



Strain Gauge Converter

KFD2-WAC2-Ex1.D

- 1-channel isolated barrier
- 24 V DC supply (Power Rail)
- Strain gauge input (full or half bridge)
- Output 0 mA ... ± 20 mA or 0 V ... ± 10 V
- 2 relay contact outputs
- Programmable high/low alarm
- Configurable by PACTware or keypad
- RS-485 interface
- Line fault detection (LFD)



Function

This isolated barrier is used for intrinsic safety applications.

The device is used with strain gauges, load cells and resistance measuring bridges.

Designed to provide 5 V excitation voltage, this barrier's high quality A/D converter allows it to be used with those devices requiring 10 V.

Up to four 350 Ω strain gauges connected in parallel may be powered and evaluated.

The device is easily configured by the use of keypad or with the PACTware configuration software.

The current measurement for tare, zero point, and final value can be entered in this manner.

A fault is signaled by LEDs and a separate collective error message output.

For additional information, refer to the manual and www.pepperl-fuchs.com.

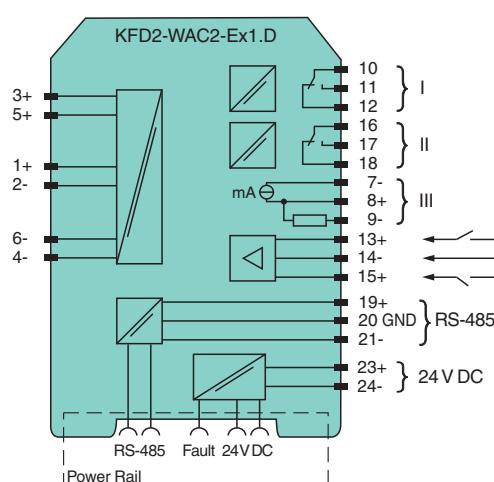
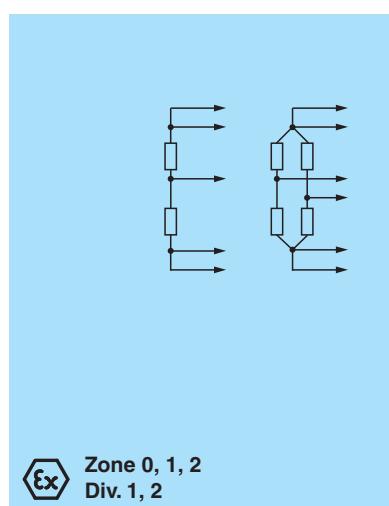
Application

Single or parallel connection of strain gauges with resulting resistance between 116 Ω to 10 k Ω can be connected and will provide a 4 mA to 20 mA output and 2 relay outputs as well as an RS-485 interface in the non-hazardous area.

The device supports the transmission of measured values via the RS-485 interface. In this mode of operation, input signal range may be transmitted with 20 bit resolution with up to 31 signal converters connected to the Power Rail UPR-05 or via terminals 19, 20 and 21. RS-485 communication may be done via the Power Rail when using power feed modules with bus access, e. g. KFD2-EB2.R4A.B or via the terminals 19, 20 and 21 of one module. The device is addressed via keypad and display or with a PC with PACTware and adapter K-ADP-USB.

For additional information, refer to the manual and www.pepperl-fuchs.com.

