POSICON** 6 x digital input 2 x multi-function relays 1 x incremental encoder input TTL, RS422 5 / 15 V power supply for rotary encoder 1 x SSI absolute encoder input 5 / 15 V power supply for rotary encoder	all ≥ SK 5**30**E onboard --- optional external 5 V power supply for rotary encoder

Table 9: Overview and assignment of extension units SK XU1-xxx

NOTICE **Encoder supply voltage**

Rotary encoder with 5 V power supply must not be connected to the SK 5xxE frequency inverters directly. For this application, a commercially external power supply should be used because the SK 5xxE frequency inverters only feature a 10…30 V output for connection of a incremental encoder.

This is why the rotary encoders must be replaced or the "old" encoders must be supplied from an external 5 V power supply when migrating to SK 5xxE frequency inverters.

2.1.3 Additional options for the functions

To migrate the various application functions, several options are available for the SK 5xxE series of frequency inverters.

Options Name	Picture	Part Number
WAGO adapter module RJ45/terminal		278910300
Setpoint converter ±10 V → 0 … 10 V		278910320
IO extension SK EBIOE-2 (only SK 540E / SK 545E)		275900210

Table 10: Overview of additional function options

Information **WAGO adapter module RJ45/terminal**

The WAGO adapter module RJ45/terminal comes with a shield clamp and is used to connect the CAN bus cable sand the external necessary 24 V power supply for the CAN / CANopen bus system. Signal connection occurs with spring terminals on the input side and an RJ45 western socket on the output side. This adapter module RJ45/terminal facilitates the connection of the CAN bus system to frequency inverters of performance levels ≥ SK 52xE.

For more information and details, please refer to the operating instructions of the frequency inverter.

Information **Setpoint converter ± 10 V**

The setpoint converter ± 10 V is used to convert the signal for the analogue inputs of unipolar (0 … 10 V and 0 / 4 … 20 mA) to bipolar (- 10 V … + 10 V) voltages. SK 5xxE frequency inverters of size 5 (≥ 11 kW) and higher can process unipolar and also bipolar analogue inputs by way of configuration with DIP switches.

For more information and details, please refer to the operating instructions of the frequency inverter.

Information **IO extension**

IO extension SK EBIOE-2 lets you connect additional IO control signals and is suitable for SK 540E or SK 545E frequency inverters.

For more details please refer to Technical Information / Data Sheet TI 275900210.

2.1.4 Performance levels SK 700E sizes 1 + 2 / 1.5 kW to 7.5 kW

Type: SK 700E-**151**-340-A (-*RS2*) Part No.: 278100150 / …(*152*)
Type: SK 700E-**221**-340-A (-*RS2*) Part No.: 278100220 / …(***222***)
Type: SK 700E-**301**-340-A (-*RS2*) Part No.: 278100300 / …(***302***)
Type: SK 700E-**401**-340-A (-*RS2*) Part No.: 278100400 / …(***402***)
Type: SK 700E-**551**-340-A (-*RS2*) Part No.: 278100550 / …(***552***)
Type: SK 700E-**751**-340-A (-*RS2*) Part No.: 278100750 / …(***752***)

Customer unit	**without extension unit**	**with extension unit**		
SK XU1-xxx / SK CU1-xxx		Encoder SK XU1-ENC 278200120	POSICON SK XU1-POS 278200130	
Basic IO SK CU1-BSC 278200000	SK 500E-**151**-340-A 275420150 SK 500E-**221**-340-A 275420220 SK 500E-**301**-340-A 275420300	SK 5**20**E-**151**-340-A 275520150 SK 5**20**E-**221**-340-A 275520220 SK 5**20**E-**301**-340-A 275520300	SK 5**40**E-**151**-340-A 275620160 SK 5**40**E-**221**-340-A 275620230 SK 5**40**E-**301**-340-A 275620310	+ optional * IO extension SK EBIOE-2 275900210
Standard IO SK CU1-STD 278200020	SK 500E-**401**-340-A 275420400 SK 500E-**551**-340-A 275420550 SK 500E-**751**-340-A 275420750	SK 5**20**E-**401**-340-A 275520150 SK 5**20**E-**551**-340-A 275520550 SK 5**20**E-**751**-340-A 275520750	SK 5**40**E-**401**-340-A 275620410 SK 5**40**E-**551**-340-A 275620560 SK 5**40**E-**751**-340-A 275620760	
Number of used analogue outputs	**1 analogue output**		**2 analogue outputs**	
Multi IO SK CU1-MLT 278200010	SK 5**20**E-**151**-340-A ** 275520150 SK 5**20**E-**221**-340-A ** 275520220 SK 5**20**E-**301**-340-A ** 275520300	+ optional *** Setpoint converter ± 10 V 278910320	SK 5**40**E-**151**-340-A ** 275620160 SK 5**40**E-**221**-340-A ** 275620230 SK 5**40**E-**301**-340-A ** 275620310	+ optional * IO extension SK EBIOE-2 275900210
Multi IO SK CU1-MLT-20mA ** 278200015	SK 5**20**E-**401**-340-A ** 275520400 SK 5**20**E-**551**-340-A ** 275520550 SK 5**20**E-**751**-340-A ** 275520750		SK 5**40**E-**401**-340-A ** 275620410 SK 5**40**E-**551**-340-A ** 275620560 SK 5**40**E-**751**-340-A ** 275620760	
+ CAN Bus SK CU1-CAN 278200050	SK 5**20**E-**151**-340-A 275520150 SK 5**20**E-**221**-340-A 275520220 SK 5**20**E-**301**-340-A 275520300		SK 5**40**E-**151**-340-A 275620160 SK 5**40**E-**221**-340-A 275620230 SK 5**40**E-**301**-340-A 275620310	
CAN Bus SK CU1-CAN-RJ 278200052	SK 5**20**E-**401**-340-A 275520400 SK 5**20**E-**551**-340-A 275520550 SK 5**20**E-**751**-340-A 275520750		SK 5**40**E-**401**-340-A 275620410 SK 5**40**E-**551**-340-A 275620560 SK 5**40**E-**751**-340-A 275620760	

*	To connect more digital inputs (acc. to SK XU1-POS) to the SK 540E frequency inverter, the optional IO extension SK EBIOE-2 (275900210) is offered. To connect the analogue inputs ± 10 V to SK 5x0E frequency inverters of sizes 1 - 4, the setpoint converters ± 10 V → 0 … 10 V (278910320) are offered. As an alternative, the ± 10 V analogue inputs can also be connected with terminal blocks X1 + X2 (see TI 275900210) when an IO extension of type SK EBIOE-2 (275900210) is used.
**	Commercially available external signal converters are necessary if the analogue outputs of the SK 5x0E frequency inverters are used and signal conversion to 0/4 … 20 mA compatible with SK CU1-MLT-20mA is necessary.
***	To connect the analogue inputs ± 10 V to the SK 520E frequency inverters of sizes 1 to 4, the setpoint converters ± 10 V → 0 … 10 V (278910320) are offered.

Table 11: Performance levels SK 700E sizes 1 + 2 / 1.5 kW to 7.5 kW

2.1.5 Performance levels SK 700E sizes 3 - 5 / 11.0 kW to 37.0 kW

Type: SK 700E-**112**-340-A *(-RS2)*	Part No.: 278101100 / …*(102)*
Type: SK 700E-**152**-340-A *(-RS2)*	Part No.: 278101500 / …(***502***)
Type: SK 700E-**182**-340-A *(-RS2)*	Part No.: 278101850 / …(***852***)
Type: SK 700E-**222**-340-A *(-RS2)*	Part No.: 278102200 / …(***202***)
Type: SK 700E-**302**-340-O	Part No.: 278103000
Type: SK 700E-**372**-340-O	Part No.: 278103700

<table>
<tr><th>Customer unit</th><th>without extension unit</th><th colspan="3">with extension unit</th></tr>
<tr><td>SK XU1-xxx
SK CU1-xxx</td><td></td><td>Encoder
SK XU1-ENC
278200120</td><td colspan="2">POSICON
SK XU1-POS
278200130</td></tr>
<tr><td>Basic IO
SK CU1-BSC
278200000</td><td rowspan="2">SK 515E-112-340-A
275721100
SK 515E-152-340-A
275721500
SK 515E-182-340-A
275721850
SK 515E-222-340-A
275722200
SK 515E-302-340-A
275723000
SK 515E-372-340-A
275723700</td><td rowspan="2">SK 535E-112-340-A
275921100
SK 535E-152-340-A
275921500
SK 535E-182-340-A
275921850
SK 535E-222-340-A
275922200
SK 535E-302-340-A
275923000
SK 535E-372-340-A
275923700</td><td rowspan="2">SK 545E-112-340-A
275921110
SK 545E-152-340-A
275921510
SK 545E-182-340-A
275921860
SK 545E-222-340-A
275922210
SK 545E-302-340-A
275923010
SK 545E-372-340-A
275923710</td><td rowspan="2">+ optional *
IO extension
SK EBIOE-2
275900210</td></tr>
<tr><td>Standard IO
SK CU1-STD
278200020</td></tr>
<tr><th>Number of used analogue outputs</th><th colspan="2">1 analogue output</th><th colspan="2">2 analogue outputs</th></tr>
<tr><td>Multi IO
SK CU1-MLT
278200010</td><td colspan="2" rowspan="4">SK 535E-112-340-A **
275921100
SK 535E-152-340-A **
275921500
SK 535E-182-340-A **
275921850
SK 535E-222-340-A **
275922200
SK 535E-302-340-A **
275923000
SK 535E-372-340-A **
275923700</td><td rowspan="2">SK 545E-112-340-A **
275921110
SK 545E-152-340-A **
275921510
SK 545E-182-340-A **
275921860
SK 545E-222-340-A **
275922210
SK 545E-302-340-A **
275923010
SK 545E-372-340-A **
275923710</td><td rowspan="2">+ optional *
IO extension
SK EBIOE-2
275900210</td></tr>
<tr><td>Multi IO
SK CU1-MLT-20mA **
278200015</td></tr>
<tr><td>+ CAN Bus
SK CU1-CAN
278200050</td><td rowspan="2">SK 545E-112-340-A
275921110
SK 545E-152-340-A
275921510
SK 545E-182-340-A
275921860
SK 545E-222-340-A
275922210
SK 545E-302-340-A
275923010
SK 545E-372-340-A
275923710</td></tr>
<tr><td>CAN Bus
SK CU1-CAN-RJ
278200052</td></tr>
</table>

*	To connect more digital inputs (acc. to SK XU1-POS) to the SK 545E frequency inverter, the optional IO extension SK EBIOE-2 (275900210) is offered. Connection of the analogue inputs ± 10 V to the SK 545E frequency inverters occurs directly to the terminal block X4 of the SK 545E from size 5 onward. As an alternative, the ± 10 V analogue inputs can also be connected with terminal blocks X1 + X2 (see TI 275900210) when an IO extension of type SK EBIOE-2 (275900210) is used.
**	Commercially available external signal converters are necessary if the analogue outputs of the SK 5x5E frequency inverters are used and signal conversion to 0/4 … 20 mA compatible with SK CU1-MLT-20mA is necessary. As an alternative, connection could occur to terminal block X2 (see TI 275900210) if only **one 0/4 … 20 mA analogue output** is used in conjunction with an SK 545E frequency inverter and a type SK EBIOE-2 (275900210) IO extension.

Table 12: Performance levels SK 700E sizes 3 - 5 / 11.0 kW to 37.0 kW

2.1.6 Performance levels SK 700E sizes 6 - 8 / 45.0 kW to 160.0 kW

Type: SK 700E-**452**-340-O	Part No.: 278104500
Type: SK 700E-**552**-340-O	Part No.: 278105500
Type: SK 700E-**752**-340-O	Part No.: 278107500
Type: SK 700E-**902**-340-O	Part No.: 278109001
Type: SK 700E-**113**-340-O	Part No.: 278111000
Type: SK 700E-**133**-340-O	Part No.: 278103200
Type: SK 700E-**163**-340-O-VT	Part No.: 278116000

Customer unit	**without extension unit**	**with extension unit**		
SK XU1-xxx / SK CU1-xxx		Encoder SK XU1-ENC 278200120	POSICON SK XU1-POS 278200130	
Basic IO SK CU1-BSC 278200000	SK 5**15**E-**452**-340-A 275724500 SK 5**15**E-**552**-340-A 275725500 SK 5**15**E-**752**-340-A 275727500 SK 5**15**E-**902**-340-A 275729000 SK 5**15**E-**113**-340-A 275721130 SK 5**15**E-**133**-340-A 275721330 SK 5**15**E-**163**-340-A 275721630	SK 5**35**E-**452**-340-A 275924500 SK 5**35**E-**552**-340-A 275925500 SK 5**35**E-**752**-340-A 275927500 SK 5**35**E-**902**-340-A 275929000 SK 5**35**E-**113**-340-A 275921130 SK 5**35**E-**133**-340-A 275921330 SK 5**35**E-**163**-340-A 275921630	SK 5**45**E-**452**-340-A 275924510 SK 5**45**E-**552**-340-A 275925510 SK 5**45**E-**752**-340-A 275927510 SK 5**45**E-**902**-340-A 275929010 SK 5**45**E-**113**-340-A 275921140 SK 5**45**E-**133**-340-A 275921340 SK 5**45**E-**163**-340-A 275921640	+ optional * IO extension SK EBIOE-2 275900210
Standard IO SK CU1-STD 278200020				
Number of used analogue outputs	**1 analogue output**		**2 analogue outputs**	
Multi IO SK CU1-MLT 278200010	SK 5**35**E-**452**-340-A ** 275924500 SK 5**35**E-**552**-340-A ** 275925500 SK 5**35**E-**752**-340-A ** 275927500 SK 5**35**E-**902**-340-A ** 275929000 SK 5**35**E-**113**-340-A ** 275921130 SK 5**35**E-**133**-340-A ** 275921330 SK 5**35**E-**163**-340-A 275921630		SK 5**45**E-**452**-340-A ** 275924510 SK 5**45**E-**552**-340-A ** 275925510 SK 5**45**E-**752**-340-A ** 275927510 SK 5**45**E-**902**-340-A ** 275929010 SK 5**45**E-**113**-340-A ** 275921140 SK 5**45**E-**133**-340-A ** 275921340 SK 5**45**E-**163**-340-A 275921640	+ optional * IO extension SK EBIOE-2 275900210
Multi IO SK CU1-MLT-20mA ** 278200015				
+ CAN Bus SK CU1-CAN 278200050			SK 5**45**E-**452**-340-A 275924510 SK 5**45**E-**552**-340-A 275925510 SK 5**45**E-**752**-340-A 275927510 SK 5**45**E-**902**-340-A 275929010 SK 5**45**E-**113**-340-A 275921140 SK 5**45**E-**133**-340-A 275921340 SK 5**45**E-**163**-340-A 275921640	
CAN Bus SK CU1-CAN-RJ 278200052				

*	To connect more digital inputs (acc. to SK XU1-POS) to the SK 545E frequency inverter, the optional IO extension SK EBIOE-2 (275900210) is offered. Connection of the analogue inputs ± 10 V to the SK 545E frequency inverters occurs directly to the terminal block X4 of the SK 545E from size 5 onward. As an alternative, the ± 10 V analogue inputs can also be connected with terminal blocks X1 + X2 (see TI 275900210) when an IO extension of type SK EBIOE-2 (275900210) is used.
**	Commercially available external signal converters are necessary if the analogue outputs of the SK 5x5E frequency inverters are used and signal conversion to 0/4 … 20 mA compatible with SK CU1-MLT-20mA is necessary. As an alternative, connection could occur to terminal block X2 (see TI 275900210) if only **one 0/4 … 20 mA analogue output** is used in conjunction with an SK 545E frequency inverter and a type SK EBIOE-2 (275900210) IO extension.

