Intelligent Drivesystems

SK 180E

High Performance AC Vector Drives
Innovative Decentralized Drive Technology

F3018

NORD DRIVESYSTEMS

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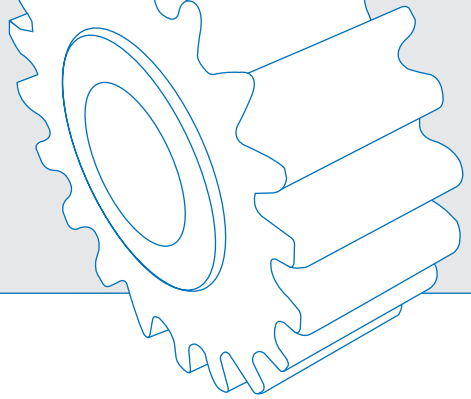


Compact & Decentralized AC Vector Drives

AC Vector Drive Series SK 180E

NORD, the drive technology specialist, has been developing and producing distributed control AC vector drives for more than 10 years. In 2009, we introduced the very popular SK 200E AC vector drive series, which was designed to mount directly in place of the motor terminal box to create a combined, fully integrated unit for use in the field. The SK 200E line is a distributed control companion to our successful SK 500E series cabinet mount drive. Together, our products offer a continuous range of performance along with optional features to simplify the drive selection process in order to serve a wide variety of applications.

Although the original SK 200E series served the full range of drive applications from simple speed control in stand alone units to complex multi drive systems controlled via field bus networks or requiring position control, our customers have encouraged us to expand our product offering even further.

NORD now offers a new product that fills the gaps between simple motor starters and complex AC drives. Many applications do not utilize the immense scope of functionality found in modern frequency inverters. This is why NORD has developed the SK 180E. This product focuses on the essential functionality that is necessary for pumps and conveyor technology. The SK180E is extremely energy efficient, cost effective and offers both significant savings as well as outstanding performance.

Technical Configuration of 180E Component Class Family - Sizes 1 & 2

SK 180E: Technical Configuration

The drives included in this family are best suited for stand alone drives as well as mixers, extruders, pumps and fans.

SK 180E	SK 190E
0.33 - 3.0 hp (0.25 - 2.2 kW)	

SK180E Size 1-2 Basic Functions

Control Signals

3 Digital Inputs

E.G. For left/right release, fixed frequencies or the switching over of parameters.

2 Digital Outputs

E.G. Reporting of errors or various limit values.

2 Analog Inputs

Connection for voltage setpoint and may be configured for additional digital inputs for the use of sensors, etc.

Integrated 24V Power Supply

Internal Control Voltage

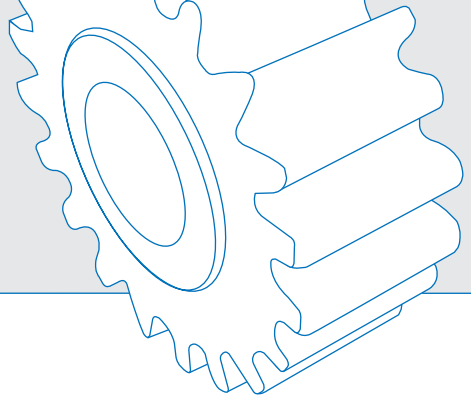
Added without additional connection. "Stand Alone" operation.

Input Power/Frame Size Matrix

Voltage	HP Rating	Frame Size
115V ~ 1	0.33-0.75	1
240V ~ 1	0.33-1.5	1 & 2
240V ~ 3	0.33-1.5	1 & 2
480V ~ 3	0.25-3.0	1 & 2

Size details on page page 30.

NORD Decentralised AC Vector Drive Overview

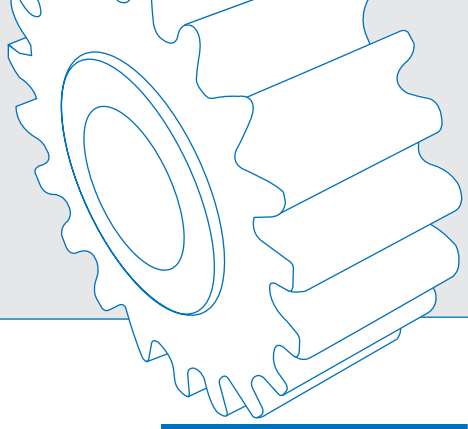


	Description / Function	SK135E	SK180E	SK200E
	Power range	**up to 10 hp**	**up to 3 hp**	**up to 30 hp**
Type	Reversing, soft start	☑	-	-
	Frequency inverter	-	☑	☑
Configuration	Connection for PTC temperature sensor	☑	☑	☑
	Uniform parameter structure / error messages	☑	☑	☑
	Configuration via software parameterisation	☑	☑	☑
	Configuration via DIP switches and potentiometers	☑	-	☑
	Number of I/Os DIN / DOUT / AIN	2 / 2 / 0	3 / 2 / 2	4 / 2(1) / 2
Brake functions	Integrated electronic brake rectifier	☑	-	☑
	Integrated brake chopper	-	❍**	☑
	Internal braking resistor	-	❍**	❍
	External braking resistor	-	❍**	❍
Housing / Version	Housing version	SK 100E	SK 100E	SK 200E
	Wall-mounting possible	☑	☑	☑
	Protection class (climate class) IP55 (3k3)	☑	☑	☑
	Protection class (climate class) IP66 (3k4)	❍	❍	❍
	ATEX Zone 22-3D	❍	❍	❍
	EMC rating: Radio interference suppression level (for motor mounting)	C1	C1	C2
	Leakage current (with active mains filter)	< 20 mA	< 16 mA	> 30 mA
Protection	PTC / I2t / Motor phase monitoring	☑	☑	☑
	Overvoltage trip / Undervoltage protection	☑	☑	☑
	Short-circuit / Earthing monitoring	-	☑	☑
Data / Bus interface	RS 232 PC diagnostic interface	☑	☑	☑
	Data storage via plug-in EEPROM	-	-	☑
	System bus	-	☑	☑
	Interface for bus coupling	❍	❍	❍
Functionality	STO function	-	-	❍
	Connection for incremental encoder (servo mode)	-	-	☑
	Posicon positioning mode	-	-	☑
	Sensorless current vector control (ISD control)	-	☑	☑
	Energy saving function: "Automatic flux optimisation"	-	☑	☑

☑ Standard Functions ❍ Optional Functions

** Unavailable from 0 - 1.1 kW

SK 180E / SK 190E Product Features



SK 180E Size 1	SK 180E Size 2
0.33 - 1.5 hp (0.25 - 1.1 kW)	1.0 - 3.0 hp (0.75 - 2.2 kW)

SK 180E

The SK 180E is a competitively priced alternative to our popular SK 200E drive. This product is targeted at the low cost simple application market segment. Basic features of the 200E remain, however the SK 180E is designed for specific market application segments. Braking is limited to the size 2 units. Encoder feedback is not included. No positioning is possible. The SK 180E has built-in 24VDC power and brake chopper however on size 2 models. Pumps, fans and simple conveyors are the target for this product offering.

SK 180E Size 1-2 Basic Functions:

- ☑ Sensorless current vector control (ISD)
- ☑ Mains / EMC Filter
- ☑ PI Process Controller
- ☑ 3x digital input, PTC input
- ☑ 2x analog input
- ☑ 2x digital output
- ☑ Immediate-access RS 232 diagnostic interface
- ☑ Energy saving function
- ☑ Simple field wiring
- ☑ Variable mounting possibilities for system connectors
- ☑ 200% Overload Capacity
- ☑ Brake Chopper + Brake Resistor*

SK 190E Size 1	SK 190E Size 2
0.33 - 1.5 hp (0.25 - 1.1 kW)	1.0 - 3.0 hp (0.75 - 2.2 kW)

SK 190E

SK 190E Additional Functions:

- ☑ Integrated Automation Interface ASi
- ☑ SK 180E basic functions (listed in table to the left)

AS interface is a field bus that allows local control of an actuator and local acceptance of sensor inputs at the drive.

AS Interface Connection with M12 Plug Connectors

Modern automation systems have a wide range of requirements, so that a suitable bus system and drive components must be selected in order to ensure efficient implementation. For simple local control, the AS interface is a cost-effective solution which enables the networking of binary sensors and actuators. The SK 190E, provides an appropriate solution by means of an AS interface, and is available in this price-sensitive offering.

The supply voltage (power) is via appropriate terminals according to the rating (1~/3~, 115/230/460V). For the control unit of the AC Vector Drive and the AS interface, the supply is via the (yellow) AS interface cable. This eliminates the need for an additional AUX cable (black).

Versions with AS-i on board:

- ☑ AS interface on board
- ☑ SK 190E basic functions

SK 190E Size 1	SK 190E Size 2
0.33 - 1.5 hp (0.25 - 1.1 kW)	1.0 - 3.0 hp (0.75 - 2.2 kW)

To connect the AS-i cable and any initiators, appropriate M12 plug connectors can be provided ex-works. These are color-coded in order to provide a definite assignment of functionalities in the field. The following versions can be selected as options.

AS interface connection

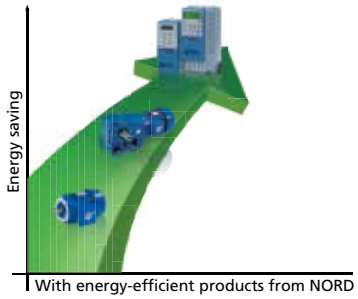
- AS interface
- Optional M12- plug connector (yellow) for AS-i: SK TIE4-M12-AS1 (Part No. 275274502)

Connection for AS interface and initiators

- AS interface
- Initiators (max. 4 x M12 connections possible, 2 with each digital input that is provided [2])
- Optional M12- plug connector (yellow) for AS-i: SK TIE4-M12-AS1 (Part No. 275274502)
- Optional M12 plug connector (black) for I/O: SK TIE4-M12-INI (Part No. 275274503)

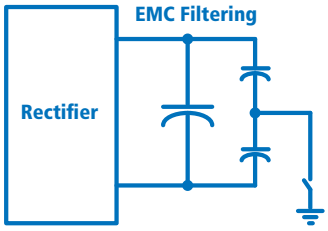
SK 180E
Application Functions

Application functions of the SK 180E



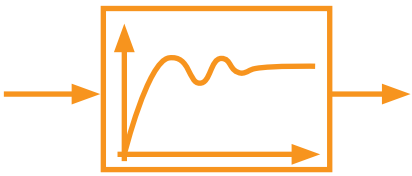
Energy-saving function

- Automatic flux optimisation for pump/fan applications
- Large energy savings possible
- Simple setting via inverter parameters



Mains EMC - Filter Class C1 (B)

- All 230/400V devices have an integrated mains filter
- Also ideal for applications in a domestic environment, due to compliance with Class C1 (for motor mounting), or Class C2 (for wall mounting with motor cables up to 5 meters long)
- Suitable for personal protection due to low leakage current (<16mA) for operation with universal current FI circuit breakers



PI process controller

- All SK 180E devices feature 2 integrated analog inputs
- P and I component may be set seperately
- High precision regulation of application variables

NORD CON

NORD CON

NORD CON is the free operating software for controlling, programming and diagnosis of all NORD AC vector drives.

