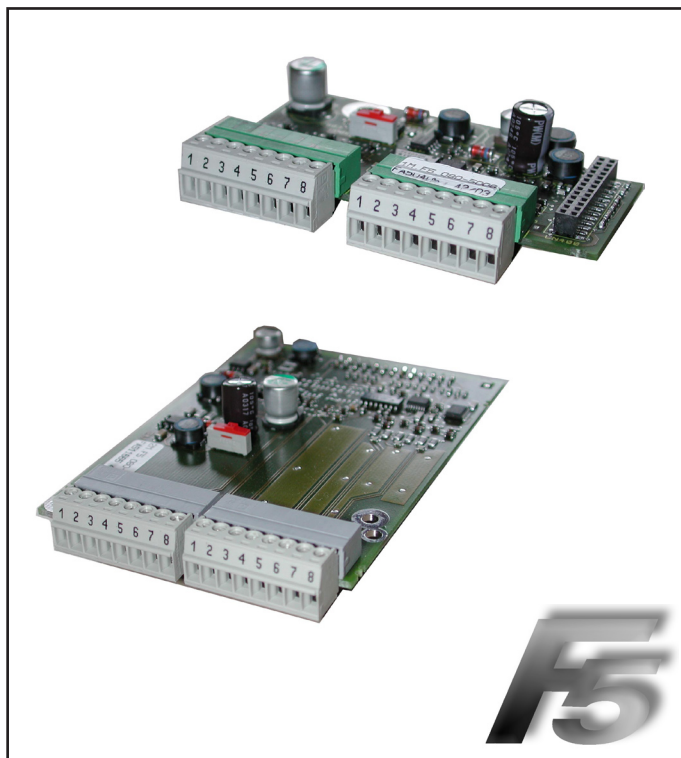


COMBIVERT

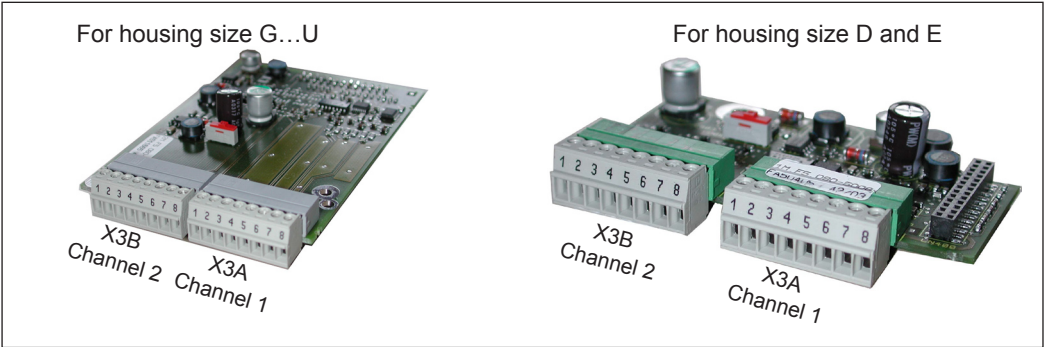


Incremental encoder input
TTL 15/24 V supply at channel 1

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1. Product Description



1.1 General

Each of the interface cards delivered by KEB include two interfaces. As there are numerous different combinations available each interface will be described by means of separate instructions. The manual covers the installation of the interface card, the connection as well as the start-up of a suitable encoder. Additional information and the parameter adjustments are described in the application manual for the inverter/servo.

1.2 Description of Encoder Interface Channel 1

Encoder type:

Incremental encoder

Voltage level:

TTL

Inputs/Tracks:

A, B and N with the respective inverted signals

Particularities:

alarm at channel 1

1.3 Part Number

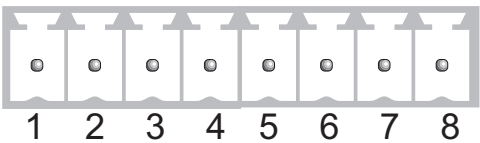
2 M.F5.K81-X Z 0 5		
	Term of delivery	0: installed Z: Option, spare part
	2. encoder interface	B: TTL-output
	applicable for housing size	1: D, E 2: G...U

