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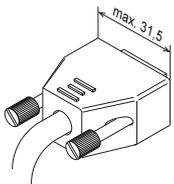
Chapter <b>3</b>	Section <b>1</b>	Page <b>2</b>	Date 02.02.99	Name: Basis <b>KEB COMBIVERT F4-F</b>	© KEB Antriebstechnik, 1999 All Rights reserved
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### 3. Hardware

#### 3.1 Control Units

##### 3.1.1 Survey

##### Housing size D - E



Observe the maximal width of connectors for X4 and X5.

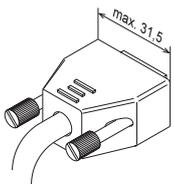
**Optional Operator**  
with 9-pole Sub-D Socket  
Parameter Interface

X2  
Terminal  
connection Control Terminal

X5  
9-pole Sub-D Socket  
**OPTION**

X4  
15-pole Sub-D Socket  
connection Incremental Encoder

##### Housing size G - L



Observe the maximal width of connectors for X4 and X5.

**Optional Operator**  
with 9-pole Sub-D Socket  
Parameter Interface

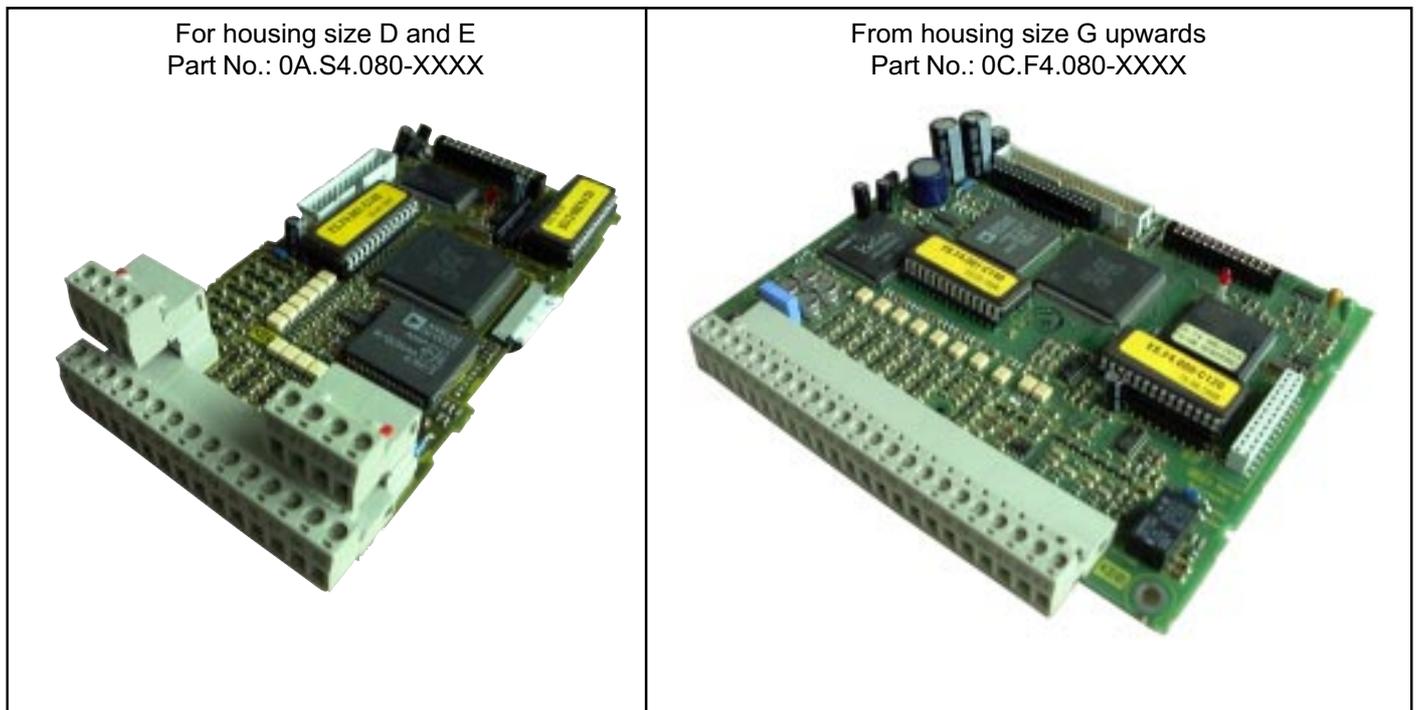
X5  
9-pole Sub-D Socket  
**OPTION**

X4  
15-pole Sub-D Socket  
connection Incremental Encoder

X2  
Terminal  
connection Control Terminals

## 3.1.2 Control Cards

Depending on the housing size 2 variants of F4-F-control cards are available:



- 2 programmable transistor outputs
- 1 programmable relay output
- 6 programmable digital inputs
- 1 non-adjustable digital inputs
- 2 analog outputs
- 2 differential voltage inputs
- 2 voltage outputs
- separate supply