SK180E Interface Connection

Connecting a SK180E to a PC/laptop is the most effective way to control your AC Vector drive. Connection is accomplished via the RS232 diagnostic interface on top of the AC Drive. The cable does not come standard with the unit but is available. We can provide a 10 foot sub D to RJ12 connector cable but needs to be ordered seperately. (Part Number 278 910 240)

Control

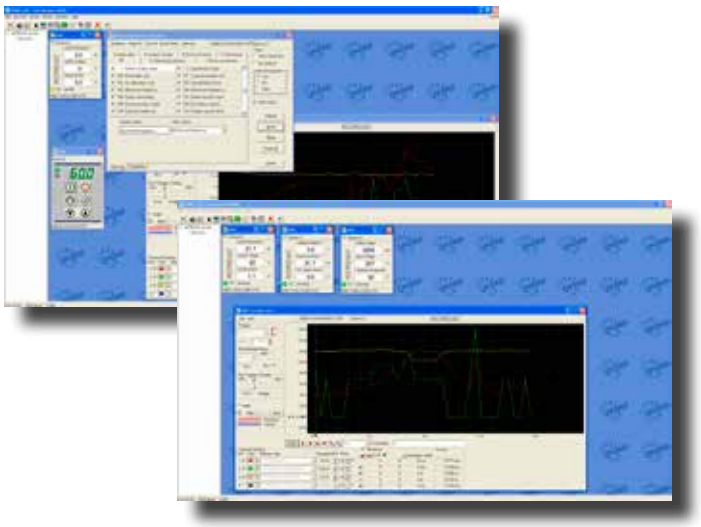
The AC vector drive can be manually operated by means of a software window with all of the operating elements of a Controlbox. An enable signal with specification of setpoint values can be given. The parameter settings can be adjusted and read. Parameters (information and error messages) can be viewed. Users therefore have a supporting aid for each commissioning.

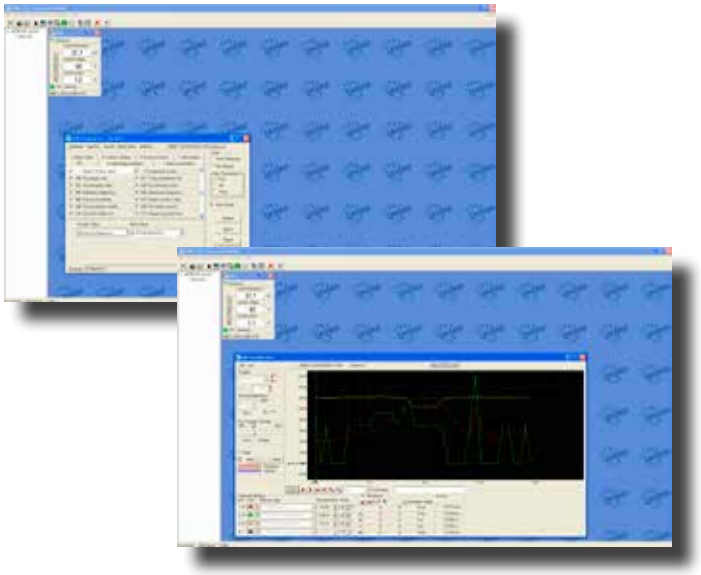
Programming

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

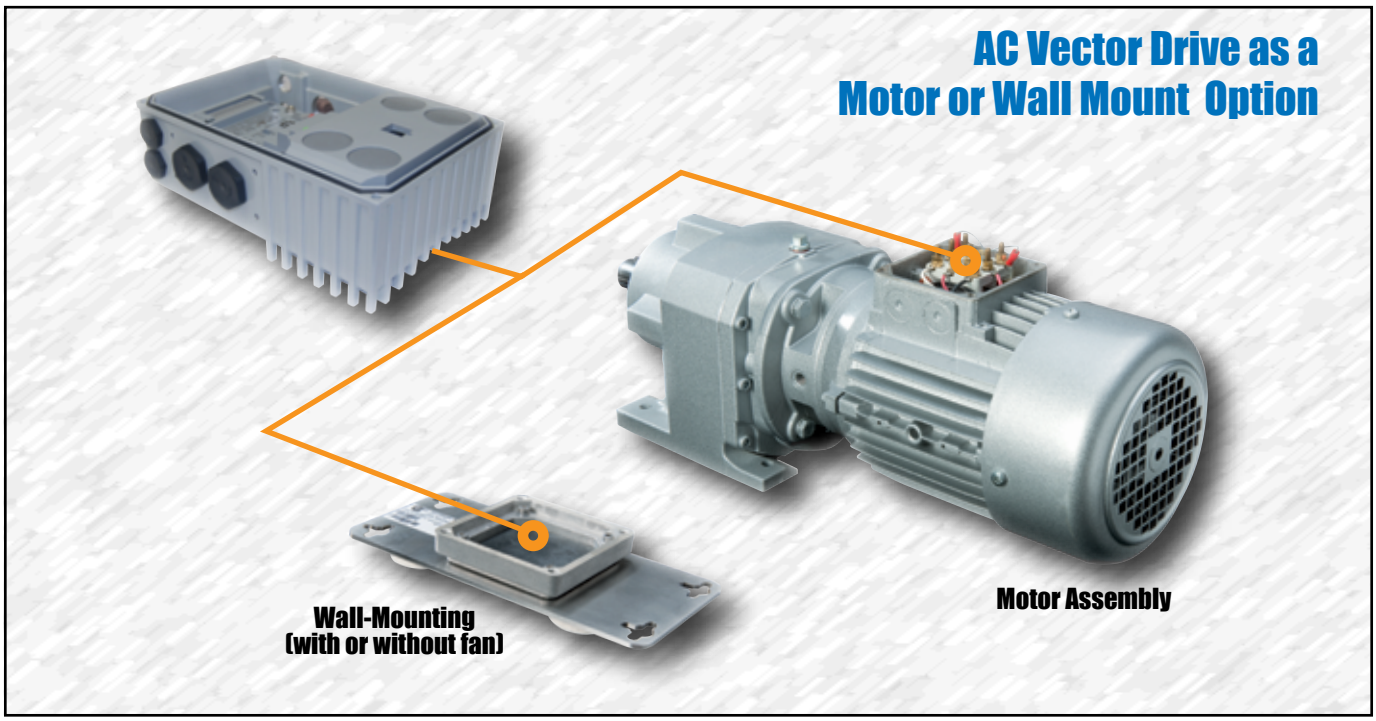
Diagnosis

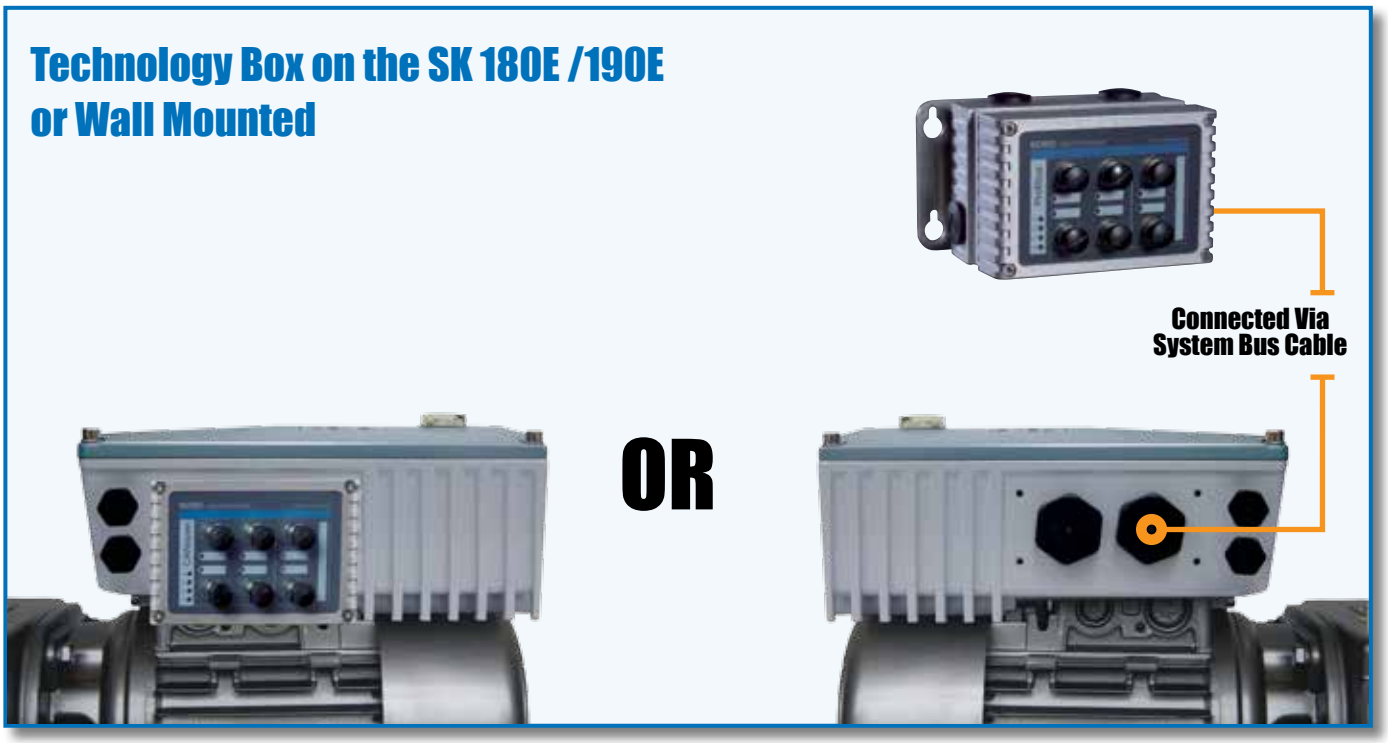
The NORD CON oscilloscope function is a simple but very useful instrument for the optimal adjustment of drive systems. By means of line graphs, all drive characteristics (current, torque, etc.) can be recorded and analysed. With these results, application-relevant settings can be fine-tuned to enable optimum operation. This is useful, e.g. for regulating the brake control or for lifting gear functions.





