Variable frequency drives for control cabinet applications

NORDAC *PRO* SK 500E series

NORD®
DRIVESYSTEMS

Powerful and versatile
NORDAC *PRO*, SK 500E series

NORDAC *PRO* - SK500E

NORDAC *PRO* SK 500E variable frequency drives are available for motors with rated powers of 0.33 – 200 HP. Their compact design makes them perfect for space-saving installation in control cabinets.

Notable features across the entire product line include:

- Sensorless current vector control ensures constant speeds even with fluctuating loads and extremely high torques during startup
- 200% overload reserve, which provides greater operational safety in cranes and lifting gear applications
- Operation of asynchronous and synchronous motors
- Integrated brake chopper for 4-quadrant operation
- Integrated line filter as the basis for optimal EMC performance

Along with the separately configurable PID or process controller, these features are a part of the basic configuration and independently carry out the control tasks. The range is supplied with either an integrated 24 V power supply unit or a separate connection for the control board supply.

The advantage of externally powered frequency drives is that access to parameter data and communication via bus interfaces is possible even when the power is switched off. Moreover, an evacuation run controlled by the VFD can be performed, resulting in an enormous boost in safety for lifting gear and similar safety-critical drive applications.

The SK 51xE and SK 530E and SK 535E models support the Safe Stop function according to EN 13849-1 (up to the maximum safety category 4, stop category 0 and 1). In addition, the SK 53xE version is equipped with the built-in POSICON function. making it suitable for all types of positioning tasks (relative and absolute).

Integrated PLC on all SK 520E models and higher allows simple and free programming of drive-related functions in accordance with IEC 61131-3. In addition, the top model SK 540E/SK 545E features a universal encoder interface which allows connection of SSI or EnDat encoders. The VFDs maintain uniform dimensions even with different functional configurations.

Basic configuration

- Sensorless current vector control (ISD control) for high precision control and fast response times
- Brake management, electromechanical holding brake
- Brake chopper to divert generated energy to a brake resistor
- RS-232 diagnostic interface
- 4 switchable parameter sets for flexible use of parameter settings (e.g. switching between drive units with different motor data)
- All common drive functions such as acceleration/braking on a ramp
- Parameters pre-set with standard values, immediately ready for use
- Scalable display values
- Stator resistance measurement to ensure optimal control characteristics

Optional

- Interfaces for many bus systems
- Various control options
  (switches, potentiometers or parameterization units)
- Variants with functional safety (Safe Stop (STO, SS1))
  Available for SK 510E and above
  (except for frequency drives with
  mains voltages <230 V AC)
- Variants with incremental encoder interface for speed feedback (servo mode)
  Available for SK 520E and higher
- Variants with PLC functionality
  Available for SK 520E and higher
- POSICON variants with positioning function (relative and absolute)
  Available for SK 530E and higher
- Universal encoder interface
  Available for SK 540E and higher

Standards and approvals

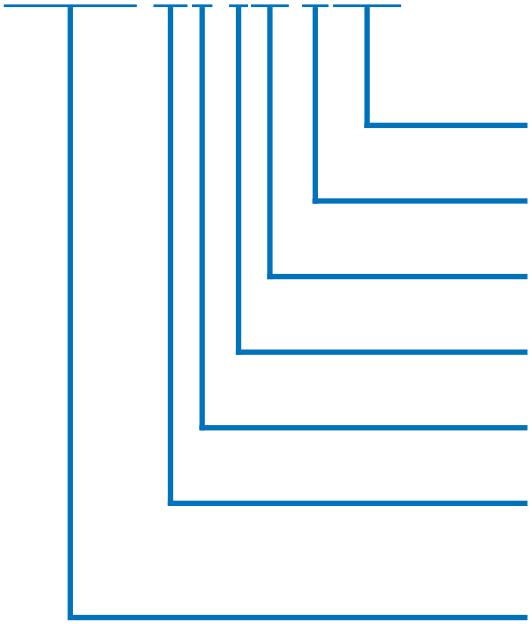
All drives of the series comply with the standards and directives listed below.

Approval	Directive		Applied standards	Certificates	Code
CE (European Union)	Low Voltage Directive	2014/35/EU	EN 61800-5-1 EN 60529 EN 61800-3 EN 63000 EN 61800-9-1 EN 61800-9-2	C310600	CE
	EMC	2014/30/EU			
	RoHS	2011/65/EU			
	Delegated directive (EU)	2015/863			
	Ecodesign	2009/125/EG			
	Regulation (EU) Ecodesign	2019/1781			
UL (USA)			UL 61800-5-1	E171342	c UL us LISTED
CSA (Canada)			C22.2 No.274-13	E171342	
RCM (Australia)	F2018L00028		EN 61800-3	133520966	
EAC (Eurasia)	TR CU 004/2011, TR CU 020/201		IEC 61800-5-1 IEC 61800-3	N RU Д-DE. HB27.B.02721/ 20	EAC

Type code

Variable frequency drives

SK 530E-370-323-A(-CP)



Configuration versions **CP** = Cold Plate or “External heat sink” technology

Radio interference filter: **0** = without, **A** = Class A1(C2) or B (C1)

Mains voltage **x12** = 115 V, **x23** = 230 V, **x40** = 400 V, **x50** = 500 V

Number of mains phases: **1xx** = 1-phase, **3xx** = 3-phase [1]

Digits before decimal point for power: **0** = 0.xx, **1** = 0x,x0.2 = 0xx.0

Device rated power: **250** = 0.25 kW / 0.33 HP, **370** = 0.37 kW / 0.5 HP, ...
163 = 160.0 kW / 200 HP

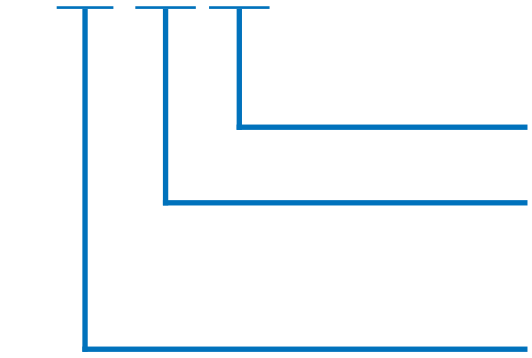
Variable frequency drive series:
SK 500E, SK 505E, SK 510E, SK 511E, SK 515E,
SK 520E, SK 530E, SK 535E, SK 540E, SK 545E,

(…)
Options, only implemented if required.

[1] Designation -3 also includes combined devices which are intended for single and three-phase operation (please refer to the technical data)

Technology units

SK TU3-CAO(-…)



Version labelling

Option type: **CAO** = CANopen®, **PBR** = Profibus DP®,
ECT = EtherCAT®, **DEV** = DeviceNet®,
IOE= I/O extension

Group: **TU** = Technology unit

(...)
Options, only implemented if required.

