

## SK CU4-REL

Part number: 275 271 011

Setpoint converter

### NOTICE

### Validity of this document

This document is only valid in combination with the operating instructions for the relevant electronic drive technology and under strict compliance with the safety and warning instructions which they contain. Safe commissioning of this module and the electronic drive technology depends on the availability of this information.

### Scope of supply

1 x	Module	<b>SK CU4-REL</b>
1 x	Cable set for digital signals	black / white / blue
1 x	Cable set for 24 VDC + analogue signals	brown / blue /grey /green
1 x	Connection cable (10 V reference voltage)	red
2 x	Connecting screws	M4 x 20, cross-head



### Field of use

Setpoint converter unit for use in a decentralised electronic drive technology frequency inverter. This module enables the conversion of bipolar signals into unipolar analogue signals. With the aid of digital signals it is also possible to control the coupling relays which are integrated into the module. The coupling relays are implemented as converters.

If required, the potential levels (analogue / digital) can be split by means of a jumper.

### Function description

The module must be supplied with 24 VDC.

#### Analogue signals:

Bipolar analogue signals (-10 V ... +10 V) must be connected to the input terminals of the module. The signal which are converted to 0...10 V must be obtained from the analogue outputs and connected to a frequency inverter. In order to ensure the function of the analogue signal converter, the 10 VDC reference voltage of the frequency inverter must be wired to the reference potential of the setpoint source(s) of the module.

#### Digital signals:

Two coupling relays are integrated into the module. These are controlled via the digital outputs of the frequency inverter and can be used as openers (NC) or closers (NO) according to their connection.

Technical Information / Datasheet	SK CU4-REL			
Setpoint converter	TI 275271011	V 1.1	1816	EN

**Technical data**

Temperature range	-25°C ... 50 °C
Temperature class	Class 3K3

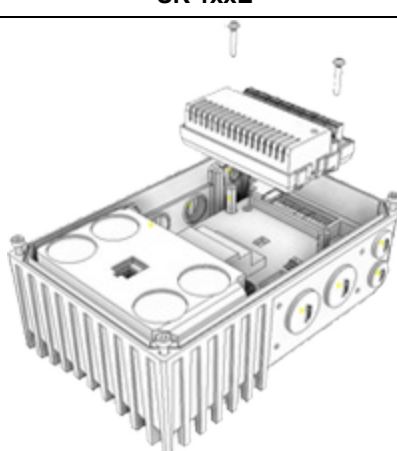
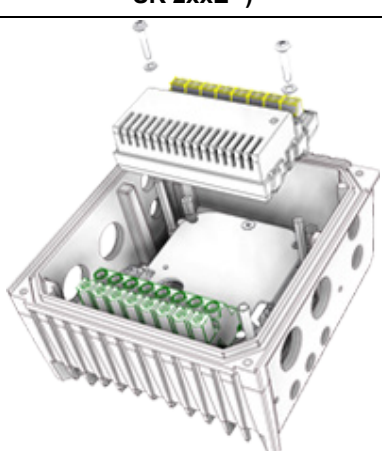
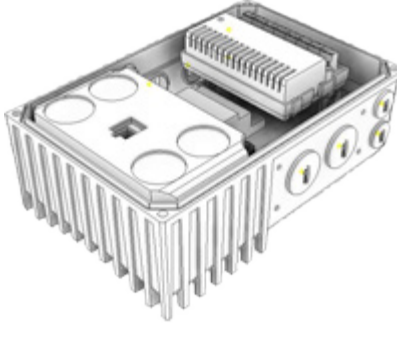
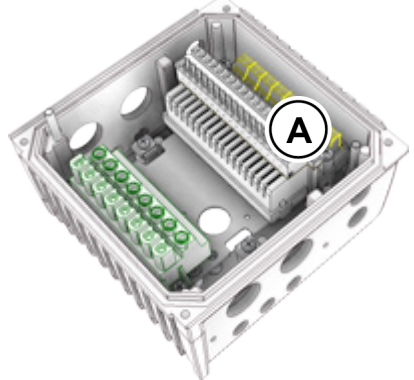
Vibration resistance	3M7
Protection class	IP20

For details of the electrical data please refer to the descriptions of the connections (📖 Section "Control terminal details").