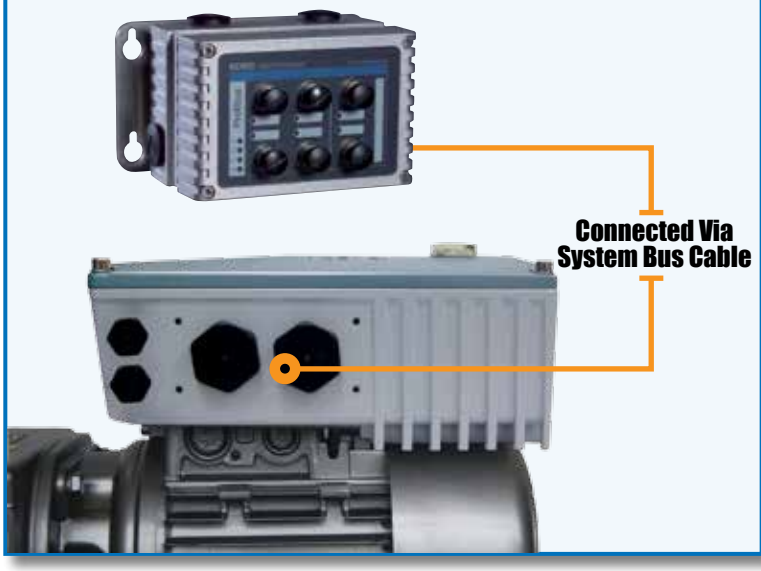
Flexible Mounting Possibilities



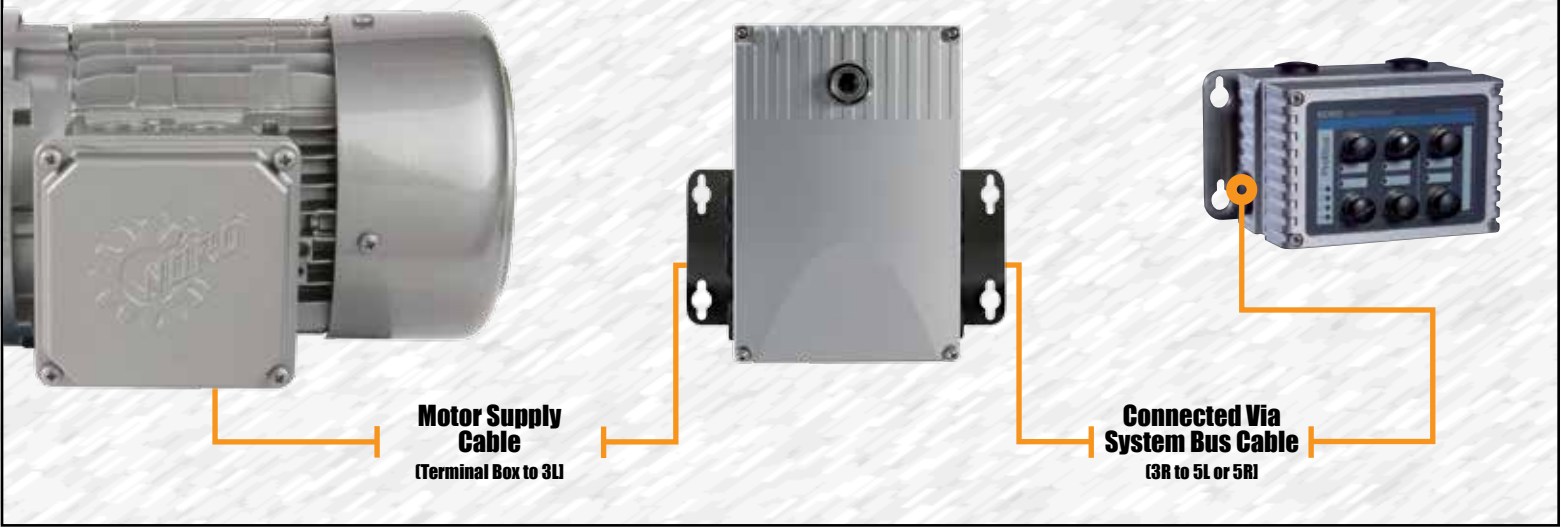


Motor-integrated SK 180E With Technology Unit

Motor-integrated SK 180E With Wall Mounted Technology Unit



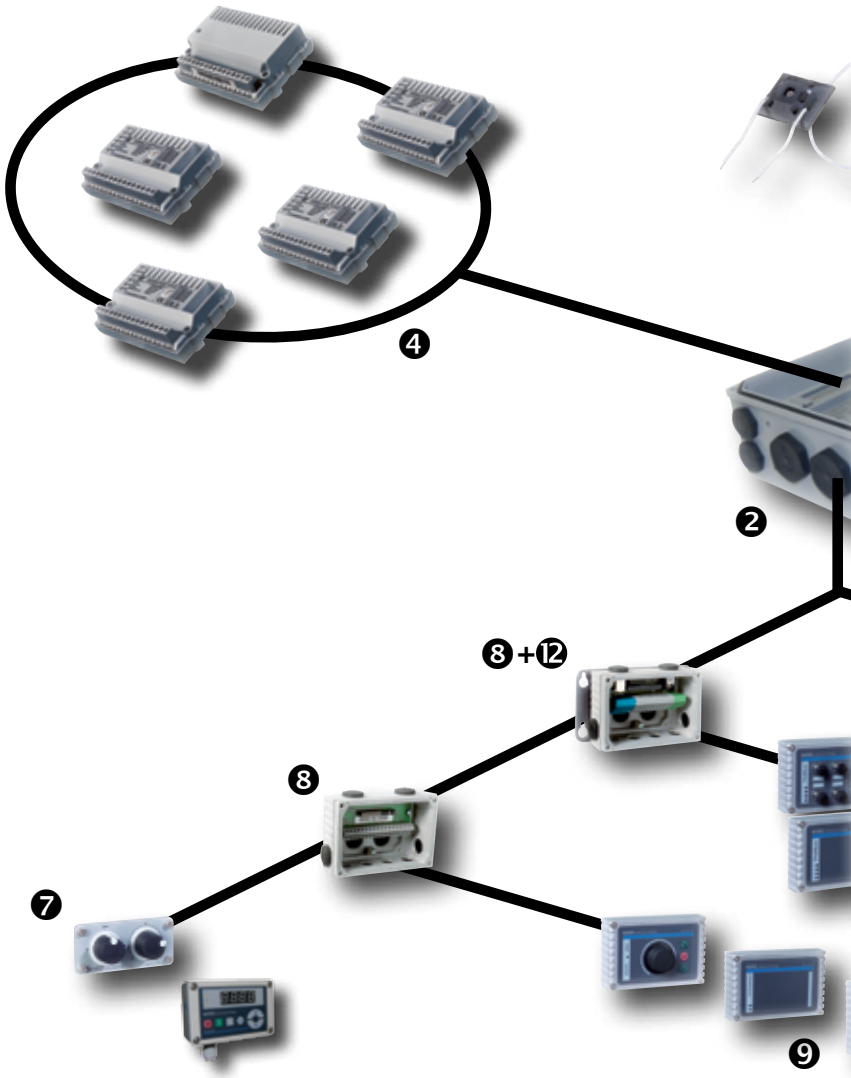
Wall Mounted Variant of an SK 180E and a Technology Unit



High Performance AC Vector Drives

SK 180E Component Overview:

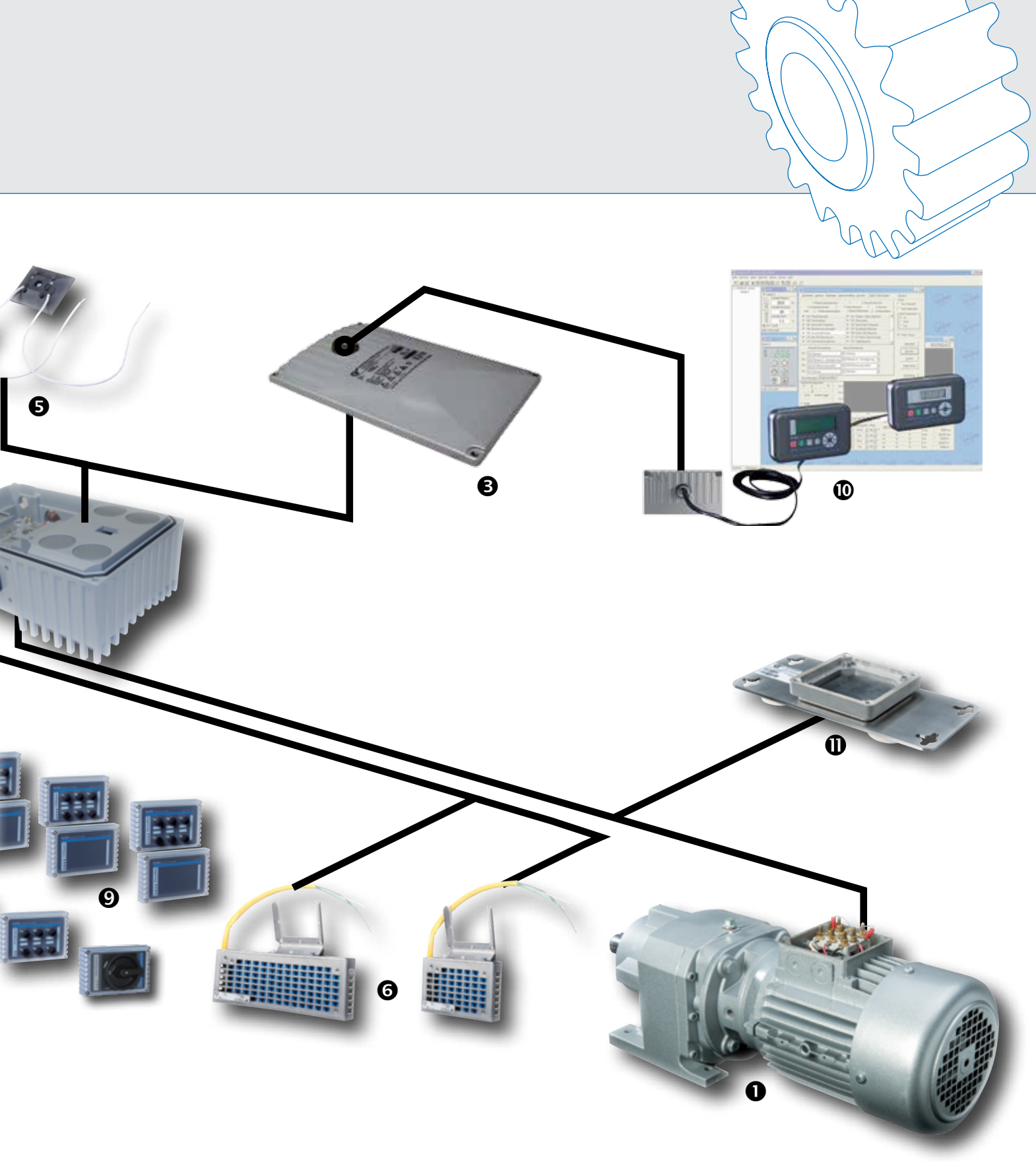
- ❶ Gearmotor
- ❷ SK 180E motor adapter unit
- ❸ SK 180E AC vector drive
- ❹ Customer unit (internal)
- ❺ Internal braking resistor
- ❻ External braking resistor
- ❼ Potentiometer option
- ❽ Technology unit adapter
- ❾ Technology units
- ❿ Programming tools
- ⓫ SK 180E Wall-Mount (bracket)
- ⓬ Technology unit wall-mount



SK 180E Characteristics:

	Units can be operated with all standard asynchronous motors
	Generously dimensioned for easy assembly of various system connectors
	Motor or wall mounting

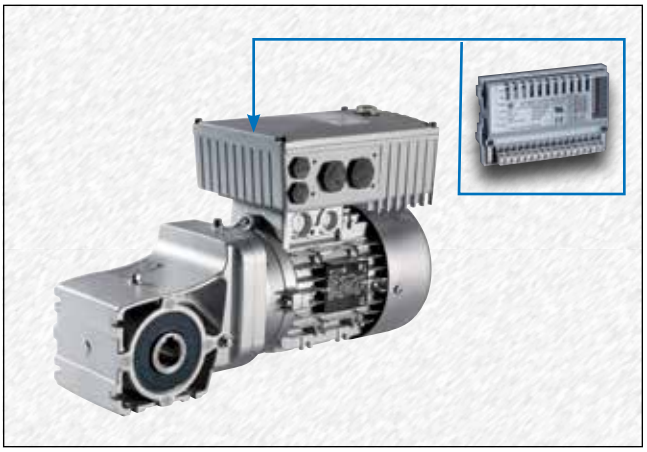
	RoHS compliance "Lead free soldering"
	UL Certification / cUL / CE


❺
❸
❿
❾
❻
⓫
❶

Internal Customer Units

Customer Units

Internal customer interfaces enable the expansion of the range of functions of SK 180E AC vector drive without changing the physical size. Users have access to both communication modules, an internal control power module or an I/O expansion.



