



## ELECTROCENTRALE BUCUREȘTI S.A.

„în reorganizare judiciară”, „în fașă de reorganizare”, „în reabilitare”

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Centrala Termoelectrica Vest

APROBAT,  
DIRECTOR GENERAL ADJUNCT

## SECȚIUNEA II

### CAIET DE SARCINI nr.09 PS / 2019

pentru achiziționare de piese de schimb pentru buclele de masura care intra in schemele de protectii aferente Centrala cu Ciclu Combinat

#### Cap.I Obiectul caietului de sarcini

1.1. Obiectul prezentului caiet de sarcini este livrarea de piese de schimb aferente achiziției de piese de schimb pentru buclele de masura care intra in schemele de protectii aferente Centrala cu Ciclu Combinat, in conformitate cu anexa nr.1 la prezentul caiet de sarcini.

#### Cap.II Scopul achiziției produselor

2.1. Achiziția și montarea în instalație a acestor piese de schimb se face în vederea restabilirii corectitudinii și siguranței în funcționare a buclelor de masura aferente agregatelor din cadrul Centralei cu Ciclu Combinat și eliminării punctelor slabe din instalații.

#### Cap.III Termenul de livrare

3.1. Termenul de livrare pentru piesele de schimb care fac obiectul prezentului caiet de sarcini este conform anexei nr.1 (15 zile calendaristice de la data perfectării contractului).

3.2. Beneficiarul nu va accepta decalări ale termenelor de livrare după semnarea contractului, deoarece piesele de schimb achiziționate vor fi folosite la înlocuirea cât mai rapidă a modulelor de putere defecte.

#### Cap.IV Caracteristici tehnice ale produselor

4.1. Caracteristicile pieselor de schimb care fac obiectul prezentului caiet de sarcini sunt menționate în fișa tehnică nr.1,2,3,4,5.

#### Cap.V Cerințe tehnice impuse de autoritatea contractantă în faza de ofertare

Oferta tehnică va cuprinde date tehnice și informații care să dovedească ca produsele oferite îndeplinesc toate condițiile tehnice descrise la capitolul anterior.

5.1. În oferta tehnică ofertantul va certifica furnizarea produselor solicitate în anexa nr.1.

5.2. În oferta tehnică se vor înscrie în mod obligatoriu informații privind termenul de livrare al produselor oferite.

5.3. Se vor prezenta fisele tehnice ale produselor oferite, specificatii tehnice, codurile de producator etc.

5.4. Deoarece se impune achizitionarea de produse 100% compatibile (din toate punctele de vedere - dimensional, tehnic, design, etc.) cu cele din instalatie, in prezentul caiet de sarcini a fost specificat producatorul acestor piese de schimb si codul de producator.

5.5. In cadrul ofertei tehnice se vor prezenta acte doveditoare care sa confirme ca produsele ce fac obiectul prezentului caiet de sarcini, sunt fabricate in sistemul de management al calitatii conform cu SR EN ISO 9001/editia in vigoare sau conform oricarui alt standard de sistem de management al calitatii echivalent.

5.6. Ofertantul va certifica faptul ca produsele oferite sunt noi (nereconditionate)

## **Cap.VI Cerinte tehnice impuse de autoritatea contractanta pe parcursul derularii contractului**

6.1. Documentatia de executie este asigurata de furnizor

6.2. Piesele de schimb executate trebuie sa corespunda documentatiilor tehnice de executie si de calitate, tuturor probelor si incercarilor finale prevazute in documentatiile proiectantului, caietului de sarcini si procedurilor de management al calitatii prevazute in manualul de calitate propriu in conformitate cu **SR EN ISO 9001/editia in vigoare**.

6.3. Materialele din care se vor confectiona piesele de schimb trebuie sa fie in termenul de garantie acordat de furnizor. Este interzisa utilizarea materialelor care au depasit termenul de garantie acordat de furnizor sau care, fiind in termenul de garantie, s-au deteriorat datorita depozitarii necorespunzatoare.

6.4. Furnizorul isi va asuma intreaga responsabilitate pentru calitatea si performantele produselor furnizate.

6.5. Pentru piesele de schimb la care se fac incercari, se considera calitatea indeplinita atat timp cat rezultatele se inscriu in tolerantele admise prin reglementarile tehnice in vigoare.

6.7. Sa execute fara plata piesele de schimb efectuate cu deficiente si abateri de la documentatii, standarde, prescriptii tehnice, constatate la receptie sau in perioada de garantie.

6.7. Furnizorul va asigura la cererea beneficiarului accesul pe fluxul de fabricatie al produselor contractate si la probele efectuate in vederea livrarii, conform prevederilor documentatiei.

## **Cap.VII Receptia**

7.1. Receptia produselor se face pe baza de receptie cantitativa efectuata la sediul beneficiarului.

7.2. Receptia cantitativa si calitativa la beneficiar se efectueaza in termen de 3 zile de la data primirii produselor, pe baza documentelor care insotesc transportul mentionate la cap.VIII.

7.3. Calitatea produselor este atestata de furnizor prin:

- certificat de calitate de la producator
- certificat de garantie
- declaratie produse noi
- declaratia de conformitate tip CE, conform HG 584/2004,
- documentatie tehnica si de montaj etc,
- documentatie de manipulare si depozitare daca este cazul

7.4. Chiar daca receptia cantitativa si calitativa a fost efectuata, aceasta nu absolve furnizorul de responsabilitatea eliminarii neconformitatilor ce pot apare la montarea produselor livrate in instalatie.

**Cap.VIII Conditii impuse privind ambalarea, conservarea, livrarea si transportul produselor**

8.1. Livrarea produselor se face franco depozit beneficiar - CTE Vest- B-dul Timisoara nr.106 sector 6, Bucuresti in intervalul orar 7-15 in zilele lucratoare, cu asigurarea mijloacelor de transport si suportarea cheltuielilor aferente de către furnizor.

8.2. Produsele se vor livra cu ambalaj sau fara in functie de specificul acestora si conditiile impuse prin caietul de sarcini sau documentatii tehnice.

8.3. Furnizorul, pe cat posibil, va utiliza ambalaje biodegradabile.

8.4. Ambalarea si conservarea produselor livrate se face in asa fel incat acestea sa-si pastreze caracteristicile calitative pe toata perioada de garantie daca nu au fost introduse la montaj.

8.5. Marcajul produselor se face conform standardelor, caietelor de sarcini, documentatiilor de executie ale furnizorului.