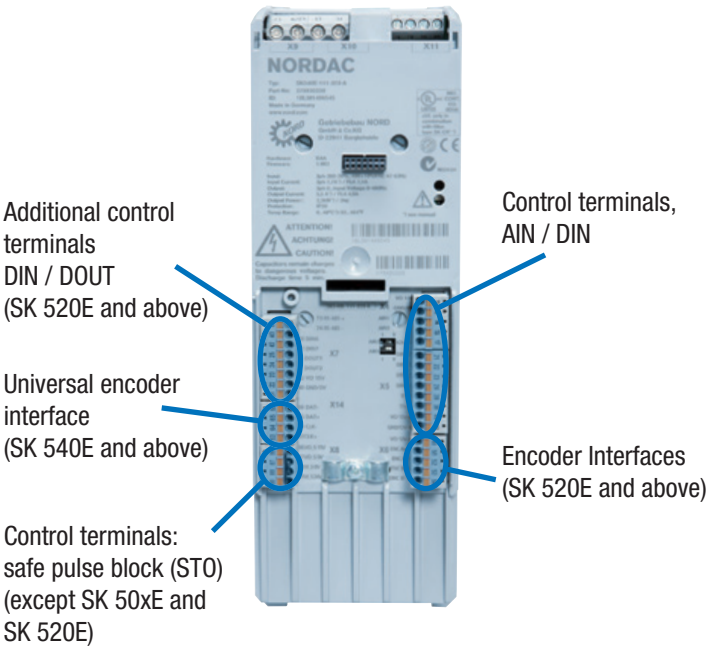
NORDAC *PRO* SK 500E
All versions at a glance

	SK 500E	SK 510E	SK 511E	SK 520E	SK 530E	SK 535E	SK 540E	SK 545E	SK 515E	SK 535E	SK 545E
	Size 1-4								Size 5-11		
Sensorless current vector control (ISD control)	●	●	●	●	●	●	●	●	●	●	●
Brake management for mechanical holding brake	●	●	●	●	●	●	●	●	●	●	●
Brake chopper (brake resistor optional)	●	●	●	●	●	●	●	●	●	●	●
RS-232 diagnostic interface	●	●	●	●	●	●	●	●	●	●	●
4 switchable parameter sets	●	●	●	●	●	●	●	●	●	●	●
All normal drive functions	●	●	●	●	●	●	●	●	●	●	●
Parameters pre-set with standard values	●	●	●	●	●	●	●	●	●	●	●
Stator resistance measurement	●	●	●	●	●	●	●	●	●	●	●
Energy-saving function, optimized efficiency in partial load operation	●	●	●	●	●	●	●	●	●	●	●
Integrated EMC line filter according to EN 61800-3, Category C2 up to 20 m motor cable, Category C1 up to 5 m motor cable (devices up to Size 4)	●	●	●	●	●	●	●	●	●	●	●
Monitoring functions	●	●	●	●	●	●	●	●	●	●	●
Load monitor	●	●	●	●	●	●	●	●	●	●	●
Link circuit coupling	●	●	●	●	●	●	●	●	●	●	●
Lifting gear functionality	●	●	●	●	●	●	●	●	●	●	●
PID controller	●	●	●	●	●	●	●	●	●	●	●
Process controller / compensator control	●	●	●	●	●	●	●	●	●	●	●
Synchronous motor operation (PMSM)	●	●	●	●	●	●	●	●	●	●	●
Cold plate up to Size 4, External heat sink technology up to Size 2	●	●	●	●	●	●	●	●	❍	❍	❍
All common field bus systems	●	●	●	●	●	●	●	●	●	●	●
Safe Stop function (STO, SS1) (not for 115 V devices)	❍	●	●	❍	●	●	●	●	●	●	●
CANopen® on board	❍	❍	●	●	●	●	●	●	●	●	●
Evacuation run	❍	❍	❍	❍	❍	●		●	●	●	●
Incremental encoder input (servo mode)	❍	❍	❍	●	●	●	●	●	❍	●	●
POSICON	❍	❍	❍	❍	●	●	●	●	❍	●	●
Internal 24 V power supply unit to supply the control board	●	●	●	●	●	❍	●	❍	●	●	●
External 24 V power supply for the control board	❍	❍	❍	❍	❍	●	❍	●	●	●	●
Automatic switching between external and internal 24 V control voltage	❍	❍	❍	❍	❍	❍	❍	❍	●	●	●
PLC functionality	❍	❍	❍	●	●	●	●	●	❍	●	●
Universal encoder interface	❍	❍	❍	❍	❍	❍	●	●	❍	❍	●

● Available as standard
● Optional
❍ Not available

		SK 500E	SK 510E	SK 511E	SK 520E	SK 530E	SK 535E	SK 540E	SK 545E	SK 515E	SK 535E	SK 545E
		Size 1-4								Size 5-11		
Control terminals	DIN	5	5	5	7	7	7	5-7 [1]	5-7 [1]	5	7	6-8 [1]
	DOUT	0	0	0	2	2	2	3-1 [1]	3-1 [1]	0	2	3-1 [1]
	Signal relay[2] (… 230 V AC, 2 A)	2	2	2	2	2	2	2	2	2	2	2
	AIN[3]	2	2	2	2	2	2	2	2	2	2	2
	AOUT[3]	1	1	1	1	1	1	1	1	1	1	1
	TF (PTC)	1[4]	1[4]	1[4]	1[4]	1[4]	1[4]	1	1	1	1	1
Encoder interfaces	TTL RS422	❍	❍	❍	●	●	●	●	●	❍	●	●
	HTL[4, 5]	●	●	●	●	●	●	●	●	●	●	●
	CANopen®	❍	❍	❍	❍	●	●	●	●	❍	●	●
	SIN / COS	❍	❍	❍	❍	❍	❍	●	●	❍	❍	●
	SSI	❍	❍	❍	❍	❍	❍	●	●	❍	❍	●
	BISS	❍	❍	❍	❍	❍	❍	●	●	❍	❍	●
	Hiperface	❍	❍	❍	❍	❍	❍	●	●	❍	❍	●
	Endat 2.1	❍	❍	❍	❍	❍	❍	●	●	❍	❍	●
Communication	CAN / CANopen®	❍	❍	2	2	2	2	2	2	2	2	2
	RS-485 / RS-232	1	1	1	1	1	1	1	1	1	1	1
	RS-485	❍	❍	❍	1	1	1	1	1		1	1
	Modbus RTU	●	●	●	●	●	●	●	●	●	●	●

1 2 digital IOs optionally parameterizable as DIN or DOUT
2 Parameterizable with DOUT functions
3 AIN/AOUT can also be used for digital signals.
AIN: 0(2) – 10 V, 0(4) – 20 mA, size 5 and above additionally ± 10 V
4 Function can only be implemented through a digital input,
5 speed control only available with SK 520E or higher.

