



**Current output 4 mA ... 20 mA**

- 1-channel
- Input EEx ia IIC
- 24 V DC nominal supply voltage
- Accuracy  $\pm 0.1\%$
- Adjustment option of temperature measuring range for Pt100, Ni100 in 2-, 3- or 4-wire versions
- Adjustment option of thermocouple (B, E, J, K, L, N, R, S or T)
- Freely definable characteristic curve for resistance  $0\ \Omega \dots 400\ \Omega$  and voltage  $-50\ mV \dots 150\ mV$
- Internal/external cold junction compensation
- Sensor burnout monitoring for thermocouples
- Sensor burnout and short-circuit monitoring (SC) for Pt100
- All settings via serial interface to PC (online parameterisation)
- Prefabricated ex-works on request
- EMC acc. to NAMUR NE 21

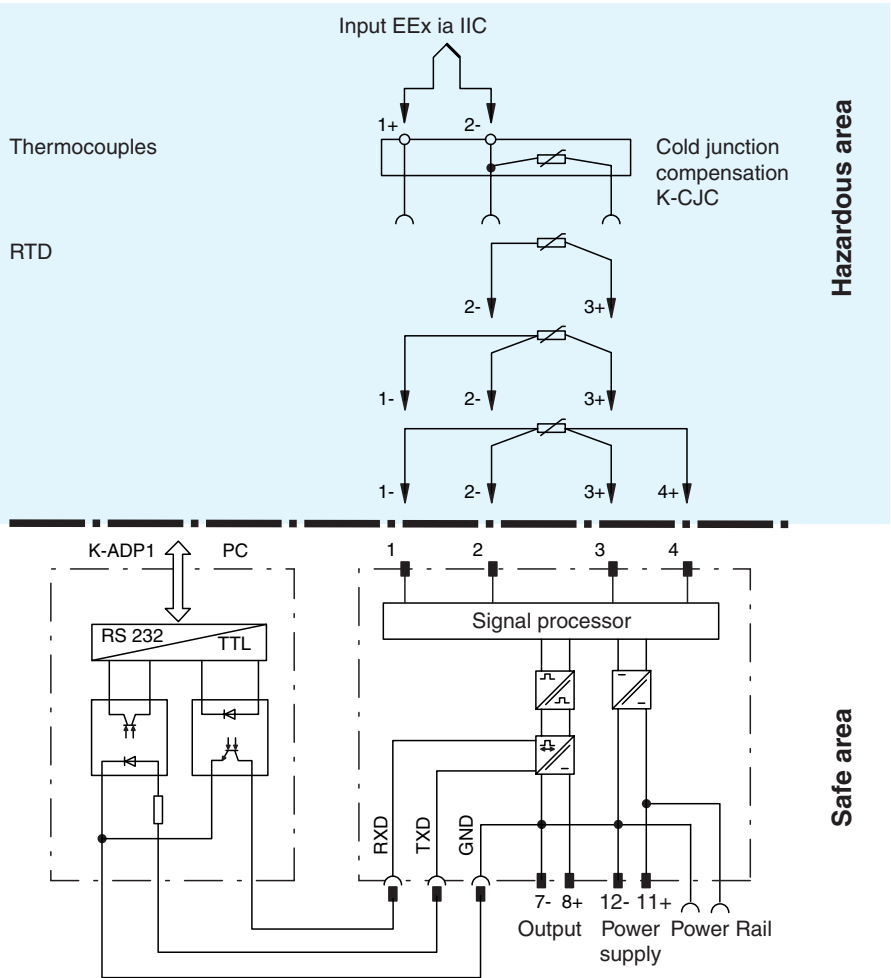
**Function**

The KFD2-UT-Ex1 is designed for the connection of Pt100, Ni100 (2-, 3-, or 4-wire version) and models B, E, J, K, L, N, R, S, or T thermocouples. A current signal of 4 mA ... 20 mA proportional to the temperature is available at the output.