8.6. Fiecare transport va fi insotit obligatoriu de urmatoarele documente:

- dispozitie de livrare - aviz de expeditie;
- toate documentele de calitate prevazute la cap.7.3;
- declaratia de conformitate tip CE, conform HG 584/2004
- documentatie tehnica si de montaj etc.

**Cap. IX Garantii**

9.1. Garantia tehnica solicitata pentru produse este de **36 luni de la livrare**.

9.2. Furnizorul are obligatia de a garanta ca produsele furnizate sunt noi si in conformitate cu specificatiile tehnice si de calitate prevazute in oferta.

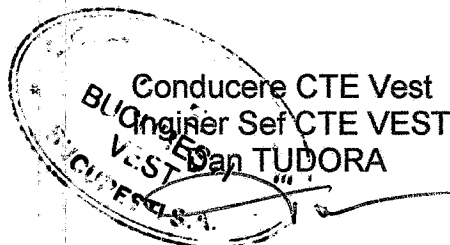
**Cap. X Alte informatii**

1) Anexele nr. 1,2,3,4,5 fac parte integranta din prezentul caiet de sarcini.

2) La elaborarea ofertei tehnice se va tine seama de cerintele descrise in prezentul caiet de sarcini si in Fisa de Date la capitolul specific "Modul de prezentare a propunerii tehnice".

Avizat,  
Sef Serviciu Coordonare Mentenanta,  
Activitati conexe ISCIR, Incidente si UCC  
Cristian DUMITRU

Responsabil SCMAC



Sef Sectie Ciclu Combinat  
Costin ZISU

Responsabil MC,  
Monica DRAGOMIR

Sef Birou Mentenanta, ISCIR, UCC,  
Daniela MOIA  
Adriana Nicoiaescu

## ANEXA nr.1 A CAIETULUI DE SARCINI

### LISTA CANTITATI PIESE DE SCHIMB

pentru achizitionare de piese de schimb pentru buclele de masura care intra in schemele de protectii aferente Centrala cu Ciclu Combinat

Nr.	Denumire produs	UM	cant	Termen zile
1	Modul tip KFD2-STC4-Ex1.20 (conform fisa tehnica anexa 2)	buc	3	15
2	Modul tip KFD2-STC4-Ex2 (conform fisa tehnica anexa 3)	buc	46	15
3	Modul tip KFD2-SOT2-Ex2 (conform fisa tehnica anexa 4)	buc	18	15
4	Modul tip KFD2-SR2-Ex2.W (conform fisa tehnica anexa 5)	buc	20	15

Inginer Sef CTE Vest,  
Dan TUDORA



Sef sectie Ciclu Combinat,  
Costin ZISU

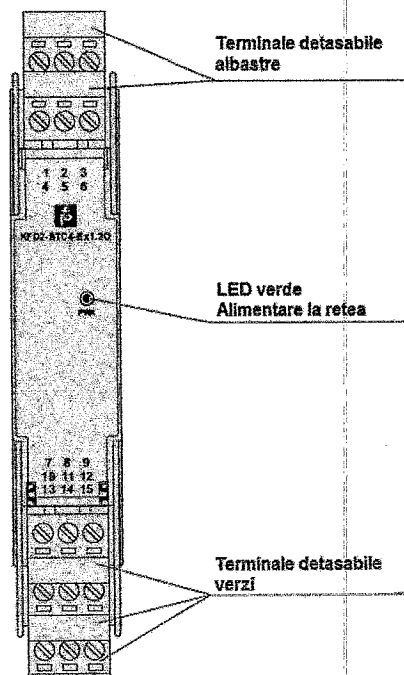
Birou Mentenanta  
Daniela MOIA  
Adriana Nicolaescu

**FISA TEHNICA**

**Modul putere tip KFD2-STC4-Ex1.20 (separator galvanic)  
SMART Transmitter Power Supply**

Date tehnice:

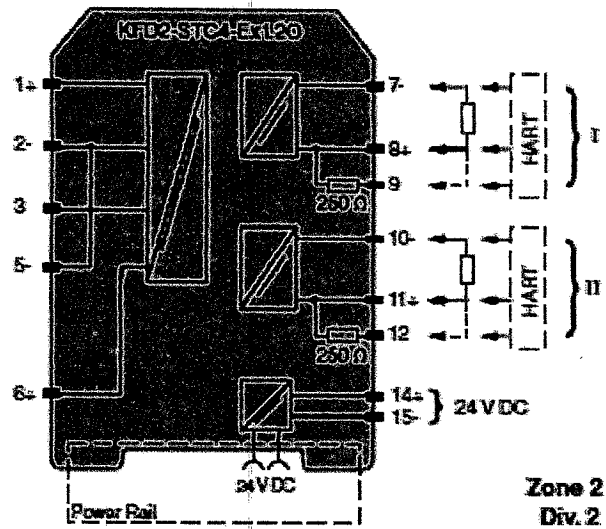
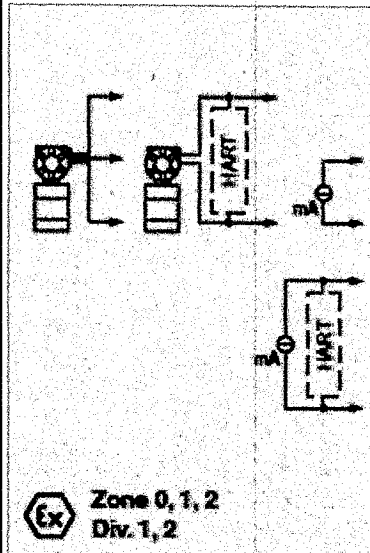
Fabricant:	PEPPERL+FUCHS
Tip:	KFD2-STC4-Ex1.20
Tip semnal:	analog
Splitter de semnal	1 intrare / 2 iesiri
Bariera izolata pe 1 canal	
Alimentare	24 Vcc (power Rail)
Terminal blocuri cu prize de incercare	
<b>Intrare</b>	
Conexiuni:	terminalele 1+, 2-, 3 sau 5-, 6+
Semnal intrare:	0/4...20 mA
Caderea de tensiune:	$\leq 2,4$ V la 20 mA (terminalele 5,6)
Rezistenta intrare:	$\leq 76\Omega$ (terminalele 2-,3); $\leq 500\Omega$ (terminalele 1+, 3)
<b>Iesire</b>	
Conexiuni:	terminalele 7-, 8+, 9 ; 10-, 11+, 12
Incarcare:	0...550 $\Omega$ la 20 mA
Semnal iesire:	0/4...20 mA
Conditii ambientale:	-20°C...60°C
Grad de protectie:	IP 20
Greutate:	~200 g
Dimensiuni:	20x124x115 mm



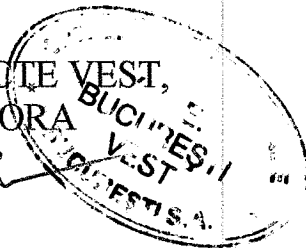
CE

Ex

SIL 3



Inginer Sef CTE VEST,  
Dan TUDORA



Sef sectie Ciclu Combinat,  
Costin ZISU

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*[Handwritten mark]*

## Features

- 1-channel isolated barrier
- 24 V DC supply (Power Rail)
- Input 2-wire and 3-wire SMART transmitters and 2-wire SMART current sources
- Signal splitter (1 input and 2 outputs)
- Dual output 0/4 mA ... 20 mA
- Terminal blocks with test sockets
- Up to SIL 3 acc. to IEC 61508

## Function

This isolated barrier is used for intrinsic safety applications. The device supplies 2-wire and 3-wire SMART transmitters in a hazardous area, and can also be used with 2-wire SMART current sources.