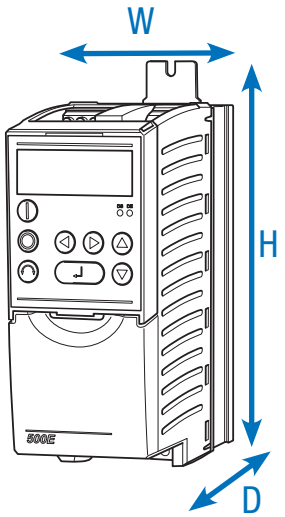


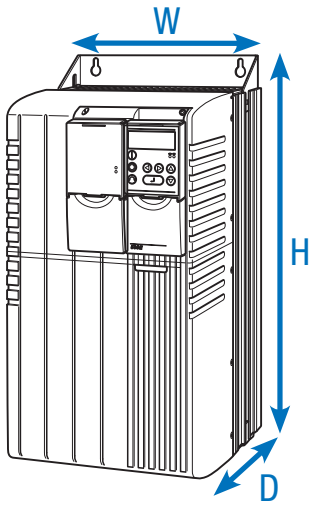
NORDAC *PRO* SK 500E variable frequency drive 1~ 110 ... 120 V und 1 / 3~ 200 ... 240 V

Output frequency	0.0 ... 400.0 Hz
Pulse frequency	3.0 ... 16.0 kHz
Typical overload capacity	150 % for 60 s, 200 % for 3.5 s
Energy efficiency class	IE2
VFD efficiency	Size 1 -4 approx. 95 % Size 5 -7 approx. 97 % Size 8 -11 approx. 98 %
Ambient temperature	0 °C ... +40 °C (S1) 0 °C ... +50 °C (S3, -70 % ED)
Protection class	IP20
Regulation and control	Sensorless current vector control (ISD), linear V/f characteristic curve
Motor temperature monitoring	I^2t Motor PTC / bi-metal switch
Leakage current	<30 mA, may be considerably less depending on the size and configuration of the VFD (refer to the manual for details)

VFDs SK 5xxE ...	Nominal motor power 230 V [kW]	Nominal motor power 240 V [HP]	Nominal output current rms [A]	Mains voltage	Output voltage
-250-112-0	0.25	0.33	1.7	1~ 110 ... 120 V. +/- 10 %. 47 ... 63 Hz	3~ 0 - 2x mains voltage
-370-112-0	0.37	0.5	2.2		
-550-112-0	0.55	0.75	3.0		
-750-112-0	0.75	1	4.0		
-111-112-0	1.1	1.8	5.3		

VFDs SK 5xxE ...	Nominal motor power 230 V [kW]	Nominal motor power 240 V [HP]	Nominal output current rms [A]	Mains voltage	Output voltage
-250-323-A	0.25	0.33	1.7	1 / 3~ 200 ... 240 V, +/- 10 %, 47 ... 63 Hz	3~ 0 up to mains voltage
-370-323-A	0.37	0.5	2.2		
-550-323-A	0.55	0.75	3.0		
-750-323-A	0.75	1	4.0		
-111-323-A	1.1	1.5	5.5		
-151-323-A	1.5	2	7.0		
-221-323-A	2.2	3	9.5		
-301-323-A	3.0	4	12.5	3~ 200 ... 240 V, +/- 10 %, 47 ... 63 Hz	
-401-323-A	4.0	5	16.0		
-551-323-A	5.5	7.5	22		
-751-323-A	7.5	10	28		
-112-323-A	11	15	46		
-152-323-A	15	20	60		
-182-323-A	18.5	25	73		





VFDs SK 5xxE ...	Weight [kg]	Weight [lbs]	Overall dimensions H x W x D [mm]	Overall dimensions H x W x D [in]	Size
-250-112-0	1.4	3.1	220 x 74 x 153	8.66 x 2.91 x 6.02	1
-370-112-0	1.4	3.1	220 x 74 x 153	8.66 x 2.91 x 6.02	1
-550-112-0	1.4	3.1	220 x 74 x 153	8.66 x 2.91 x 6.02	1
-750-112-0	1.4	3.1	220 x 74 x 153	8.66 x 2.91 x 6.02	1
-111-112-0	1.8	4	220 x 74 x 153	8.66 x 2.91 x 6.02	1

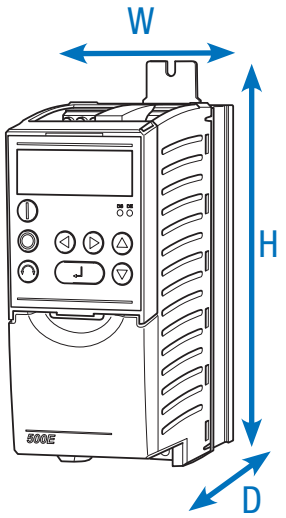
VFDs SK 5xxE ...	Weight [kg]	Weight [lbs]	Overall dimensions H x W x D [mm]	Overall dimensions H x W x D [in]	Size
-250-323-A	1.6	3.5	220 x 74 x 153	8.66 x 2.91 x 6.02	1
-370-323-A	1.6	3.5	220 x 74 x 153	8.66 x 2.91 x 6.02	1
-550-323-A	1.6	3.5	220 x 74 x 153	8.66 x 2.91 x 6.02	1
-750-323-A	1.6	3.5	220 x 74 x 153	8.66 x 2.91 x 6.02	1
-111-323-A	2.0	4.4	260 x 74 x 153	8.66 x 2.91 x 6.02	2
-151-323-A	2.0	4.4	260 x 74 x 153	8.66 x 2.91 x 6.02	2
-221-323-A	2.0	4.4	260 x 74 x 153	8.66 x 2.91 x 6.02	2
-301-323-A	2.7	6	275 x 98 x 181	10.83 x 3.89 x 7.13	3
-401-323-A	2.7	6	275 x 98 x 181	10.83 x 3.89 x 7.13	3
-551-323-A	8.0	17.6	357 x 162 x 224	14.06 x 6.38 x 8.82	5
-751-323-A	8.0	17.6	357 x 162 x 224	14.06 x 6.38 x 8.82	5
-112-323-A	10.3	22.7	397 x 180 x 234	15.63 x 7.09 x 9.21	6
-152-323-A	15.0	33	485 x 210 x 236	19.09 x 8.27 x 9.29	7
-182-323-A	15.0	33	485 x 210 x 236	19.09 x 8.27 x 9.29	7

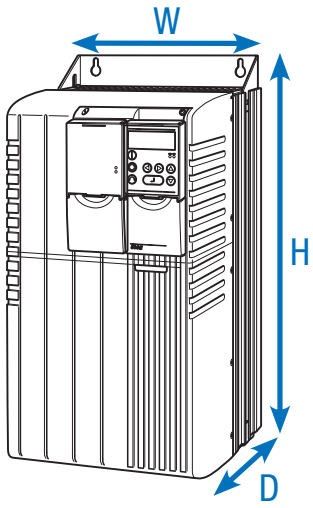
NORDAC *PRO* SK 500E variable frequency drive 3~ 380 ... 480 V

Output frequency	0.0 ... 400.0 Hz
Pulse frequency	3.0 ... 16.0 kHz
Typical overload capacity	150 % for 60 s, 200 % for 3.5 s
Energy efficiency class	IE2
VFD efficiency	Size 1 -4 approx. 95 % Size 5 -7 approx. 97 % Size 8 -11 approx. 98 %
Ambient temperature	0 °C ... +40 °C (S1) 0 °C ... +50 °C (S3, -70 % ED)

Protection class	IP20
Regulation and control	Sensorless current vector control (ISD), linear V/f characteristic curve
Motor temperature monitoring	I^2t Motor PTC / bi-metal switch
Leakage current	<30 mA, may be considerably less depending on the size and configuration of the VFD (refer to the manual for details)