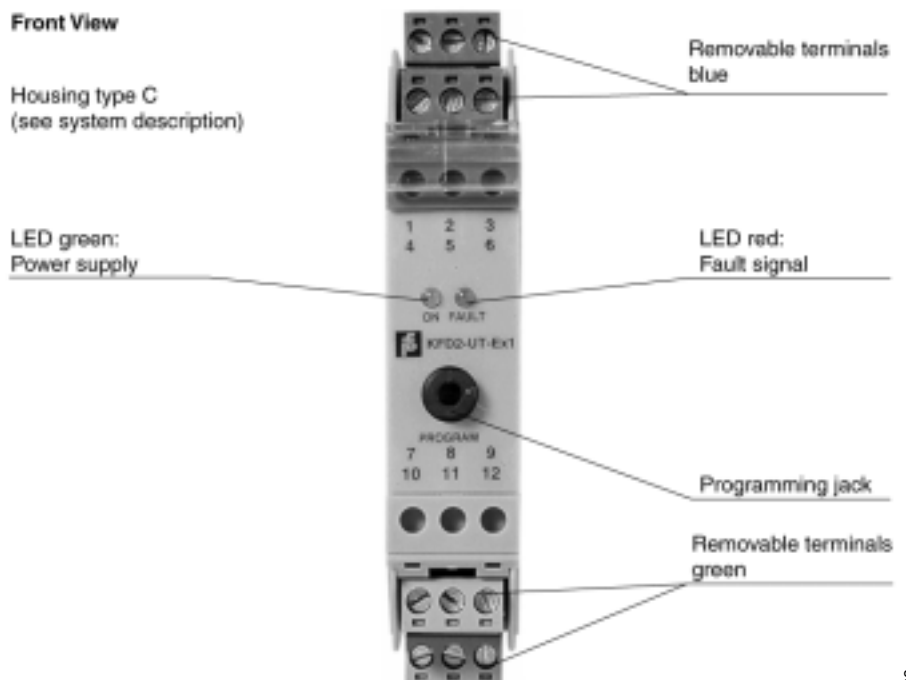
The parameterisation occurs via software in accordance with VDI/VDE GMA 2187. The input is galvanically isolated from the output, the programming output and the power supply. The PC's serial interface is galvanically isolated from the programming input by connecting the K-ADP1 program adapter. The isolation of the programming jack from the input makes programming during operation and through a connected measurement circuit possible.

Internal or external cold junction compensation may be selected by using thermocouples.

The reaction to fault signals is programmable (up or downscaled output). A fault is indicated by a red flashing LED per NAMUR NE 44.



**Composition**



<b>Supply</b>		
Connection	Power Rail or terminals 11+, 12-	
Rated voltage	20 ... 35 V DC	
Ripple	within the supply tolerance	
Power loss	1 W	
Power consumption	≤ 1,5 W	
<b>Input</b>		
Connection	terminals 1, 2, 3 and 4 suitable for Pt100, Ni100, Thermoelemente Typ B, E, J, K, L, N, R, S or T (IEC 584). Configuration via programming socket.	
Lead resistance	≤ 50 Ω per lead	
Measuring current	approx. 400 µA with resistance measuring sensor current for lead breakage monitoring switched off during the measurement	
<b>Output</b>		
Connection	terminals 7-, 8+	
Current output	4 ... 20 mA ; 20,5 mA at input signal overrange ; fault signal: downscale 2 ... 4 mA or upscale 20.5 ... 22 mA (programmable) ; load: ≤500 Ohm	
Safety maximum voltage $U_m$	250 V	
<b>Transfer characteristics</b>		
Deviation		
After calibration	Pt100: ± 0.01 % of measuring value in K + 0.05 % of span + 0.1 K (4-wire connection) thermocouple: ± 0.05 % of measuring value in °C + 0.05 % of span + 1 K This includes ± 0.8 K error of the cold junction compensation	
Temperature	current output (deviation of cjc included): Pt100: (± 0.0015 % from measurement value in K + 0.006 % of range)/K $\Delta T_U$ <sup>*)</sup> thermocouple: (± 0.02 K + 0.004 % from measurement value in °C + 0.006 % of range)/K $\Delta T_U$ <sup>*)</sup> voltage output (deviation of cjc included): Pt100: (± 0.0015 % from measurement value in K + 0.0075 % of range)/K $\Delta T_U$ <sup>*)</sup> thermocouple: (± 0.02 K + 0.004 % from measurement value in °C + 0.0075 % of range)/K $\Delta T_U$ <sup>*)</sup> <sup>*)</sup> $\Delta T_U$ = ambient temperature change referenced to 23 °C (296 K)	
Influence of supply voltage	< 0.01 % of span	
Influence of load	≤ 0,001 % of output value per 100 Ohm (current output)	
Response time	≤ 430 ms	
<b>Electrical isolation</b>		
Input/Output	safe electrical isolation acc. to EN 50020, voltage peak value 375 V	
Input/Power supply	safe electrical isolation acc. to EN 50020, voltage peak value 375 V	
Input/Programming input	available There is no electrical isolation between the programming input and the supply and output. The K-ADP1 interface (see section accessories and installation) provide galvanic isolation so that ground loops are avoided.	
<b>Standard conformity</b>		
Coordination of insulation	acc. to DIN EN 50178	
Electrical isolation	acc. to DIN EN 50178	
Electromagnetic compatibility	acc. to EN 50081-2 / EN 50082-2, NAMUR NE 21	
Climatic conditions	acc. to DIN IEC 721	
<b>Directive conformity</b>		
Electromagnetic compatibility	standards	
Directive 89/336/EG	on request	
<b>Ambient conditions</b>		
Ambient temperature	-20 ... 60 °C (253 ... 333 K)	
<b>Mechanical specifications</b>		
Protection degree	IP20	
Mass	approx. 110 g	
<b>Data for application in conjunction with hazardous areas</b>		
EC-Type Examination Certificate	BAS 01 ATEX 7256 ; for additional certificates refer to the approval list	
Group, category, type of protection	⊕ II (1) G D [EEx ia] IIC (-20 °C ≤ T <sub>a</sub> ≤ 60 °C)	
Voltage $U_0$	11 V	
Current $I_0$	33 mA	
Power $P_0$	90 mW	
<b>Supply</b>		
Safety maximum voltage $U_m$	250 V	
Type of protection [EEx ia]		
Explosion group	IIA	IIB IIC
External capacitance	60 µF	13,8 µF 1,97 µF
External inductance	251 mH	121 mH 32 mH
Internal capacitance (EEx ia)	0 µF	