**Installation**

Installation location	In defined option slot inside the frequency inverter (SK 1xxE, 2xxE)
Fastening	with screw fastenings

**Installation steps (example illustration)**

	SK 1xxE	SK 2xxE *)
1.		
2.		

\*) Before carrying out installation step 1 it may be necessary to remove the control terminal bar ( A ), The control terminal bar ( A ) must be fitted after installation step 2.

### Connections

Terminals	Screw terminals	1 terminal bar with 16 connections, (5 mm spacing)
Cable cross section	0.14...2.5 mm	AWG 14-26
PE connection	Via device	Via screws for installation in the device

### Control terminal details

#### Labelling, function

10V REF	Reference voltage (input)	DIN:	Digital input
24 V	Control voltage (input)	GND:	Reference potential for digital signals
AGND	Reference potential for analogue signal	R	Relay
AIN:	Analogue input		
AOUT:	Analogue output		

### Connections, Functions

#### SK CU4-REL

Labelling	Function
R21	Relay 2 basis
R22	Relay 2, NC
R24	Relay 2, NO
R11	Relay 1 basis
R12	Relay 1, NC
R14	Relay 1, NO
40	GND/0V
C2	DIN2
C1	DIN1
118	AOUT2
117	AOUT1
116	AIN2
114	AIN1
111	10 V REF
112	AGND / 0V
44	24 V

Digital/relay potential level

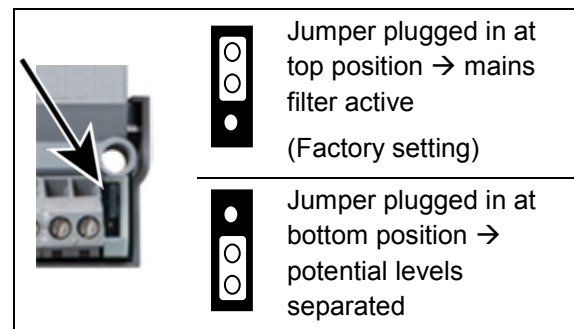
Analogue potential level



The terminal strip is divided into two potential levels (potential separation max. 50 V DC). On delivery, these are connected together with a plug-in jumper.

In case of signal processing faults, the potential levels can be separated by moving the jumper.

To do this, the jumper must be transferred from the top to the bottom.