VFDs SK 5xxE ...	Nominal motor power 400 V [kW]	Nominal motor power 480 V [HP]	Nominal output current rms [A]	Mains voltage	Output voltage
-550-340-A	0.55	0.75	1.7		
-750-340-A	0.75	1	2.3		
-111-340-A	1.1	1.5	3.1		
-151-340-A	1.5	2	4.0		
-221-340-A	2.2	3	5.5		
-301-340-A	3.0	4	7.5		
-401-340-A	4.0	5	9.5		
-551-340-A	5.5	7.5	12.5		
-751-340-A	7.5	10	16.0		
-112-340-A	11.0	15	24.0		
-152-340-A	15.0	20	31.0	3~ 380 ... 480 V, -20 % / +10 %, 47 ... 63 Hz	3~ 0 up to mains voltage
-182-340-A	18.5	25	38.0		
-222-340-A	22.0	30	46.0		
-302-340-A	30.0	40	60.0		
-372-340-A	37.0	50	75.0		
-452-340-A	45.0	60	90.0		
-552-340-A	55.0	75	110.0		
-752-340-A	75.0	100	150.0		
-902-340-A	90.0	125	180.0		
-113-340-A	110.0	150	220.0		
-133-340-A	132.0	180	260.0		
-163-340-A	160.0	220	320.0		





VFDs SK 5xxE ...	Weight [kg]	Weight [lbs]	(Overall) dimensions H x W x D [mm]	(Overall) dimensions H x W x D [in]	Size
-550-340-A	1.4	3.1	220 x 74 x 153	8.66 x 2.91 x 6.02	1
-750-340-A	1.4	3.1	220 x 74 x 153	8.66 x 2.91 x 6.02	1
-111-340-A	1.8	4	260 x 74 x 153	10.24 x 2.91 x 6.02	2
-151-340-A	1.8	4	260 x 74 x 153	10.24 x 2.91 x 6.02	2
-221-340-A	1.8	4	260 x 74 x 153	10.24 x 2.91 x 6.02	2
-301-340-A	2.7	6	275 x 98 x 181	10.83 x 3.86 x 7.13	3
-401-340-A	2.7	6	275 x 98 x 181	10.83 x 3.86 x 7.13	3
-551-340-A	3.1	6.8	320 x 98 x 181	12.59 x 3.86 x 7.13	4
-751-340-A	3.1	6.8	320 x 98 x 181	12.59 x 3.86 x 7.13	4
-112-340-A	8.0	17.6	357 x 162 x 224	14.06 x 6.38 x 8.82	5
-152-340-A	8.0	17.6	357 x 162 x 224	14.06 x 6.38 x 8.82	5
-182-340-A	10.3	22.7	397 x 180 x 234	15.63 x 7.09 x 9.21	6
-222-340-A	10.3	22.7	397 x 180 x 234	15.63 x 7.09 x 9.21	6
-302-340-A	16.0	35.3	485 x 210 x 236	19.09 x 8.27 x 9.29	7
-372-340-A	16.0	35.3	485 x 210 x 236	19.09 x 8.27 x 9.29	7
-452-340-A	20.0	44.1	598 x 265 x 286	23.54 x 10.43 x 11.26	8
-552-340-A	20.0	44.1	598 x 265 x 286	23.54 x 10.43 x 11.26	8
-752-340-A	25.0	55.1	636 x 265 x 286	25.04 x 10.43 x 11.26	9
-902-340-A	25.0	55.1	636 x 265 x 286	25.04 x 10.43 x 11.26	9
-113-340-A	46.0	101.4	720 x 395 x 292	28.35 x 15.55 x 11.50	10
-133-340-A	49.0	108	720 x 395 x 292	28.35 x 15.55 x 11.50	10
-163-340-A	52.0	114.6	799 x 395 x 292	31.46 x 15.55 x 11.50	11

Interfaces for operation, parameterization, and communication

Optional modules are available with up to 14 languages for displaying status, operational indicators, parameterization, and operation of the variable frequency drive. Variants are available for direct mounting on the device, installation in a control cabinet door, and handheld versions.

	Type designation Material No.	Description	Remarks
	PotentiometerBox SK TU3-POT 275 900 110	Suitable for control, potentiometer 0 … 100% .	Installation in the SK TU3 slot on the FI.[1]
	ParameterBox SK TU3-PAR 275 900 100	Suitable for control and parameterization, LCD screen (illuminated), plain text display in 14 languages, memory for 5 device data sets, convenient control keypad.	Installation in the SK TU3 slot on the VFD.[1]
	ControlBox SK TU3-CTR 275 900 090	Suitable for control and parameterization, 4-digit, 7-segment display, convenient control keypad.	Installation in the SK TU3 slot on the FI.[1]
	SimpleBox SK CSX-0 275 900 095	Suitable for control and parameterization, 4-digit, 7-segment display, direct control of a device, one-button operation.	The module is connected to the RJ 12 interface of the VFD and does not occupy the option slot for SK TU3 modules. Simultaneous control of a bus interface is therefore possible. Mounted on the VFD.
	ParameterBox SK PAR-3E 275 281 414	Suitable for control and parameterization, LCD screen (illuminated), plain text display in 14 languages, direct control of up to 5 devices, memory for 5 device data sets, convenient control keypad, for installation in a control cabinet door.	Electrical data: 4.5 … 30 V DC / 1.3 W, supply e.g. directly via the VFD. Control cabinet installation.
	SimpleControlBox SK CSX-3E 275 281 413	Suitable for control and parameterization, 4-digit, 7-segment display, direct control of a VFD, convenient control keypad.	Electrical data: 4.5 … 30 V DC / 1.3 W, Supply e. g. directly via the VFD. Control cabinet installation.
	Control and parameterization software NORDCON	Software for control and parameteriZation as well as support for commissioning and fault analysis of NORD electronic drive technology. Parameter names in 14 languages.	Free download at: www.nord.com
	Bluetooth stick NORDAC *ACCESS BT* SK TIE5-BT-STICK 275 900 120	Interface for wireless connection to a mobile terminal device (e.g. tablet or smartphone) via Bluetooth. The NORDCON *APP*, the NORDCON software for mobile terminal devices, enables smart operation and parameterization as well as commissioning assistance and fault analysis of NORD electronic drive technology.	Available free of charge for Android and iOS:

[1] Cannot be combined with other SK TU3 modules as only one slot is available on the device.

Industrial Ethernet, Field bus and IO extensions

Variant		Designation Material No.	Description connection	Remarks
PROFIBUS DP®		SK TU3-PBR 275 900 030	Field bus interface Type PROFIBUS DP®. SUB-D9	Baud rate: maximum 1.5 MBaud Protocol: DPV 0 Addressing: via parameter
		SK TU3-PBR-24V 275 900 160		Baud rate: maximum 12 MBd Protocol: DPV 0 Addressing: Addressing: via rotary coding switch or parameter 24 V DC connection: via connection terminals
EtherCAT®		SK TU3-ECT 275 900 180	Ethernet-based bus interface Type EtherCAT®. 2 x RJ45	Baud rate: maximum 100 MBaud 24 V DC connection: via terminal Usable as a gateway to control up to a total of four variable frequency drives.
EtherNet/IP®		SK TU3-EIP 275 900 150	Ethernet-based bus interface Type EtherNet / IP® 2 x RJ45	Baud rate: maximum 100 MBaud 24 V DC connection: via terminal Usable as a gateway to control up to a total of four variable frequency drives.
POWERLINK		SK TU3-POL 275 900 140	Ethernet-based bus interface Type POWERLINK 2 x RJ45	Baud rate: maximum 100 MBaud 24 V DC connection: via terminal Usable as a gateway to control up to a total of four variable frequency drives.
PROFINET IO®		SK TU3-PNT 275 900 190	Ethernet-based bus interface Type PROFINET IO®. 2 x RJ45	Baud rate: maximum 100 MBaud 24 V DC connection: via terminal Usable as a gateway to control up to a total of four variable frequency drives.