Table 13: Performance levels SK 700E sizes 6 - 8 / 45.0 kW to 160.0 kW

2.2 Technology units

The technology units are available as optional extensions for the modular slot on the front of the frequency inverter. There are plug-in technology units for communications and operation/diagnosis.

The first sub-chapter presents the optional and replaceable operation/diagnosis options providing data backup and saving functions (number of storage areas) of parameter and data records.

The second sub-chapter presents the optional and replaceable communication technology units. These are used for individual solutions and applications for implementing the standard field bus control systems such as PROFIBUS DP, CAN, CANopen, DeviceNet, AS-Interface, etc.

2.2.1 Technology units for operation and diagnosis

Technology unit SK TU1-xxx Part No.	Name Information Data	Technology unit SK TU3-xxx Part No.
SK TU1-POT 278200110	**PotentiometerBox** • 1 setpoint potentiometer 0 … 100 % • ON/OFF button • Status LEDs	SK TU3-POT 275900110
SK TU1-CTR 278200090	**ControlBox** • 4-digit 7-segment LED display • ON/OFF /Reverse button • save 1 data record • display parameter record LEDs	SK TU3-CTR 275900090
SK TU1-PAR 278200100	**ParameterBox** • illuminated plain text display • 4-row LCD • ON/OFF /Reverse button • save 5 data records • Status LEDs • 6 languages • help texts	SK TU3-PAR 275900100
SimpleBox not available	**SimpleBox** (par. operation with SK TU3-xxx possible) • 4-digit 7-segment LED display • ON/OFF Button/rotating knob • display parameter record LEDs • connect to diagnosis RJ12 socket of frequency inverter	SK CSX-0 275900095

Table 14: Technology units for operation and diagnosis

Information **Operating Manual**

For more information on the technology units for operation and diagnosis listed in this chapter (PotentiometerBox, ControlBox, ParameterBox and SimpleBox), refer to the separate Operating Instructions BU 0040 (see www.nord.com).

2.2.2 Field bus and communication technology units

Technology unit SK TU1-xxx Part No.	Name Information Data	Technology unit SK TU3-xxx Part No.
SK TU1-RS2 278200080	**RS232 interface** • 1 x RS232 interface, SUB-D socket, 9-pole • Status LEDs optional RS232 connection cable (278910030) to the PC / NORD CON connection	all SK 5**xx**E with RS232 interface 275xxxxxx
SK TU1-PBR 278200060	**PROFIBUS DP module** • Baud rate: 1.5 MBps • 9-pole SUB-D socket • BUS status LEDs • PE shield clamp	SK TU3-PBR 275900060
SK TU1-PBR-24V 278200160	**PROFIBUS DP module** • Baud rate: 12.0 MBps • 9-pole SUB-D socket • BUS status LEDs • PE shield clamp • with external 24 V power supply via 2-pole terminal connector • rotary encoder switch for bus address and Baud rate	SK TU3-PBR-24V 275900160
SK TU1-CAN 278200070	**CAN module** • Baud rate: 500 kBps • 9-pole SUB-D plug • BUS status LEDs • PE shield clamp • terminal resistor via DIP switch	all SK 5**11**E with CAN interface 2 x RJ45 sockets
SK TU1-CAO 278200075	**CANopen module** • Baud rate: 500 kBps, optional 1.0 MBps • 9-pole SUB-D plug • with external 24 V power supply via SUB-D9 plug • PE shield clamp • BUS status and module status LEDs • rotary encoder switch for bus address and Baud rate • terminal resistor via DIP switch	SK TU3-CAO 275900075

Technology unit SK TU1-xxx Part No.	Name Information Data	Technology unit SK TU3-xxx Part No.
SK TU1-DEV 278200085	**DeviceNet module** • Baud rate: 500 kBps • 5-pole terminal connector • PE shield clamp • with external 24 V power supply via terminal connector • BUS status and module status LEDs • rotary encoder switch for bus node address and Baud rate • terminal resistor via DIP switch	SK TU3-DEV 275900085
SK TU1-IBS 278200065	**InterBus module** • Baud rate: 500 kBps, optional 2.0 MBps • 2 x 9-pole SUB-D plug/socket • PE shield clamp • with external 24 V power supply via 2-pole terminal connector • BUS status and module status LEDs • rotary encoder switch for PPO type	SK TU3-IBS 275900065
SK TU1-AS1 278200170	**AS interface module** • Slave profile S7.4 (standard slaves) • 1 x bus connection terminal connector, 5-pole • 1 x IO / sensors and actuators terminal connector, 8-pole • with external 24 V (AUX) power supply via 5-pole terminal connector or also via 8-pole IO terminal connector • BUS status, AS-i IO sensor and actuator status LEDs	SK TU3-AS1 275900170

Table 15: Field bus and communication technology units

Information — Operating Manual

For more information on the field bus and communication technology units listed in this chapter (RS232, PROFIBUS DP, CAN, CANopen, etc.), refer to the separate bus-specific Operating Instructions BU 00xx (see www.nord.com). For an overview of the Operating Instructions, please refer to Section 5.1.1 Manuals.

Information — NORD software files

The appropriate software files (GSD, EDS) are available for download in Internet (see www.nord.com) for the field bus options which are available for the relevant options.

The software files for the SK 5xxE series of frequency inverters differ from those for the SK 700E series. For further details please refer to chapter 5.2.2 NORD options.

2.3 Control boxes / control units

The convenient control boxes / control units are offered as optional extension units for direct connection to the frequency inverters. There are two versions - a **handheld** and an **installation version** of the control boxes.

The next two sub-chapters describe and compare the control boxes and versions available as option.

Information **Operating Manual**

For more information on the control box versions (PotentiometerBox, ControlBox, ParameterBox and SimpleBox), refer to the separate Operating Instructions BU 0040 (see www.nord.com).

Information **Software update**

There are new software versions for older models of the control boxes (handheld and installation versions of Simple ControlBox and ParameterBox). To update the software, contact Service / Technical Support if needed, refer to chapter 5.5 Technical support for more information.

2.3.1 Handheld version

Control box SK PAR-2H Part No.	Name Information Data	Control box SK xxx-3H Part No.
Simple ControlBox not available	**Handheld Simple ControlBox** (SK CSX-x**H**) • IP54 • 4-digit 7-segment LED display • ON/OFF /Reverse button • display parameter record LEDs • RJ12 socket	SK CSX-3H 275281013
ParameterBox SK PAR-2H 275910100	**Handheld ParameterBox** (SK PAR-x**H**) • IP54 • illuminated plain text display • 4-row LCD • ON/OFF /Reverse button • save 5 data records • Status LEDs • 6 languages • help texts • incl. connection cable(M12 / RJ12) • USB interface (only SK PAR-3H) for connection to PC	SK PAR-3H 275281014

Table 16: Handheld control boxes

2.3.2 Built-in variant

The following control boxes/units are designed for installation in switch cabinet doors and control panels.

Control box SK PAR-2E Part No.	Name Information Data	Control box SK xxx-3E Part No.
Simple ControlBox not available	**Built-in Simple ControlBox** (SK CSX-x**E**) • IP54 (front) • 4-digit 7-segment LED display • ON/OFF /Reverse button • display parameter record LEDs • RJ12 socket	SK CSX-3E 275281413
ParameterBox SK PAR-2E 278910110	**Built-in ParameterBox** (SK PAR-x**E**) • IP54 (front) • illuminated plain text display • 4-row LCD • ON/OFF /Reverse button • save 5 data records • status LEDs • 6 languages • help texts • screw terminals(only SK PAR-2E) and RJ12 connection socket (both units)	SK PAR-3E 275281414

Table 17: Built-in control boxes

2.4 Accessories and adapter cables

Several accessories and adapter cables are offered for parameter set-up and commissioning of frequency inverters. With these accessories, the frequency inverter can be connected to a PC and controlled with the NORDCON software.

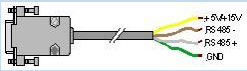
SK 700E Type Part No.	Name Information Data	SK 5xxE Type Part No.
Interface converter SK IC1-232/485 276970020	**Interface converter RS232 / RS485** • Signal converter from RS485 to RS232 • Baud rate selectable from 4800 to 38400 bps with DIP switch • external +5 V power supply with USB / 5 V supply cable (278910220) for SK IC1-232/485 • terminator resistor via DIP switch	SK 5xxE with RS232 interface not required
VECTOR connection cable  278910020	**P-Box Vector connection cable** • 9-pole SUB-D socket, RS485 side • 4-wire cable with open cable ends for connection to SK CU1-STD • 3.0 m long • use with SK IC1-232/485 interface converter	SK 5xxE with RS232 interface not required
RS232 connection cable 278910030	**P-Box RS232 Vector connection cable** • 9-pole SUB-D socket and plug, RS232 on both sides • 2.0 m long • accessories for SK IC1-232/485 interface converter + SK TU1-RS2 technology box	SK 5xxE with RS232 interface not required
Adapter RJ12/SUB-D9 278910240	**PC connection cable RJ12-SUB-D9** • 9-pole SUB-D socket, RJ12 plug • RS232 connection cable • 3.0 m long • accessories for connection to the PC SK 700E with integrated RS232 interface socket and all SK 5xxE frequency inverters	Adapter RJ12/SUB-D9 278910240

Table 18: Communication accessories and adapter cables

Information **Operating Manual**

For more information on the interface converter SK IC1-232/485, refer to the separate Operating Instructions BU 0010 (see www.nord.com).

For the respective pin assignment of sockets and plugs of the above connection and adapter cables, refer to the pertaining manuals (BU 0500, BU 0505 und BU 0700 - see www.nord.com) of the respective frequency inverter series or the separate Operating Instructions BU 0040. For an overview of the Operating Instructions, please refer to Section 5.1.1 Manuals.

2.5 EMC kits for SK 5xxE frequency inverters

There are more optional components such as EMC kits for the SK 5xxE frequency inverters to ensure optimum and EMC compliant cabling. The EMC kits are allocated to the respective sizes of the SK 5xxE frequency inverters and come with shield bracket, two fastening screws and a pre-assembled PE cables and must be ordered as an option. The shield brackets (without shield clamps) are mounted on the housing as standard/ex factory of SK 700E frequency inverters of sizes 1 to 4 - in the performance range from SK 700E-151-340-A (-RS2) to SK 700E-222-340-A (-RS2).

Figure 5: SK 500E with EMC kit SK EMC2-x

Size SK 700E Performance range	Size SK 5xxE Performance range	EMC kit Name Part No.
Size 1 SK 700E-151-340-A … SK 700E-401-340-A *	Sizes 1 + 2 SK 5xxE-151-340-A … SK 5xxE-221-340-A	SK EMC2-1 275999011
Size 2 SK 700E-551-340-A … SK 700E-751-340-A *	Sizes 3 + 4 SK 5xxE-301-340-A … SK 5xxE-751-340-A	SK EMC2-2 275999021
Size 3 SK 700E-112-340-A … SK 700E-152-340-A *	Size 5 SK 5xxE-112-340-A … SK 5xxE-152-340-A	SK EMC2-3 275999031
Size 4 SK 700E-182-340-A … SK 700E-222-340-A *	Size 6 SK 5xxE-182-340-A … SK 5xxE-222-340-A	SK EMC2-4 275999041
Size 7 SK 5xxE-302-340-A … SK 5xxE-372-340-A	Size 7 SK 5xxE-302-340-A … SK 5xxE-372-340-A	SK EMC2-5 275999051
Sizes 8 + 9 SK 5xxE-452-340-A … SK 5xxE-902-340-A	Sizes 8 + 9 SK 5xxE-452-340-A … SK 5xxE-902-340-A	SK EMC2-6 275999061
Sizes 10 + 11 SK 5xxE-113-340-A … SK 5xxE-163-340-A	Sizes 10 + 11 SK 5xxE-113-340-A … SK 5xxE-163-340-A	SK EMC2-7 275999071
*	Also applies to the SK 700E frequency inverters with optional “onboard” RS232 interface such as SK 700E-xxx-340-A-**RS2**. These frequency inverters already come ex factory with shield bracket but without appropriate shield clamps.	

Table 19: Overview of EMC kits for SK 5xxE frequency inverters

Information **EMC kit SK EMC2-x**

The EMC Kit provides the possibility of attaching the screening of the motor cable to a large surface of the frequency inverter (interference source). If necessary a screened brake resistor cable can be attached with the second hammer clamp. The screening angle is attached to the two housing screws on the lower edge (below the U-V-W terminals). The motor cable screening is earthed to a large area of the screening angle by means of the hammer clamp. As an alternative, you can also use the EMC kit as a strain relief only (e.g. for connection cable of a bus system) (heed bending radii!).

For more information and connection details, please refer to the operating instructions BU 0500 or BU 0505 (see www.nord.com) for the SK 5xxE frequency inverter series.

2.6 Mains filter

The SK 700E-xxx-340-**A** (-RS2) frequency inverters in the power range of 1.5 kW to 22.0 kW feature an integrated mains filter (Class A or C2) for a maximum motor cable length of 15 m and shielded motor cable. In contrast, the SK 700E-xxx-340-**O** frequency inverters of power range ≥ 30.0 kW do not feature an integrated mains filter. The SK 5xxE frequency inverters already feature an internal Class B or C1 mains filter (only sizes 1 to 4) for a maximum motor cable length of 5 m and shielded motor cable. For a maximum motor cable length of 20 m and shielded motor cable, the internal mains filter complies with EMC limit value classes A or C2 (all sizes). In order to comply with a higher radio interference suppression level Class B or C1, adaptive mains filters as external accessories for frequency inverter operation can be used with longer motor cables. There are two versions of these external mains filters that are to reduce the emissions of electrical interference.