It transfers the analog input signal to the safe area as two isolated current values.

Digital signals may be superimposed on the input signal in the hazardous or safe area and are transferred bi-directionally.

If the HART communication resistance in the loop is too low, the internal resistance of 250  $\Omega$  between terminals 8, 9 and 11, 12 can be used.

Test sockets for the connection of HART communicators are integrated into the terminals of the device.

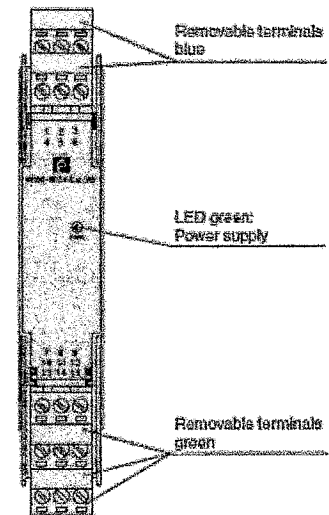
## Application

The device supports the following SMART protocols:

- HART
- BRAIN
- Foxboro

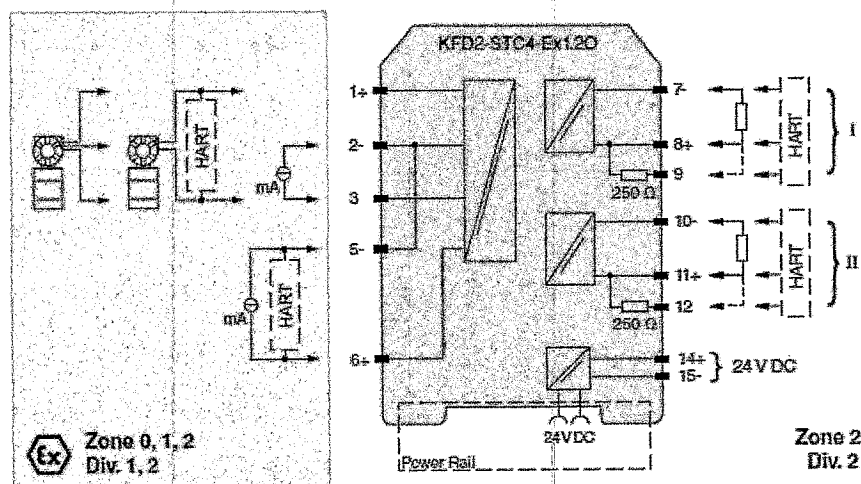
## Assembly

Front view



SIL 3

## Connection



Release date 2017-12-05 16:43 Date of issue 2017-12-05 28/07/2017

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

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General specifications		
Signal type		Analog input
Functional safety related parameters		
Safety Integrity Level (SIL)		SIL 3
Supply		
Connection		Power Rail or terminals 14+, 15-
Rated voltage	$U_i$	20 ... 35 V DC
Ripple		within the supply tolerance
Power dissipation		1.8 W
Power consumption		2.4 W
Input		
Connection side		field side
Connection		terminals 1+, 2-, 3 or 5-, 6+
Input signal		0/4 ... 20 mA
Open circuit voltage/short-circuit current		terminals 1+, 3-: 22.7 V / 38 mA
Voltage drop		terminals 5, 6: $\leq 2.4$ V at 20 mA
Input resistance		terminals 2-, 3: $\leq 76 \Omega$ terminals 1+, 3: $\leq 500 \Omega$ (250 $\Omega$ load)
Available voltage		terminals 1+, 3: $\geq 16$ V at 20 mA
Output		
Connection side		control side
Connection		terminals 7-, 8+, 9; 10-, 11+, 12
Load		0 ... 550 $\Omega$ at 20 mA
Output signal		0/4 ... 20 mA (overload $> 25$ mA)
Ripple		$\leq 50 \mu\text{A}_{\text{rms}}$
Transfer characteristics		
Deviation		at 20 °C (68 °F), 0/4 ... 20 mA $\leq 10 \mu\text{A}$ incl. calibration, linearity, hysteresis, loads and fluctuations of supply voltage
Influence of ambient temperature		0.25 $\mu\text{A/K}$
Frequency range		
Settling time		field side into the control side: bandwidth with 0.5 V <sub>pp</sub> signal 0 ... 7.5 kHz (-3 dB)
Rise time/fall time		control side into the field side: bandwidth with 0.5 V <sub>pp</sub> signal 0.3 ... 7.5 kHz (-3 dB)
Galvanic isolation		
Output/power supply		functional insulation, rated insulation voltage 50 V AC
Output/output		functional insulation, rated insulation voltage 50 V AC
Indicators/settings		
Display elements		LED
Labeling		space for labeling at the front
Directive conformity		
Electromagnetic compatibility		
Directive 2014/30/EU		EN 61326-1:2013 (industrial locations)
Conformity		
Electromagnetic compatibility		NE 21:2011
Degree of protection		IEC 60529:2001
Protection against electrical shock		UL 61010-1:2012
Ambient conditions		
Ambient temperature		-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications		
Degree of protection		IP20
Connection		screw terminals
Mass		approx. 290 g
Dimensions		20 x 124 x 115 mm (0.8 x 4.9 x 4.5 inch), housing type B2
Mounting		on 35 mm DIN mounting rail acc. to EN 60715:2001
Data for application in connection with hazardous areas		
EU-Type Examination Certificate		
Marking		BAS 99 ATEX 7060 X Ⓔ II (1)G [Ex ia Ga] IIC, Ⓔ II (1)D [Ex ia Da] IIIC, Ⓔ I (M1) [Ex ia Ma] I
Input		[Ex ia Ga] IIC, [Ex ia Da] IIIC, [Ex ia Ma] I
Supply		
Maximum safe voltage	$U_{\text{in}}$	250 V (Attention! The rated voltage can be lower.)
Equipment		terminals 1+, 3-
Voltage	$U_o$	25.4 V
Current	$I_o$	88.8 mA
Power	$P_o$	551 mW