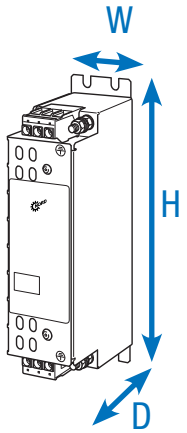
Line filter
Improvement of EMC

General

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

Chassis line filter, SK HLD

The line filter meets protection class IP20 and enables interference suppression Class C1 with max. 25 m shielded motor cable and Class C2 with max. 50 m cable. The line filters are installed separately from the variable frequency drive.



	VFDs SK 5xxE ...	Line filter type Material No.	Continuous current [A]	Leakage current[1] [mA]	Overall dimensions H x W x D
3~ 230 V	0.25 … 1.1 kW 0.333 … 1.5 HP	SK HLD 110-500/8 278 272 008	8	20 / 190	190 x 45 x 75 mm 7.48 x 1.77 x 2.95 in
	1.5 … 2.2 kW 2 … 3 HP	SK HLD 110-500/16 278 272 016	16	21 / 205	250 x 45 x 75 mm 9.84 x 1.77 x 2.95 in
	3.0 … 5.5 kW 4 … 7.5 HP	SK HLD 110-500/30 278 272 030	30	29 / 280	270 x 55 x 95 mm 10.62 x 2.16 x 3.74 in
	7.5 kW 10 HP	SK HLD 110-500/42 278 272 042	42	30 / 290	310 x 55 x 95 mm 12.20 x 2.16 x 3.74 in
	11 kW 15 HP	SK HLD 110-500/75 278 272 075	75	22 / 210	310 x 85 x 135 mm 12.20 x 3.34 x 5.31 in
	15 … 18.5 kW 20 … 25 HP	SK HLD 110-500/100 278 272 100	100	30 / 290	325 x 95 x 150 mm 12.79 x 3.74 x 5.90 in
3~ 400 V	0.55 … 2.2 kW 0.75 … 3 HP	SK HLD 110-500/8 278 272 008	8	20 / 190	190 x 45 x 75 mm 7.48 x 1.77 x 2.95 in
	3.0 … 5.5 kW 4 … 7.5 HP	SK HLD 110-500/16 278 272 016	16	21 / 205	250 x 45 x 75 mm 9.84 x 1.77 x 2.95 in
	7.5 kW 10 HP	SK HLD 110-500/30 278 272 030	30	29 / 280	270 x 55 x 95 mm 10.62 x 2.16 x 3.74 in
	11 kW 15 HP	SK HLD 110-500/42 278 272 042	42	30 / 290	310 x 55 x 95 mm 12.20 x 2.16 x 3.74 in
	15 …18.5 kW 20 … 25 HP	SK HLD 110-500/55 278 272 055	55	30 / 290	255 x 85 x 95 mm 10.03 x 3.34 x 3.74 in
	22 kW 30 HP	SK HLD 110-500/75 278 272 075	75	22 / 210	310 x 85 x 135 mm 12.20 x 3.34 x 5.31 in
	30 kW 40 HP	SK HLD 110-500/100 278 272 100	100	30 / 290	325 x 95 x 150 mm 12.79 x 3.74 x 5.90 in
	37… 45 kW 50 … 60 HP	SK HLD 110-500/130 278 272 130	130	22 / 210	325 x 95 x 150 mm 12.79 x 3.74 x 5.90 in
	55 kW 75 HP	SK HLD 110-500/180 278 272 180	180	31 / 300	440 x 130 x 181 mm 17.32 x 5.11 x 7.12 in
	75 … 90 kW 100 … 125 HP	SK HLD 110-500/250 278 272 250	250	37 / 355	525 x 155 x 220 mm 20.66 x 6.10 x 8.66 in
	110 … 160 kW 150 … 200 HP	Currently in preparation			

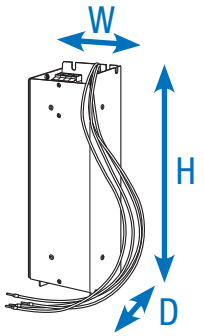
[1] Leakage current 1st value: rated for the maximum permissible input voltage fluctuation according to IEC 38 + 10%

Leakage current 2nd value: calculated at maximum input voltage and failure of 2 phases (typically at 50 Hz)

Bottom-mounted line filter, combination filter SK NHD

The line filter offers protection class IP20 and is available for variable frequency drive powers of 10 HP (400 V). The line filter is able to be mounted flat underneath the VFD, reducing the space required.

These combination filters combine the advantages of a line filter and a line choke in a single housing and provide class C1 interference suppression with max. 50 m shielded motor cable and class C2 with max. 100 m cable



	VFDs SK 5xxE ...	Line filter type Material No.	Continuous current [A]	Inductance [mH]	Leakage current[1] [mA]	Overall dimensions H x W x D
3~ 230 V	0.25 … 0.75 kW 0.33 … 1 HP	SK NHD-480/6-F 278 273 006	5.5	3 x 6.4	7.7 / 74.4	290 x 88 x 74 mm 11.41 x 3.46 x 2.91 in
	1.1 … 2.2 kW 1.5 … 3 HP	SK NHD-480/10-F 278 273 010	9.5	3 x 3.7	15.0 / 144.0	305 x 115 x 98 mm 12.00 x 4.52 x 3.85 in
	3.0 … 4.0 kW 4 … 5.5 HP	SK NHD-480/16-F 278 273 016	16	3 x 2.2	21.5 / 206.5	350 x 140 x 98 mm 13.77 x 5.51 x 3.85 in
3~ 400 V	0.55 … 0.75 kW 0.75 … 1 HP	SK NHD-480/3-F 278 273 003	2.3	3 x 15.3	4.3 / 40.0	250 x 75 x 60 mm 9.84 x 2.95 x 2.36 in
	1.1 … 2.2 kW 1.5 … 3 HP	SK NHD-480/6-F 278 273 006	5.5	3 x 6.4	7.7 / 74.4	290 x 88 x 74 mm 11.41 x 3.46 x 2.91 in
	3.0 … 4.0 kW 4 … 5.5 HP	SK NHD-480/10-F 278 273 010	9.5	3 x 3.7	15.0 / 144.0	305 x 115 x 98 mm 12.00 x 4.52 x 3.85 in
	5.5 … 7.5 kW 7.5 … 10 HP	SK NHD-480/16-F 278 273 016	16	3 x 2.2	21.5 / 206.5	350 x 140 x 98 mm 13.77 x 5.51 x 3.85 in

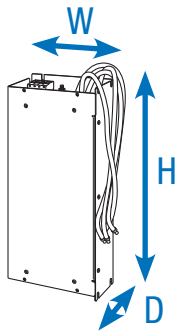
[1] Leakage current 1st value: rated for the maximum permissible input voltage fluctuation according to IEC 38 + 10%

Leakage current 2nd value: calculated at maximum input voltage and failure of 2 phases (typically at 50 Hz)

Line filter
Improvement of EMC

Bottom-mounted line filter, SK LF2

The line filter meets protection class IP00 and is available for variable frequency drive powers of 50 HP (400 V). The line filter can be mounted flat underneath the VFD, reducing the space requirement. These line filters enable class C1 interference suppression with max. 50 m shielded motor cable and class C2 with max. 100 m cable.