Versions

- Footprint mains filter
- Chassis mains filter

Footprint

Chassis (low power)

Chassis (high power)

Figure 6: Mains filter versions

The **footprint mains filters** of type **SK LF1-460/xx-F** for SK 700E frequency inverters are only available for the power range of 1.5 kW to 22.0 kW. For SK 5xxE frequency inverters, only footprint mains filters of type **SK LF2-480/xxx-F** are available for the power range of 11.0 kW to 37.0 kW. For the SK 5xxE frequency inverters, 3 additional **footprint combination mains filters** of type **SK NHD-480/xx-F** are available for the power range of 1.5 kW to 7.5 kW in addition to the mains filters mentioned above. These footprint combination mains filters combine the advantages of a mains filter and an additional integrated mains input choke in a single housing.

The **chassis mains filters** of type **SK HLD 110-500/xxx** are available for the entire power range of 1.5 kW to 160.0 kW of SK 700E frequency inverters. Up to a power 110 kW, these chassis mains filters are also UL-approved and comply with radio interference suppression level Class A or C2 up to a maximum motor cable length of 50 m. Applications with motor cable lengths of up to 25 m; Class B or C1.

For application with an SK 5xxE frequency inverter, the identical, dependence of the input current, chassis mains filter SK HLD 110-500/xxx can only be used in the power range of 11.0 kW to 160.0 kW. For more details regarding the allocation of the respective mains filters, refer to the following sub-chapters.

Information **EMC limit value classes**

For more details regarding the EMC limit value classes and permitted motor cable lengths, please refer to the respective manuals (BU 0700 and BU 0500 or BU 0505, see www.nord.com).

2.6.1 Footprint mains filters and footprint combination mains filters

The footprint (**UB**)- **mains filters SK LFx-4x0/xx-F** and the combined **footprint combination mains filters SK NHD-480/xx-F** differ by the additional integrated mains input choke. The following tables list and compare the various footprint mains filters allocated to each of the performance levels. Both mains filters come in protection class IP20 and can be fitted as footprint and also as book size components. Mains connection to the mains filters occurs with screw terminals. Depending on the cable type (shielded or unshielded) and the length of the motor cable, both footprint mains filters feature a radio interference suppression level Class B or C1 with a maximum motor cable length of 50 m and a shielded cable. For a maximum motor cable length of 100 m and shielded motor cable, both footprint mains filters comply with EMC limit value classes A or C2.

1.5 kW to 7.5 kW

Footprint mains filter SK LF1-460/xx-F Part No.	**Name Information Data**	**Footprint combination mains filter SK NHD-480/xx-F Part No.**
SK LF1-460/14-F 278271014	**Footprint mains filter / footprint combination mains filter** • Power 1.5 kW and 2.2 kW • Class 3 (B)	SK NHD-480/6-F 278273006
	Footprint mains filter / footprint combination mains filter • Power 3.0 kW and 4.0 kW • Class 3 (B)	SK NHD-480/10-F 278273010
SK LF1-460/24-F 278271024	**Footprint mains filter / footprint combination mains filter** • Power 5.5 kW and 7.5 kW • Class 3 (B)	SK NHD-480/16-F 278273016

Table 20: 1.5 kW – 7.5 kW footprint mains filter and footprint combination mains filter

11.0 kW to 22.0 kW

Footprint mains filter SK LF1-460/xx-F Part No.	Name Information Data	Footprint mains filter SK LF2-480-xx-F Part No.
SK LF1-460/45-F 278271045	**Footprint mains filter** • Power 11.0 kW and 15.0 kW • Class 3 (B)	SK LF2-480/45-F 278273045
SK LF1-460/66-F 278271066	**Footprint mains filter** • Power 18.5 kW and 22.0 kW • Class 3 (B)	SK LF2-480/66-F 278273066

Table 21: 11.0 kW – 22.0 kW footprint mains filter

Information **Technical information / data sheets**

The **Technical Information** TI030 xxxxxxxxx offers more details such as dimensions of the various mains filter types listed in the present chapter.

The **TI**s Technical Information / data sheets of the mains filters can be downloaded on www.nord.com or can be provided upon request.

2.6.2 Chassis mains filters

Various sizes of the **chassis mains filters SK HLD 110-500/xxx** are available for both frequency inverter series (SK 700E and SK 5xxE) and all available frequency inverter power levels up to 110.0 kW.

For frequency inverter power levels 132.0 kW and 160.0 kW, other chassis mains filters of type SK HFD 103-500/300 or SK HFD 103-500/400 in a different version. The chassis mains filters come in protection class IP20 and are UL-approved (except for the SK HFD 103-500/xxx types).

Mains connection to the mains filters occurs with screw terminals. Depending on the type (shielded or unshielded) and the length of the motor cable, the chassis mains filters SK HLD 110-500/xxx feature a radio interference suppression level Class B or C1 with a maximum motor cable length of 25 m and a shielded cable. For a maximum motor cable length of 50 m and shielded motor cable, the chassis mains filter complies with EMC limit value classes A or C2. Chassis mains filters **SK HFD 103-500/xxx**, however, only comply with radio interference suppression level Class A.

Information **Chassis mains filters**

The present chapter will describe only some special requirements with regard of a deviating allocation because the chassis mains filters SK HLD 110-500/xxx or SK HFD 103-500/xxx are used for both frequency inverter series (SK 5xxE and SK 700E).

11.0 kW

Chassis mains filter SK HLD 110-500/xx Part No.	Name Information Data	Chassis mains filter SK HLD 110-500/xx Part No.
SK HLD-110-500/30 278272030	**Chassis mains filters** • power 11.0 kW • Class 3 (B) • 30.0 A / 42.0 A continuous current • 29. 0 / 280.0 mA or 20.0 / 290.0 mA leakage current	SK HLD-110-500/42 278272042

Table 22: 11.0 kW chassis mains filter

30.0 kW and 37.0 kW

Chassis mains filter SK HLD 110-500/xx Part No.	Name Information Data	Chassis mains filter SK HLD 110-500/xx Part No.
SK HLD-110-500/75 278272075	**Chassis mains filter / footprint combination mains filter** • power 30.0 kW • Class 3 (B) • 75.0 A / 100.0 A continuous current • 22. 0 / 210.0 mA or 30.0 / 290.0 mA leakage current	SK HLD-110-500/100 278272100
SK HLD-110-500/100 278272100	**Chassis mains filter / footprint combination mains filter** • power 37.0 kW • Class 3 (B) • 100.0 A / 130.0 A continuous current • 30. 0 / 290.0 mA or 22.0 / 210.0 mA leakage current	SK HLD-110-500/130 278272130

Table 23: 30.0 and 37.0 kW chassis mains filter

30.0 kW and 37.0 kW alternative with footprint mains filter

Chassis mains filter SK HLD 110-500/xx Part No.	Name Information Data	Footprint mains filter SK LF2 480/105-F Part No.
SK HLD-110-500/75 278272075	**Chassis mains filter / footprint mains filter** • power 30.0 kW • Class 3 (B) • 75.0 A / 105.0 A continuous current • 22. 0 / 210.0 mA or 12.0 / 120.0 mA leakage current	SK LF2-480/105-F 278273105
SK HLD-110-500/100 278272100	**Chassis mains filter / footprint mains filter** • power 37.0 kW • Class 3 (B) • 100.0 A / 105.0 A continuous current • 30. 0 / 290.0 mA or 12.0 / 120.0 mA leakage current	

Table 24: 30.0 and 37.0 kW chassis mains filter and footprint mains filter

55.0 kW

Chassis mains filter SK HLD 110-500/xx Part No.	Name Information Data	Chassis mains filter SK HLD 110-500/xx Part No.
SK HLD-110-500/130 278272130	**Chassis mains filters** • power 55.0 kW • Class 3 (B) • 130.0 A / 180.0 A continuous current • 22. 0 / 210.0 mA or 31.0 / 300.0 mA leakage current	SK HLD-110-500/180 278272180

Table 25: 45.0 kW chassis mains filter

75.0 kW

Chassis mains filter SK HLD 110-500/xx Part No.	Name Information Data	Chassis mains filter SK HLD 110-500/xx Part No.
SK HLD-110-500/180 278272180	**Chassis mains filters** • power 75.0 kW • Class 3 (B) • 180.0 A / 250.0 A continuous current • 31. 0 / 300.0 mA or 37.0 / 355.0 mA leakage current	SK HLD-110-500/250 278272250

Table 26: 75.0 kW chassis mains filter

Information — Technical information / data sheets

For more information and specifications such as dimensions of the chassis and footprint mains filters mentioned in this chapter, please refer to the pertaining **Technical Information** TI030 xxxxxxxxx or the respective manuals (BU 0700 and BU 0500 or BU 0505).

The **TI**s Technical Information / data sheets of the chassis and footprint mains filters can be downloaded on www.nord.com or can be provided upon request.

2.7 Chokes

Chokes are inductive, passive components used for current limitation, interference suppression and damping of undesired harmonic content.

There are two types of chokes: input and output chokes.

Choke type

- Input choke (mains choke)
- Output choke (motor choke)

Input choke

Output chokes

Figure 7: Choke types

Both choke types are available for the entire power ranges of the SK 700E and also the SK 5xxE frequency inverters from 1.5 kW to 160.0 kW.

To reduce harmful mains voltage peaks or mains voltage fluctuations, adaptive **input chokes** of type **SK CI1-4x0/xxx-C** can be connected upstream of the frequency inverter if required by the system. The use of input chokes considerably reduces external mains feedback effects and the proportion of current harmonics to a minimum.

To improve the EMC characteristics and for safety reasons, **output chokes** of type **SK CO1-4x0/xxx-C** are often implemented between frequency inverter and the motor in case of long motor cables. They reduce the electromagnetic radiation emitted by the motor cable or provide cable compensation in case of long motor cables. For more details regarding the allocation of the respective input and output chokes, refer to the following sub-chapters.

2.7.1 Input choke

The **input chokes SK CI1-4x0/xxx-C** are connected upstream of the frequency inverter and restrict the input current to nearly the output current of the frequency inverter.

The tables below allocate the input chokes to the power ranges of the two frequency inverter series and compare them. The input chokes are UL-approved and should always be installed in the switch cabinet because of their IP00 protection class. Input chokes have screw terminals for connection.

Information **Input choke**

It is recommended that an input choke is **always** used for frequency inverters with a power of **more than 45 kW**. As a rule, you can continue using existing input chokes of type SK CI1-**460**/xxx-C of the SK 700E for the SK 5xxE when migrating from the SK 700E to an SK 5xxE frequency inverter. For new installations and system extensions with an SK 5xxE frequency inverter, an input choke of type SK CI1-**480**/xxx-C with **higher rated voltage** (see tables below) should be planned and implemented.

1.5 kW to 15.0 kW

Input choke SK CI1-460/xxx-C Part No.	Name Information Data	Input choke SK CI1-480/xxx-C Part No.
SK CI1-460/6-C 276995004	**Input choke** • Power 1.5 kW and 2.2 kW • 6.0 A continuous current • 3 x 4.88 mH inductivity	SK CI1-480/6-C 276993006
SK CI1-460/11-C 276995010	**Input choke** • Power 3.0 kW and 4.0 kW • 11.0 A continuous current • 3 x 2.93 mH inductivity	SK CI1-480/11-C 276993011
SK CI1-460/20-C 276995020	**Input choke** • Power 5.5 kW and 7.5 kW • 20.0 A continuous current • 3 x 1.47 mH inductivity	SK CI1-480/20-C 276993020
SK CI1-460/40-C 276995040	**Input choke** • Power 11.0 kW and 15.0 kW • 40.0 A continuous current • 3 x 0.73 mH inductivity	SK CI1-480/40-C 276993040

Table 27: 1.5 kW – 15.0 kW input chokes

18.5 kW to 30.0 kW

Input choke SK CI1-460/xxx-C Part No.	Name Information Data	Input choke SK CI1-480/xxx-C Part No.
SK CI1-460/40-C 276995040	**Input choke** • Power 18.5 kW • 40.0 A / 70.0 A continuous current • 3 x 0.73 mH / 0.47 mH inductivity	SK CI1-480/70-C 276993070
SK CI1-460/70-C 276995070	**Input choke** • Power 22.0 kW and 30.0 kW • 70.0 A continuous current • 3 x 0.47 mH inductivity	

Table 28: 18.5 kW – 30.0 kW input chokes

37.0 kW to 75.0 kW

Input choke SK CI1-460/xxx-C Part No.	Name Information Data	Input choke SK CI1-480/xxx-C Part No.
SK CI1-460/100-C 276995100	**Input choke** • Power 37.0 kW and 45.0 kW • 100.0 A continuous current • 3 x 0.29 mH inductivity	SK CI1-480/100-C 276993100
SK CI1-460/160-C 276995160	**Input choke** • Power 55.0 kW and 75.0 kW • 160.0 A continuous current • 3 x 0.18 mH inductivity	SK CI1-480/160-C 276993160

Table 29: 37.0 kW – 75.0 kW input chokes

90.0 kW to 160.0 kW

Input choke SK CI1-460/xxx-C Part No.	Name Information Data	Input choke SK CI1-480/xxx-C Part No.
SK CI1-460/280-C 276995280	**Input choke** • Power 90.0 kW, 110.0 kW and 132.0 kW • 280.0 A continuous current • 3 x 0.10 mH inductivity	SK CI1-480/280-C 276993280
SK CI1-460/350-C 276995350	**Input choke** • Power 160.0 kW • 350.0 A continuous current • 3 x 0.084 mH inductivity	SK CI1-480/350-C 276993350

Table 30: 90.0 kW – 160.0 kW input chokes

Information — Technical information / data sheets

For more information and specifications such as dimensions of the input chokes mentioned in this chapter, please refer to the pertaining **Technical Information** TI021 xxxxxxxxx or the respective manuals (BU 0700 and BU 0500 or BU 0505).

The **TI**s Technical Information / data sheets of the input chokes can be downloaded on www.nord.com or can be provided upon request.

2.7.2 Output choke

The **output chokes SK CO1-4x0/xxx-C** are connected between frequency inverter and motor.

The tables below allocate the output chokes to the power range of the two frequency inverter series and compare them. The output chokes are UL-approved and should always be installed in the switch cabinet because of their IP00 protection class. Output chokes have screw terminals for connection.

Information — **Output choke**

We recommend using an **output choke** with motor cables **longer than 100 m** (**unshielded**) or **longer than 30 m** (**shielded**). As a rule, you can continue using existing output chokes of type SK CO1-**460**/xxx-C of the SK 700E for the SK 5xxE when migrating from the SK 700E to an SK 5xxE frequency inverter.

For new installations and system extensions with an SK 5xxE frequency inverter, you should always plan and implement an SK CO1-**480**/60-C with **higher rated voltage** in the power range of 18.5 kW to 300 kW.

All available output chokes for both frequency inverter series have been designed for a frequency inverter **pulse frequency** of**3** to **6 KHz** only!