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Internal inductance (EEx ia)	0 mH		
Statement of conformity	TÜV 02 ATEX 1797 X (observe statement of conformity)		
Group, category, type of protection, Temperature classification	⊕ II 3 G EEx nA II T4		
Electrical isolation			
Input/Output	safe electrical isolation acc. to EN 50020, voltage peak value 375 V		
Input/Power supply	safe electrical isolation acc. to EN 50020, voltage peak value 375 V		
Directive conformity	standards		
Directive 94/9 EU	on request		
<b>Entity parameter</b>			
Certification number	4Z6A5.AX		
FM control drawing	No. 116-0129		
Suitable for installation in division 2	yes		
Connection	terminals 1, 2, 3, 4		
Input I			
Voltage $V_{OC}$	11,6 V		
Current $I_t$	30,9 mA		
Explosion group	A&B	C&E	D, F&G
Max. external capacitance $C_a$	1,83 $\mu$ F	5,48 $\mu$ F	14,61 $\mu$ F
Max. external inductance $L_a$	35,9 mH	128,2 mH	307,1 mH
<b>Safety parameter</b>			
CSA control drawing	LR 65756-13		
Control drawing	No. 116-0132		
Connection	terminals 1, 2, 3, 4, 5		
Input I			
Voltage $V_{OC}$	10,5 V		
Explosion group	A&B	C&E	D, F&G
Max. external capacitance $C_a$	2,6 $\mu$ F	8 $\mu$ F	21 $\mu$ F
Max. external inductance $L_a$	45 mH	160 mH	387 mH

## Accessories

### PR-03 Power Rail

### UPR-03 Power Rail

### KFD2-EB2 power feed module

The devices are supplied with 24 VDC through the KFD2-EB2 power feed module and the PR-03 or the UPR-03 Power Rail. Each power feed module monitors and provides protection for groups of as many as 100 individual devices. The PR-03 Power Rail is an insert component for the DIN rail. The UPR-03 Power Rail is a complete unit consisting of an electrical insert and an aluminium DIN rail measuring 35 mm x 15 mm x 2000 mm. The devices are simply snapped in place to make electrical contact.

If a Power Rail is not being used, power can be supplied to the devices directly through the device terminals.

### K-CJC

Removable terminals with integrated temperature measurement sensor for cold junction compensation for thermocouples.

### PACT<sup>ware</sup>™

Device-specific drivers (DTM)

### Adapter K-ADP1

Interface adapter for connection with the serial interface of a PC/Notebook.