	VFDs SK 5xxE ...	Line filter type Material No.	Continuous current [A]	Leakage current[1] [mA]	Overall dimensions H x W x D
3~ 230 V	5.5 … 7.5 kW 7.5 … 10 HP	SK LF2-480/45-F 278 273 045	45	12 / 120	388 x 164 x 75 mm 15.27 x 6.45 x 2.95 in
	11 kW 15 HP	SK LF2-480/66-F 278 273 066	66	12 / 120	428 x 182 x 75 mm 16.85 x 7.16 x 2.95 in
	15 … 18.5 kW 20 … 25 HP	SK LF2-480/105-F 278 273 105	105	22 / 210	527 x 210 x 95 mm 20.74 x 8.26 x 3.74 in
3~ 400 V	0.55 … 0.75 kW 0.75 … 1 HP	SK LF2-480/2-F 278 273 002	2.3	6,4 / 61,5	250 x 75 x 48 mm 9.84 x 2.95 x 1.88 in
	1.1 … 2.2 kW 1.5 … 3 HP	SK LF2-480/5-F 278 273 005	5.5	7.7 / 74.3	290 x 88 x 48 mm 11.41 x 3.46 x 1.88 in
	3.0 … 4.0 kW 4 … 5 HP	SK LF2-480/9-F 278 273 009	9.5	19.5 / 187	305 x 115 x 54 mm 12.00 x 4.52 x 2.12 in
	5.5 … 7.5 kW 7.5 … 10 HP	SK LF2-480/15-F 278 273 015	16	20.2 / 193	350 x 115 x 54 mm 13.77 4.52 x 2.12 in
	11 … 15 kW 15 … 20 HP	SK LF2-480/45-F 278 273 045	45	12 / 120	388 x 164 x 75 mm 15.27 x 6.45 x 2.95 in
	18.5 … 22 kW 25 … 30 HP	SK LF2-480/66-F 278 273 066	66	12 / 120	428 x 182 x 75 mm 16.85 x 7.16 x 2.95 in
	30 … 37 kW 40 … 50 HP	SK LF2-480/105-F 278 273 105	105	22 / 210	527 x 210 x 95 mm 20.74 x 8.26 x 3.74 in

[1] leakage current 1st value: rated for the maximum permissible input voltage fluctuation according to IEC 38 + 10%

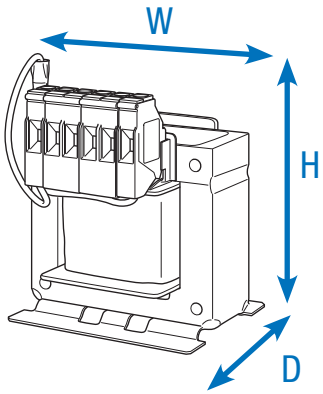
Leakage current 2nd value: calculated at maximum input voltage and failure of 2 phases (typically at 50 Hz)

Mains chokes
Reduction of mains feedback

General

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

It is recommended that a mains choke be used at all times for a VFD capacity of 60 HP and above. This will have an additional positive effect on device protection and EMC characteristics. All chokes have protection class IP00 and are UL certified.

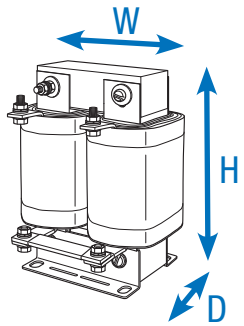


VFDs SK 5xxE ...		Choke type Material No.	Continuous current [A]	Inductance [mH]	Overall dimensions H x W x D
1~ 230 V	0.25 … 0.75 kW 0.33 … 1 HP	SK CI1-230/8-C 278 999 030	8	2 x 1.0	89 x 65 x 78 mm 3.50 x 2.56 x 3.07 in
	1.1 … 2.2 kW 1.5 … 3 HP	SK CI1-230/20-C 278 999 040	20	2 x 0.4	106 x 90 x 96 mm 4.17 x 3.54 x 3.78 in
3~ 230 V	0.25 … 0.75 kW 0.33 … 1 HP	SK CI1-480/6-C 276 993 006	6	3 x 4.88	117 x 96 x 60 mm 4.60 x 3.78 x 2.36 in
	1.1 … 1.5 kW 1.5 … 2 HP	SK CI1-480/11-C 276 993 011	11	3 x 2.93	140 x 120 x 85 mm 5.51 x 4.72 x 3.35 in
	2.2 … 3.0 kW 3 … 4 HP	SK CI1-480/20-C 276 993 020	20	3 x 1.47	177 x 155 x 110 mm 6.97 x 6.10 x 4.33 in
	4.0 … 7.5 kW 5 … 10 HP	SK CI1-480/40-C 276 993 040	40	3 x 0.73	172 x 155 x 115 mm 6.77 x 6.10 x 4.53 in
	11 … 15 kW 15 … 20 HP	SK CI1-480/70-C 276 993 070	70	3 x 0.47	220 x 185 x 122 mm 8.66 x 7.28 x 4.80 in
	18.5 kW 25 HP	SK CI1-480/100-C 276 993 100	100	3 x 0.29	263 x 240 x 148 mm 10.35 x 9.45 x 5.83 in
3~ 400 V	0.55 … 2.2 kW 0.75 … 3 HP	SK CI1-480/6-C 276 993 006	6	3 x 4.88	117 x 96 x 60 mm 4.60 x 3.78 x 2.36 in
	3.0 … 4.0 kW 4 … 5 HP	SK CI1-480/11-C 276 993 011	11	3 x 2.93	140 x 120 x 85 mm 5.51 x 4.72 x 3.35 in
	5.5 … 7.5 kW 7.5 … 10 HP	SK CI1-480/20-C 276 993 020	20	3 x 1.47	177 x 155 x 110 mm 6.97 x 6.10 x 4.33 in
	11 … 15 kW 15 … 20 HP	SK CI1-480/40-C 276 993 040	40	3 x 0.73	172 x 155 x 115 mm 6.77 x 6.10 x 4.53 in
	18.5 … 30 kW 25 … 40 HP	SK CI1-480/70-C 276 993 070	70	3 x 0.47	220 x 185 x 122 mm 8.66 x 7.28 x 4.80 in
	37 … 45 kW 50 … 60 HP	SK CI1-480/100-C 276 993 100	100	3 x 0.29	263 x 240 x 148 mm 10.35 x 9.45 x 5.83 in
	55 … 75 kW 75 … 100 HP	SK CI1-480/160-C 276 993 160	160	3 x 0.18	268 x 352 x 140 mm 10.55 x 13.86 x 5.51 in
	90 kW 125 HP	SK CI1-480/280-C 276 993 280	280	3 x 0.10	268 x 352 x 169 mm 10.55 x 13.85 x 6.65 in
	110 … 132 kW 150 … 180 HP	SK CI1-480/350-C 276 993 350	350	3 x 0.08	268 x 352 x 169 mm 10.55 x 13.85 x 6.65 in
	160 kW 215 HP	Not available			

Link circuit choke
Reduction of mains feedback

Link circuit choke
SK DCL

Similar to a mains choke, a link circuit choke reduces the network loads of a variable frequency drive that are inherent to its functional principle. It is connected to accessible contacts in the VFD‘s intermediate circuit and is available for 60HP and above. All chokes have protection class IP00 and are UL certified.