18.5 kW to 30.0 kW

Output choke SK CO1-460/xxx-C Part No.	Name Information Data	Output choke SK CO1-480/xxx-C Part No.
SK CO1-460/60-C 276996060	**Output choke 460 / 480** • Power 18.5 kW to 30.0 kW • 60.0 A / 60.0 A continuous current • 3 x 0.33 mH / 3 x 0.33 mH inductivity	SK CO1-480/60-C 276992060

Table 31: 18.5 kW – 30.0 kW output chokes

90.0 kW

Output choke SK CO1-460/xxx-C Part No.	Name Information Data	Output choke SK CO1-460/xxx-C Part No.
SK CO1-460/170-C 276996170	**Output choke** • Power 90.0 kW • 170.0 A / 240.0 A continuous current • 3 x 0.13 mH / 3 x 0.07 mH inductivity	SK CO1-460/240-C 276996240

Table 32: 90.0 kW output chokes

Information — **Technical information / data sheets**

For more information and specifications such as dimensions of the input chokes mentioned in this chapter, please refer to the pertaining **Technical Information** TI022 xxxxxxxxx or the respective manuals (BU 0700 and BU 0500 or BU 0505).

The **TI**s Technical Information / data sheets of the output chokes can be downloaded on www.nord.com or can be provided upon request.

2.8 Braking resistors

External braking resistors are available as accessory for the SK 700E-xxx-340-**A** (-RS2) and also the SK 5xxE-xxx-340-A frequency inverters.

Both frequency inverter series feature integrated brake choppers, to absorb the fed back energy (resulting from dynamic brake actions) using an external braking resistor.

There are two versions of these external braking resistors that are used to prevent overvoltage-induced switch-off actions of the frequency inverters.

Version

- Footprint braking resistor
- Chassis braking resistor

Footprint versions SK BR1 / SK BR4

Chassis (type 1) SK BR2

Chassis (type 2) SK BR2

Figure 8: Braking resistor versions

The **footprint braking resistors** of type **SK BR1-xxx/xxx-F** for SK 700E frequency inverters are only available for the power range of 1.5 kW to 7.5 kW. For SK 5xxE frequency inverters, footprint braking resistors of type **SK BR4-xxx/xxx** are available for the power range of 1.5 kW to 7.5 kW.

The **chassis braking resistors** of type **SK BR2 –xxx/xxx-C** are available for the entire power range of SK 700E frequency inverters from 1.5 kW to 160.0 kW.

For application with an SK 5xxE frequency inverter, the identical - depending of the resistance - chassis braking resistors BW SK BR2-xxx-xxx-C can only be used in the power range from 3.0 kW to 160.0 kW. For more details regarding the allocation of the respective braking resistors, refer to the following sub-chapters.

Information **Braking resistors**

For more details regarding the resistances, continuous power specifications and dimensions of the braking resistors, please refer to the respective manuals (BU 0700 and BU 0500 or BU 0505, see www.nord.com).

2.8.1 Footprint braking resistors

The tables below list and compare the **footprint braking resistors SK BR1-xxx/xxx-F** or **SK BR4-xxx/xxx** allocated to the power ranges. The footprint braking resistors types/versions are different for both series of frequency inverters. Depending on the available space and the respective switch cabinet depth, both footprint braking resistor versions can be mounted either flat or vertically (book size) next to the frequency inverter. For thermal protection of the footprint braking resistor of type SK BR4-xxx/xxx, an optional temperature sensor (bimetal, 100 °C switching point, Part No. 275991200) can be fitted. Both footprint braking resistor versions are UL-approved and, because of their protection class IP40, can also be installed outside the switch cabinet for improved heat dissipation. For this purpose, the connection cables of the footprint braking resistors must be extended accordingly.

1.5 kW to 7.5 kW

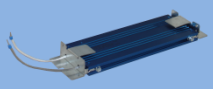
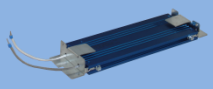
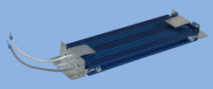
Footprint braking resistor SK BR1-xxx/xxx-F Part No.	**Name Information Data**	**Footprint braking resistor SK BR4-xxx/xxx Part No.**
SK BR1-200/300-F 278281030	**Footprint braking resistor BR1 / BR4** • Power 1.5 kW and 2.2 kW • 200 Ω / 220 Ω resistance • 300 W / 200 W continuous power • Connection via led out cables 0.3 m / 0.5 m cable length	SK BR4-220/200  275991220
SK BR1-100/400-F 278281040	**Footprint braking resistor BR1 / BR4** • Power 3.0 kW and 4.0 kW • 100 Ω / 100 Ω resistance • 400 W / 400 W continuous power • Connection via led out cables 0.3 m / 0.5 m cable length	SK BR4-100/400  275991240
SK BR1-60/600-F 278281060	**Footprint braking resistor BR1 / BR4** • Power 5.5 kW and 7.5 kW • 60 Ω / 60 Ω resistance • 600 W / 600 W continuous power • Connection via led out cables 0.3 m / 0.5 m cable length	SK BR4-60/600  275991260

Table 33: 1.5 kW – 7.5 kW footprint braking resistors

Information **Technical information / data sheets**

For more information, resistances, continuous power ratings and specifications such as dimensions of the footprint braking resistors mentioned in this chapter, please refer to the pertaining **Technical Information** TI014 xxxxxxxxx and the respective manuals (BU 0700 and BU 0500 or BU 0505).

The manuals and the **TI**s Technical Information / data sheets of the footprint braking resistors can be downloaded on www.nord.com or can be provided upon request.

2.8.2 Chassis braking resistors

Various sizes of the **chassis braking resistors SK BR2-xxx/xxx-C** are available for both frequency inverter series (SK 700E and SK 5xxE) and all available frequency inverter power levels up to 160.0 kW. There are two types/sizes, type 1 and type 2. The chassis braking resistors or resistor elements are integrated into a housing grating and can be used universally. The chassis braking resistors come with an integrated temperature sensor (bimetal) ex-factory. The temperature sensor can be connected to a digital input of the frequency inverter with two terminals (4 mm²), and one of the safety functions ("Block voltage" or "Emergency stop ") can be programmed.

Both chassis braking resistor versions are UL-approved and, because of their protection class IP20, can also be installed outside the switch cabinet for improved heat dissipation. For this purpose, the chassis braking resistors have to be connected to the respective frequency inverter via a separate connection cable, a shielded cable is recommended. The connection cable should be as short as possible.

Information — **Chassis braking resistors**

As the chassis braking resistors SK BR2 -xxx/xxx-C are used for both series of frequency inverters (SK 5xxE and SK 700E), there is no allocation to the frequency inverter power levels in the present chapter.

Information — **Technical Information**

For more details regarding the resistances, continuous power specifications and dimensions of the braking resistors, please refer to the respective manuals (BU 0700 and BU 0500 or BU 0505).

The manuals can be downloaded from www.nord.com.

3 Power and control terminal connection

3.1 Power connection

Connection of mains power, motor cable and braking resistor to the SK 700E series of frequency inverters occurs from below. The structure and the layout of the terminal strip of both versions are slightly different (frequency inverters up to 22.0 kW and more than 30.0 kW).

Power connection ≤ 22.0 kW **Power connection ≥ 30.0 kW**

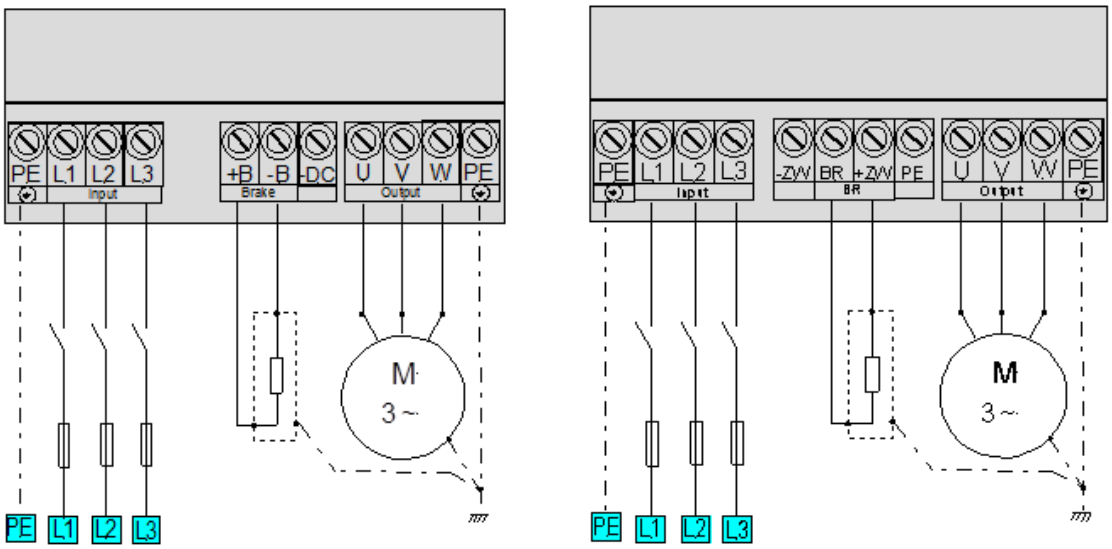
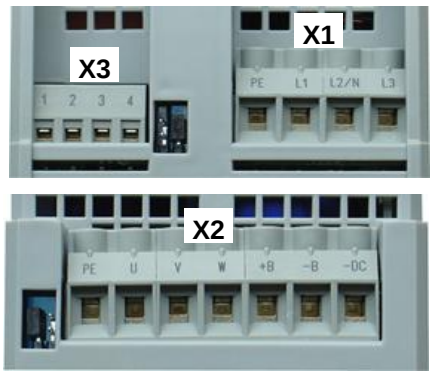


Figure 9: Power connection SK 700E

Compared to the SK 700E (all connections from below), the terminal connections of the SK 5xxE up to 37.0 kW are structured differently. Mains connection to the SK 5xxE frequency inverters occurs from above, motor and braking resistors connect from below. All terminal connections to inverters of size 8 (≥ 45.0 kW) and higher occur from below, on the frequency inverter front.

Figure 10: Power connection SK 5xxE up to size 7



Terminal strips:

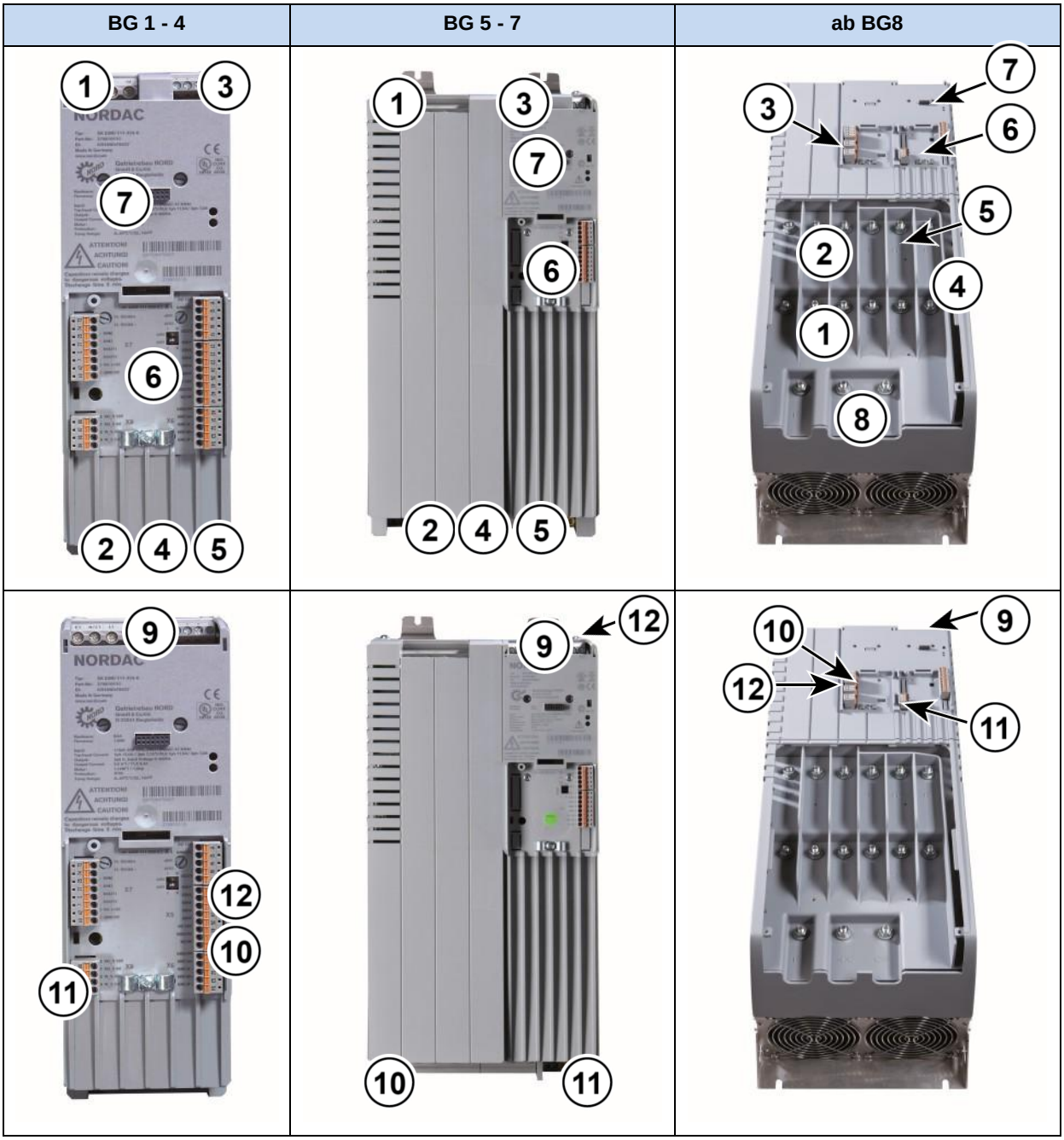
Connection from above

X1 mains connection

X3 multifunction relay

Connection from below

X2 motor connection, braking resistor



1 =	Mains connection	L1, L2/N, L3, PE	X1	
2 =	Motor connection	U, V, W, PE	X2	
3 =	multi-function relay	1 - 4	X3	
4 =	Braking resistor	+B, -B	X2	
5 =	DC - link circuit	-DC	X2	Above Size 8: + DC, - DC
6 =	Control terminals	IOs, GND, 24Vout, IG, DIP for AIN	X4, X5, X6, X7, X14	
7 =	Technology unit			
8 =	Link circuit choke	-DC, CP, PE	Above size 8:	
9 =	communication	CAN/CANopen; RS232/RS485	X9 / X10; X11	
10 =	Thermistor	T1/2 or TF+/-	X13	Up to size 4 (except SK 54xE): to DIN 5
11 =	Safe pulse block	86, 87, 88, 89	X8	
12 =	Control voltage VI 24V	40, 44	X12	Except SK 5x0E and SK 511E

Figure 11 Power and control connections SK 5xxE from size 1 up to 11

3.2 Control terminal connection

To connect I/O control signals to the SK 700E series of frequency inverters, several customer units of type SK CU1-xxx are available.