Release date: 2017-12-05 16:43 Date of issue: 2017-12-05 2585774\_002.pdf

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

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Permissible connection values [EEx ia]		
Equipment		terminals 2-, 3
Current $I_i$ / Current $I_i$		74 mA / 115 mA
Current	$I_i$	115 mA
Voltage	$U_o$	3.5 V
Current	$I_o$	74 mA
Power	$P_o$	64 mW
Permissible connection values [EEx ia]		
Equipment		terminals 1+, 2 / 3-
Voltage	$U_i$	30 V
Current	$I_i$	115 mA
Voltage	$U_o$	25.4 V
Current	$I_o$	115 mA
Power	$P_o$	584 mW
Permissible connection values [EEx ia]		
Equipment		terminals 5-, 6+
Voltage	$U_i$	30 V
Current	$I_i$	115 mA
Voltage	$U_o$	8.7 V
Current	$I_o$	0 mA
Output		
Maximum safe voltage	$U_m$	250 V (Attention! The rated voltage can be lower.)
Certificate		TÜV 99 ATEX 1499 X
Marking		Ⓔ II 3G Ex nA II T4 [device in zone 2]
Galvanic isolation		
Input/Output		safe electrical isolation acc. to IEC/EN 60079-11, voltage peak value 375 V
Input/power supply		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, EN 60079-15:2010
International approvals		
UL approval		
Control drawing		116-0428 (ct/Luc)
IECEX approval		IECEX BAS 04.0016X IECEX CML 15.0055X
Approved for		[Ex ia Ga] IIC, [Ex ia Da] IIC, [Ex ia Ma] I Ex nA IIC T4 Gc
General information		
Note		Both output loads must be connected to ensure complete and correct operation within the technical specification. Open circuit of one of the two outputs will not affect the connected output, but would result in a loss of transmitter supply voltage of up to 0.7 Volt.
Supplementary information		Observe the certificates, declarations of conformity, instruction manuals, and manuals where applicable. For information see <a href="http://www.pepperl-fuchs.com">www.pepperl-fuchs.com</a> .

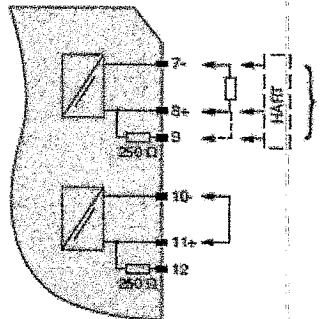
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### Configuration active output (source)

If only one output of the two outputs is used, a plug-in jumper have to be set as follows.



### Accessories

#### Power feed module KFD2-EB2

The power feed module is used to supply the devices with 24 V DC via the Power Rail. The fuse-protected power feed module can supply up to 150 individual devices depending on the power consumption of the devices. Collective error messages received from the Power Rail activate a galvanically-isolated mechanical contact.

#### Power Rail UPR-03

The Power Rail UPR-03 is a complete unit consisting of the electrical insert and an aluminium profile rail 35 mm x 15 mm. To make electrical contact, the devices are simply engaged.

#### Profile Rail K-DUCT with Power Rail

The profile rail K-DUCT is an aluminum profile rail with Power Rail insert and two integral cable ducts for system and field cables. Due to this assembly no additional cable guides are necessary.



*Power Rail and Profile Rail must not be fed via the device terminals of the individual devices!*

## ANEXA nr.3 A CAIETULUI DE SARCINI

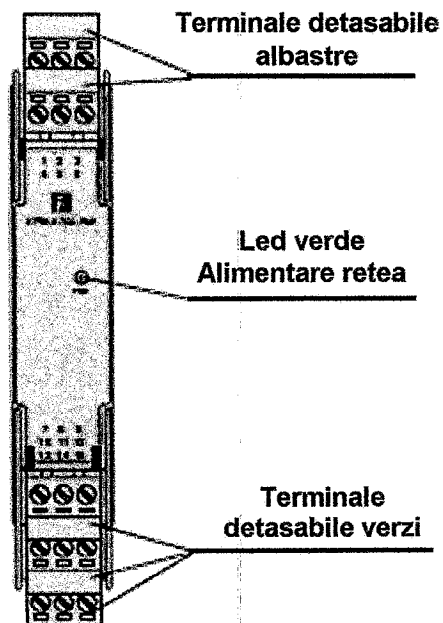
### FISA TEHNICA

#### **Modul putere tip KFD2-STC4-Ex2 (separator galvanic) SMART Transmitter Power Supply**

Date tehnice:

Fabricant:	PEPPERL+FUCHS
Tip:	KFD2-STC4-Ex2
Tip semnal:	analog
Bariera izolata pe 2 canale	
Alimentare	24 Vcc (power Rail)
Terminal blocuri cu puncte de testare	
<b>Intrare</b> Conexiuni:	terminalele 1+,3- ; 4+, 6-
Semnal intrare:	0/4...20 mA
Caderea de tensiune:	$\leq 16$ V la 20 mA (terminalele 1+,3)
<b>Iesire</b> Conexiuni:	terminalele 7-, 8+ ; 10-,11+
Incarcare:	0...500 $\Omega$ la 20mA
Semnal iesire:	0/4...20 mA
Conditii ambientale:	-20°C...60°C
Grad de protectie:	IP 20
Greutate:	~ 150 g
Dimensiuni:	20x124x115 mm

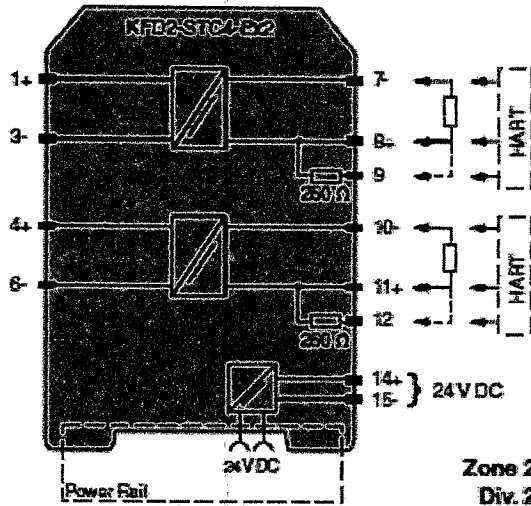
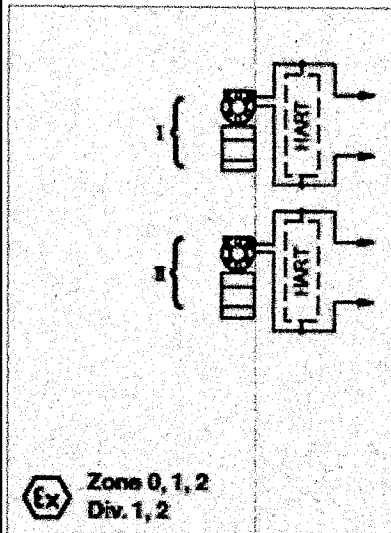
Front view