Communication

Profibus

Bus module for the control, programming and diagnosis of the AC vector drive via the Profibus interface.

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

CANopen

Bus module for the control, programming and diagnosis of the AC vector drive via the CANopen interface.

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

DeviceNet

Bus module for the control, programming and diagnosis of the AC vector drive via the DeviceNet interface.

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

Internal Customer Units

EtherCAT®

Bus module for the control, programming and diagnosis of the AC drive via EtherCAT® interface.

- Baud rate: Max. 100 MBaud
- 2x digital inputs
- Address and baud rate via dip-switch
- Protocol: DS301
- Status LED: 6 status LEDs

Control

Electronic Brake Rectifier

Module for the electronic control of an electromagnetic brake.

- Mains Voltage: 115V, 240V, 400V, or 480V.
- 1x digital input
- 1x digital output
- 0.5 A maximum permissable permanent relay current, suppression level C2

Line Voltage (AC)	Brake Coil Voltage (DC)
100-120	105
200-240	105
380-420	180
440-480	205

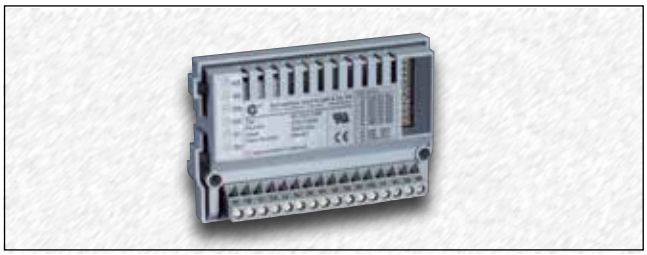
Setpoint Converter (Relay Module)

Bus module for the bipolar setpoint signals and relay changeover contacts.

- 2x digital inputs, 2x analog inputs
- 2x analog outputs
- 2x relay outputs (changeover)
- 100 mA Maximum permissable permanent relay current

I/O Extension

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



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

Internal Customer Units

Operation

Potentiometer Adapter

With the Potentiometer Adapter a robust unit with switching (right-off-left) and a potentiometer may be integrated. This only changes the physical size by the size of the control elements. Connection is achieved with the use of an internal 24V control power module.

- SK CU4-POT : Part Number - 275 271 207
- Additional option with analog input required for SK1X0E.

Robust Switches for Potentiometers

This is an upgrade to the standard Potentiometer box. There are more durable dials that are utilized and are available for both digital and analog input.

- SK TIE4-SWT : Part Number - 275 274 701
- Connection to digital inputs.
- SK TIE4-POT : Part Number - 275 274 700

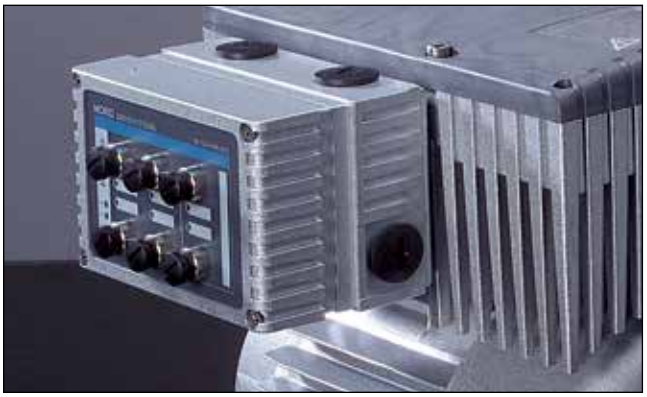
Internal Customer Units Ordering Info

	**Profibus Interface**	
	SK CU4-PBR	(Part. No. 275 271 000 IP55) (Part. No. 275 271 500 IP66)
	**CANopen Interface**	
	SK CU4-CAO	(Part. No. 275 271 001 IP55) (Part. No. 275 271 501 IP66)
	**DeviceNET Interface**	
	SK CU4-DEV	(Part. No. 275 710 002 IP55) (Part. No. 275 710 502 IP66)
	**EtherCAT Interface**	
	SK CU4-ECT	(Part. No. 275 271 017 IP55) (Part. No. 275 271 517 IP66)
	**Setpoint Converter (Relay Module)**	
	SK CU4-REL	(Part. No. 275 271 011 IP55) (Part. No. 275 271 511 IP66)
	**Electronic Brake Rectifier**	
	SK CU4-MBR	(Part. No. 275 271 010 IP55) (Part. No. 275 271 510 IP66)
	**I/O Extension**	
	SK CU4-IOE	(Part. No. 275 271 006 IP55) (Part. No. 275 271 506 IP66)
	**Potentiometer Adapter**	
	SK CU4-POT	(Part. No. 275 271 207 IP55) (Part. No. 275 271 707 IP66)
	**Robust Switches / Potentiometer**	
	SK TIE4-SWT	(Part. No. 275 274 701)
	Connection to digital inputs	
	SK TIE4-POT	(Part. No. 275 274 700)

External Customer Units

Variable Mounting

For the distributed control SK 180E AC vector drives, optional technology units are available. These units may be mounted directly on the device or separately on the machine frame or plant component. Communication systems both with & without connection facilities for sensors, actuators and control modules are available for most current applications.



Technology unit mounted directly on the AC Vector Drive

Technology units for wall mounting

Tunneling of Parameter Data Via the System BUS

The bus Technology units of the SK 180E provide economical and user-friendly configuration of the drive systems in the field. With the system bus, up to 4 AC vector drives and the bus technology unit can be linked via the system bus, which is integrated as standard. Therefore the connection to the host bus system is made at a single point. However, all data sets can be accessed by tunneling of the parameter data. Both the technology units and the data sets of each of the connected SK 180E devices can be accessed via the RS 232 interface.

External Technology Units

Communication

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

Profibus

Bus module for the control, programming and diagnosis of the AC vector drive.

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

Ethernet IP

Bus module for the control, programming and diagnosis of the AC vector drive.

- Baud rate: Max. 100 MBaud
- Access of up to 4 AC vector drives via system bus
- 8x Digital inputs / 2x Digital outputs
- Diagnosis via UDP or TCP/IP
- Status LEDs for operating status

CANopen

Bus module for the control, programming and diagnosis of the AC vector drive.

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

DeviceNet

Bus module for the control, programming and diagnosis of the AC vector drive.

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

EtherCAT

An Ethernet based bus module for the control, programming and diagnosis of the AC vector drive.

- Baud rate: Max. 100 MBaud
- Protocol: CoE
- Access of up to 8 AC vector drives via system bus
- Provision of I/Os on the Profibus: 8x In / 2x Out
- Diagnosis via RS 232
- Status LED: BG status, BG fault, DIN1, DIN2, Bus status, Bus fault

ProfiNET

An Ethernet ProfINET based bus module for the control, programming and diagnosis of the AC vector drive. Equipped with a RJ45 based connector that conforms to AIDA specification.

- Baud rate: Max. 100 MBaud
- Protocol: ProfiNET IO Conformance class B
- Access of up to 8 AC vector drives via system bus
- Provision of I/Os on the Profibus: 8x In / 2x Out
- Diagnosis via RS 232
- Status LED: BG status, BG fault, DIN1, DIN2, Bus status, Bus fault

Control

I/O Extension

With an external I/O Extension actuator signals may be included in distributed drive structures. These are transferred to the AC vector drive via the system bus and may be used as a drive function or forwarded to a host bus system (e.g. Profibus).

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

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

Maintenance Switch

With this unit, you may switch off the supply of power or motor voltage to a drive and secure that drive against switching back on. This is very important when you are servicing or repairing a drive.

External Technology Units

External Customer Units Ordering Information

	**Profibus Interface and Adapter**	
	IP55 unit: SK TU4-PBR (Part. No. 275 281 100) + SK TI4-TU-BUS (Part. No. 275 280 000)	**IP66 unit:** SK TU4-PBR-C (Part. No. 275 281 150) + SK TI4-TU-BUS-C (Part. No. 275 280 500)
	IP55 unit with M12 Connector: SK TU4-PBR-M12 (Part. No. 275 281 200) + SK TI4-TU-BUS (Part. No. 275 280 000)	**IP66 unit with M12 Connector:** SK TU4-PBR-M12-C (Part. No. 275 281 250) + SK TI4-TU-BUS-C (Part. No. 275 280 500)
	**CANopen Interface and Adapter**	
	IP55 unit: SK TU4-CAO (Part. No. 275 281 101) + SK TI4-TU-BUS (Part. No. 275 280 000)	**IP66 unit:** SK TU4-CAO-C (Part. No. 275 281 151) + SK TI4-TU-BUS-C (Part. No. 275 280 500)
	IP55 unit with M12 Connector: SK TU4-CAO-M12 (Part. No. 275 281 201) + SK TI4-TU-BUS (Part. No. 275 280 000)	**IP66 unit with M12 Connector:** SK TU4-CAO-M12-C (Part. No. 275 281 251) + SK TI4-TU-BUS-C (Part. No. 275 280 500)
	**DeviceNet Interface and Adapter**	
	IP55 unit: SK TU4-DEV (Part. No. 275 281 102) + SK TI4-TU-BUS (Part. No. 275 280 000)	**IP66 unit:** SK TU4-DEV-C (Part. No. 275 281 152) + SK TI4-TU-BUS-C (Part. No. 275 280 500)
	IP55 unit with M12 Connector: SK TU4-DEV-M12 (Part. No. 275 281 202) + SK TI4-TU-BUS (Part. No. 275 280 000)	**IP66 unit with M12 Connector:** SK TU4-DEV-M12-C (Part. No. 275 281 252) + SK TI4-TU-BUS-C (Part. No. 275 280 500)
	**EtherCAT Interface and Adapter**	
	IP55 unit (M12): SK TU4-ECT (Part. No. 275 281 117) + SK TI4-TU-BUS (Part. No. 275 280 000)	**IP66 unit (M12):** SK TU4-ECT-C (Part. No. 275 281 167) + SK TI4-TU-BUS-C (Part. No. 275 280 500)
	**PROFINET Interface and Adapter**	
	IP55 unit (RJ45): SK TU4-PNT (Part. No. 275 281 115) + SK TI4-TU-BUS (Part. No. 275 280 000)	**IP66 unit (RJ45):** SK TU4-PNT-C (Part. No. 275 281 165) + SK TI4-TU-BUS-C (Part. No. 275 280 500)
	**Ethernet IP**	
	IP55 unit (M12): SK TU4-EIP (Part. No. 275 281 119) + SK TI4-TU-BUS (Part. No. 275 280 000)	**IP66 unit (M12):** SK TU4-EIP-C (Part. No. 275 281 169) + SK TI4-TU-BUS-C (Part. No. 275 280 500)
	**I/O Extension Interface and Adapter**	
	IP55 unit: SK TU4-IOE (Part. No. 275 281 106) + SK TI4-TU-BUS (Part. No. 275 280 000)	**IP66 unit:** SK TU4-IOE-C (Part. No. 275 281 156) + SK TI4-TU-BUS-C (Part. No. 275 280 500)
	IP55 unit with M12 Connector: SK TU4-IOE-M12 (Part. No. 275 281 206) + SK TI4-TU-BUS (Part. No. 275 280 000)	**IP66 unit with M12 Connector:** SK TU4-IOE-M12-C (Part. No. 275 281 256) + SK TI4-TU-BUS-C (Part. No. 275 280 500)
	**Maintenance Switch**	
	IP55 unit: SK TU4-MSW (Part. No. 275 281 123) + SK TI4-TU-BUS (Part. No. 275 280 200)	**IP66 unit:** SK TU4-MSW-C (Part. No. 275 281 173) + SK TI4-TU-BUS-C (Part. No. 275 280 700)

Control Units

Operation, Display & Diagnostics

According to the application, there are various methods of controlling, programming or troubleshooting a SK 180E AC vector drive.