The SK 5xxE series of frequency inverters features onboard control terminals for the connection of I/O control signals.

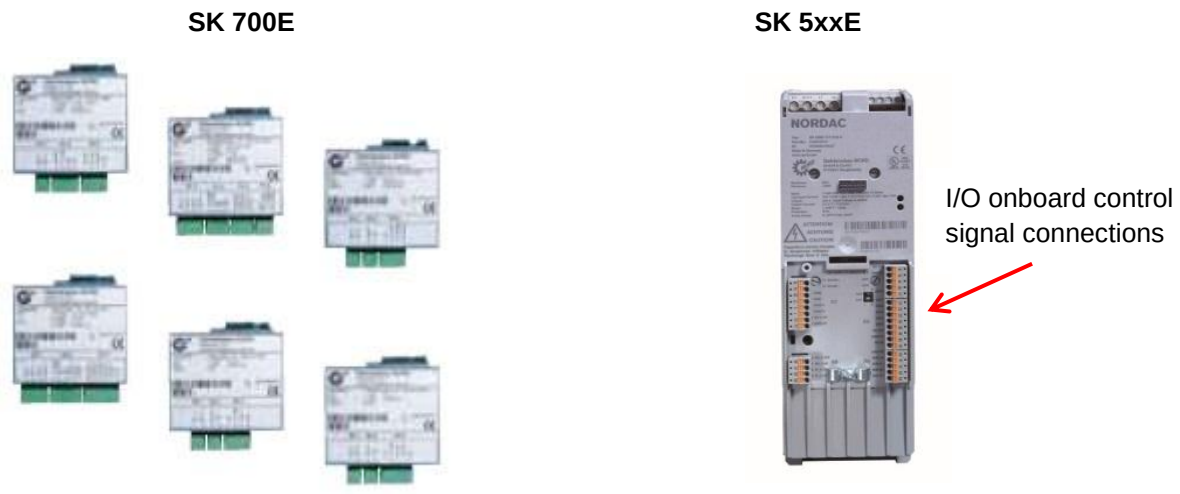


Figure 12: Customer units SK CU1-xxx and I/O control signal connections

3.2.1 I/O customer units

To connect I/O control signals to the SK 700E frequency inverters, 6 different I/O customer units are offered. In contrast, the SK 5xxE series of frequency inverters by default comes with respective onboard terminals to connect the I/O control signals. Please heed the differing terminal numbers/terminal names (e.g. terminal 42 / VO 15V, terminal 44 / VI 24V or VO 24V) for the different power supplies of inputs and outputs of the SK 5xxE frequency inverter types or sizes.

SK 700E				Name Function [factory setting]	SK 5xxE			
Customer unit SK CU1-BSC Part No.	Connector Terminal No. Name				Terminal strip Terminal No. Name			SK 5xxE onboard Part No.
Basic I/O SK CU1-BSC 278200000	X3.1	01	REL1.1	Relay 1 / output 1 NO relay contact [brake control {1}]	X3	1	K1.1	X3
		02	REL1.2			2	K1.2	
	X3.2	11	VREF 10V	10 V reference voltage	X4	11	VO 10V	X4
		12	AGND/0V	0 V analogue		12	GND/0V	
		13	AIN1 -	analogue input 1 -		12	GND/0V	
		14	AIN1 +	analogue input 1 + [setpoint frequency {1}]		14	AIN1	
	X3.3	21	DIG IN 1	digital input 1 [release right {1}]	X5	21	DIN1	X5
		22	DIG IN 2	digital input 2 [release left {2}]		22	DIN2	
		23	DIG IN 3	digital input 3 [Par. record switchover {8}]		23	DIN3	
		42	VO + 15V	15 V supply voltage		42* 44*	VO 15V VI 24V VO 24V	275xxxxxx
*	Depending on the frequency inverter types and sizes, the supply voltages, terminal numbers or terminal names differ. Terminal X5: **42 / VO 15V** for SK 500E, SK 510E, SK 511E, SK 520E, SK 530E and SK 540E, all sizes 1 - 4 Terminal X5: **44 / VI 24V** for SK 505E, SK 515E, SK 535E and SK 545E, all sizes 1 - 4, VI 24V is **mandatory** for 24 V supply of the digital inputs and the control unit of the frequency inverter. This terminal is also available on terminal block X7, X12 and X15. Terminal X5: **44 / VO 24V** for SK 505E, SK 515E, SK 535E and SK 545E, ≥ size 5, VO 24V is available as 24 V output voltage for supplying the digital inputs. This terminal is also available on terminal block X7. For more information, refer to manuals BU 0500 or BU 0505 (see www.nord.com).							

Table 34: Customer unit Basic I/O, SK CU1-BSC

Information — **Analogue input (differential input)**

When using the analogue input of the Basic I/O SK CU1-BSC customer unit , implemented as differential input, it must be taken into consideration that the SK 5xxE frequency inverters only feature non-isolated analogue inputs! This also applies to the basic I/O of type SK CU1-STD for SK 700E frequency inverters.

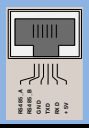
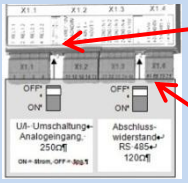
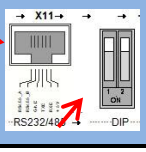
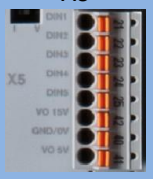
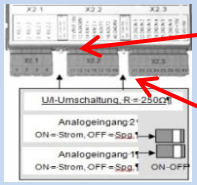
SK 700E					SK 5xxE			
Customer unit SK CU1-STD Part No.	**Connector Terminal No. Name**			**Name Function [factory setting]**	**Terminal strip Terminal No. Name**			**SK 5xxE onboard Part No.**
Basic I/O SK CU1-STD 278200020	X1.1	01	REL1.1	Relay 1 / output 1 NO relay contact [brake control {1}]	X3	1	K1.1	X3
		02	REL1.2			2	K1.2	
		03	REL2.1	Relay 2 / output 2 NO relay contact [Ready/Fault {7}]		3	K2.1	
		04	REL2.2			4	K2.2	
	X1.2	11	VREF 10V	10 V reference voltage	X4	11	VO 10V	X4
		12	AGND/0V	0 V analogue		12	GND/0V	
		13	AIN1 -	analogue input 1 -		12	GND/0V	
		14	AIN1 +	analogue input 1 + [setpoint frequency {1}]		14	AIN1	
		17	AOUT1	Analogue output 1 [no function {0}]		17	AOUT1	
	X1.3	21	DIG IN 1	digital input 1 [release right {1}]	X5	21	DIN1	X5 275xxxxxx
		22	DIG IN 2	digital input 2 [release left {2}]		22	DIN2	
		23	DIG IN 3	digital input 3 [Par. record switchover {8}]		23	DIN3	
		24	DIG IN 4	digital input 4 [fixed frequency 1 {4}]		24	DIN4	
		42	VO + 15V	15 V supply voltage		42* 44*	VO 15V VI 24V VO 24V	
	X1.4	41	VO +5V	5 V supply voltage		41	VO 5V	
		40	GND/0V	0 V digital		40	GND/0V	
		73	RS485 +	Data cable RS485	X11	1	RS485 A+	X11 
		74	RS485 -	Data cable RS485		2	RS485 A-	
	DIP left	ON = current OFF = voltage [Default = OFF]		Analogue input 1 Activatable 250 Ω load resistor for 0 / 4…20 mA	left = I (current) right = V (volt.) [Default = V]			DIP top
	DIP right	ON = activated [Default = OFF]		120 Ω terminal resistor for **RS485** interface	**RJ12** socket ON = activated [Default = OFF] **RS232** comm. DIP 1 = **OFF**			DIP 1 
*	Meaning see table / page 54.							

Table 35: Customer unit basic I/O, SK CU1-STD

SK 700E					SK 5xxE			
Customer unit SK CU1-MLT Part No.	**Connector Terminal No. Name**			**Name Function [factory setting]**	**Terminal strip Terminal No. Name**			**SK 5xxE onboard Part No.**
Multi I/O SK CU1-MLT 278200010	X2.1	01	REL1.1	Relay 1 / output 1 NO relay contact [brake control {1}]	X3	1	K1.1	X3
		02	REL1.2			2	K1.2	
		03	REL2.1	Relay 2 / output 2 NO relay contact [Ready/Fault {7}]		3	K2.1	
		04	REL2.2			4	K2.2	
	X2.2	11	VREF 10V	10 V reference voltage	X4	11	VO 10V	X4
		12	AGND/0V	0 V analogue		12	GND/0V	
		14	AIN1 +	analogue input 1 + [setpoint frequency {1}]		14**	AIN1	
		16	AIN2 +	analogue input 2 + [OFF {0}]		16**	AIN2	
		17	AOUT1	Analogue output 1 [no function {0}]		17	AOUT1	
		18	AOUT2	Analogue output 2 [no function {0}]	plus IO extension SK EBIOE-2 *** *for 2nd analogue output., 0…10 V*			
		40	GND/0V	0 V digital	X4	12	GND/0V	
	X2.3	21	DIG IN 1	digital input 1 [release right {1}]	X5	21	DIN1	X5 
		22	DIG IN 2	digital input 2 [release left {2}]		22	DIN2	
		23	DIG IN 3	digital input 3 [Par. record switchover {8}]		23	DIN3	
		24	DIG IN 4	digital input 4 [fixed frequency 1 {4}]		24	DIN4	
		25	DIG IN 5	digital input 5 [no function {0}]		25	DIN5	X7
		26	DIG IN 6	digital input 6 [no function {0}]	X7	26 ****	DIN6	
		42	VO + 15V	15 V supply voltage	X5	42* 44*	VO 15V VI 24V VO 24V	275xxxxxx
		41	VO +5V	5 V supply voltage		41 ****	VO 5V	

SK 700E		Name Function [factory setting]	SK 5xxE	
Customer unit SK CU1-MLT Part No.	**Connector Terminal No. Name**		**Terminal strip Terminal No. Name**	**SK 5xxE onboard Part No.**
	DIP left DIP right	Analogue input 1 ON = current OFF = voltage [Default = OFF] Activatable 250 Ω load resistor for 0 / 4…20 mA left = I (current) right = V (volt.) [Default = V] Analogue input 2	DIP top DIP bottom	

*	Meaning see table / page 54.
**	The setpoint converter ±10 V (278910320) is only needed for sizes 1 to 4 (1.5 kW to 7.5 kW) of all SK 5xxE frequency inverters. In case of applications with frequency inverters ≥ size 5 and ±10 V signals at the analogue inputs, only SK 54xE types of frequency inverters should be used.
***	The IO extension SK EBIOE-2 (275900210) can be used to connect the 2nd analogue output (0…10 V) and the two analogue inputs (-10 V…+10 V). Thus, additional ±10 V setpoint converters (278910320) are not needed. The IO extension SK EBIOE-2 can only be connected to SK 540E and SK 545E frequency inverters. For more information, refer to the Technical Information **TI 275900210** (see www.nord.com).
****	Terminal **X7: 26 / DIN6** is available on ≥SK 520E frequency inverters only.
*****	Terminal **X5: 41 / VO 5V** is **not** available on SK 540E frequency inverters and on SK 545E frequency inverters **≥ size 5** only.

Table 36: Customer unit Multi I/O, SK CU1-MLT

SK 700E					SK 5xxE			
Customer unit SK CU1-MLT-20mA Part No.	**Connector Terminal No. Name**			**Name Function [factory setting]**	**Terminal strip Terminal No. Name**			**SK 5xxE onboard Part No.**
Multi I/O SK CU1-MLT-20mA 278200015	X2.1	01	REL1.1	Relay 1 / output 1 NO relay contact [brake control {1}]	X3	1	K1.1	X3
		02	REL1.2			2	K1.2	
		03	REL2.1	Relay 2 / output 2 NO relay contact [Ready/Fault {7}]		3	K2.1	
		04	REL2.2			4	K2.2	
	X2.2	11	VREF 10V	10 V reference voltage	X4	11	VO 10V	X4
		12	AGND/0V	0 V analogue		12	GND/0 V	
		14	AIN1 +	analogue input 1 + [setpoint frequency {1}]		14**	AIN1	
		16	AIN2 +	analogue input 2 + [OFF {0}]		16**	AIN2	
		17	AOUT1	Analogue output 1 [no function {0}]		17 ****	AOUT1	
		18	AOUT2	Analogue output 2 [no function {0}]	plus IO extension SK EBIOE-2 *** *for 2nd analogue output., 0…10 V*			
		40	GND/0V	0 V digital	X4	12	GND/0 V	
	X2.3	21	DIG IN 1	digital input 1 [release right {1}]	X5	21	DIN1	X5
		22	DIG IN 2	digital input 2 [release left {2}]		22	DIN2	
		23	DIG IN 3	digital input 3 [Par. record switchover {8}]		23	DIN3	
		24	DIG IN 4	digital input 4 [fixed frequency 1 {4}]		24	DIN4	
		25	DIG IN 5	digital input 5 [no function {0}]		25	DIN5	X7
		26	DIG IN 6	digital input 6 [no function {0}]	X7	26	DIN6	
		42	VO + 15V	15 V supply voltage	X5	42* 44*	VO 15V VI 24V VO 24V	275xxxxxx
		41	VO +5V	5 V supply voltage		41 ****	VO 5V	

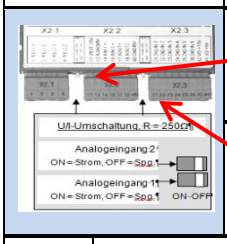
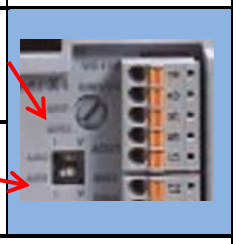
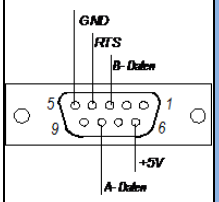
SK 700E		Name Function [factory setting]	SK 5xxE	
Customer unit SK CU1-MLT-20mA Part No.	**Connector Terminal No. Name**		**Terminal strip Terminal No. Name**	**SK 5xxE onboard Part No.**
	DIP left DIP right	Analogue input 1 ON = current OFF = voltage [Default = OFF] Activatable 250 Ω load resistor for 0/4…20 mA left = I (current) right = V (volt.) [Default = V] Analogue input 2	DIP top DIP bottom	
*	Meaning see table / page 54.			
**	Meaning see table / page 57.			
***	Meaning see table / page 57.			
****	Meaning see table / page 57.			
*****	Meaning see table / page 57.			
******	The analogue 0…10 V output signal of SK 5xxE frequency inverters must be converted to 0/4…20 mA with a commercially available external signal converter. As an alternative, an SK 54xE frequency inverter with an IO extension SK EBIOE-2 (275900210) can be used. For more information, refer to the Technical Information **TI 275900210** (see www.nord.com).			