CE



SIL 2



Inginer Sef CTB WEST,  
Dan TUDORA STESII

Sef sectie Ciclu Combinat,  
Costin ZISU

*Costin ZISU*

*28*

### Features

- 2-channel isolated barrier
- 24 V DC supply (Power Rail)
- Input 2-wire SMART transmitters
- Output 0/4 mA ... 20 mA
- Terminals with test points
- Up to SIL 2 acc. to IEC 61508

### Function

This isolated barrier is used for intrinsic safety applications. The device supplies 2-wire SMART transmitters in a hazardous area.

It transfers the analog input signal to the safe area as an isolated current value.

Digital signals may be superimposed on the input signal in the hazardous or safe area and are transferred bi-directionally.

If the HART communication resistance in the loop is too low, the internal resistance of 250  $\Omega$  between terminals 8, 9 and 11, 12 can be used.

Test sockets for the connection of HART communicators are integrated into the terminals of the device.

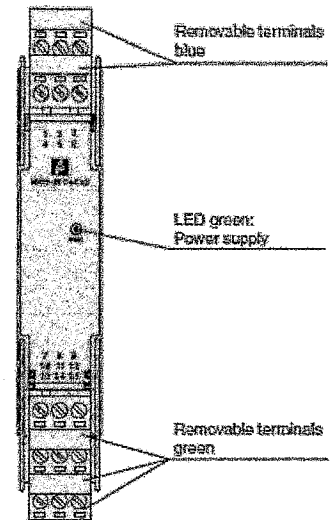
### Application

The device supports the following SMART protocols:

- HART
- BRAIN
- Foxboro

### Assembly

Front view

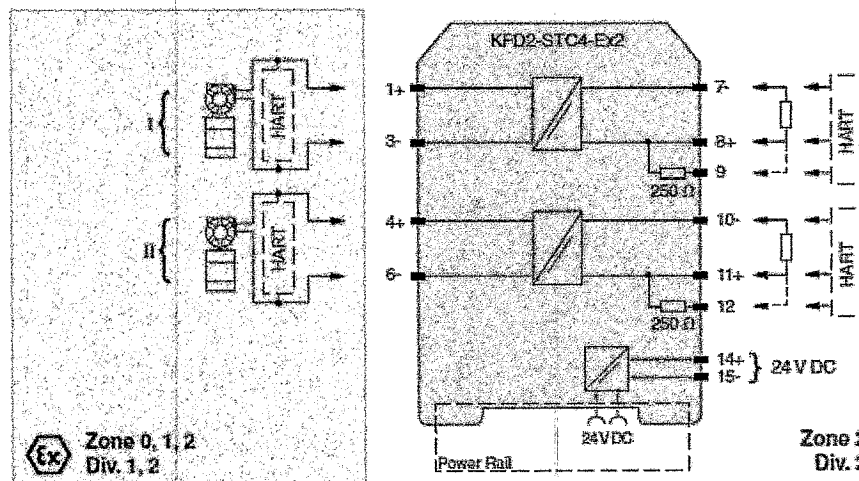


CE



SIL 2

### Connection



Release date: 2017-08-09 14:39 Date of issue: 2017-08-10 2:48:09 eng.xml

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

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General specifications		
Signal type		Analog input
Functional safety related parameters		
Safety Integrity Level (SIL)		SIL 2
Supply		
Connection		Power Rail or terminals 14+, 15-
Rated voltage	$U_r$	20 ... 35 V DC
Ripple		within the supply tolerance
Power dissipation		1.8 W
Power consumption		≤ 2.7 W
Input		
Connection side		field side
Connection		terminals 1+, 3-, 4+, 6-
Input signal		0/4 ... 20 mA
Available voltage		≥ 16 V at 20 mA, terminals 1+, 3
Output		
Connection side		control side
Connection		terminals 7-, 8+, 10-, 11+
Load		0 ... 550 Ω at 20 mA
Output signal		0/4 ... 20 mA (overload > 25 mA)
Ripple		≤ 50 μA rms
Transfer characteristics		
Deviation		at 20 °C (68 °F), 0/4 ... 20 mA ≤ 10 μA incl. calibration, linearity, hysteresis, loads and fluctuations of supply voltage
Influence of ambient temperature		0.25 μA/K
Frequency range		field side into the control side: band width with 1 V <sub>pp</sub> signal 0 ... 7.5 kHz (-3 dB) safe area to hazardous area: band width with 1 V <sub>SS</sub> signal 0.3 ... 7.5 kHz (-3 dB)
Settling time		200 μs
Rise time/fall time		20 μs
Galvanic isolation		
Output/power supply		functional insulation, rated insulation voltage 50 V AC
Output/Output		functional insulation, rated insulation voltage 50 V AC
Indicators/settings		
Display elements		LED
Labeling		space for labeling at the front
Directive conformity		
Electromagnetic compatibility		
Directive 2014/30/EU		EN 61326-1:2013 (Industrial locations)
Conformity		
Electromagnetic compatibility		NE 21:2011
Degree of protection		IEC 60529:2001
Protection against electrical shock		UL 91010-1:2012
Ambient conditions		
Ambient temperature		-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications		
Degree of protection		IP20
Connection		screw terminals
Mass		approx. 150 g
Dimensions		20 x 124 x 115 mm (0.8 x 4.9 x 4.5 inch), housing type B2
Mounting		on 35 mm DIN mounting rail acc. to EN 60715:2001
Data for application in connection with hazardous areas		
EU-Type Examination Certificate		BAS 99 ATEX 7025 X
Marking		Ⓔ II (1) G [Ex ia Ga] IIC, Ⓔ II (1) D [Ex ia Da] IIC, Ⓔ I (M1) [Ex ia Ma] I
Input		[Ex ia Ga] IIC, [Ex ia Da] IIC, [Ex ia Ma] I
Voltage	$U_o$	25.2 V
Current	$I_o$	93 mA
Power	$P_o$	0.886 W
Supply		
Maximum safe voltage	$U_m$	250 V (Attention! The rated voltage can be lower.)
Certificate		
Marking		Ⓔ II 3G Ex nA II T4 [device in zone 2]
Galvanic isolation		
Input/Output		safe electrical isolation acc. to IEC/EN 60079-11, voltage peak value 375 V
Input/power supply		safe electrical isolation acc. to IEC/EN 60079-11, voltage peak value 375 V

