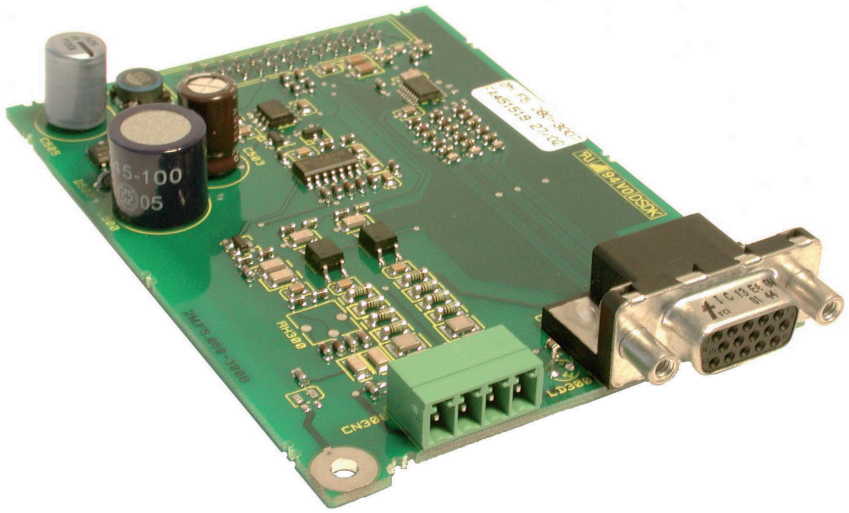
COMBIVERT



GB INSTRUCTION MANUAL

Encoder interface

Channel 1 variable

Channel 2 Analog Input ±10 V

Mat.No.	Rev.
DVF5ZEM-K000	1A

KEB

1. Safety Instructions

Prior to performing any work on the unit the user must familiarize himself with the unit. This includes especially the knowledge and observance of the safety and warning directions. The pictographs used in this Instruction Manual have following meaning:

Danger — Refers to danger of life by electric current.

Warning — Refers to possible danger of injury or life.

Note — Refers to tips and additional information.

1.1 Validity

The information contained in the technical documentation, as well as any user-specific advice in spoken and written and through tests, are made to best of our knowledge and information about the application. However, they are considered for information only without responsibility. This also applies to any violation of industrial property rights of a third-party.

Inspection of our units in view of their suitability for the intended use must be done generally by the user. Inspections are particulary necessary, if changes are executed, which serve for the further development or adaption of our products to the applications (hardware, software or download lists). Inspections must be repeated completely, even if only parts of hardware, software or download lists are modified.

Controlling by the user — Application and use of our units in the target products is outside of our control and therefore lies exclusively in the area of responsibility of the user.

Use under special conditions — The used semiconductors and components of KEB are developed and dimensioned for the use in industrial products. If the KEB COMBIVERT is used in machines, which work under exceptional conditions or if essential functions, life-supporting measures or an extraordinary safety step must be fulfilled, the necessary reliability and security must be ensured by the machine builder.

1.2 Qualification

All operations serving transport, installation and commissioning as well as maintenance are to be carried out by skilled technical personnel (observe IEC 364 or CENELEC HD 384 or DIN VDE 0100 and national accident prevention rules!). According to this manual qualified staff means:

- those who are able to recognise and judge the possible dangers based on their technical training and experience
- those with knowledge of the relevant standards and who are familiar with the field of power trasmission (VDE 0100, VDE 0160 (EN 50178), VDE 0113 (EN 60204) as well as the approporiate regulations for your area.

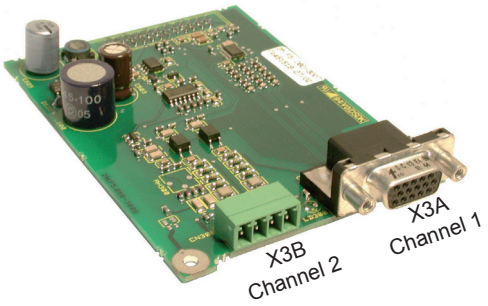
Danger by high voltage — KEB electronics components contain dangerous voltages which can cause death or serious injury. In operation, drive converters, depending on their degree of protection, may have live, uninsulated, and possibly also moving and hot surfaces.

In case of inadmissible removal of the required covers, of improper use, wrong installation or maloperation, there is the danger of serious personal injury and damage to property.

2. Product Description

Figure 1: Analog Input ±10V at Channel 2

Circuit board 2MF5280-3008



X3B	X3A
Channel 2	Channel 1
Analog Input ±10 V	variable

2.1 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 instruction comprises 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.