- Parameter Box
- Simple Box
- Setpoint Box
- Potentiometer Adapter
- PC/laptop with NORDCON software
- Dip-switches

Control Units Ordering Info

	**Parameter Box**	
	SK PAR-3H (Handheld)	(275 281 014)
	SK PAR-3E (Cabinet Mount)	(275 281 414)
	**Simple Box**	
	SK CSX-3H (Handheld)	(275 281 013)
	SK CSX-3E (Cabinet Mount)	(275 281 413)
	**Setpoint Box**	
	SK SSX-3A	(275 281 513)
	**Potentiometer Adapter**	
	SK CU4-POT	(275 271 207)

Parameter Box

Control panel and plain text display for text-controlled commissioning, programming and control of the AC vector drive. 5 data sets can be stored. Direct connection to a PC is possible via USB. This option is available as a handheld or panel mount version.

Simple Box

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

Setpoint Box

Control panel with 4-digit 7-segment display for rapid and direct programming and diagnosis. Used for local operation and may be installed permanently.

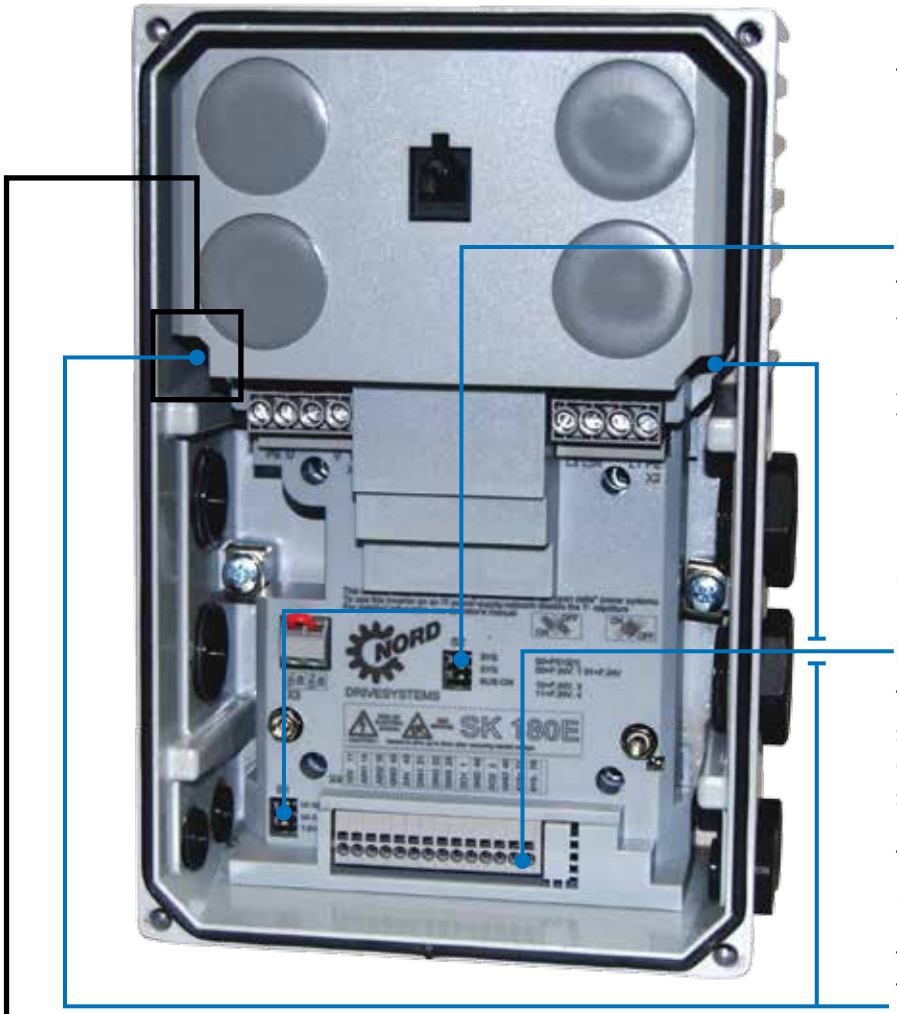
Potentiometer Adapter

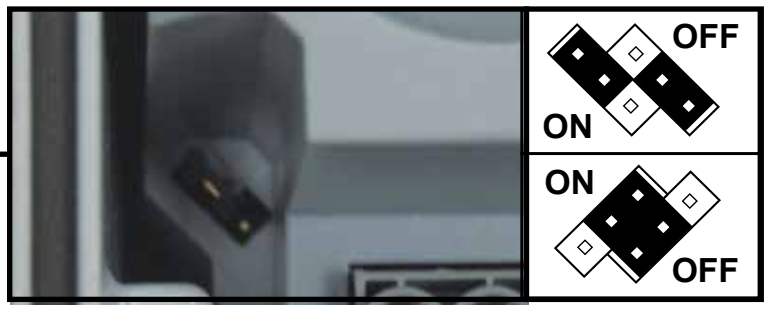
As an addition to the main unit, the Potentiometer Box provides robust control elements for right-hand/left-hand operation & a setpoint potentiometer. This version allows direct operation of the device.

Direct control via right/left switch and potentiometer

	**External Potentiometer Unit** (Standard IP66)					
	115/230V unit:			**460V unit:**		
	SK CU4-24V-123-B	(Part. No. 275 271 108)		SK CU4-24V-140-B	(Part. No. 275 271 109)	
+	SK POT1-1	(Part. No. 278 910 120)	+	SK POT1-1	(Part. No. 278 910 120)	
	**Side Mounted Switches / Potentiometers** (Standard IP66)					
	115/230V unit:			**460V unit:**		
	SK TIE4-SWT	(Part. No. 278 274 701)		SK TIE4-SWT	(Part. No. 278 274 701)	
+	SK TIE4-POT	(Part. No. 278 274 700)	+	SK TIE4-POT	(Part. No. 278 274 700)	
+	SK CU4-24V-123-B	(Part. No. 275 271 108)	+	SK CU4-24V-140-B	(Part. No. 275 271 109)	

Selectable Configuration of Drive Functions





Configuring Your Drive Functions

The SK 180E provides the possibility of setting the required drive functions from parameters by means of dip-switches.

Programming with dip-switches

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

If only a low level of functionality with simple handling is required, there is no need for a parameter storage device. The settings can be made directly, without programming accessories/tools.

Programming with the terminal strip

The drive can be operated from the terminal strip. You need to order or provide local operator controls. PLC outputs can supply operation and speed command if you prefer or a field bus option may be added to allow remote filed bus control. The control terminal block includes digital inputs, analog inputs, PTC inputs and digital outputs. Push in terminals are provided in order to eliminate the use of tools to attach wires to the block. The terminals are programmable and preprogrammed for the most common functions. If the terminal function definitions need to be adjusted, Nordcon, or an external control unit will be required.

Power network setting

The filtering of the AC vector drive may be selected with this jumper. This makes it possible to use the inverter in a non grounded voltage network, or under low leakage current operation (ground-fault circuit). This setting is for use on power sources that are not firmly referenced to ground potential.

SK 180E
Status & Diagnostics

Direct-access to diagnostic tools

A great advantage of a distributed control drive system is that the location of the AC vector drive is near the motor, which is extremely beneficial in large plant facilities. Therefore direct access to the drivesystem for monitoring and diagnosis is a great benefit. The diagnostic tools for the SK 180E are easily visible and accessible behind a transparent screw-on cover.

SK 180E - Sizes 1-2

1. RS 232 diagnostic interface

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

* DIP Switches for Analog Inputs

DIP Switches on the SK180E are included and located internally.

SK 190E - Sizes 1-2

1. RS 232 diagnostic interface

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

2. Status-LEDs for device status and ASI status

Status LEDs for device status and ASI status are visible through the site glass. They have a green and red component to indicate status or fault.

* DIP Switches for Analog Inputs

DIP Switches on the SK190E are included and located internally.

Flexible Plug-in Systems

System Connecters

The screw connections on the respective adapter unit may be fitted with system connectors for power, motor output, control as well as bus signals.

Adapter Unit / AC Vector Drive

Option Slots for SK TI4 Units or Power Plugs

3AR or 3BR	M25 Screw Connections
3AL or 3BL	M25 Screw Connection
4R or 4L	M16 Screw Connection
5R or 5L	M16 Screw Connection

System Connectors for Option Slots

Operation		
SK TIE4-POT	Potentiometer	3R or 3L
SK TIE4-SWT	Switch L-O-R	
Bus System		
SK TIE4-M12-AS1	AS Interface	4R or 4L (Adapter Unit) or 1 - 4 (Connection Unit)
SK TIE4-M12-ASI-AUX	AS Interface	
SK TIE4-M12-CAO	CANopen	
SK TIE4-M12-PBR	Profibus	
SK TIE4-M12-SYSM	System Bus Master	
SK TIE4-M12-SYSS	System Bus Slave	
Control Signals		
SK TIE4-M12-ANA	Analog Value	5R or 5L (Adapter Unit)
SK TIE4-M12-INI	Initiator	
SK TIE4-M12-POW	24V Supply	

Connection / Technology Unit

Option Slots for the SK TI4-TU-... Technology Units

1	M16 Screw Connection
2	M16 Screw Connection
3	M16 Screw Connection
4	M16 Screw Connection
5R or 5L	M20 Screw Connection

Connection / Customer Unit & Brake Resistor

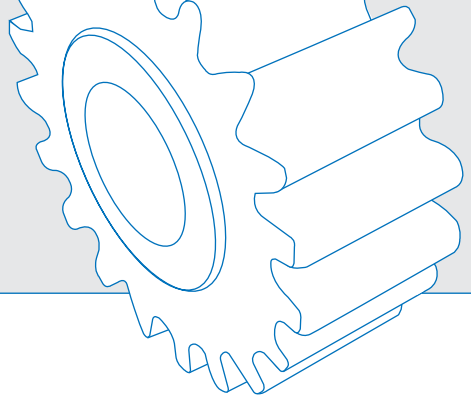
1	Customer Unit Mounting*
2	Brake Resistor Mounting*

* Only available for SK180E size 2 units

System Connectors

		Connector Type	Description	Part Number
Power		SK TIE4-HAN-Q5	Power in/out (HANQ5)	275 274 110
	Other versions available upon request			
Bus System		SK TIE4-M12-AS1	AS interface (M12)	275 274 502
		SK TIE4-M12-ASI-AUX	AS interface (M12, AUX)	275 274 513
		SK TIE4-M12-CAO	CANopen (M12)	275 274 501
		SK TIE4-M12-PBR	Profibus (M12)	275 274 500
		SK TIE4-M12-SYSM	System Bus (M12) Master	275 274 505
		SK TIE4-M12-SYSS	System Bus (M12) Slave	275 274 506
Control Signals		SK TIE4-M12-ANA	Analog Value (M12)	275 274 508
		SK TIE4-M12-INI	Initiator (M12)	275 274 503
		SK TIE4-M12-POW	24V Supply (M12)	275 274 407
		SK TIE4-M12-M16	Extension from M12 to M16	275 274 510