Release date: 2017-03-09 14:39 Date of issue: 2017-03-10 23:59:59, gmg, xat

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

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Directive conformity	
Directive 2014/34/EU	EN 60079-0:2012+A11:2013, EN 60079-11:2012, EN 60079-15:2010
International approvals	
UL approval	
Control drawing	116-0428 (cULus)
IECEx approval	IECEx BAS 04.0015X IECEx CML 15.0055X
Approved for	[Ex ia Ga] IIC, [Ex ia Ga] IIC, [Ex ia Ma] I Ex nA IIC T4 Gc
General information	
Supplementary information	Observe the certificates, declarations of conformity, instruction manuals, and manuals where applicable. For information see <a href="http://www.pepperl-fuchs.com">www.pepperl-fuchs.com</a> .

### Accessories

#### Power feed module KFD2-EB2

The power feed module is used to supply the devices with 24 V DC via the Power Rail. The fuse-protected power feed module can supply up to 150 individual devices depending on the power consumption of the devices. Collective error messages received from the Power Rail activate a galvanically-isolated mechanical contact.

#### Power Rail UPR-03

The Power Rail UPR-03 is a complete unit consisting of the electrical insert and an aluminium profile rail 35 mm x 15 mm. To make electrical contact, the devices are simply engaged.

#### Profile Rail K-DUCT with Power Rail

The profile rail K-DUCT is an aluminum profile rail with Power Rail insert and two integral cable ducts for system and field cables. Due to this assembly no additional cable guides are necessary.



*Power Rail and Profile Rail must not be fed via the device terminals of the individual devices!*

Release date 2017-06-09 14:35 Date of issue 2017-06-15 263492\_jrj.xml

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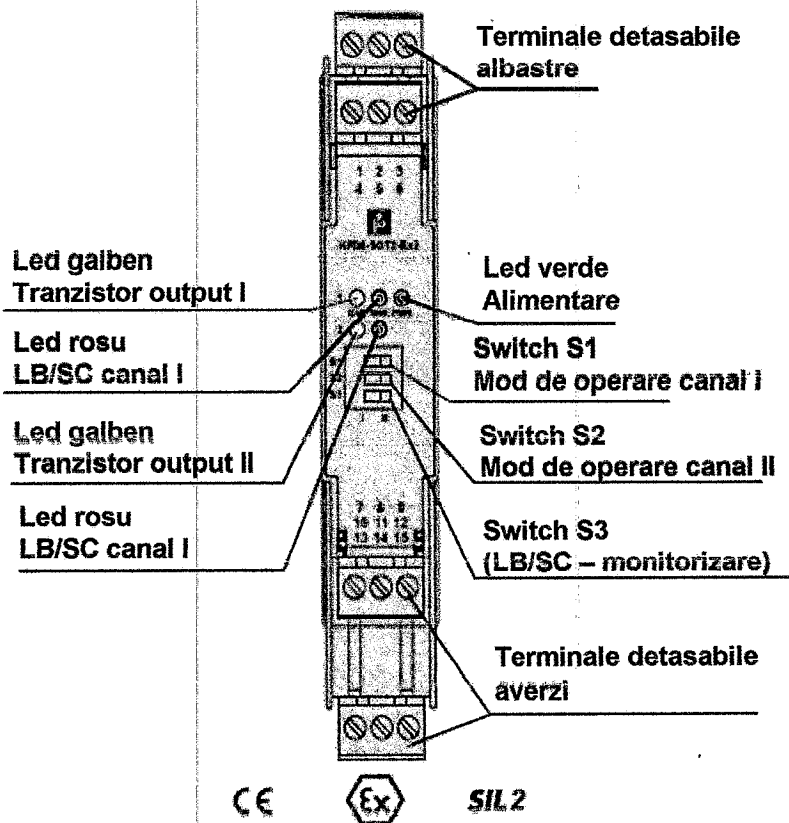
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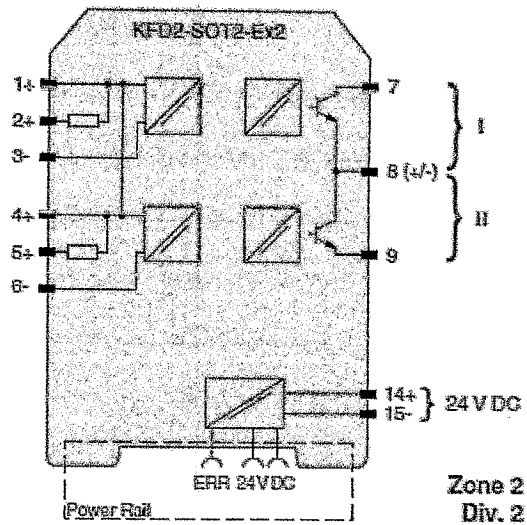
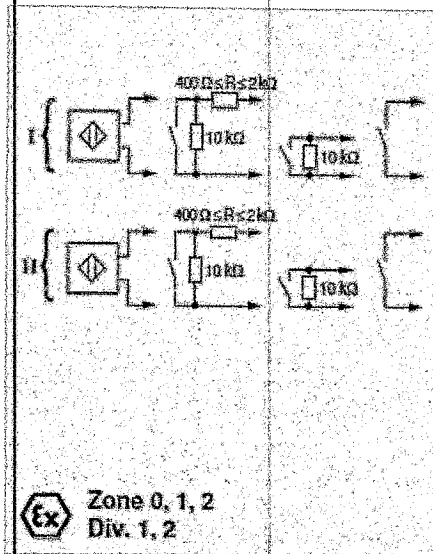
**FISA TEHNICA**

**Modul de amplificare tip KFD2-SOT2-Ex2**  
**Switch Amplifier**

Date tehnice:

Fabricant:	PEPPERL+FUCHS
Tip:	KFD2-SOT2-Ex2
Tip semnal:	digital
Bariera izolata pe 2 canale	
Alimentare	24 Vcc (power Rail)
Tensiune nominala $U_r$	20.... 30V CC
Curent nominal $I_r$	$\leq 50$ mA
Contact uscat / intrari NAMUR	
Detectarea defectului pe linie	
Tranzistor pasiv de iesire, nepolarizat	
Mod reversibil de functionare	
Intrare Conexiuni:	terminalele 1+,2+,3- ; 4+,5+, 6-
Iesire Conexiuni:	output I : terminalele 7-, 8+ output II: terminalele 8 , 9
Tensiune de comutare:	$\leq 30$ V
Curent de comutare:	$\leq 100$ mA, (scurtcircuit protejat)
Conditii ambientale:	-20°C...60°C
Grad de protectie:	IP 20
Greutate:	~ 150 g
Dimensiuni:	20x119x115 mm