Table 37: Customer unit Multi I/O 20mA, SK CU1-MLT-20mA

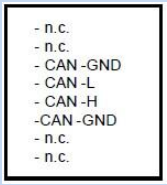
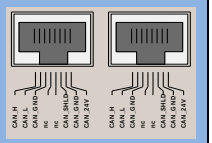
3.2.2 Field bus customer units

To connect field bus systems (incl. some I/O control signal terminals) to the SK 700E frequency inverters, 4 different field bus customer units are offered. In contrast, the SK 5xxE series of frequency inverters by default comes with respective onboard terminals to connect some field bus systems and some I/O control signals. Please heed the differing terminal numbers/terminal names (e.g. terminal 42 / VO 15V, terminal 44 / VI 24V or VO 24V) for the different power supplies of inputs and outputs of the SK 5xxE frequency inverter types or sizes.

SK 700E				Name Function [factory setting]	SK 5xxE			
Customer unit SK CU1-PBR Part No.	**Connector Terminal No. Name**				**Terminal strip Terminal No. Name**			**SK 5xxE onboard Part No.**
PROFIBUS DP SK CU1-PBR 278200030	X6.1	01	REL1.1	Relay 1 / output 1 NO relay contact [brake control {1}]	X3	1	K1.1	X3 X5
		02	REL1.2			2	K1.2	
	X6.2	42	VO + 15V	15 V supply voltage	X5	42* 44*	VO 15V VI 24V VO 24V	
		21	DIG IN 1	digital input 1 [release right {1}]		21	DIN1	
		41	VO +5V	5 V supply voltage		41	VO 5V	
		40	GND / 0V	0 V digital		40	GND/0V	
	X6.3	47	PBR +5V	PBR 5 V supply voltage	SUB D9 socket	PIN 6	+5 V	**SK TU3-PBR technology unit Part No.**
		48	PBR 0V	PBR 0 V supply voltage		PIN 5	GND	
		81	PBR A	PROFIBUS DP BUS + (**green** wire) RxD/TxD-P		PIN 8	A data	PROFIBUS DP SK TU3-PBR ** 275900030
		82	PBR B	PROFIBUS DP BUS - (**red** wire) RxD/TxD-N		PIN 3	B data	
		83	PBR RTS	PROFIBUS DP Ready to send		PIN 4	RTS	
	X6.4	81	PBR A	PROFIBUS DP BUS + (**green** wire) RxD/TxD-P		PE separately via cable lug 		
		82	PBR B	PROFIBUS DP BUS - (**red** wire) RxD/TxD-N				
		90	SHIELD	PROFIBUS DP cable shield				

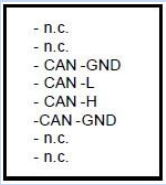
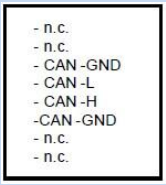
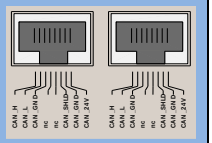
SK 700E		Name Function [factory setting]	SK 5xxE	
Customer unit SK CU1-PBR Part No.	**Connector Terminal No. Name**		**Terminal strip Terminal No. Name**	**SK 5xxE onboard Part No.**
	DIP left DIP right	PROFIBUS DP RTA ON = bottom OFF = top [Default = OFF] activatable 120 Ω terminal resistor PROFIBUS DP RTB	Sliding switch SUB-D9	
*	Depending on the frequency inverter types and sizes, the supply voltages, terminal numbers or terminal names differ. Terminal X5: **42 / VO 15V** for SK 500E, SK 510E, SK 511E, SK 520E, SK 530E and SK 540E, all sizes 1 - 4 Terminal X5: **44 / VI 24V** for SK 505E, SK 515E, SK 535E and SK 545E, all sizes 1 - 4, VI 24V is **mandatory** for 24 V supply of the digital inputs and the control unit of the frequency inverter. This terminal is also available on terminal block X7, X12 and X15. Terminal X5: **44 / VO 24V** for SK 505E, SK 515E, SK 535E and SK 545E, ≥ size 5, VO 24V is available as 24 V output voltage for supplying the digital inputs. This terminal is also available on terminal block X7. For more information, refer to manuals BU 0500 or BU 0505 (see www.nord.com).			
**	For more information on the technology unit SK TU3-PBR, refer to manual BU 0020 (see www.nord.com). As an option, the technology unit SK TU3-PBR-24V (27590160) can be operated with an external 24 V power supply. Manual BU 0020 provides more information.			

Table 38: Field bus customer unit PROFIBUS DP, SK CU1-PBR

SK 700E				Name Function [factory setting]	SK 5xxE			
Customer unit SK CU1-CAN Part No.	**Connector Terminal No. Name**				**Terminal strip Terminal No. Name**			**SK 5xxE onboard Part No.**
CAN Bus SK CU1-CAN 278200050	X5.1	01	REL1.1	Relay 1 / output 1 NO relay contact [brake control {1}]	X3	1	K1.1	X3
		02	REL1.2			2	K1.2	
	X5.2	42	VO + 15V	15 V supply voltage	X5	42* 44*	VO 15V VI 24V VO 24V	X5
		21	DIG IN 1	digital input 1 [release right {1}]		21	DIN1	
	X5.3	41	VO +5V	5 V supply voltage		41	VO 5V	
		40	GND / 0V	0 V digital		40	GND/0V	
		75	CAN1 H	CAN CAN BUS High	X9 + X10	PIN 1	CAN_H	CAN onboard X10 + X9 *** 275xxxxx
		76	CAN1 L	CAN CAN BUS Low		PIN 2	CAN_L	
1 x RJ45 socket  	RJ45	1	n. c.	n. c.		PIN 4	n.c.	
		2	n. c.	n. c.		PIN 5	n.c.	
		3	GND	CAN GND / 0 V supply voltage		PIN 3	CAN_GND	
		4	CAN_L (-)	CAN CAN BUS Low		PIN 2	CAN_L	
		5	CAN_H (+)	CAN CAN BUS High		PIN 1	CAN_H	
		6	GND	CAN GND / 0 V supply voltage		PIN 7	CAN_GND	RJ45 sockets X10 X9
		7	n. c.	n. c.		PIN 4	n.c.	
		8	n. c.	CAN 24 V external supply voltage		PIN 8	CAN_24V	
		Housing		PE cable shield		PIN 6	CAN_SHD	

***	For more information on the two onboard RJ45 CAN bus sockets (X9 and X10), please refer to manuals BU 0060, BU 0500 or BU 0505 (see www.nord.com). The CAN onboard function is only available for all frequency inverter types ≥ SK 511E. To use the CAN / CANnord functions of the SK 5xxE frequency inverters, the **CAN** bus requires an **external 24 V voltage supply**. Connection of the external 24 V supply occurs via the two RJ45 sockets X9 or X10, pin 3 or 7 for CAN_GND and pin 8 for CAN_24V. More information on the WAGO adapter module RJ45 / terminal, see chapter 2.1.3 Additional options for the functions.

Table 39: Field bus customer unit CAN, SK CU1-CAN

SK 700E				Name Function [factory setting]	SK 5xxE			
Customer unit SK CU1-CAN-RJ Part No.	Connector Terminal No. Name				Terminal strip Terminal No. Name			SK 5xxE onboard Part No.
CANnord Bus SK CU1-CAN-RJ 278200052	X7.1	01	REL1.1	Relay 1 / output 1 NO relay contact [brake control {1}]	X3	1	K1.1	X3
		02	REL1.2			2	K1.2	
	X7.2	42	VO + 15V	15 V supply voltage	X5	42* 44*	VO 15V VI 24V VO 24V	X5
		21	DIG IN 1	digital input 1 [release right {1}]		21	DIN1	
		22	DIG IN 2	digital input 2 [release left {2}]		22	DIN2	
		23	DIG IN 3	digital input 3 [Par. record switchover {8}]		23	DIN3	
		24	DIG IN 4	digital input 4 [fixed frequency 1 {4}]		24	DIN4	
		25	DIG IN 5	digital input 5 [no function {0}]		25	DIN5	
		40	GND / 0V	0 V digital		40	GND/0V	CAN onboard X10 + X9 ***
2 x RJ45 sockets   	X7.3 RJ45 sockets 2 x available	1	n. c.	n. c.	X9 + X10	PIN 4	n.c.	275xxxxx
		2	n. c.	n. c.		PIN 5	n.c.	
		3	GND	CAN GND / 0 V supply voltage		PIN 3	CAN_GND	
		4	CAN_L (-)	CAN CAN BUS Low		PIN 2	CAN_L	
		5	CAN_H (+)	CAN CAN BUS High		PIN 1	CAN_H	
		6	GND	CAN GND / 0 V supply voltage		PIN 7	CAN_GND	RJ45 sockets X10 X9
		7	n. c.	n. c.		PIN 4	n.c.	
		8	n. c.	CAN 24 V external supply voltage		PIN 8	CAN_24V	
		Housing		PE cable shield		PIN 6	CAN_SHD	

***	Meaning see table / page 63.

Table 40: Field bus customer unit CAN, SK CU1-CAN-RJ

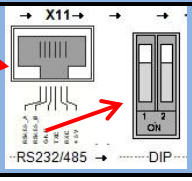
SK 700E					SK 5xxE			
Customer unit SK CU1-USS Part No.	**Connector Terminal No. Name**			**Name Function [factory setting]**	**Terminal strip Terminal No. Name**			**SK 5xxE onboard Part No.**
USS Bus SK CU1-USS 278200040 	X4.1	01	REL1.1	Relay 1 / output 1 NO relay contact [brake control {1}]	X3	1	K1.1	X3
		02	REL1.2			2	K1.2	
	X4.2	42	VO + 15V	15 V supply voltage	X5	42* 44*	VO 15V VI 24V VO 24V	X5
		21	DIG IN 1	digital input 1 [release right {1}]		21	DIN1	
		41	VO +5V	5 V supply voltage		41	VO 5V	
		40	GND / 0V	0 V digital		40	GND/0V	
	X4.3	73	RS485 +	RS485 + RS485_A	X11	PIN 1	RS485_A	RS485 onboard X11 **** 275xxxxx
		74	RS485 -	RS485 - RS485_B		PIN 2	RS485_B	
	DIP	ON = activated [Default = OFF]		activatable 120 Ω terminal resistor for **RS485** interface	**RJ12** socket ON = activated [Default = OFF] **RS232** comm. DIP 1 = **OFF**		DIP 1	
****	For more information on the USS / RS485 interface or the onboard RS485 / RJ45 socket (X11), please refer to manuals BU 0050, BU 0500 or BU 0505 (see www.nord.com).							

Table 41: Field bus customer unit USS, SK CU1-USS

3.2.3 PTC connection

Connection of the motor temperature sensor of PTC to the SK 700E series of frequency inverters occurs by way of one of the digital inputs of the customer units or extension units. Depending on the size of the PTCs, connection to the SK 5xxE series of frequency inverters occurs via digital inputs (preferably DI 5) or, with size ≥ 5, via separate terminals T1 and T2 of terminal block X15.

Size	SK 700E			SK 5xxE		
	1 - 8			1 - 4	5 - 7	8 - 11
Terminal block terminals	**I/O customer units**			-	-	-
	SK CU1-BSC	X3.3 /	21 – 23 42			
	SK CU1-STD	X1.3 / X1.4	21 – 24 41			
	SK CU1-MLT SK CU1-MLT-20mA	X2.3 /	26 41			
	Field bus customer units			-	-	-
	SK CU1-PBR	X6.2 /	21 41			
	SK CU1-CAN	X5.2 / X5.3 /	21 41			
	SK CU1-CAN-RJ	X7.2 /	21 – 25 42			
	SK CU1-USS	X4.2 /	21 41			
	Extension units			X5 / 25 41	X13 / T1 T2	X15 / T1 T2
	SK XU1-ENC	X11.1 /	33 41			
	SK XU1-POS	X10.2 / X10.4 /	27 – 32 41			

Table 42: PTC connection terminals

4 Dimensions

4.1 Frequency inverter

Contrary to the SK 700E, the SK 5xxE frequency inverters cannot be mounted directly with their rear in a switch cabinet but with two (sizes 1 – 4) or four (sizes 5 – 7) supplied wall mount bracket.

SK 5xxE frequency inverters ≥ size 8 feature an assembly device for the wall mount brackets integrated their housing.

Figure 13: Wall mount bracket

4.1.1 Frequency inverter series SK 700E ↔SK 5xxE

The tables and figures below give the dimensions [mm] of both series of frequency inverters, depending on their power as well as the respective weights [kg].