Meaning, Functions		Description / Technical data																											
Terminal				Parameter																									
No.	Designation	Meaning	No.	Function of factory setting																									
<b>Control voltage</b>		For the supply of the module with a 24 V control voltage																											
		24 V DC $\pm$ 25 % 20 mA																											
<b>44</b>	24V	voltage (input)	-	-																									
<b>112</b>	AGND / 0V	Reference potential GND	-	-																									
<b>Analogue inputs</b>		Connection for bipolar analogue signals (input) for conversion into unipolar analogue signals.																											
		Resolution 10Bit V= -10 ... 10 V Ri= 2 M $\Omega$	+ 10 V Reference voltage: 5 mA from device (frequency inverter)																										
<b>111</b>	10V REF	+ 10 V Reference voltage	The conversion of the analogue signals is inverted.																										
<b>112</b>	AGND / 0V	Analogue reference potential GND																											
<b>114</b>	AIN1	Analogue input 1																											
<b>116</b>	AIN2	Analogue input 2																											
<b>Analogue outputs</b>		Analogue signal connection (output)		<table border="1"> <thead> <tr> <th colspan="2">Signal IN</th> <th colspan="2">Signal OUT</th> </tr> <tr> <th>Terminal</th> <th>Value</th> <th>Terminal</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>114</td> <td>-10 V</td> <td>117</td> <td>+10 V</td> </tr> <tr> <td>114</td> <td>+10 V</td> <td>117</td> <td>0 V</td> </tr> <tr> <td>116</td> <td>-10 V</td> <td>118</td> <td>+10 V</td> </tr> <tr> <td>116</td> <td>+10 V</td> <td>118</td> <td>0 V</td> </tr> </tbody> </table>		Signal IN		Signal OUT		Terminal	Value	Terminal	Value	114	-10 V	117	+10 V	114	+10 V	117	0 V	116	-10 V	118	+10 V	116	+10 V	118	0 V
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116	+10 V	118	0 V																										
		Resolution 10Bit Accuracy 0.25 V, V= 0 ... 10 V I= $\leq$ 10 mA (load capacity) Pulsed signal (8 kHz)																											
<b>117</b>	AOUT1	Analogue output 1	Assignment of the functions of the analogue input signals is carried out via parameter P400[...] of the frequency inverter.																										
<b>118</b>	AUOT2	Analogue output 2																											
<b>Digital inputs</b>		Digital relay input for connection of a digital output signal from the electronic drive technology.																											
		Low: 0 - 5 V (2.8 k $\Omega$ ) High: 18 - 30 V (1.6 k $\Omega$ )	Response time max 7 ms																										
<b>C1</b>	DIN1	Digital input 1	Assignment of the functions of the digital output signals is made via parameter P434[...] of the frequency inverter.																										
<b>C2</b>	DIN2	Digital input 2																											
<b>40</b>	GND/0V	Reference potential GND																											
<b>Relay outputs</b>		Relay output designed as converter, control via the signals which are applied to the digital input.																											
		Low: 0 - 5 V (2.8 k $\Omega$ ) High: 18 - 30 V (1.6 k $\Omega$ ) Load: maximum 1 A, 30 V DC Response time max 7 ms	Service life Mechanical: 1x10 <sup>8</sup> OPS (operations) Electrical: 3x10 <sup>5</sup> OPS (operations)																										
<b>R14</b>	R1 NO	Relay 1.1 – Closer (NO)	Signal source: <b>DIN1</b> Relay connection for function as <i>Normally open: R11 / R14</i>   <i>Opener: R11 / R12</i>																										
<b>R12</b>	R1 NC	Relay 1.2 – Opener (NC)																											
<b>R11</b>	R1 Basis	Relay 1.3 – Basis																											
<b>R24</b>	R2 NO	Relay 2.1 – Closer (NO)	Signal source: <b>DIN2</b> Relay connection for function as <i>Closer (NO): R21 / R24</i>   <i>Opener (NC) R21 / R22</i>																										
<b>R22</b>	R2 NC	Relay 2.2 – Opener (NC)																											
<b>R21</b>	R2 Basis	Relay 2.3 – Basis																											

**Connection example**

44	brown	24 V DC	Connection to the 24 V output of the electronic drive technology
112	blue	AGND / 0V	Connection to the Analogue Ground of the electronic drive technology
111	red	+10V REF	Connection to the reference voltage source of the electronic drive technology
114		AIN1	Analogue signal 1, bipolar: Connection of an external bipolar analogue signal
116		AIN2	Analogue signal 2, bipolar: Connection of an external bipolar analogue signal
117	grey	AOUT1	Analogue signal 1, unipolar: Connection to an analogue input of the electronic drive technology
118	green	AOUT2	Analogue signal 2, unipolar: Connection to a further analogue input of the electronic drive technology
C1	black	DIN1	Digital signal 1: Connection to a digital output of the electronic drive technology
C2	white	DIN2	Digital signal 2: Connection to a further digital output of the electronic drive technology
40	blue	GND	Connection to Ground / 0 V of the electronic drive technology
R14	-----	R1 NO	Relay 1 Relay signal corresponding to digital signal 1
R12	-----	R1 NC	R11 / R14 = NO R11 / R12 = NC
R11	-----	R1 Basis	
R24	-----	R2 NO	Relay 2 Relay signal corresponding to digital signal 2
R22	-----	R2 NC	R21 / R24 = NO R21 / R22 = NC
R21	-----	R2 Basis	

**Further documentation ([www.nord.com](http://www.nord.com))**

Document	Name
<a href="#">BU 0135</a>	Motor starter manual SK 135E, SK 175E
<a href="#">BU 0180</a>	Frequency inverter manual SK 180E, SK 190E

Document	Name
<a href="#">BU 0200</a>	Frequency inverter manual SK 2xxE