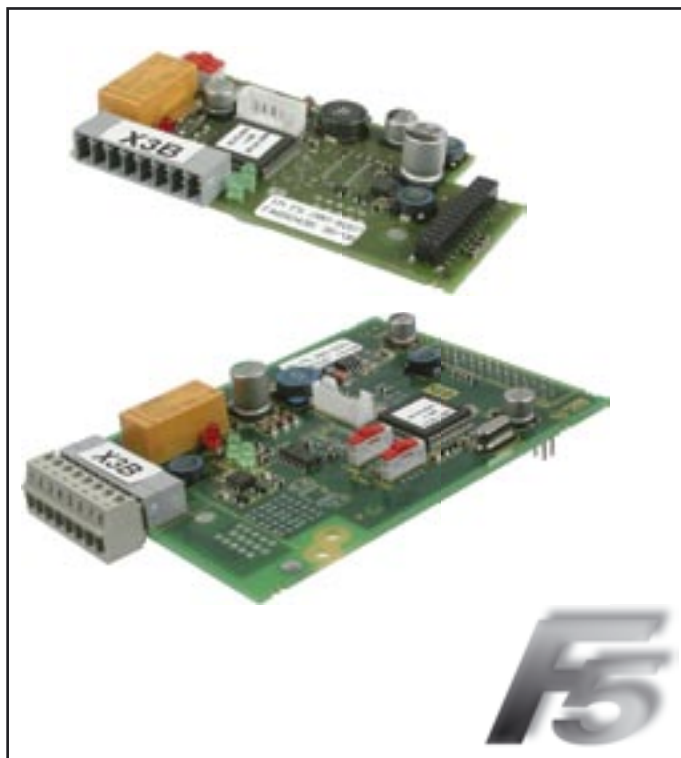


# COMBIVERT



INSTRUCTION MANUAL

Encoder Interface

Channel 1

Incremental Encoder Input HTL

Channel 2

non

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<b>GB</b>	<b>1. Product description</b> .....	<b>4</b>
	1.1 <b>General</b> .....	<b>4</b>
	1.2 <b>Description of encoder interface</b> .....	<b>4</b>
	1.3 <b>Material number</b> .....	<b>4</b>
	1.4. <b>Scope of delivery (option or replacement delivery)</b> .....	<b>4</b>
	1.5 <b>Description of the input X3B</b> .....	<b>5</b>
	1.6 <b>Power supply</b> .....	<b>5</b>
	1.6.1 Max. load capacity in dependence of voltage supply .....	<b>5</b>
	1.7 <b>Signal inputs</b> .....	<b>5</b>
	1.7.1 Technical data .....	<b>5</b>
	1.8.1 Signal characteristic of the HTL encoder .....	<b>6</b>
	1.8.2 Encoder breakage recognition .....	<b>6</b>
	1.8 <b>Description of the switches and LED's</b> .....	<b>6</b>
	<b>2. Installation and Start-up</b> .....	<b>7</b>
	2.1 <b>Mechanical installation</b> .....	<b>7</b>
	2.2 <b>Electrical installation HTL encoder</b> .....	<b>7</b>
	2.3 <b>Tested encoder</b> .....	<b>8</b>
	2.4 <b>Start-up</b> .....	<b>8</b>
	2.5 <b>Encoder 1 status (Ec.37)</b> .....	<b>8</b>

# HTL - Single channel encoder interface

## 1. Product description



### 1.1 General

The encoder interface HTL has only one channel. It operates internally with push-pull, so only the +tracks must be connected. The instruction covers the installation of the interface card, the connection as well as the start-up of a suitable encoder. Further information and the parameter adjustments are described in the application manual for the inverter/servo.

### 1.2 Description of encoder interface

Encoder type: Incremental encoder  
Voltage level: HTL  
Inputs/Tracks: A+, B+ (HTL)  
Particularities: Speed and acceleration monitoring

### 1.3 Material number

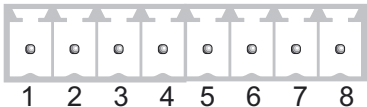
1 MF5K8G- 6 0 0 7

	<b>Term of delivery</b>	0: installed	Z: Option, spare part
	<b>2. Encoder interface</b>	6: none	
	<b>applicable for housing size</b>	1: D, E (circuit board 1MF5280-6007)	

### 1.4. Scope of delivery (option or replacement delivery)

- encoder interface
- packing material

## 1.5 Description of the input X3B

Terminal strip X3B		
		
PIN	Name	Description
1	NO contact	Error relay NO contact
2	NC contact	Error relay NC contact
3	Switching contact	Error relay switching contact
4	HTL A+	HTL input track A+ (parallel with X3A.7)
5	HTL B+	HTL input track B+ (parallel with X3A.2)
6	+24V	Voltage output 20...30V, power supply for the encoders
7	COM	Reference potential for voltage supply
8	GND	Connection for shield - is directly connected with the inverter earth.

## 1.6 Power supply

### 1.6.1 Max. load capacity in dependence of voltage supply

Max. load capacity at 24V: 170 mA

Max. load capacity at 5V: 400 mA

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).