Dimensions

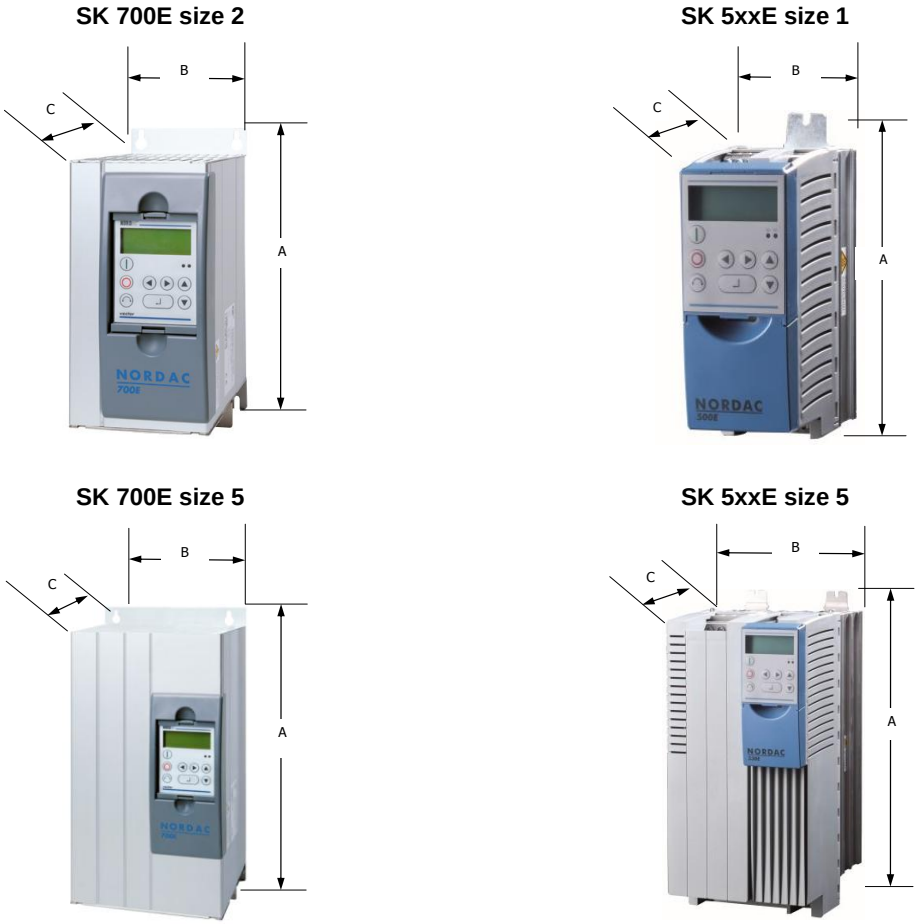


Figure 14: Dimensions of SK 700E and SK 5xxE series of frequency inverters

Dimensions and weights

SK 5xxE- ... / SK 700E- ...	Dimensions [mm]	... 151-340-A	... 221-340-A	... 301-340-A	... 401-340-A	... 551-340-A	... 751-340-A	... 112-340-A	... 152-340-A	... 182-340-A	... 222-340-A	SK 700E Weight approx. [kg]
... 151-340-A (-RS2) ... 221-340-A (-RS2)	**A** [height]	281	260									4.0
	B [width]	123	74									
	C [depth]	219	153									
... 301-340-A (-RS2) ... 401-340-A (-RS2)	**A** [height]			281	275							4.0
	B [width]			123	98							
	C [depth]			219	181							
... 551-340-A (-RS2) ... 751-340-A (-RS2)	**A** [height]					331	320					5.0
	B [width]					123	98					
	C [depth]					219	181					
... 112-340-A (-RS2) ... 152-340-A (-RS2)	**A** [height]							386	377			9.0
	B [width]							201	162			
	C [depth]							268	224			
... 182-340-A (-RS2) ... 222-340-A (-RS2)	**A** [height]									431	397	12.5
	B [width]									201	180	
	C [depth]									268	234	
SK 5xxE weight approx. [kg]		1.8		2.7		3.1		8.0		10.3		

Table 43: Dimensions and weights of frequency inverters, power 1.5 kW – 22.0 kW

SK 5xxE- ... / SK 700E- ...	Dimensions [mm]	... 302-340-A	... 372-340-A	... 452-340-A	... 552-340-A	... 752-340-A	... 902-340-A	... 113-340-A	... 133-340-A	... 163-340-A		SK 700E Weight approx. [kg]
... 302-340-O ... 372-340-O	**A** [height]	599	485									24.0
	B [width]	263	210									
	C [depth]	263	236									
... 452-340-O ... 552-340-O	**A** [height]			599	598							28.0
	B [width]			263	265							
	C [depth]			263	286							
... 752-340-O ... 902-340-O	**A** [height]					736	636					45.0
	B [width]					263	265					
	C [depth]					336	286					
... 113-340-O ... 133-340-O	**A** [height]							1207	720			115.0
	B [width]							354	395			
	C [depth]							263	292			
... 163-340-O-VT	**A** [height]									1207	799	
	B [width]									354	395	
	C [depth]									263	292	
SK 5xxE weight approx. [kg]		16,0		20,0		25,0		46,0 / 49,0		52.0		

Table 44: Dimensions and weights of frequency inverters, power 30.0 kW – 163.0 kW

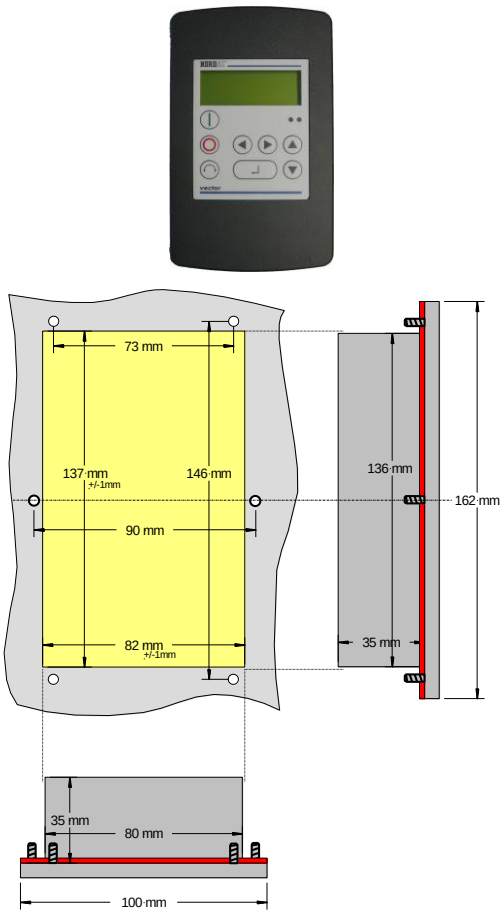
4.2 Options

4.2.1 Control and parameter box

The following table and figures show the dimensions [mm] of both built-in control and parameter boxes SK PAR-2E and SK PAR-3E.

Dimensions

SK PAR-2E



SK PAR-3E

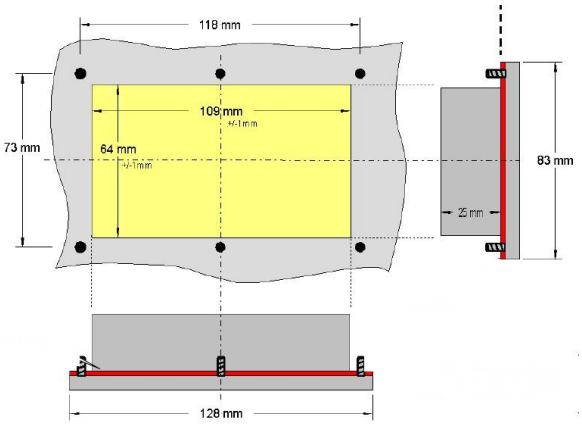


Figure 15: Dimensions of the built-in SK PAR-2E and SK PAR-3E parameter boxes

Information **SimpleBox SK CSX-3E**

The dimensions and fastening points of the SimpleBox SK CSX-3E are identical with those of the built-in parameter box SK PAR-3E.

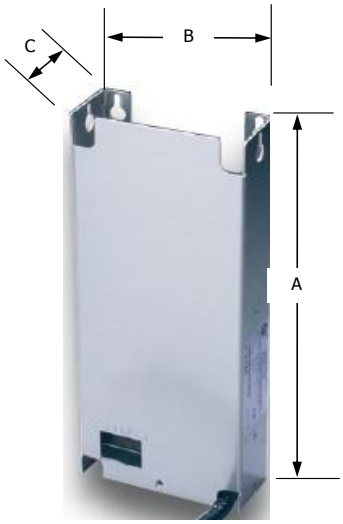
4.3 Mains filters

4.3.1 Footprint mains filters and combination mains filters

The table and figures below give the dimensions [mm] of footprint mains filters as well as the respective weights [kg].

Dimensions

SK LF1-460/xx-F



SK LF2-480/xxx-F

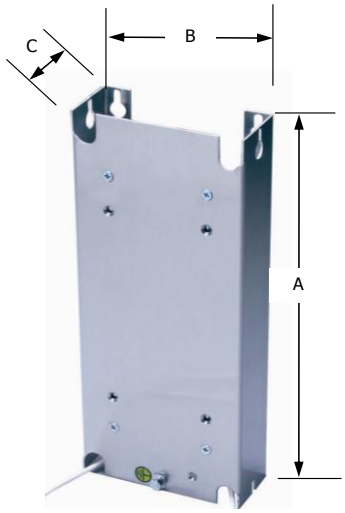


Figure 16: Dimensions of footprint mains filters SK LF1-460/xx-F and SK LF2-480/xxx-F

SK NHD-480/xxx-F

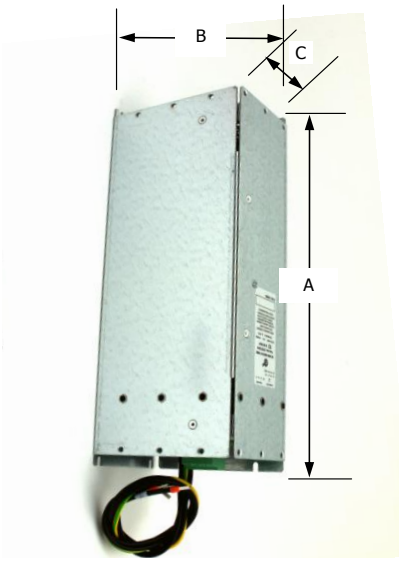


Figure 17: Dimensions of footprint combination mains filters SK NHD-480/xx-F

Dimensions and weights

SK 5xxE / SK 700E	Dimensions [mm]	SK NHD-480/6-F 1.5 kW and 2.2 kW		SK NHD-480/10-F 3.0 kW and 4.0 kW		SK NHD-480/16-F 5.5 kW and 7.5 kW		SK LF2-480/45-F 11.0 kW and 15.0 kW		SK LF2-480/66-F 18.5 kW and 22.0 kW		Mains filter Weight approx. [kg]
SK LF1-460/14-F 1.5 kW and 2.2 kW	**A** [height]	281	290									1.1
	B [width]	121	88									
	C [depth]	48	74									
SK LF1-460/14-F 3.0 kW and 4.0 kW	**A** [height]			281	305							1.1
	B [width]			121	115							
	C [depth]			48	98							
SK LF1-460/24-F 5.5 kW and 7.5 kW	**A** [height]					331	350					1.5
	B [width]					121	140					
	C [depth]					58	98					
SK LF1-460/45-F 11.0 kW and 15.0 kW	**A** [height]							386	380			3.0
	B [width]							165	164			
	C [depth]							73	75			
SK LF1-460/66-F 18.5 kW and 22.0 kW	**A** [height]									431	428	4.2
	B [width]									201	182	
	C [depth]									83	75	
Mains filter weight ca. [kg]		3.1		5.2		7.2		4.9		6.6		

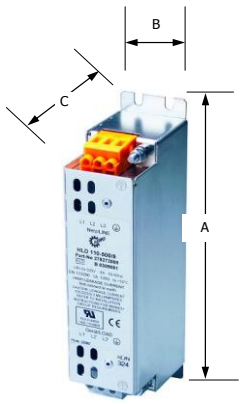
Table 45: Dimensions and weights of footprint mains filters, power 1.5 kW – 22.0 kW

4.3.2 Chassis mains filters

The tables and figures below give the dimensions [mm] of footprint mains filters as well as the respective weights [kg].

Dimensions

SK HLD 110-500/xx



SK LF2-480/xxx-F

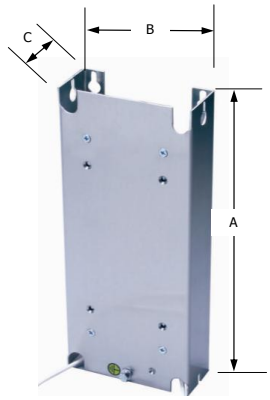


Figure 18: Dimensions of chassis and footprint mains filters SK HLD 110-500/xx and SK LF2-480/xxx-F

Dimensions and weights

SK 5xxE / SK 700E	Dimensions [mm]	SK HLD-110-500/42 11.0 kW		SK HLD-110-500/100 30.0 kW		SK HLD-110-500/130 37.0 kW		SK HLD-110-500/180 55.0 kW		SK HLD-110-500/250 75.0 kW		SK LF2-480/105-F 30.0 kW and 37.0 kW	alternative	Mains filter Weight approx. [kg]
SK HLD-110-500/30 11.0 kW	**A** [height]	270	310											1.8
	B [width]	55	55											
	C [depth]	95	95											
SK HLD-110-500/75 30.0 kW	**A** [height]			310	325							310	525	4.5
	B [width]			85	95							85	210	
	C [depth]			135	150							135	95	
SK HLD-110-500/100 37.0 kW	**A** [height]					325	325					325	525	5.2
	B [width]					95	95					95	210	
	C [depth]					150	150					150	95	
SK HLD-110-500/130 55.0 kW	**A** [height]							325	440					5.6
	B [width]							95	130					
	C [depth]							150	181					
SK HLD-110-500/180 75.0 kW	**A** [height]									440	525			9.2
	B [width]									130	155			
	C [depth]									181	220			
Mains filter weight approx. [kg]		2.1		5.2		5.6		9.2		12.2		10.0		

Table 46: Dimensions and weights of chassis and footprint mains filters, power 11.0 kW – 75.0 kW

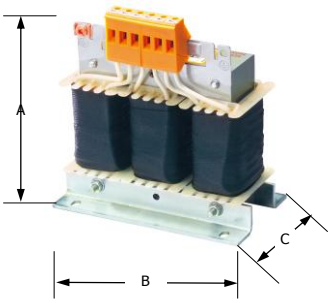
4.4 Chokes

4.4.1 Input chokes

The table and figures below give the dimensions [mm] of input chokes as well as the respective weights [kg].