General Specifications



Function	Specification
Power / Voltage	1~ 115 V 0.33 - 0.75 hp 0.25 – 0.75 kW (no mains filter) 1/3~ 240 V 0.33 - 1.5 hp 0.25 – 1.1 kW 3~ 480 V 0.25 - 3.0 hp 0.25 – 2.2 kW
Standard	• Integrated mains filter Class C1 (residential environment) for motor mounting of the frequency inverter, Class C2 (industrial areas) for wall-mounting with motor cable length up to 5m • Low leakage current (< 16 mA) • Adaptation for operation on IT network by means of jumpers (change of leakage current possible) • Consistent and user-friendly parameter structure • Automatic motor parameter identification
Output frequency	0.0 ... 400.0 Hz
Typical overload capacity	200% for 3.5 s 150% for 60 s
Protective Indicators	Overtemperature, short circuit, earth fault, over/under-voltage, overload
Regulation and control	Sensorless current vector control (ISD), linear V/f characteristic curve, automatic flux optimisation (energy-saving function)
Motor temperature monitoring	Temperature sensor (PTC), temperature monitor (bimetal), temperature sensor (KTY84) I^2t motor
Standard interfaces	RS 485 (USS), RS 232 (commissioning and diagnosis), system bus
Ambient temperature	-25 - 50°C for size 1 units, -25°C - 40°C for size 2 units (please refer to user manual BU0180 for more specific information regarding duty cycle & mounting style)
Version	Motor mounted, wall mounted
Protection class	IP55 optional IP66 IP66 measures: • Powder coated housing • Coated PCBs • Low pressure test • Membrane valve

Nomenclature Examples

Frequency Inverter -Basic Device

SK 180E – 370 – 323 – A – (-C)

- IP protection Class: standard = IP55, C = "Coated" IP66
- Radio Interference Filter: O = Without, A = Class A1, B = Class B1
- Mains Voltage: x12 = 115, x23 = 230V, x40 = 400/460V
- Number of Mains Phases : 1xx = 1~phase, 3xx 3~phase
- Digits before decimal point for power: 0 = 0.xx, 1 = 0x.x0, 2 = 0xx.0
- Device nominal power: 250 = 0.25kW, 370 = 0.37kW, 221 = 2.2kW
- Device Series: SK 180E or SK 190E

Adapter Unit - Frequency Inverter

SK TIE4 – 1 – 190 – 1 – (–C–WMK–1)

- Wall Mounting Kit: -1 = SI + II, -2 = SIII
- IP protection Class: standard = IP55, C = "Coated" IP66
- Mains Connection: 1 - 1~115/230V*, 3 = 3~230/460V*
- Suitable device types: SK 180E, SK 190E
- Size: 1= SI, 2 = SII, 3 = SIII
- Device Series: SK TI4 = Adapter unit SK TI4

* The voltage depends on the AC vector drive used.

For Dynamic Braking Resistor

SK BRI4 – 1 – 200 – 100

- Continuous Rating
- Resistance (Ω)
- Energy Consumption (kWs)
- Option Series: BRI4 =Internal Customer Unit, BRE4 = External Technology Unit

Adapter Unit - Technology Unit

SK TI4 – TU – BUS – (–C–WMK–TU)

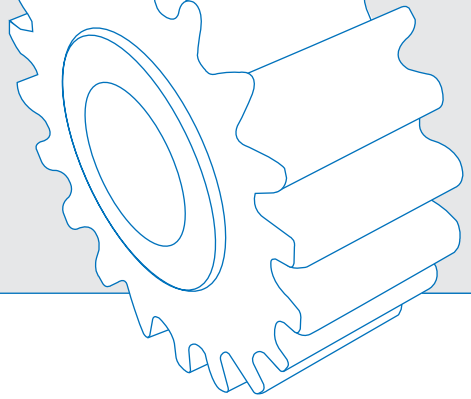
- Wall Mounting Kit: -1 = SI + II, -2 = SIII
- IP protection Class: Standard = IP55, C = "Coated" IP66
- Suitable Device Types: NET = Optional net module, BUS = Optional bus module
- Group: TU = Technology Unit
- Device Series: SK TI4 = Adapter unit SK TI4

For Bus Module or I/O Extension

SK TU4 – CAO – (–C–M12)

- M12 System Connector
- IP protection Class: standard = IP55, C = "Coated" IP66
- Option Type: CAO = CANopen, PBR = Profibus, ECT = EtherCAT®, DEV = DeviceNET, IOE = I/O Erweiterung
- Option Series: TU4 = External Technology Unit, CU4 = Internal Customer Unit

SK 180E Frame Size 1-2 Selection Guide



AC Vector Drive Selection

	Series		kW Ratings		Input Voltage		Protection Class
SK	❶	E-	❷	-	❸		❹

❶ Series
180: Basic
190: Basic + AS Interface

❷ kW Rating
250: 0.25 kW (0.33 hp)
370: 0.37 kW (0.50 hp)
550: 0.55 kW (0.75 hp)
750: 0.75 kW (1 hp)
111: 1.11 kW (1.50 hp)
151: 1.5 kW (2 hp)
221: 2.2 kW (3 hp)

❸ Input Voltage
112-O: 100-120V, 1-phase (0.25 - 0.75 kW)
123-B: 200-240V, 1-phase (0.25 - 1.1 kW)
323-B: 200-240V, 3-phase (0.25 - 1.1 kW)
340-B: 380-480V, 3-phase (0.25 - 2.2 kW)

❹ Protection Class
Blank: IP55
-C: IP66

(if required)

Programmer/Operation Device

- ❒ **SK CSX-3H**: Simple Box (LED Display)
- ❒ **SK PAR-3H**: Parameter Box (LCD Plain Language Display)
- ❒ **SK CSX-3E**: Panel Mount Simple Box (LED Display)
- ❒ **SK PAR-3E**: Panel Mount Parameter Box (LCD Plain Lang Disp.)
- ❒ **RJ12-SUB/D**: PC Cable for NORDCON software

(if required)

Customer Unit Selection

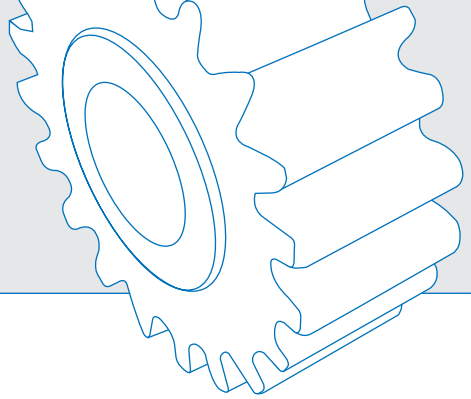
	Fieldbus/IOE Option	M12 Connection Option	180E-Specific Option	Protection Class
SK CU4	❼	❽	❾	❹

❼ Fieldbus, I/O Extension Module
PBR: Profibus Interface
CAO: CANopen Interface
ECT: EtherCat Interface
DEV: DeviceNet Interface
IOE: I/O Extension

❽ M12 Connectors for Module I/O
Blank: Not Required
M12: M12 Connector Required

❾ 180E-Specific Option
MBR: Internal Brake Rectifier/Control (See note on brake coil volt.)
REL: Bipolar Signal Conditioning (-10...+10V) and 2x Relay Outputs

❹ Protection Class
Blank: IP55
-C: IP66



(if required)

Technology Unit-Specific Option Selection

	TU-Specific Option	Protection Class*
SK TU4 -	⓫	❹

* Applies only to external "TU4" units

⓫ Fieldbus, I/O Extension module
PBR: Profibus Interface
CAO: CANopen Interface
ECT: EtherCat Interface
DEV: DeviceNet Interface
EIP: EtherNet Interface
PNT: ProfiNet Interface
MSW: Maintenance Switch
IOE: I/O Extension
REL: Bipolar Signal Conditioning (-10...+10V) and 2x Relay Outputs

❹ Protection Class
Blank: IP55
-C: IP66

(Required for all "SK TU-XXX" modules)

Technology Unit Adapter Selection

	Assembly Adapter for TU4*	Protection Class*
SK TI4-TU-	⓬	❹

* Applies only to external "TU4" units

⓬ Assembly Adapter for TU4 Technology Units
BUS: For all PBR, CAO, DEV, IOE, PNT, ECT & EIP Tech. Units
MSW: For the MSW Technology Unit

(If required)

Local Potentiometer Operator

❒ **SK CU4-POT**: Local Speed Pot and L/OFF/R Selector Switch

(If required)

Dynamic Braking Resistor Selection

	Assembly Adapter for TU4*	Brake Resistor Rating
SK	⓭	⓮

⓭ Dynamic Braking Resistor Location (only on Frame size 2)
BRI4: Internal
BRE4: External

⓮ BRI4 Internal Dynamic Braking Resistor Rating
1-200-100: 200-240V: 3-phase (0.75-1.1 kW)
1-400-100: 380-480V: 3-phase (1.5-2.2 kW)

⓮ BRE4 External Dynamic Braking Resistor Rating
1-100-100: 200-240V: 1-phase & 200-240V, 1-phase (all ratings)
1-200-100: 200-240V: 3-phase (0.75-1.1 kW)

(If required)

Wall Mount Adapter

	Selection Code for Adapter
SK TIE4-WMK-	

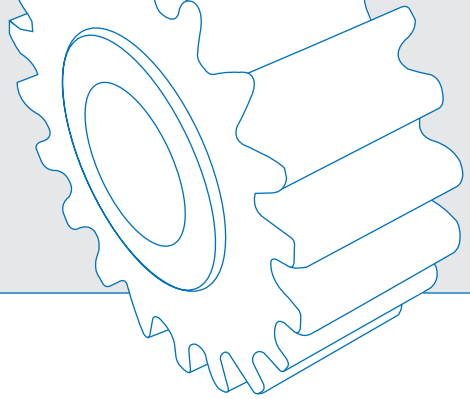
⓯ Wall Mount Adapter Code
1: For drive frame sizes 1 & 2**
** See box 5 for frame sizes

Notes

- Motor Adapter is required for all drives.
- Only 1 Internal CU4 customer unit may be installed per drive (with the exception of the SK CU4-POT).
- Only one External TU4 technology unit (or SK CU4-POT) may be installed per drive.
- Drive utilizes an internal 24Vdc power supply in order to operate. External 24dc power supplies must not be used with the SK2X0E series.
- Required brake coil voltage if SKCU4-MBR is selected.