Inginer Sef CTI VEST,  
Dan TUDORA

Sef sectie Ciclu Combinat,  
Costin ZISU

*[Signature]*

*[Handwritten mark]*

## Features

- 2-channel isolated barrier
- 24 V DC supply (Power Rail)
- Dry contact or NAMUR inputs
- Passive transistor output, non-polarized
- Line fault detection (LFD)
- Reversible mode of operation
- Up to SIL 2 acc. to IEC 61508

## Function

This isolated barrier is used for intrinsic safety applications. It transfers digital signals (NAMUR sensors/mechanical contacts) from a hazardous area to a safe area.

Each proximity sensor or switch controls a passive transistor output for the safe area load. The normal output state can be reversed using switch S1 for channel I and switch S2 for channel II.

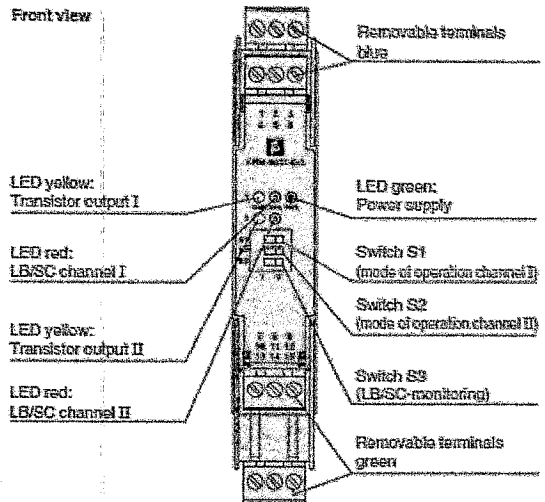
Switch S3 enables or disables line fault detection of the field circuit.

During an error condition, the transistors revert to their de-energized state and LEDs indicate the fault according to NAMUR NE44.

A unique collective error messaging feature is available when used with the Power Rail system.

## Assembly

Front view

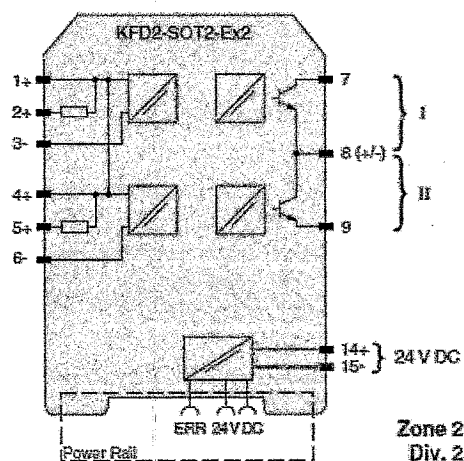
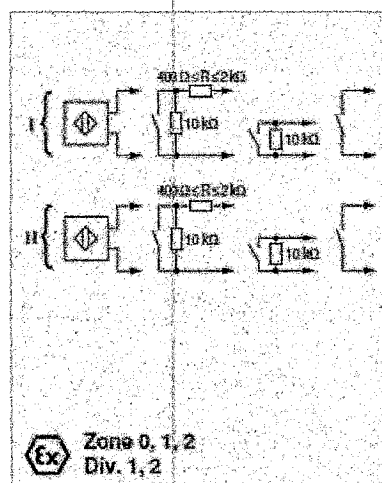


CE



SIL 2

## Connection



Release date: 2019-01-25 Date of issue: 2019-01-25 181003\_eng.xml

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**PEPPERL+FUCHS**

General specifications		
Signal type		Digital Input
Functional safety related parameters		
Safety Integrity Level (SIL)		SIL 2
Supply		
Connection		Power Rail or terminals 14+, 15-
Rated voltage	$U_T$	20 ... 30 V DC
Ripple		$\leq 10\%$
Rated current	$I_T$	$\leq 50\text{ mA}$
Input		
Connection side		field side
Connection		terminals 1+, 2+, 3-, 4+, 5+, 6-
Rated values		acc. to EN 60947-5-6 (NAMUR), see system description for electrical data
Open circuit voltage/short-circuit current		approx. 8 V DC / approx. 8 mA
Switching point/switching hysteresis		1.2 ... 2.1 mA / approx. 0.2 mA
Line fault detection		breakage $I \leq 0.1\text{ mA}$ , short-circuit $I > 6\text{ mA}$
Output		
Connection side		control side
Connection		output I: terminals 7, 8; output II: terminals 8, 9
Switching voltage		$\leq 30\text{ V}$
Switching current		$\leq 100\text{ mA}$ , short-circuit protected
Signal level		1-signal: switching voltage - 2.5 V max. at 10 mA switching current or 3 V max. at 100 mA switching current 0-signal: switched off (off-state current $\leq 10\text{ }\mu\text{A}$ )
Output I, II		signal, electronic output, passive
Collective error message		Power Rail
Transfer characteristics		
Switching frequency		$\leq 5\text{ kHz}$
Galvanic isolation		
Input/Output		reinforced insulation acc. to IEC 62103, rated insulation voltage 300 V <sub>rms</sub>
Input/power supply		reinforced insulation acc. to IEC 62103, rated insulation voltage 300 V <sub>rms</sub>
Output/power supply		basic insulation according to IEC 62103, rated insulation voltage 50 V <sub>CE</sub>
Input/output		not available
Output/Output		not available
Indicators/settings		
Display elements		LEDs
Control elements		DIP-switch
Configuration		via DIP switches
Labeling		space for labeling at the front
Directive conformity		
Electromagnetic compatibility		
Directive 2014/30/EU		EN 61326-1:2013 (industrial locations)
Conformity		
Galvanic isolation		IEC 62103:2003
Electromagnetic compatibility		NE 21:2004
Degree of protection		IEC 60529:2001
Input		EN 60947-5-6:2000
Ambient conditions		
Ambient temperature		-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications		
Degree of protection		IP20
Connection		screw terminals
Mass		approx. 150 g
Dimensions		26 x 119 x 115 mm (0.8 x 4.7 x 4.5 inch), housing type B2
Mounting		on 35 mm DIN mounting rail acc. to EN 60715:2001
Data for application in connection with hazardous areas		
EU Type Examination Certificate		PTB 00 ATEX 2035
Marking		Ⓔ II (1) G [Ex ia] IIC Ⓔ II (1) D [Ex ia] IIC Ex ia IIC, Ex ia IIC
Input		
Voltage	$U_o$	10.5 V
Current	$I_o$	13 mA
Power	$P_o$	34 mW (linear characteristic)
Supply		
Maximum safe voltage	$U_m$	40 V DC (Attention! The rated voltage can be lower.)