2.2 Material number

2M	F5	K81	X	X	X	X

Term of delivery	0	installed		Z	Option, spare part
	3	TTL Output	3008		
	F5	Series			
applicable for housing size	2M	G…U (circuit board 2MF5280-xxxx see above)			

2.3 Scope of delivery (option or replacement delivery)

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

2.4 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

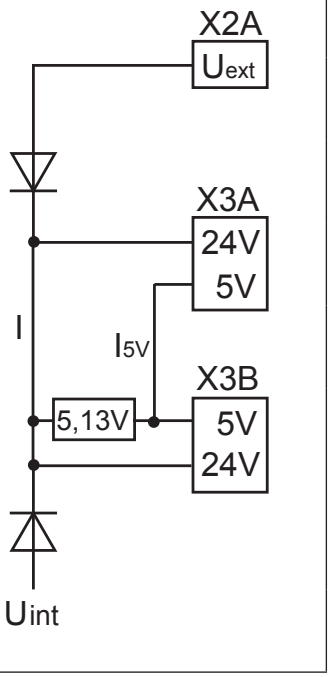
	With the default trimming an accuracy of 2 % is reached with the installation of the analog card. A trimming between control card and option is required for a higher accuracy. An instruction for this is available in the Infobak under www.keb.de in section "Downloads".

3. Description of the Interface

3.1 Voltage supply

Figure 3.1 Voltage supply of control and encoder interfaces

U_{int}	24 VDC	Internal voltage supply of COMBIVERT.
I	I = 0.17 A at internal supply I = max.1 A at external supply	
U_{ext}	Control terminal strip (X2A) of the COMBIVERT with external voltage supply 24…30 Vdc.	
24 V	Voltage output of encoder interfaces X3A and X3B for encoder supply.	
5V	Voltage output of encoder interfaces X3A and X3B for encoder supply.	
I_{24V}	Current I reduces itself by draw current I5V at the 5 V output in accordance with the following formula: $I_{24V} = I - \frac{5.13\,V \times I_{5V}}{U_{int}}$	
I_{5V}	Max. 300 mA can be drawn at the 5 V output of the encoder interfaces.	



3.2 Channel 1

The description of input X3A is depending on the used encoder interface. It is described in a separate manual.

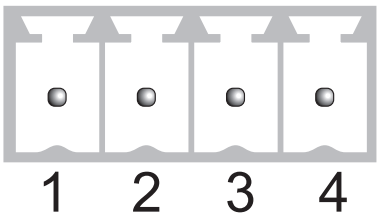
3.3 Channel 2

3.3.1 Specifications

X3B	Terminal strip 4-pole
Interface type	Analog input
Input voltage	±10 Vdc
Input resistance	60 kΩ
Scan time	1 ms

3.3.2 Description of X3B

Figure 3.3.2 Socket X3B



Attention! Plug connector only when COMBIVERT and supply voltage are switched off!

PIN	Name	Description
1	AN3+	Analog input +
2	AN3-	Analog input -
3	FE	Function earth, connection for shielding
4	–	reserved

4. Start-up

After 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.10 and control whether „18: analog option ±10V“ is entered. The displayed value has to be confirmed by „ENTER“ in any case.
- Adjust parameters according to the following list.

4.1 Evaluation of the analog signal

The ± 10V analog signal is input to the analog option channel of the control card (see application manual chapter "Analog inputs and outputs“). Here you have different possibilities to use the analog signal:

- for speed-/frequency setting via the analog inputs
- as speed feedback for speed control
- for torque control
- for the technology controller

4.1.2 Parameter adjustments for speed-/frequency setting

Display parameter

Parameter		Description
ru.31	AN3 pre amplifier display	Percentage display of the input value of the analog option
ru.32	AN3 post amplifier display	Percentage display of the analog channel after amplification and limitation

Parameters for the adjustment of the analog channel

Parameter		Description
An.20	AN3 interface selection	This parameter defines the source of the AN3 signal (default „analog option“)
An.21 : An.29	These parameters for amplification, offset error, offsets as well as upper and lower limits serve for definition of the working range.	
An.30	Sel. REF input/AUX-function	This parameter determines the further use of the analog signal.

4.1.3 Parameter adjustments for speed control

If the analog signal is used for speed control, the conversion in speed occurs according to the following formula:

$$\text{ru.10 [rpm]} = \frac{\text{Ec.25}}{100\%} \times \text{ru.32 [rpm]}$$

Display parameter

Parameter		Description
ru.10	encoder 2 speed	Display of the actual speed
ru.31	AN3 pre amplifier display	Percentage display of the input value of the analog option
ru.32	AN3 post amplifier display	Percentage display of the analog channel after amplification and limitation

Parameters for the adjustment of the drive data

Parameter		Default value
cS.01	Actual source	Adjust "Channel 2" to use the analog option.
Ec.25	Nominal tacho speed	The maximum speed must be set at +10 V.
Ec.14	Gear 2 numerator	The relation of maximum motor speed / maximum speed must be set at +10 V.
Ec.15	Gear 2 determinator	
dr.xx	Enter motor data; especially important motor rated speed and -frequency	

4.1.3 Further adjustments

Further adjustments and application possibilities can be taken from the appropriate application manual.

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