Connection



Technical Data

General specifications

Signal type

Analog input

Technical Data

Supply		
Connection		Power Rail or terminals 23+, 24-
Rated voltage	U_r	20 ... 35 V DC
Ripple		within the supply tolerance
Power consumption		max. 3 W
Interface		
Connection		Power Rail or terminals 19+, 20 GND, 21-
Type		RS-485
Programming interface		programming socket
Field circuit		
Connection		terminals 1+, 2-, 3+, 4-, 5+, 6-
Lead resistance		max. 25 Ω per line
Input I		
Connection		terminals 1+, 2-
Sensor supply		1 ... 5 V
Connection		terminals 3+, 4- (supply); 5+, 6- (signal)
Short-circuit current		50 mA
Load		$\geq 116 \Omega$ up to 5V, $\geq 85 \Omega$ up to 4V
Input		
Connection side		field side
Connection		Input I: terminals 1+, 2-; Input II: terminals 13+, 14-; Input III: terminals 15+, 14-
Programmable Tare		0 ... 500 % of span
Input I		Signal, analog
Input signal		-100 ... 100 mV
Input resistance		$> 1 \text{ M}\Omega$ for voltage measurement
Input II, III		tare adjustment, calibration and zero
Open circuit voltage/short-circuit current		18 V / 5 mA
Active/Passive		$I > 4 \text{ mA}/I < 1.5 \text{ mA}$
Output		
Connection side		control side
Connection		Output I: terminals 10, 11, 12; Output II: terminals 16, 17, 18; Output III: terminals 7-, 8+, 9-
Output I, II		Relay output
Contact loading		253 V AC/2 A/500 VA/cos ϕ min. 0.7; 40 V DC/2 A resistive load
Mechanical life		2×10^7 switching cycles
Output III		Analog output
Current range		-20 ... 20 mA
Load		max. 550 Ω
Analog voltage output		0 ... ± 10 V; output resistance 500 Ω (bridge between terminal 7 and 9)
Analog current output		0 ... ± 20 mA or 4 ... 20 mA; load 0 ... 550 Ω (terminals 7 and 8)
Line fault detection		downscale -21.5 mA (-10.75 V) or 2 mA (1 V), upscale 21.5 mA (10.75 V)
Collective error message		Power Rail
Transfer characteristics		
Deviation		
Resolution/accuracy		$\leq \pm 0.05$ % incl. non-linearity and hysteresis
Temperature effect		$\leq \pm 0.01$ %/K
Reaction time		300 ... 850 ms
Galvanic isolation		
Input I/other circuits		reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V _{eff}
Output I, II against eachother		reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V _{eff}
Output I, II/other circuits		reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V _{eff}
Output III/Output II, III		not available
Output III/Programming socket		not available

Technical Data

Other circuits from each other	functional insulation, rated insulation voltage 50 V _{eff}	
Indicators/settings		
Display elements	LEDs , display	
Control elements	Control panel	
Configuration	via operating buttons via PACTware	
Labeling	space for labeling at the front	
Directive conformity		
Electromagnetic compatibility		
Directive 2014/30/EU	EN 61326-1:2013 (industrial locations)	
Low voltage		
Directive 2014/35/EU	EN 61010-1:2010	
Conformity		
Electromagnetic compatibility	NE 21:2006	
Degree of protection	IEC 60529:2001	
Ambient conditions		
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)	
Mechanical specifications		
Degree of protection	IP20	
Connection	screw terminals	
Mass	approx. 250 g	
Dimensions	40 x 119 x 115 mm (1.6 x 4.7 x 4.5 inch) (W x H x D) , housing type C2	
Mounting	on 35 mm DIN mounting rail acc. to EN 60715:2001	
Data for application in connection with hazardous areas		
EU-type examination certificate	TÜV 04 ATEX 2531	
Marking	Ex II (1)G [Ex ia Ga] IIC Ex II (1)D [Ex ia Da] IIIC Ex I (M1) [Ex ia Ma] I	
Supply	Power Rail or terminals 23+, 24- non-intrinsically safe	
Maximum safe voltage	U _m	40 V DC (Attention! U _m is no rated voltage.)
Input I	terminals 1+, 2- Ex ia IIC, Ex iaD	
Voltage U _o	14 V	
Current I _o	238 mA	
Power P _o	833 mW (linear characteristic)	
Input II and III	terminals 13+, 14-; 15+, 14- non-intrinsically safe	
Maximum safe voltage U _m	40 V DC (Attention! U _m is no rated voltage.)	
Output I, II	terminals 10, 11, 12; 16, 17, 18 non-intrinsically safe	
Maximum safe voltage	U _m	253 V AC / 40 V DC (Attention! U _m is no rated voltage.)
Contact loading	253 V AC/2 A/500 VA/cos φ min. 0.7; 40 V DC/2 A resistive load	
Output III	terminals 7-, 8+, 9- non-intrinsically safe	
Maximum safe voltage U _m	U _m	40 V DC (Attention! U _m is no rated voltage.)
Interface	RS 485 programming jack	
Maximum safe voltage	U _m	40 V DC (Attention! U _m is no rated voltage.)
Galvanic isolation		
Input I/other circuits	safe electrical isolation acc. to IEC/EN 60079-11, voltage peak value 375 V	
Directive conformity		
Directive 2014/34/EU	EN 60079-0:2012+A11:2013 , EN 60079-11:2012	
International approvals		
FM approval		
Control drawing	116-0302 (cFMus)	
UL approval	E223772	
IECEx approval		
IECEx certificate	IECEx TUN 06.0005	
IECEx marking	[Ex ia Ga] IIC , [Ex ia Da] IIIC , [Ex ia Ma] I	