### 3.1.3 Control Terminal Strip X2

from housing size G upwards

for housing size D and E

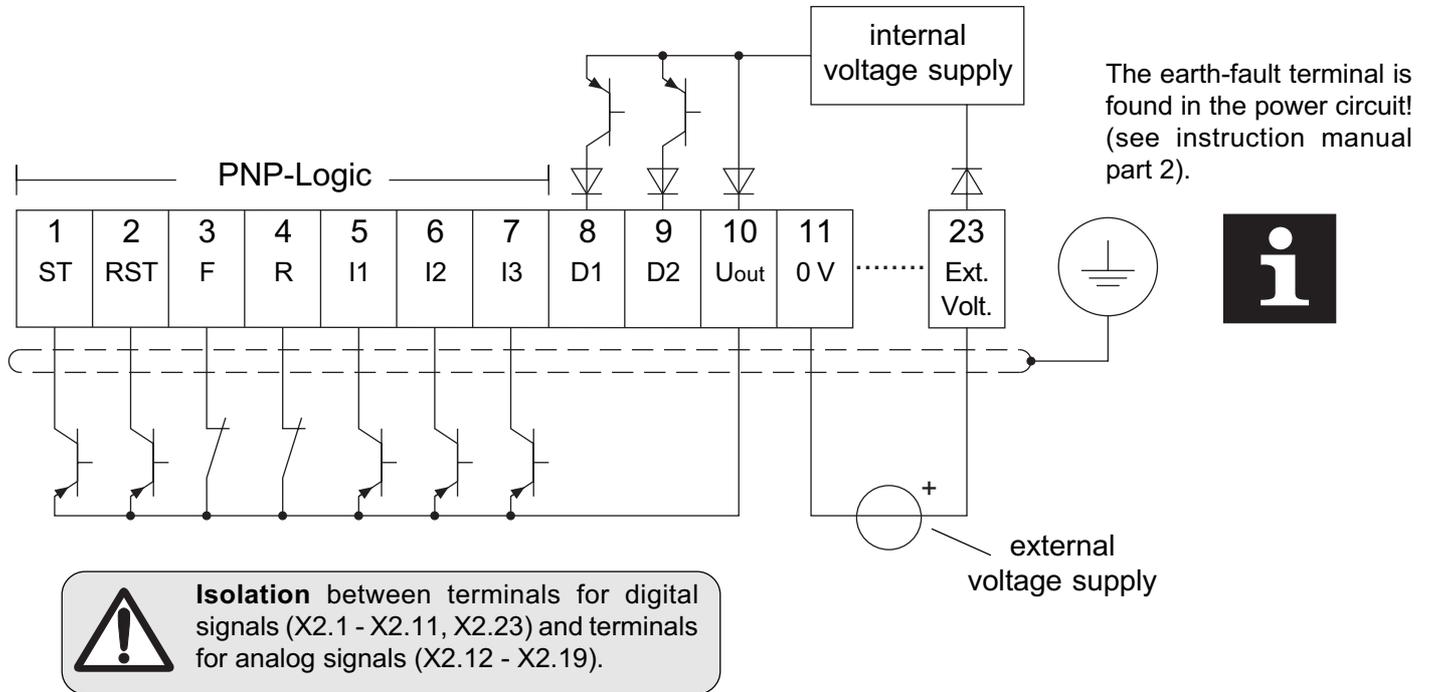


Ter.	Name	Function	
1	ST	Control release	<b>Digital Inputs</b> logic 1: $\pm (12...30V)$ internal input resistor: approx. 2 k $\Omega$ Logic: PNP/NPN (prog. with di. 1 )  (*1) Factory setting, also other functions can be assigned to the terminals (see chapter 6.3 „Digital inputs“) Scan time: 2ms
2	I4	Reset	
3	I5	Rotation selection / forward *1	
4	I6	Rotation selection / reverse *1	
5	I1	Programmable input 1 (Jog-speed forward *1)	
6	I2	Programmable input 2 (Jog-speed reverse *1)	
7	I3	Programmable input 3 (external fault *1)	
8	D1	Digital output 1 (Out 1)	programmable <b>PNP-transistor outputs</b> 14...30 V / max. 20 mA per output (see chapter 6.3 „Digital In- and Outputs“)
9	D2	Digital output 2 (Out 2)	
10	Uout	Voltage output	<b>Voltage output:</b> supply voltage provided by the inverter for digital in- and outputs <b>Voltage:</b> depending on power circuit and load 16...30 V max.60 mA
11	0V	Mass for Uout and digital in-/outputs	
12	CRF	+10 V reference voltage	<b>Voltage output:</b> +10V (+/-3%); max. 4 mA <b>Mass</b> for analog in-/outputs
13	COM	Analogmass	
14	REF 1 +	Analog setpoint input	<b>Differential voltage input</b> $\pm 10 V$ / resolution: 12 Bit / $R_i = 24 k\Omega / 40 k\Omega$ (see next page) Current inputs can only be realized by external switch mode with load resistance (see chapter 6.2). Scan time: 2ms / At fast setpoint input and torque control: 128 $\mu$ s
15	REF 1 -	<b>see An.2 - An.5 (chapter 5.9)</b>	
16	REF 2 +	Prog. analog input	
17	REF 2 -	<b>see An.8 - An.11 (chapter 5.9)</b>	
18	A1	Analog output 1	<b>Analog outputs</b> Voltage range: 0... $\pm 10V$ / internal resistance: 100 $\Omega$ Resolution: 10 bit (see chapter 6.2 „Analog outputs“) Scan time: 2ms
19	A2	Analog output 2	
20	RLA	Output relay (Out 3)	30 VDC / 1A (see chapter 6.3 „Digital In- and Outputs“)
21	RLB		
22	RLC		
23	Ext. Spg.	External voltage supply	<b>External voltage input: Bezugspotential 0V (X2.11)</b> external supply voltage for digital in-/outputs (only necessary if the voltage provided by the inverter is too low for a primary control or an external encoder) and for the supply of the control card at switched off power circuit ( <b>this function is not available for all power circuit sizes</b> )