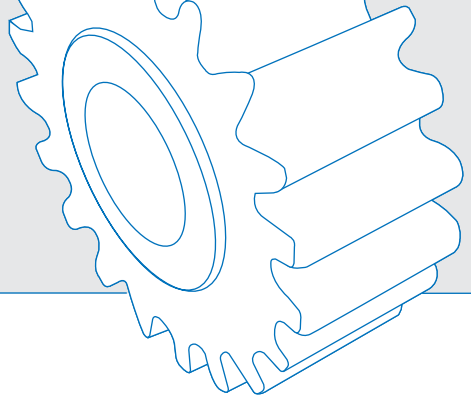
Line Voltage (AC)	Brake Coil Voltage (DC)
100-120	105
200-240	105
380-420	180
440-480	205

SK 180E
AC Vector Drive Ratings



	AC Vector Drive type SK 1xxE...	SK 180E	SK 190E	Mains voltage	Output voltage	
1 ~ 100V ... 120V	-250-112-O (-C)	☑	☑	1 ~ 100...120V -/+10% 47...63Hz	3 ~ AC 0V up to twice the mains voltage	
	-370-112-O (-C)	☑	☑			
	-550-112-O (-C)	☑	☑			
	-750-112-O (-C)	☑	☑			
1 or 3 ~ 200 ... 240V	-250-323-B (-C)	☑	☑	3 ~ 200...240V -/+10% 47...63Hz	3 ~ AC 0V up to the mains voltage	
	-370-323-B (-C)	☑	☑			
	-550-323-B (-C)	☑	☑			
	-750-323-B (-C)	☑	☑			
	-111-323-B (-C)	☑	☑			
3~380 ... 480V	-250-340-B (-C)	☑	☑	3 ~ 380...480V - 20% / +10% 47...63Hz	3 ~ AC 0V up to the mains voltage	
	-370-340-B (-C)	☑	☑			
	-550-340-B (-C)	☑	☑			
	-750-340-B (-C)	☑	☑			
	-111-340-B (-C)	☑	☑			
	-151-340-B (-C)	☑	☑			
	-221-340-B (-C)	☑	☑			

Standard - IP55 **(-C) - IP66** **☑ - Available**

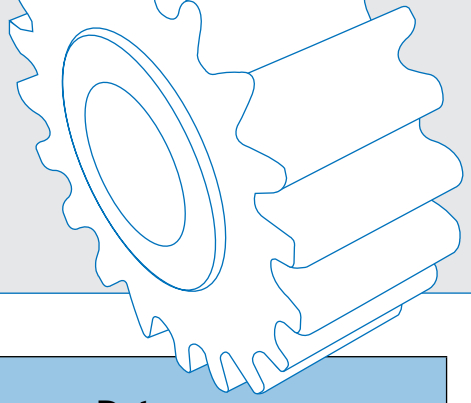


Nominal motor power		Typical input current		Nominal output current
[kW]	[hp]	1 ~ rms [A]	3 ~ rms [A]	rms [A]
0.25	0.33	7.6	-	1.7
0.37	0.50	11.0	-	2.1
0.55	0.75	14.3	-	3.0
0.75	1.0	18.0	-	4.0
0.25	0.33	4.5	3.2	1.7
0.37	0.50	5.7	3.8	2.2
0.55	0.75	7.2	4.8	3.0
0.75	1.0	10.6	7.0	4.0
1.1	1.50	14.0	9.2	5.5
0.25	0.33	-	2.0	1.2
0.37	0.50	-	2.3	1.5
0.55	0.75	-	2.6	1.7
0.75	1.0	-	3.2	2.3
1.1	1.50	-	4.1	3.1
1.5	2.0	-	6.0	4.0
2.2	3.0	-	7.0	5.5

Operator Interface
Customer Units

	Customer Units	Option Type	Part Numbers
Communication		ProfiBus SK CU4-PBR	275 271 000 (IP55) 275 271 500 (IP66)
		DeviceNET SK CU4-DEV	275 271 002 (IP55) 275 271 502 (IP66)
		CANopen SK CU4-CAO	275 271 001 (IP55) 275 271 501 (IP66)
		EtherCAT SK CU4-ECT	275 271 017 (IP55) 275 271 517 (IP66)
		Setpoint Converter SK CU4-REL	275 271 011 (IP55) 275 271 511 (IP66)
		Electronic Brake Rectifer SK CU4-MBR	275 271 010 (IP55) 275 271 510 (IP66)
I/O extension		I/O extension SK CU4-IOE	275 271 006 (IP55) 275 271 506 (IP66)
Poti-Adapter		Potentiometer Adapter SK CU4-POT	275 271 207 (IP55) 275 271 707 (IP66)

Operator Interface	Option Type	Part Numbers
	ParameterBox SK PAR-3H SK PAR-3E	275 281 014 (Handheld) 275 281 414 (Panel Mount)
	SimpleBox SK CSX-3H SK CSX-3E	275 281 013 (Handheld) 275 281 413 (Panel Mount)
	Setpoint Box SK SSX-3A	275 281 513
	Adapter Kit SK TIE4-SSX-3A ADAPTERKIT	275 274 910

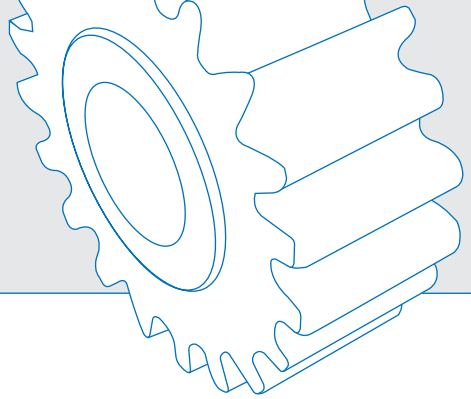


Description	Data
Bus module for the control, programming and diagnosis of the AC vector drive via ProfiBus.	Baud rate: Max. 12 MBaud Protocol: DPV 0 and DPV 1 2x digital inputs
Bus module for the control, programming and diagnosis of the AC vector drive via DeviceNET.	Baud rate: Max. 500 kBaud Protocol: AC-Drive 2x digital inputs
Bus module for the control, programming and diagnosis of the AC vector drive via CANopen.	Baud rate: Max. 1 MBaud Protocol: DS 301 and DS 402 2x digital inputs
Bus module for the control, programming and diagnosis of the AC vector drive via EtherCAT	
Module for bipolar setpoint signals and relay changeover contacts.	2x analog inputs / 2x analog outputs 2x digital inputs, 2x relay outputs 100mA (≤30 VDC) Max permissable relay current
Module for electronic control of an electromagnetic brake.	Mains Voltage 230V/460 1x Digital input, 1x Digital output 0.5A Max permissable relay current, suppression Lv. 2
I/O module for the provision of digital inputs and outputs in the field.	2x digital inputs 2x analog inputs / 1x analog output
For the inclusion of switching/potentiometer control elements directly to the SK 180E. Connection to internal 24V mains unit	1x switch, Left/Off/Right 1x continuously variable potentiometer 0-100%

Description	Data
Control panel and plain text display for text-controlled commissioning, programming and control of the AC vector drive.	Plain text display 6 languages 5 data sets can be stored
Control panel with 4-digit 7-segment display for rapid and direct programming and diagnosis.	4-digit, 7-segment display No data sets can be stored
Control panel with 4-digit 7 segment display for rapid and direct programming and diagnosis. Used for local operation and may be installed permanently.	4-digit, 7-segment display
Mounting Bracket and cable for Installing the setpoint box on the side of the SK 180E.	N/A

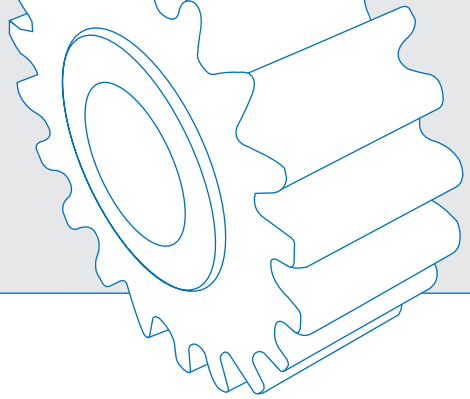
External Technology Units

	Technology Units	Option Type	Part Numbers
Communication		**Profibus** SK TU4-PBR SK TU4-PBR-C	275 281 100 (IP55) 275 281 150 (IP66)
		**ProfiBus M12** SK TU4-PBR-M12 SK TU4-PBR-M12-C	275 281 200 (IP55 - M12) 275 281 250 (IP66 - M12)
		**DeviceNET** SK TU4-DEV SK TU4-DEV-C	275 281 102 (IP55) 275 281 152 (IP66)
		**DeviceNET M12** SK TU4-DEV-M12 SK TU4-DEV-M12-C	275 281 202 (IP55 - M12) 275 281 252 (IP66 - M12)
		**CANopen** SK TU4-CAO SK TU4-CAO-C	275 281 101 (IP55) 275 281 151 (IP66)
		**CANopen M12** SK TU4-CAO-M12 SK TU4-CAO-M12-C	275 281 201 (IP55 - M12) 275 281 251 (IP66 - M12)
		**EtherCAT** SK TU4-ECT SK TU4-ECT-C	275 281 117 (IP55 - M12) 275 281 167 (IP66 - M12)
		**ProfiNET** SK TU4-PNT SK TU4-PNT-C	275 281 115 (IP55 - RJ45) 275 281 165 (IP66 - RJ45)
		**EtherNET IP** SK TU4-EIP SK TU4-EIP-C	275 281 119 (IP55 - M12) 275 281 169 (IP66 - M12)
I/O Extension		**I/O Extension** SK TU4-IOE SK TU4-IOE-C	275 281 106 (IP55) 275 281 156 (IP66)
		**I/O extension with M12** SK TU4-IOE-M12 SK TU4-IOE-M12-C	275 281 206 (IP55 - M12) 275 281 256 (IP66 - M12)
Disconnect		**Disconnect (Maint. Switch)** SK TU4-MSW SK TU4-MSW-C	275 281 123 (IP55) 275 281 173 (IP66)



Description	Data
Bus module for the control, programming and diagnosis of the AC vector drive via ProfiBus.	Baud rate: Max. 12 MBaud Protocol: DPV 0 and DPV 1 4x digital In, 2x digital Out
Bus module for the control, programming and diagnosis of the AC vector drive via ProfiBus. M12 plug connector for connecting sensors and actuators.	Baud rate: Max. 12 MBaud Protocol: DPV 0 and DPV 1 4x digital In, 2x digital Out to M12
Bus module for the control, programming and diagnosis of the AC vector drive via DeviceNET.	Baud rate: Max. 500 kBaud Protocol: AC-Drive 4x digital In, 2x digital Out
Bus module for the control, programming and diagnosis of the AC vector drive via DeviceNET. M12 plug connector for connecting sensors and actuators.	Baud rate: Max. 500 kBaud Protocol: AC-Drive 4x digital In, 2x digital Out to M12
Bus module for the control, programming and diagnosis of the AC vector drive via CANopen.	Baud rate: Max. 1 MBaud Protocol: DS 301 and DS 402 4x digital In, 2x digital Out
Bus module for the control, programming and diagnosis of the AC vector drive via CANopen. M12 plug connector for connecting sensors and actuators.	Baud rate: Max. 1 MBaud Protocol: DS 301 and DS 402 4x digital In, 2x digital Out to M12
Ethernet Based Bus module for the control, programming and diagnosis of the AC vector drive via EtherCAT	Baud Rate: Max 100MBaud Supported Profiles: CoE 8x digital in, 2x digital out
Ethernet Based Bus module for the control, programming and diagnosis of the AC vector drive via ProfiNET. RJ45 connector to AIDA specifications.	Baud Rate: 100MBaud Protocol: ProfiNET IO conformance class B 8x digital in, 2x digital out
Ethernet Based Bus module for the control, programming and diagnosis of the AC vector drive via EtherNET IP. M12 plug connector for connecting sensors and actuators.	Baud Rate: 100MBaud Protocol: EtherNET IP 8x digital in, 2x digital out
O module for the provision of digital inputs and outputs in the field. Connection via system bus	4x digital inputs / 2x digital outputs 2x analog inputs / 1x analog output
O module for the provision of digital inputs and outputs in the field. Connection via system bus M12 plug connector for connecting sensors and actuators.	4x digital inputs / 2x digital outputs 2x analog inputs / 1x analog output to M12
Lockable Service/Repair Switch	3 LEDs for Active Phases 16Amps Max permissable current