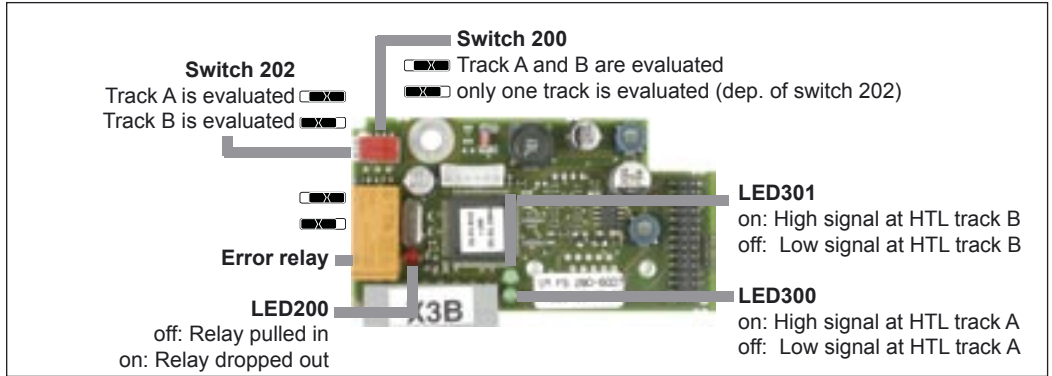
## 1.7 Signal inputs

### 1.7.1 Technical data

Input resistance:	HTL:	5 kΩ
Logic level:	HTL:	15...30V
Limiting frequency:	HTL:	100 kHz
Encoder line number:	8/1250Ink	
Max. line length:	50m, the value is additionally limited by the signal frequency, cable capacity and voltage supply.	

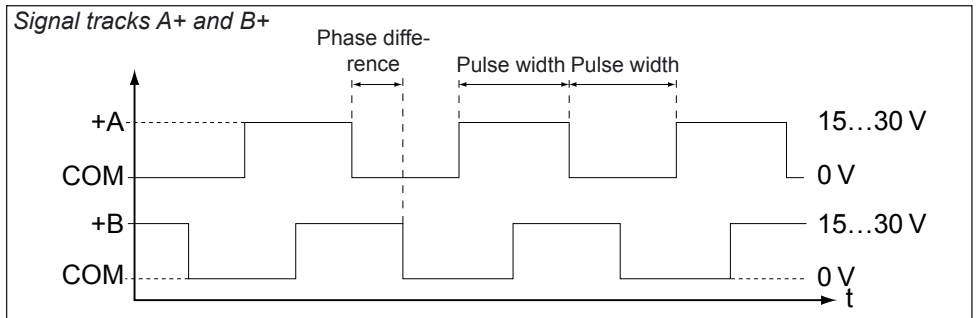
# HTL - Single channel encoder interface

## 1.8 Description of the switches and LED's



### 1.8.1 Signal characteristic of the HTL encoder

In case of HTL encoder interface the signals A+ and B+ are rectangular signals with a phase-angle displacement by 90 degrees. The inverted signals will be generated internally and does not need to be provided by the encoder. A zero signal is not supported. The pulse width and the phase difference must be  $2\mu\text{s}$  at least.



### 1.8.2 Encoder breakage recognition

Encoder breakage recognition is not supported with this encoder interface.

## 2. Installation and Start-up

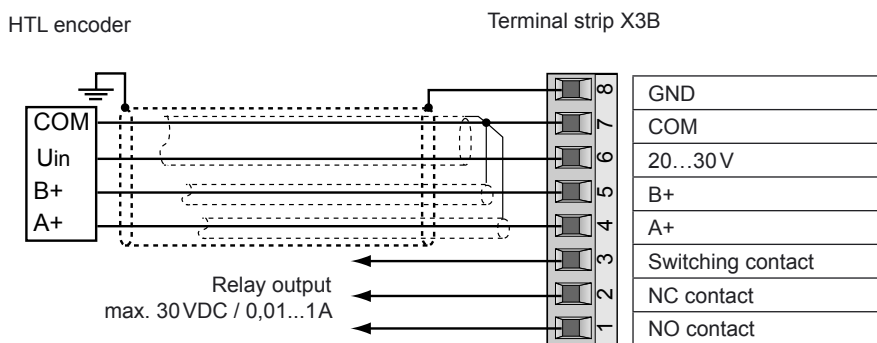
### 2.1 Mechanical installation

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 HTL encoder

Connection of the HTL encoder to X3B



# HTL - Single channel encoder interface

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## 2.3 Tested encoder

The following HTL-incremental encoder have been tested by KEB on it application:

- Heidenhain ROD 436

However, this does not restrict the use of rotary encoder with same specifications of other manufacturers.

## 2.4 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 absolutely confirm the displayed value with „**ENTER**“.
- Select parameter Ec.1 and adjust increments per revolution

## 2.5 Encoder 1 status (Ec.37)

The parameter Ec.37 displays the current status of the encoder at channel 1.

Value	Description Ec.37
0	no communication between interface and control card
16	Encoder and interface are correct; position values are transferred; encoder relay is pulled in
72	A relay contact serves as acknowledge contact. This error is released, if triggering signal and acknowledge contact are different longer than 10 ms.
76	Speed tripping at a speed > 3800 rpm. Depending on the exceeding the break time amounts to 16...128 ms (plus relay break time < 10 ms). The acceleration tripping is depending on switch S200 and amounts to <ul style="list-style-type: none"><li>• the evaluation of both tracks of a speed of 3750 rpm</li><li>• the evaluation of one track of a speed of 5610 rpm</li></ul> Depending on the exceeding the break time amount to 48...176 ms (plus relay break time < 10 ms).
255	no communication between interface and control card

If Ec.37 <> 16 the COMBIVERT F5-M/S switches off with error 35 "E.EnCC" (error encoder change) when the modulation is switched on. F5-G switches only to error, if encoder channel 1 is activated (S.1 = 0) as actual value source for the speed controller.

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





# Notes

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