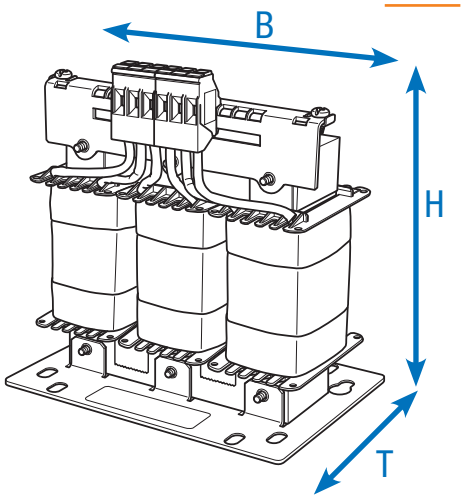
VFDs SK 5xxE ...	Choke type Material No.	Continuous current [A]	Inductance [mH]	Overall dimensions H x W x D
45 … 55 kW 60 … 75 HP	SK DCL-950/120-C 276 997 120	120	0.50	230 x 148 x 147 mm 9.06 x 5.83 x 5.79 in
75 … 90 kW 100 … 125 HP	SK DCL-950/200-C 276 997 200	200	0.30	260 x 170 x 153 mm 10.24 x 6.69 x 6.02 in
110 kW 150 HP	SK DCL-950/260-C 276 997 260	260	0.25	284 x 180 x 174 mm 11.18 x 7.09 x 6.85 in
132 kW 180 HP	SK DCL-950/320-C 276 997 320	320	0.20	282 x 180 x 189 mm 11.10 x 7.09 x 7.44 in
160 kW 215 HP	SK DCL-950/380-C 276 997 380	200	0.17	282 x 180 x 189 11.10 x 7.09 x 7.44

Motor chokes
Compensation of cable capacities

General

Long motor cable lengths (cable capacity) often require the use of additional motor chokes (output chokes) on the VFD output. The use of motor chokes positively effects device protection and EMC characteristics.

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



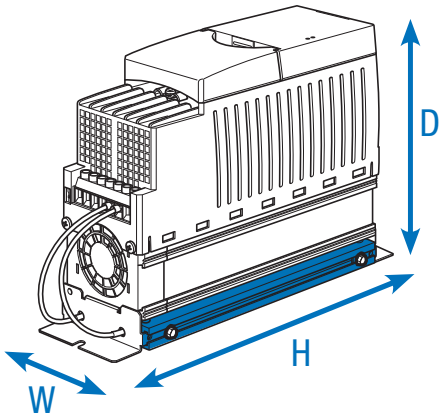
	VFDs SK 5xxE ...	Choke type Material No.	Continuous current [A]	Inductance [mH]	Overall dimensions H x W x D
3~ 230 V	0.25 … 0.75 kW 0.33 … 1 HP	SK CO1-460/4-C 276 996 004	4	3 x 3.5	140 x 120 x 104 mm 5.51 x 4.72 x 4.09 in
	1.1 … 1.5 kW 1.5 … 2 HP	SK CO1-460/9-C 276 996 009	9	3 x 2.5	160 x 155 x 110 mm 6.30 x 6.10 x 4.33 in
	2.2 … 4.0 kW 3 … 5 HP	SK CO1-460/17-C 276 996 017	17	3 x 1.2	201 x 185 x 102 mm 7.91 x 7.28 x 4.02 in
	5.5 … 7.5 kW 7.5 … 10 HP	SK CO1-460/33-C 276 996 033	33	3 x 0.6	201 x 185 x 122 mm 7.91 x 7.28 x 4.80 in
	11 … 15 kW 15 … 20 HP	SK CO1-480/60-C 276 992 060	60	3 x 0.33	210 x 185 x 112 mm 8.27 x 7.28 x 4.41 in
	18.5 kW 25 HP	SK CO1-460/90-C 276 996 090	90	3 x 0.22	325 x 352 x 144 mm 12.80 x 13.86 x 5.67 in
3~ 400 V	0.55 … 1.5 kW 0.75 … 2 HP	SK CO1-460/4-C 276 996 004	4	3 x 3.5	140 x 120 x 104 mm 5.51 x 4.72 x 4.09 in
	2.2 … 4.0 kW 3 … 5 HP	SK CO1-460/9-C 276 996 009	9	3 x 2.5	160 x 155 x 110 mm 6.30 x 6.10 x 4.33 in
	5.5 … 7.5 kW 7.5 … 10 HP	SK CO1-460/17-C 276 996 017	17	3 x 1.2	201 x 185 x 102 mm 7.91 x 7.28 x 4.02 in
	11 … 15 kW 15 … 20 HP	SK CO1-460/33-C 276 996 033	33	3 x 0.6	201 x 185 x 122 mm 7.91 x 7.28 x 4.80 in
	18.5 … 30 kW 25 … 40 HP	SK CO1-480/60-C 276 992 060	60	3 x 0.33	210 x 185 x 112 mm 8.27 x 7.28 x 4.41 in
	37 … 45 kW 50 … 60 HP	SK CO1-460/90-C 276 996 090	90	3 x 0.22	352 x 144 x 325 mm 13.86 x 5.67 x 12.80 in
	55 … 75 kW 75 … 100 HP	SK CO1-460/170-C 276 996 170	170	3 x 0.13	320 x 412 x 200 mm 12.60 x 16.22 x 7.87 in
	90 … 110 kW 125 … 150 HP	SK CO1-460/240-C 276 996 240	240	3 x 0.07	320 x 412 x 225 mm 12.60 x 16.22 x 8.86 in
	132 … 160 kW 180 … 215 HP	SK CO1-460/330-C 276 996 330	330	3 x 0.03	268 x 352 x 188 mm 10.55 x 13.86 x 7.40 in

Braking resistors for dynamic drive characteristics

Bottom-mounted braking resistors SK BR4

Available in four sizes for variable frequency drives of up to 10 HP (400 V), this brake resistor can be mounted flat or vertically next to the VFD, reduceing the space requirement.

The specified resistance values are electrically matched to standard applications and all brake resistors have protection class IP40 and are UL certified.



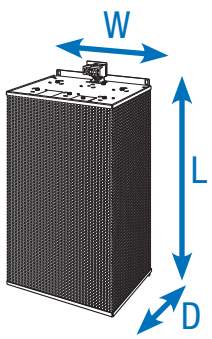
	VFDs SK 5xxE ...	Resistor type Material No.	Resistance [Ω]	Continuous output [W]	Short-term power [kW][1]	Overall dimensions H x W x D
230 V / 115 V	0.25 … 0.37 kW 0.33 … 0.5 HP	SK BR4-240/100 275 991 110	240	100	2.2	230 x 88 x 175 mm 9.05 x 3.46 x 6.88 in
	0.55 … 0.75 kW 0.75 … 1 HP	SK BR4-150/100 275 991 115	150	100	2.2	230 x 88 x 175 mm 9.05 x 3.46 x 6.88 in
	1.1 … 2.2 kW 1.5 … 3 HP	SK BR4-75/200 275 991 120	75	200	4.4	270 x 88 x 175 mm 10.62 x 3.46 x 6.88 in
	3.0 … 4.0 kW 4 … 5 HP	SK BR4-35/400 275 991 140	35	400	8.8	285 x 98 x 239 mm 11.22 x 3.85 x 9.40 in
400 V	0.55 … 0.75 kW 0.75 … 1 HP	SK BR4-400/100 275 991 210	400	100	2.2	230 x 88 x 175 mm 9.05 x 3.46 x 6.88 in
	1.1 … 2.2 kW 1.5 … 3 HP	SK BR4-220/200 275 991 220	220	200	4.4	270 x 88 x 175 mm 10.62 x 3.46 x 6.88 in
	3.0 … 4.0 kW 4 … 5 HP	SK BR4-100/400 275 991 240	100	400	8.8	285 x 98 x 239 mm 11.22 x 3.85 x 9.40 in
	5.5 … 7.5 kW 7.5 … 10 HP	SK BR4-60/600 275 991 260	60	600	13.0	330 x 98 x 239 mm 12.99 x 3.85 x 9.40 in
	Temperature monitoring for SK BR4 resistors with installation close to the VFD 275 991 100		Bimetallic switch as opener Nominal switching temperature: 180°C			Broad brake resistor + 10 mm (on one side) the dimensions apply to the VFD, including the braking resistor
	Temperature monitoring for SK BR4 resistors with direct installation under the VFD 275 991 200		Bimetallic switch as opener Nominal switching temperature: 100°C			