Internal & External Brake Resistors



Internal brake resistors

Inverter type SK 1x0E...		Resistor type	Part number
3~240V	... -750-323-A to ... -111-323-A	SK BRI 4- 1-200-100	275 272 008
3~480V	... -151-340-A to ... -221-340-A	SK BRI 4- 1-400-100	275 272 012

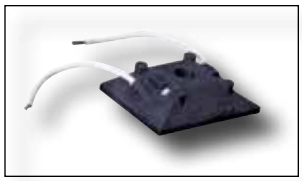
External brake resistors

Inverter type SK 1x0E		Resistor type	Part number
1~ 240V	... -750-323-A to ... -111-323-A	SK BRE 4- 1-100-100	275 273 005
3~ 240V	... -151-340-A to ... -221-340-A	SK BRE 4- 1-200-100	275 273 008

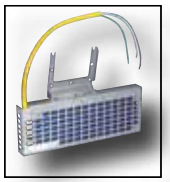
Overvoltage Filters

Inverter ID	Resistor type	Co
SK 1X0E-250-323-A - SK 1X0E-111-323-A*	SK CIF-323-20 (alternatively SK CIF-323-40)	
SK 1X0E-250-340-A - SK 1X0E-221-340-A	SK CIF-340-30 (alternatively SK CIF-340-60)	

*** Only when used with a suitable mains choke.**



Internal brake resistor



External brake resistor

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

*) Permissible max. once within 120 seconds

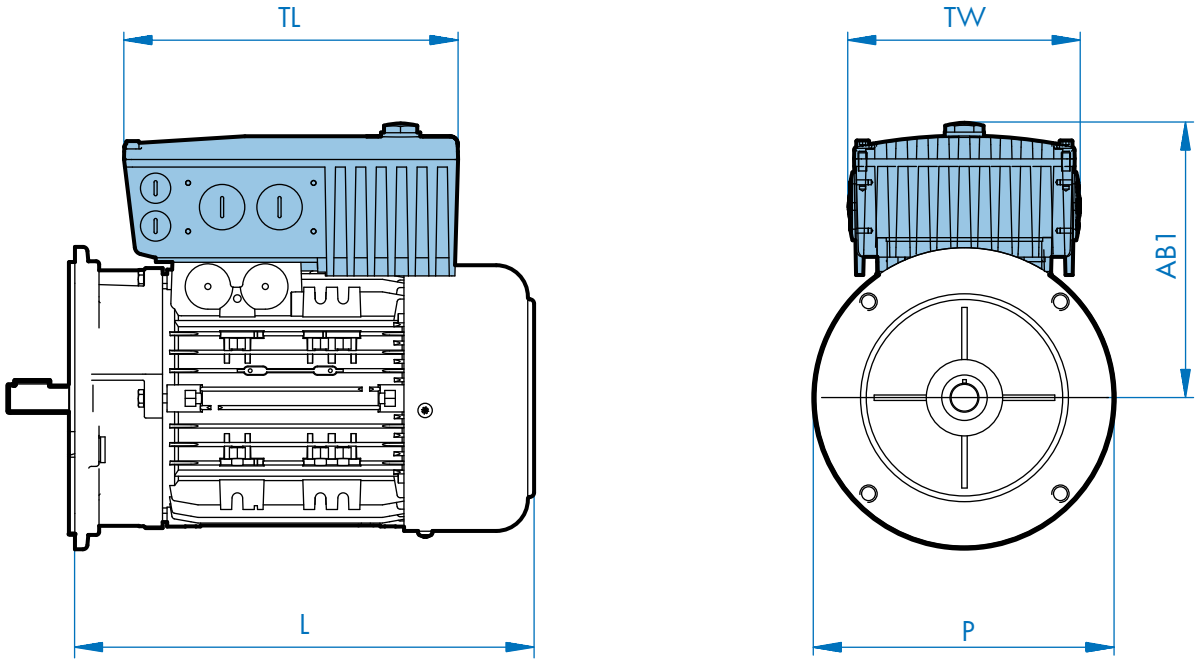
	Resistance [Ω]	Continuous rating [W]	Energy consumption*) [kWs]
	100	100	2.2
	200	100	2.2

*) Permissible max. once within 120 seconds

ntinuous Current	Part Number	Data Sheet
20 (40)	276 997 070 (276 997 071)	TI 030 276997070 (TI 030 276997071)
30 (60)	276 997 080 (276 997 081)	TI 030 276997080 (TI 030 276997081)

Dimensions

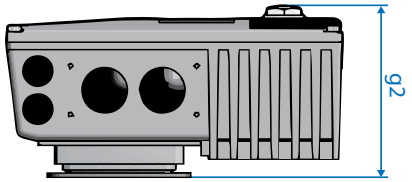
Motor Dimensions with SK 180E Motor Mounted AC Vector Drive

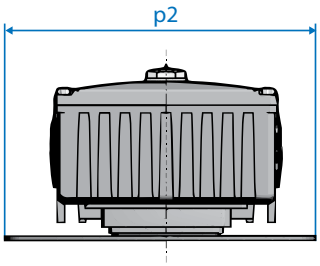


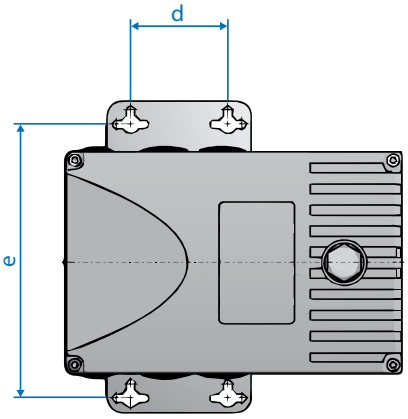
AC Vector Drive Size	Motor	Width P [in]	Width TW [in]	Length L [in]	Length TL [in]	AB1 [in]	Weight (no motor) [lbs]
Size 1	71S/L	5.71	6.06	8.43	8.70	6.99*	4.41
	80S/L	6.50		9.29		6.75	
	90S/L	7.20		10.87		6.95	
Size 2	80S/L	6.50	6.50	9.29	10.04	7.74	7.28
	90S/L	7.20		10.87		7.93	
	100L/LA	7.91		12.05		8.37	

* Includes additional adapter and seal (additional 18mm) part # 275119050

SK 180E Wall Mount Dimensions

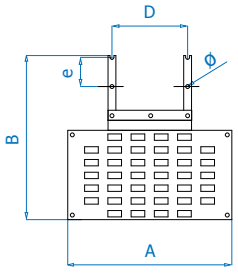


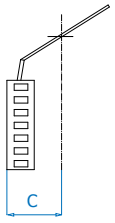




Device Type Size	Part Number	Wall Mounting SKTIE4 WMK-1				Total Weight Approx. [lb]
		g2	d	e	Ø	
Size 1 → SK TIE4-WMK-1	275 274 000	4.45	7.087	2.52	0.217	5.73
Size 2 → SK TIE4-WMK-1	275 274 000	4.55	7.087	2.52	0.217	8.60

SK 180E External Brake Resistor Dimensions (only available for size 2 drive)





Resistor Type	Size	A	B	C	Fixing Dimensions		
					D	e	Ø
SK BRE4-1-100-100 SK BRE4-1-200-100	Size 1	5.91	7.09	2.36	3.27	1.26	0.17

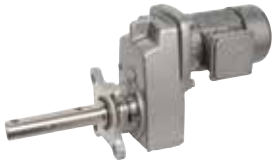
Product Overview

UNICASE™ SPEED REDUCERS

HELICAL IN-LINE
- Foot or Flange Mount
- Torque up to 205,000 lb-in
- Gear ratios – 1.82:1 to over 300,000:1

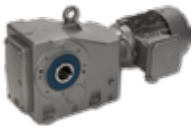
NORDBLOC®.1 HELICAL IN-LINE
- Foot or Flange Mount
- Torque up to 26,550 lb-in
- Gear ratios – 1.88:1 to over 370:1

PARALLEL HELICAL CLINCHER™
- Shaft, Flange or Foot Mount
- Torque up to 797,000 lb-in
- Gear ratios – 4.26:1 to over 300,000:1



SCP SCREW CONVEYOR PACKAGE
- Shaft, or Flange Mount
- Torque up to 53,100 lb-in
- Gear ratios – 4.32:1 to over 1500:1

RIGHT ANGLE HELICAL-BEVEL 2-STAGE
- Foot, Flange or Shaft Mount
- Torque up to 5,840 lb-in
- Gear ratios – 4.1:1 to 70:1



RIGHT ANGLE HELICAL-BEVEL
- Foot, Flange or Shaft Mount
- Torque up to 283,000 lb-in
- Gear ratios – 8.04:1 to over 300,000:1

RIGHT ANGLE HELICAL-WORM
- Foot, Flange or Shaft Mount
- Torque up to 27,585 lb-in
- Gear ratios – 4.40:1 to over 300,000:1

HIGH PERFORMANCE MOTORS & BRAKEMOTORS

INVERTER/VECTOR DUTY
- Standard or Energy Efficient
- Integral, NEMA or Metric IEC
- 1/6 to 250 hp

UNICASE™ SPEED REDUCERS

MINICASE™ RIGHT ANGLE WORM
- Foot, Flange or Shaft Mount
- Torque up to 3,540 lb-in
- Gear ratios – 5:1 to 500:1

FLEXBLOC™ WORM
- Modular bolt-on options
- Torque up to 4,683 lb-in
- Gear ratios – 5:1 to 3,000:1

MAXXDRIVE™ LARGE INDUSTRIAL GEAR UNITS PARALLEL HELICAL
- Modular bolt-on options
- Torque up to 2,027,000 lb-in
- Gear ratios – 5:1 to 1,600:1

MAXXDRIVE™ LARGE INDUSTRIAL GEAR UNITS HELICAL-BEVEL
- Modular bolt-on options
- Torque up to 2,027,000 lb-in
- Gear ratios – 5:1 to 1,600:1

NORDAC AC VECTOR DRIVES

SK180E FAMILY
- Distributed, simple speed control
- 380-480V, 3-phase to 3.0 hp
- 200-240V, 3-phase to 1.5 hp
- 200-240V, 1-phase to 1.5 hp
- 100-120V, 1-phase to 0.75 hp

SK200E **FAMILY**
- Distributed, high performance
- 380-480V, 3-phase to 30 hp
- 200-240V, 3-phase to 15 hp
- 200-240V, 1-phase to 1.5 hp
- 100-120V, 1-phase to 1 hp

SK500E FAMILY
- Compact, cabinet mount, high performance
- 380-480V, 3-phase, to 125 hp
- 200-240V, 3-phase, to 25 hp
- 200-240V, 1-phase, to 3 hp
- 100-120V, 1-phase, to 1.5 hp

NORD DRIVESYSTEMS

www.nord.com

NORD Gear Corporation
National Customer Service Toll-Free: 888.314.6673
info.us@nord.com

NORD Gear Limited
Toll-Free in Canada: 800.668.4378
info.ca@nord.com

WEST
Corona, CA (Los Angeles)
Phone: 608.849.0190

MIDWEST
Waunakee, WI (Madison)
Phone: 608.849.7300

EAST
Charlotte, NC
Phone: 608.849.0140

CANADA
Brampton, ON (Toronto)
Phone: 905.796.3606

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