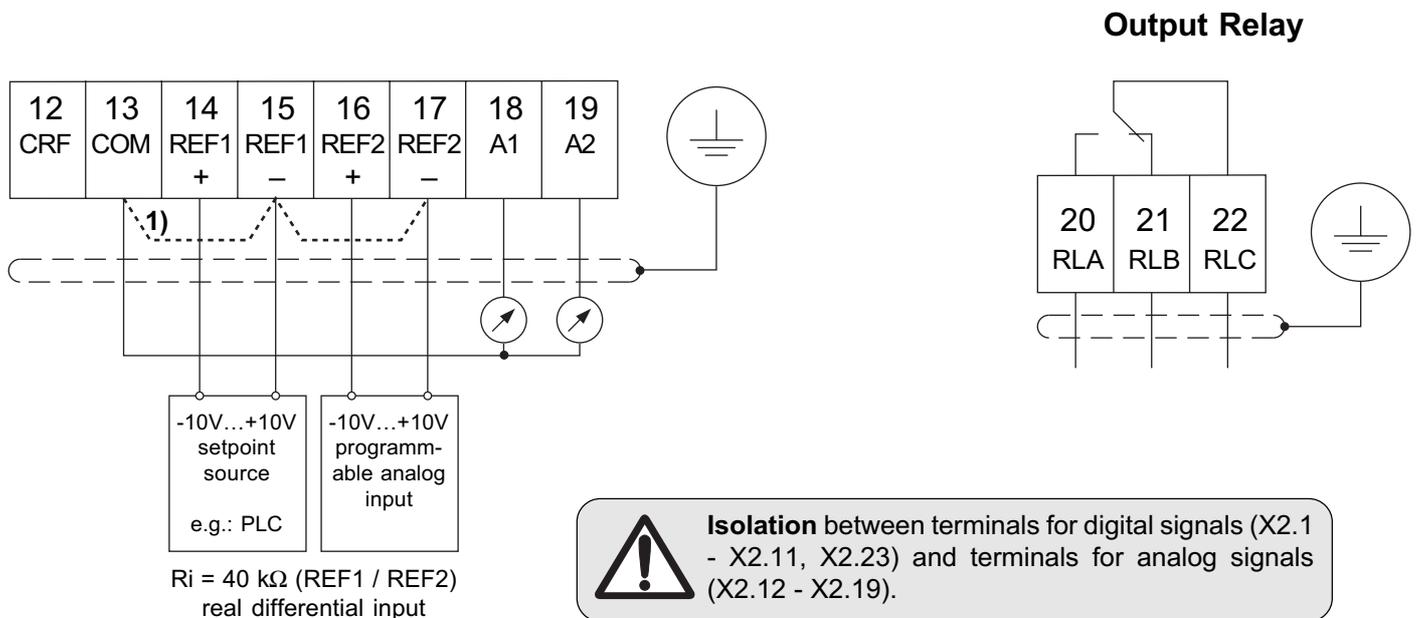
! Potential isolation between terminals for digital signals (X2.1 - X2.11, X2.23) and terminals for analog signals (X2.12 - X2.19).

! Release of rotation (X2.3 / X2.4) and torque limitation (prog. funktion for analog input 2 (X2.16 / X2.17)) do not have a function in the Drive-Mode (see chapter 4.4).

### 3.1.4 Wiring of Digital In-/Outputs



### 3.1.5 Wiring of Analog In-/Outputs



1) differential input with internal ground (COM)  
Ri = 24 kΩ (REF1 / REF2)