Technical Data

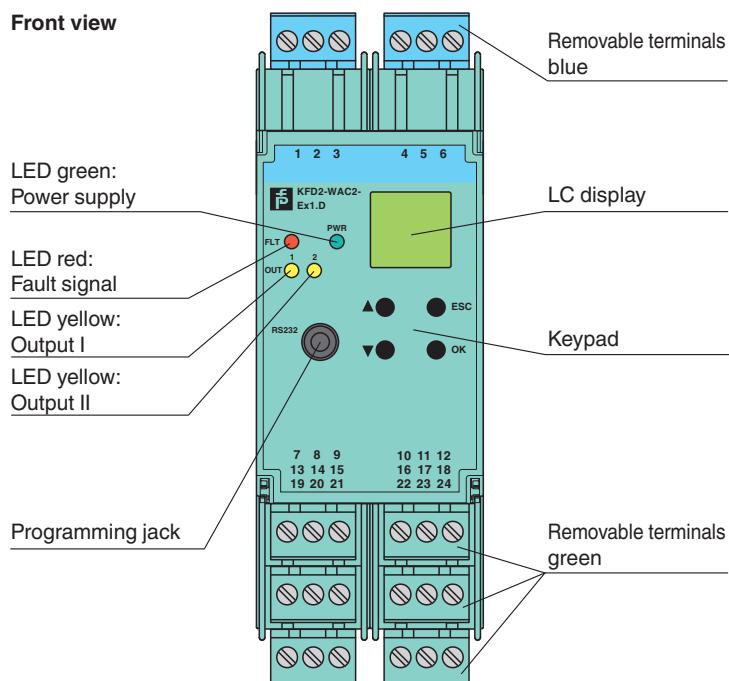
General information

Supplementary information

Observe the certificates, declarations of conformity, instruction manuals, and manuals where applicable. For information see www.pepperl-fuchs.com.

Assembly

Front view



Matching System Components

Release date: 2023-05-31 Date of issue: 2023-05-31 Filename: 231221_eng.pdf

	DTM Interface Technology	Device type manager (DTM) for interface technology
	PACTware 5.0	FDT Framework
	K-ADP-USB	Programming adapter with USB interface
	KFD2-EB2	Power Feed Module
	UPR-03	Universal Power Rail with end caps and cover, 3 conductors, length: 2 m
	UPR-03-M	Universal Power Rail with end caps and cover, 3 conductors, length: 1,6 m
	UPR-03-S	Universal Power Rail with end caps and cover, 3 conductors, length: 0.8 m
	K-DUCT-BU	Profile rail, wiring comb field side, blue
	K-DUCT-BU-UPR-03	Profile rail with UPR-03- * insert, 3 conductors, wiring comb field side, blue

Refer to "General Notes Relating to Pepperl+Fuchs Product Information".

Pepperl+Fuchs Group
www.pepperl-fuchs.com

USA: +1 330 486 0002
pa-info@us.pepperl-fuchs.com

Germany: +49 621 776 2222
pa-info@de.pepperl-fuchs.com

Singapore: +65 6779 9091
pa-info@sg.pepperl-fuchs.com

 **PEPPERL+FUCHS**

Accessories

	KF-ST-5GN	Terminal block for KF modules, 3-pin screw terminal, green
	KF-ST-5BU	Terminal block for KF modules, 3-pin screw terminal, blue
	KF-CP	Red coding pins, packaging unit: 20 x 6