1.4. Scope of Delivery (option or replacement delivery)

- Encoder interface
- two instruction manuals
- fixing bolt
- packing material

1.5 Description of Socket X3A

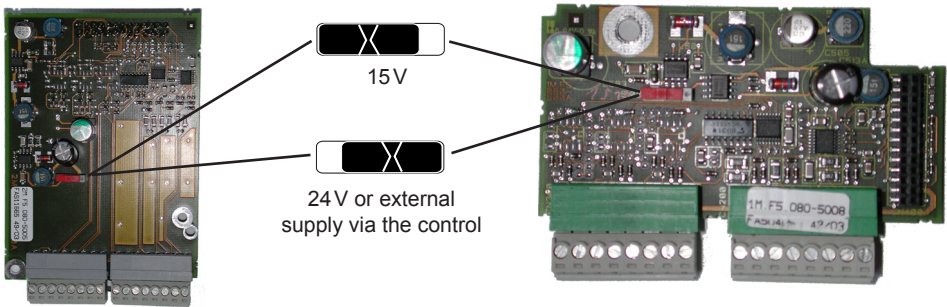
Socket X3A (top view)



PIN	Name	Description
1	A+	Incremental encoder track A+
2	A-	Signal input A- (difference signal to A+)
3	B+	Incremental encoder track B+
4	B-	Signal input B- (difference signal to B+)
5	N+	Zero track N+
6	N-	Signal input N- (difference signal to N+)
7	15/24V	Voltage output 15/20...30V, power supply for the encoders switchable with dip switch S100
8	COM	Reference potential for supply voltage
-	GND	Connect the shield on a proper place at the inverter ground.

1.6 Power supply

1.6.1 Adjustment of the Supply Voltage



1.6.2 Max. Load Capacity in Dependence of Voltage Supply

- Max. load capacity at 15V: 300mA
- Max. load capacity at 24V: 170mA
- Max. load capacity in case of external supply 1A (dependent on external voltage source)

The specified currents are reduced by the current taken from the second interface (see application manual Chapter 6.10). In the case the specified currents are not sufficient an external supply can be connected via the control unit (see application manual Chapter 3.1).

1.7 Signal input

1.7.1 Technical Data

Input resistance:	150 Ω
Logic level:	5V TTL
Cut-off frequency:	200 kHz
Encoder line number:	1...16383 Inc (Recommendation: 2500 Inc at rotary speed < 4500 rpm)
Maximum cable length:	50 m, the value is additionally limited by the signal frequency, cable capacity and voltage supply.

1.7.2 Input Signals of Encoder Inputs

At this TTL-encoder interface the signals A+ and B+ are electrically phase-shifted by 90° rectangular signals with the respective inverted signals.