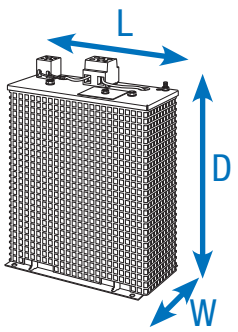
[1] Once within 120 s, for a maximum duration of 1.2 s

Chassis braking resistors, SK BR2

Chassis braking resistor elements are integrated into a housing cage and connected to the VFD via a separate connecting cable. These brake resistors need to be mounted horizontally (apart from SK BR2-xxx/400-C) using a shielded cable as short as possible.

All brake resistors have protection class IP20





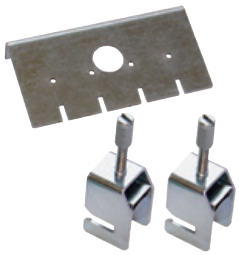
only SK BR2-xxx/400-C

	VFDs SK 5xxE ...	Resistor type Material No.	Resistance [Ω]	Continuous output [W]	Short-term power [kW][2]	Overall dimensions L x W x D
230 V	3.0 … 4.0 kW 4 … 5 HP	SK BR2-35/400-C[1] 278 282 045	35	400	12	178 x 100 x 252 mm 7.00 x 3.93 x 9.92 in
	5.5 … 7.5 kW 7.5 … 10 HP	SK BR2-22/600-C 278 282 065	22	600	18	385 x 92 x 120 mm 15.15 x 3.62 x 4.72 in
	11 kW 15 HP	SK BR2-12/1500-C 278 282 015	12	1500	45	585 x 185 x 120 mm 23.03 x 7.28 x 4.72 in
	15 … 18.5 kW 20 … 25 HP	SK BR2-9/2200-C 278 282 122	9	2200	66	485 x 275 x 120 mm 19.09 x 10.82 x 4.72 in
400 V	3.0 … 4.0 kW 4 … 5 HP	SK BR2-100/400-C[1] 278 282 040	100	400	12	178 x 100 x 252 mm 7.00 x 3.93 x 9.92 in
	5.5 … 7.5 kW 7.5 … 10 HP	SK BR2-60/600-C 278 282 060	60	600	18	385 x 110 x 120 mm 15.15 x 3.62 x 4.72 in
	11 … 15 kW 15 … 20 HP	SK BR2-30/1500-C 278 282 150	30	1500	45	585 x 185 x 120 mm 23.03 x 7.28 x 4.72 in
	18.5 … 22 kW 25 … 30 HP	SK BR2-22/2200-C 278 282 220	22	2200	66	485 x 275 x 120 mm 19.09 x 10.82 x 4.72 in
	30 … 37 kW 40 … 50 HP	SK BR2-12/4000-C 278 282 400	12	4000	120	585 x 266 x 210 mm 23.03 x 10.47 x 8.26 in
	45 … 55 kW 60 … 75 HP	SK BR2-8/6000-C 278 282 600	8	6000	180	395 x 490 x 260 mm 15.55 x 19.29 x 10.23 in
	75 … 110 kW 100 … 150 HP	SK BR2-6/7500-C 278 282 750	6	7500	225	595 x 490 x 260 mm 23.42 x 19.29 x 10.23 in
	132 … 160 kW 180 … 215 HP	SK BR2-3/7500-C 278 282 753	3	7500	225	595 x 490 x 260 mm 23.42 x 19.29 x 10.23 in
	132 … 160 kW 180 … 215 HP	SK BR2-3/17000-C 278 282 754	3	17 000	510	795 x 490 x 260 mm 31.29 x 19.29 x 10.23 in
	Temperature monitoring for SK BR2 resistors integrated (2 terminals 4 mm²)		Bimetallic switch as opener. Nominal switching temperature: 180°C.			

[1] Type of assembly: vertical

[2] Once within 120 s, for a maximum duration of 1.2 s

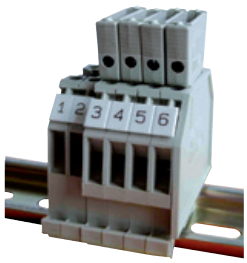
NORDAC *PRO* variable frequency drive
Accessories



EMV-Kit

For EMC-compliant connection of shielded cables and to produce strain relief.

Size of VFD	EMV-Kit	Material No.
Size 1 and size 2	SK EMC 2-1	275 999 011
Size 3 and size 4	SK EMC 2-2	275 999 021
Size 5	SK EMC 2-3	275 999 031
Size 6	SK EMC 2-4	275 999 041
Size 7	SK EMC 2-5	275 999 051
Size 8 and size 9	SK EMC 2-6	275 999 061
Size 10 and size 11	SK EMC 2-7	275 999 071

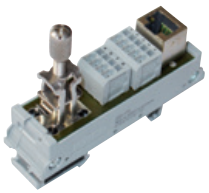


Connection Kit HTL encoder WK 4/2/4*680 OHM

For connection of an HTL encoder to the TTL encoder input of the frequency drive, top-hat rail mounting.
Material No.: 278 910 340

RJ45 WAGO connection module

Connects a CANopen® encoder to one of the two RJ45 connection sockets of the frequency drive.
Material No.: 278 910 300



Signal converter +/- 10 V

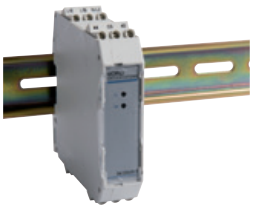
Connects a bipolar analog signal to the unipolar analog input of a VFD (up to size 4), top-hat rail mounting.
Material No.: 278 910 320

IO expansion SK EBIOE-2

The standard number of inputs and outputs on the device can be supplemented using an extension that is top-hat rail mounting.
Material No.: 275 900 210
Available for SK 540E and higher

Electronic brake rectifier SK EBGR-1

Used for direct control and supply of an electromagnetic holding brake.
Material No.: 19 140 990



Adapter module V/I CONVERTER 10 V/20 mA

The module serves the conversion of analog (0–10 V) signals into equivalent current signals (0–20 mA).
Material no.: 278910315

Adapter module level adapter HTL – RS422

The module serves the conversion of HTL or TTL signals into complementary signals with RS422 levels, top-hat rail mounting.
Material no.: 278910360

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