Dimensions

SK CI1-460/xxx-C



SK CI1-480/xxx-C

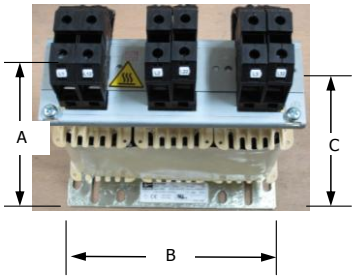


Figure 19: Dimensions of input chokes SK CI1-460/xxx-C and SK CI1-480/xxx-C

Dimensions and weights

SK 5xxE / SK 700E	Dimensions [mm]	SK CI1-480/6-C 1.5 kW and 2.2 kW		SK CI1-480/11-C 3.0 kW and 4.0 kW		SK CI1-480/20-C 5.5 kW and 7.5 kW		SK CI1-480/40-C 11.0 kW and 15.0 kW		SK CI1-480/70-C 18.5 kW and 30.0 kW		Choke Weight approx. [kg]
SK CI1-460/6-C 1.5 kW and 2.2 kW	**A** [height]	140	117									2.4
	B [width]	125	96									
	C [depth]	71	60									
SK CI1-460/11-C 3.0 kW and 4.0 kW	**A** [height]			160	140							3.4
	B [width]			155	120							
	C [depth]			84	85							
SK CI1-460/20-C 5.5 kW and 7.5 kW	**A** [height]					201	177					6.6
	B [width]					190	155					
	C [depth]					98	110					
SK CI1-460/40-C 11.0 kW and 15.0 kW	**A** [height]							201	172			10.4
	B [width]							190	155			
	C [depth]							118	115			
SK CI1-460/40-C 18.5 kW	**A** [height]									201	220	10.4
	B [width]									190	185	
	C [depth]									118	122	
SK CI1-460/70-C 22.0 kW and 30.0 kW	**A** [height]									220	220	14.0
	B [width]									230	185	
	C [depth]									124	122	
Choke weight approx. [kg]		0.5		5.2		7.2		4.9		6.6		

Table 47: Dimensions and weights of input chokes, power 1.5 kW – 30 kW

Dimensions and weights

SK 5xxE / SK 700E	Dimensions [mm]	SK CI1-480/100-C 37.0 kW and 45.0 kW		SK CI1-480/160-C 55.0 kW and 75.0 kW		SK CI1-480/280-C 90.0 kW and 132.0 kW		SK CI1-480/350-C 160.0 kW			Choke Weight approx. [kg]
SK CI1-460/100-C 37.0 kW and 45.0 kW	**A** [height]	290	263								18.8
	B [width]	230	240								
	C [depth]	148	148								
SK CI1-460/160-C 55.0 kW and 75.0 kW	**A** [height]			360	268						25.4
	B [width]			299	352						
	C [depth]			170	140						
SK CI1-460/280-C 90.0 kW and 132.0 kW	**A** [height]					270	268				58.0
	B [width]					190	352				
	C [depth]					98	169				
SK CI1-460/350-C 160.0 kW	**A** [height]							270	268		41.5
	B [width]							300	352		
	C [depth]							190	169		
Choke weight approx. [kg]		18.4		27.0		40.5		41.5			

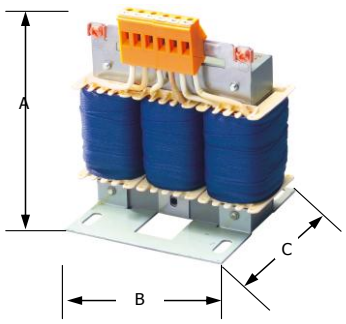
Table 48: Dimensions and weights of input chokes, power 37 kW – 160 kW

4.4.2 Output chokes

The table and figures below give the dimensions [mm] of output chokes as well as the respective weights [kg].

Dimensions

SK CO1-460/xxx-C



SK CO1-480/xxx-C

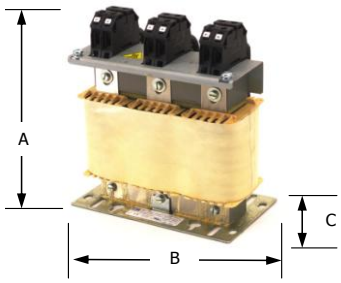


Figure 20: Dimensions of output chokes SK CO1-460/xxx-C and SK CO1-480/xxx-C

Dimensions and weights

SK 5xxE / SK 700E	Dimensions [mm]	SK CO1-480/60-C 18.5 kW and 30.0 kW		SK CO1-460/240-C 90.0 kW		Choke Weight approx. [kg]
SK CO1-460/60-C 18.5 kW to 30.0 kW	**A** [height]	260	117			13.8
	B [width]	125	96			
	C [depth]	71	60			
SK CO1-460/170-C 90.0 kW	**A** [height]			160	140	47.0
	B [width]			155	120	
	C [depth]			84	85	
Choke weight approx. [kg]		9.0		63.5		

Table 49: Dimensions and weights of output chokes, power 18.5 kW – 30.0 kW and 90.0 kW

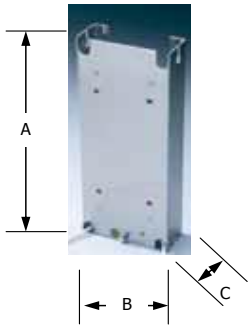
4.5 Braking resistors

4.5.1 Footprint braking resistors

The tables and figures below give the dimensions [mm] of footprint braking resistors as well as the respective weights [kg].

Dimensions

SK BR1-xxx/xxx-F



SK BR4-xxx/xxx

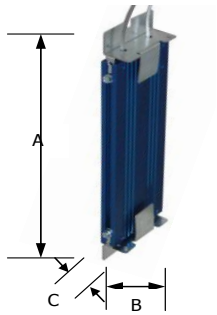


Figure 21: Dimensions of footprint braking resistors SK BR1/xxx/xxx-F and SK BR4-xxx/xxx

Dimensions and weights

SK 5xxE / SK 700E	Dimensions [mm]	SK BR4-220/200 1.5 kW and 2.2 kW		SK BR4-100/400 3.0 kW and 4.0 kW		SK BR4-60/600 5.5 kW and 7.5 kW				Resistance Weight approx. [kg]
SK BR1-200/300-F 1.5 kW and 2.2 kW	**A** [height]	281	270							1.0
	B [width]	121	88							
	C [depth]	48	27							
SK BR1-100/400-F 3.0 kW and 4.0 kW	**A** [height]			281	285					1.6
	B [width]			121	98					
	C [depth]			48	58					
SK BR1-60/600-F 5.5 kW and 7.5 kW	**A** [height]					331	330			1.9
	B [width]					121	98			
	C [depth]					48	58			
Resistor weight approx. [kg]		0.7		1.6		2.1				

Table 50: Dimensions and weights of footprint braking resistors, power 1.5 kW – 7.5 kW

4.5.2 Chassis braking resistors

Information **Chassis braking resistors**

As the chassis braking resistors SK BR2 -xxx/xxx-C are used for both series of frequency inverters (SK 5xxE and SK 700E), there is no allocation to the frequency inverter power levels in the present chapter.

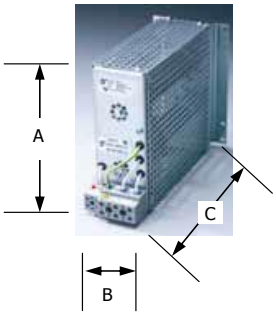
Information **Technical Information**

For more details regarding the dimensions and weights of the chassis braking resistors, please refer to the respective manuals (BU 0700 and BU 0500 or BU 0505) or the **Technical Information**.

The manuals and the **TI**s Technical Information / data sheets of the braking resistors can be downloaded on www.nord.com or can be provided upon request.

Dimensions

SK BR2-xxx/xxx-C
Type 1



SK BR2-xxx/xxx-C
Type 2

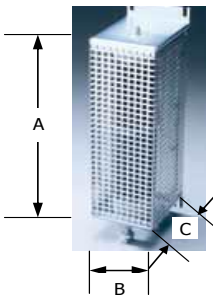


Figure 22: Dimensions of chassis braking resistors SK BR2/xxx/xxx-C

5 Additional information / Appendix

5.1 Further documentation

To supplement the present Migration Guide, manuals, Technical Information / data sheets, flyers and brochures are available that provide, additional information on the products mentioned, in the present document.

5.1.1 Manuals

Basic information about the frequency inverters can be found in the relevant manuals for the frequency inverter series (e.g. **BU 0500** for SK 500E).

Further information for bus-specific technology options (e.g. field bus options SK TU3-PBR-24V) is given in respective supplementary manuals (e.g. **BU 0020** for PROFIBUS DP options).

Separate information on the control and parameter boxes (e.g. SK TU3-PAR or SK PAR-2E) is available in manual BU 0040 Control and Parameter Boxes.

Document	Name
BU 0000	Manual of NORD CON software
BU 0020	Manual of PROFIBUS DP
BU 0030	Manual of CANbus
BU 0040	Manual of Control and Parameter Boxes
BU 0060	Manual of CANopen
BU 0070	Manual of InterBus
BU 0080	Manual of DeviceNet
BU 0090	Manual of AS Interface
BU 0500	Manual of SK 5xxE (SK 500E … SK 535E)
BU 0505	Manual of SK 54xE (SK 540E and SK 545E)
BU 0510	Manual of POSICON positioning control for ≥ SK 530E
BU 0700	Manual of SK 700E
BU 0710	Manual of POSICON positioning control for SK 700E
BU 0920	Manual of setpoint card + / - 10 V

5.1.2 Technical information / data sheets

Basic information on some optional components such as braking resistors, EMC mains filters, adapter and connection cables - used for the frequency inverter series mentioned here – is available in separate Technical Information / data sheets (e.g. TI 275900210 for the IO extensions SK EBIOE-2).

Document	Name
TI 275900210	Tech. Information / data sheet SK EBIOE-2 IO extension
TI014_275991240	Data sheet of braking resistor SK BR4-100/400
TI014_275991260	Data sheet of braking resistor SK BR4-60/400
TI030_278273006	Data sheet of EMC mains filter SK NHD-480/6-F
TI030_278273010	Data sheet of EMC mains filter SK NHD-480/10-F
TI030_278273016	Data sheet of EMC mains filter SK NHD-480/16-F
TI051_275274601	Data sheet of connection cable SK TIE4-RJ12-RJ12
TI051_278910020	Data sheet of connection cable P-Box Vector
TI051_278910220	Data sheet of adapter cable USB / 5 V

For more information on other optional components such as input and output chokes, chassis and footprint braking resistors etc., please refer to the manuals of the frequency inverter series (BU 0500, BU 0505 and BU 0700).

Please contact the Service / Technical Support of Getriebebau NORD GmbH & Co. KG if you need other information regarding the optional components.

We can also provide manufacturer-specific data sheets upon request.

5.1.3 Product flyers / brochures

Comprehensive product information on the two frequency inverter series SK 5xxE and SK 700E, the various technology options and pertaining accessories (such as chokes, braking resistors, EMC mains filters, etc.) is available in the respective product flyers for both frequency inverter series (**F 3050** and F 3051 for SK 500E).

Document	Name
F 3050	Switch cabinet inverter SK 500E
F 3051	Switch cabinet inverter SK 500E 45 – 160 KW
F 3070	Frequency inverter SK 700E

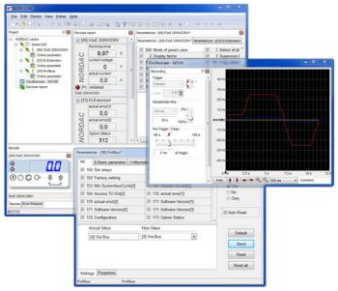
5.2 Software

The software listed below can be downloaded on the homepage www.nord.com (main page -> Documentation -> Software).

Information **Software**

Getriebebau NORD GmbH & Co. KG will not assume liability for installation and operation of NORD CON, NORDAC options software and NORD EPLAN MACROS!

5.2.1 NORD CON



You can download a PC application from www.nord.com for programming and operating the SK 5xxE and SK 2xxE series of frequency inverters.

NORD CON Version 2.0 can set up parameters of starters, frequency inverters as well as technology units and customer units.

For further information please refer to the link below.

Software	Description	Version
NORD CON	NORD CON is a PC program to control and parameterise frequency inverters manufactured by NORD GmbH & Co. KG. Communication with the frequency inverter occurs via the serial SUB-D9 interface of the PC or a commercially available USB connected to a USB port.	≥ 2.2

5.2.2 NORD options

For planning and programming the various bus system options, several software files can be downloaded from www.nord.com for the SK 5xxE series of frequency inverters allowing for integration into a wide range of automation systems.

NORDAC Options contain device-specific information and parameters necessary for connecting bus-specific field bus options (technology units and customer units) of NORD frequency inverters to the currently used bus system.

For more information, please refer to the link below or the pertaining "readme" text files.

Software	Description	Version
NORDAC Options	NORDAC Options are software files with bus system-specific software files (such as PROFIBUS DP – GSD, CANopen – EDS, EtherCAT – XML, etc.) for planning of system-specific automation projects with frequency inverters by Getriebebau NORD GmbH & Co. KG. The software files are allocated to the available field bus options of the various frequency inverter series. Implementation of the software files occurs by inclusion into the controller or automation software of the respective bus system manufacturer.	Software-specific

Notes on NORDAC Options

The following **must** be heeded when planning software of automation systems (PLC, CANopen Master, etc.) when migrating to the new field bus technology units of type SK TU3-xxx (-24V) for the SK 5xxE series of frequency inverters:

1. different software files for PROFIBUS DP (GDS), CANopen (EDS) and DeviceNet (EDS)
2. different order of process data (PZD)

   PROFIBUS DP Area with PPO types 2 and 4: setpoints and actual values 2 / 3 are swapped

   CANopen Area with up to three 16-bit: setpoints and actual values 2 / 3 are swapped

   DeviceNet Area with up to three 16-bit: setpoints and actual values 2 / 3 are swapped
3. Different structure of the parameter label (PKE)
   Some parameter names and structures such as array parameter structure, parameter functions, sub index (IND) etc. have changed

Information **Supplementary manuals**

For more information on the deviations/differences of the parameterisation structures, regarding the field bus communication variants, please refer to the respective supplementary manual (e.g. BU 0020 PROFIBUS DP), also see chapter 5.1.1 Manuals.

5.3 3D models

Upon request, Service / Technical Support of Getriebebau NORD GmbH & Co. KG can provide STEP 3D models of the frequency inverters and of some optional components.

5.4 NORD EPLAN macros

To plan and create circuit diagrams for the SK 5xxE series of frequency inverters, appropriate EPLAN macros can be downloaded from www.nord.com.

For further information please refer to the link below.

Software	Description	Version
NORD EPLAN macros	There are NORD EPLAN macros for planning and documenting electronic automation projects for frequency inverters by Getriebebau NORD GmbH & Co. KG.	≥ 5.50 or Electric P8

5.5 Technical support

Please contact the Service / Technical Support of Getriebebau NORD GmbH & Co. KG if you need other information regarding the present document or other possible applications.

Upon request, users can obtain additionally required information or software files (such as special software versions, firmware for software updates, etc.) after technical consultation.

5.6 Abbreviations in the Migration Guide

AS (AS1)	AS Interface
AIN	Analogue input
AOUT	Analogue output
BSC	Basic customer unit
BR	Braking resistor
CAN	Controller Area Network
CAO	Controller Area Network, higher level protocol
CTR	ControlBox
CU1	Customer unit
DEV	DeviceNET
DI (DIN)	Digital input
DO (DOUT)	Digital output
I / O	Input /Output
EBIOE-2	External IO extension
EDS	Electronic Data Sheet
EMC	Electromagnetic compatibility
ENC	Extension unit Encoder
FI	Frequency inverter
GSD	Device master data
I/O	In / Out (Input / Output)
IND	Index
LCD	Liquid crystal display
LED	Light emitting diode
MLT	Multi customer unit
PAR	Parameterbox
PBR	PROFIBUS DP
PKE	Parameter identifier
POS	Extension unit POSICON
RS2	Abbreviation for RS232 interface
RS232	Serial interface
RS485	Standard interface
PZD	Process data
PPO	Parameter process data object
SK	Schlicht & Küchenmeister
STD	Standard customer interface
PLC	Programmable Logic Controller
SSI	Synchronous serial interface
SW	Software version, P707
TI	Technical information / Data sheet (Data sheet for NORD accessories)
TTL	Transistor-transistor logic
TU1 / TU3	Technology unit
UB	Footprint
USS	Universal serial interface Protocol
XU1	Extension unit

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