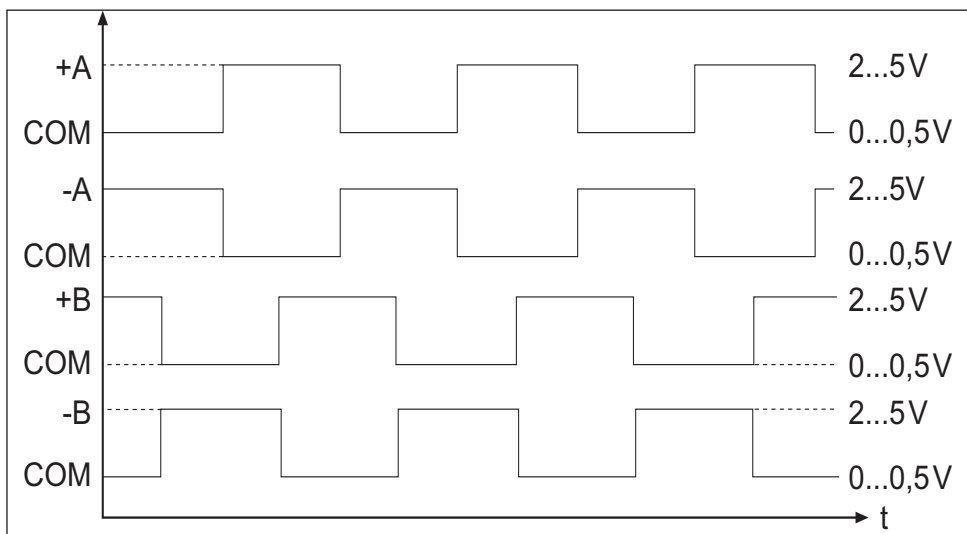
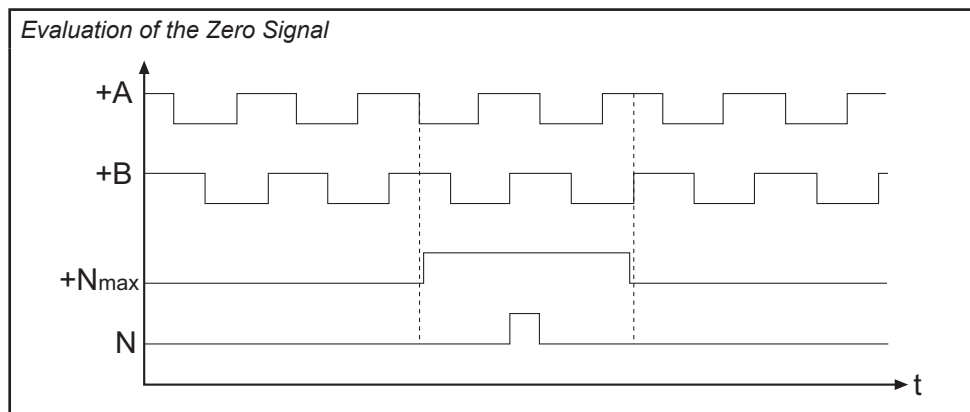


Figure 1.7.2 Signal tracks A+ and B+

Installation and Start-up

1.7.3 Evaluation of the Zero Signal

The zero impulse is required to determine valid position points. In case of pure speed controls the signal does not need to be connected. In the following signal sequence the maximum permissible length of the zero impulse of the encoder is visible. The zero signal will be acquired if A+ ,B+ and N+ are at high level. By that there is only one valid position point which is independent from the travel direction.



1.7.4 Encoder breakage recognition

For a monitoring of the encoder to channel 1 and the encoder cable the signal tracks and the zero track are monitored. If the connected encoder has no zero track, then the 5V-supply from channel 2 must be assigned to track N+ and COM to N- at the encoder plug. The monitoring for channel 1 will be switched on/off with parameter Ec.20 Bit 2.

The recognition of encoder breakage triggers an „error! encoder 1“ (value 32), if the voltage between two signal pairs is smaller than 2V.

2. Installation and Start-up

2.1 Mechanical Installation

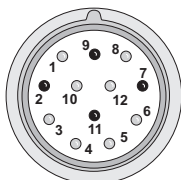
All kind of works on the inverter may be carried out by authorized personnel in accordance with the EMC and safety rules only.

- Switch inverter de-energized and await capacitor discharge time
- Pull off operator
- Remove plastic cover
- Remove fixing bolt
- Fix interface board beginning from the socket connector straightly
- Screw in fixing bolt
- Attach plastic cover

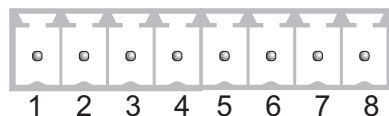
2.2 Electrical Installation

Connection of the encoder cable

Motor encoder plug



Socket X3A



Name	PIN			PIN	Name	Core color
A+	5			1	A+	green
A-	6			2	A-	yellow
B+	8			3	B+	blue
B-	1			4	B-	red
N+	3			5	N+	gray
N-	4			6	N-	pink
15/24 V	12			7	15/24 V	brown
COM	10			8	COM	white
GND	-			-	GND	shielding

2.3 Start-up

After the installation or exchange of an encoder interface some adjustments of the inverter/servo software have to be done before operation:

- Switch on inverter
- Select application mode
- Select parameter Ec.0 and control whether value „13: inc. input with alarm 24V TTL is entered. **The displayed value has to be confirmed by „ENTER“ in any case.**
- Select parameter Ec.1 and adjust increments per revolution
- Select parameter Ec.20 and adjust the alarm function dependent on operation with Bit 2.

2.4 Error Messages

Error messages and their meaning are described in Chapter 9 of the application manual.



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