Release date: 2019-01-25 Date of issue: 2019-01-25 121005\_eng.pdf

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**PEPPERL+FUCHS**

Type of protection [EEEx ia and EEEx ib]	
Output	
Maximum safe voltage $U_m$	40 V DC (Attention! The rated voltage can be lower.)
EU-Type Examination Certificate	DMT 01 ATEX E 133
Marking	Ⓔ I (M1) [Ex ia] I
Certificate	TÜV 99 ATEX 1499 X
Marking	Ⓔ II 3G Ex nA II T4
Galvanic isolation	
Input/Output	safe electrical isolation acc. to IEC/EN 60079-11, voltage peak value 375 V
Input/power supply	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, EN 60079-15:2010, EN 50303:2000
International approvals	
FM approval	
Control drawing	116-0035
CSA approval	
Control drawing	116-0047
IECEx approval	
IECEx certificate	IECEx PTB 05.0011
IECEx marking	[Ex ia] IIC, [Ex ia] I, [Ex ia] IIC
General information	
Supplementary information	Observe the certificates, declarations of conformity, instruction manuals, and manuals where applicable. For information see <a href="http://www.pepperl-fuchs.com">www.pepperl-fuchs.com</a> .
Accessories	
Optional accessories	<ul style="list-style-type: none"> <li>- power feed module KFD2-EB2(R4A.B)(SP)</li> <li>- universal power rail UPR-03(M)(-S)</li> <li>- profile rail K-DUCT-BU(UPR-03)</li> </ul>

Release date: 2019-01-25 09:38 Date of issue: 2019-01-25 18:00, eng, uni

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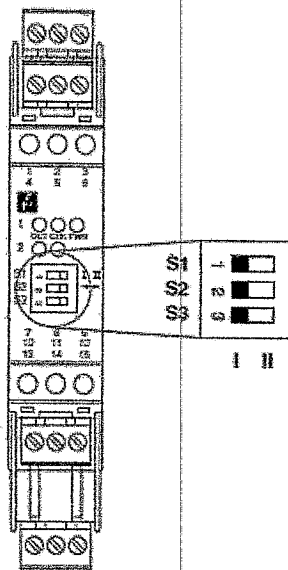
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**PEPPERL+FUCHS**

# Configuration



## Switch position

S	Function		Position
1	Mode of operation Output I active	with high input current	I
		with low input current	II
2	Mode of operation Output II active	with high input current	I
		with low input current	II
3	Line fault detection	ON	I
		OFF	II

## Operating status

Control circuit	Input signal
Initiator high impedance/ contact opened	low input current
Initiator low impedance/ contact closed	high input current
Lead breakage, lead short-circuit	Line fault

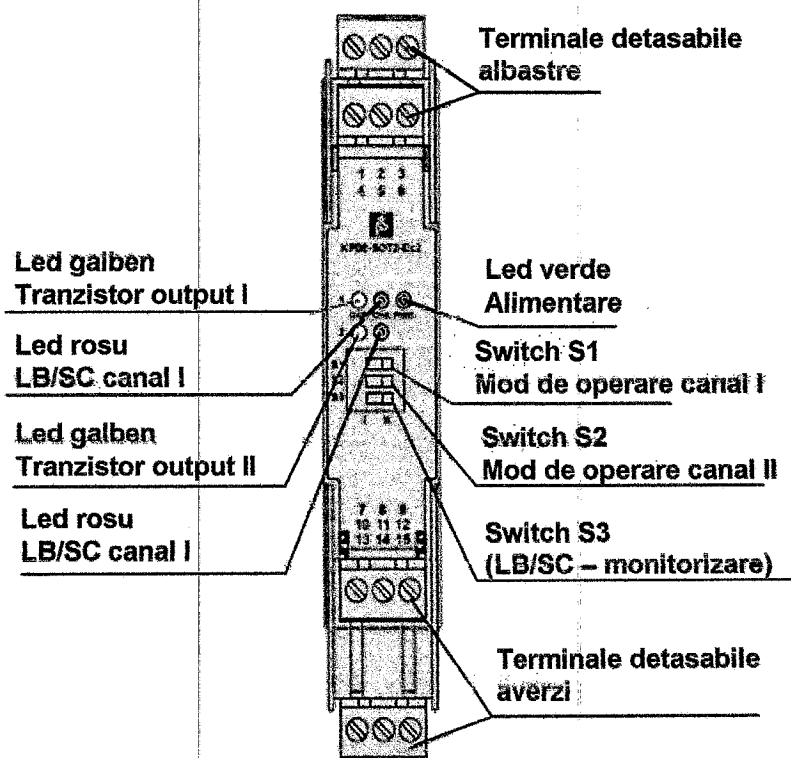
Factory settings: switch 1, 2 and 3 in position I

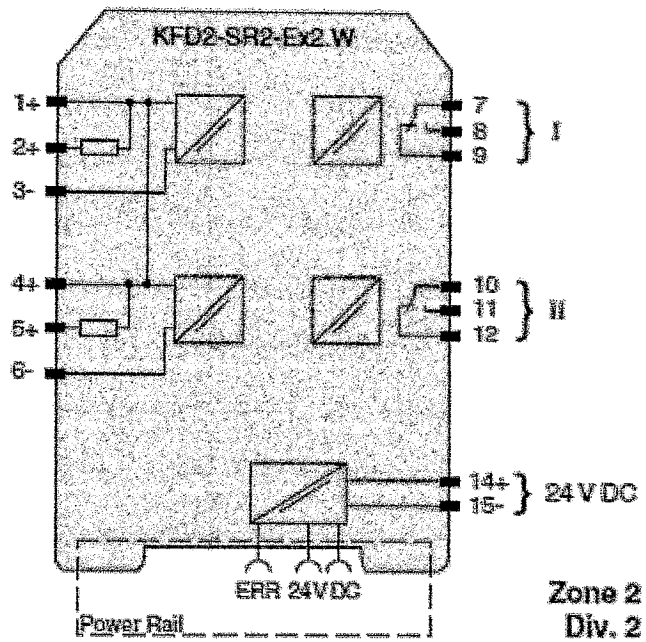
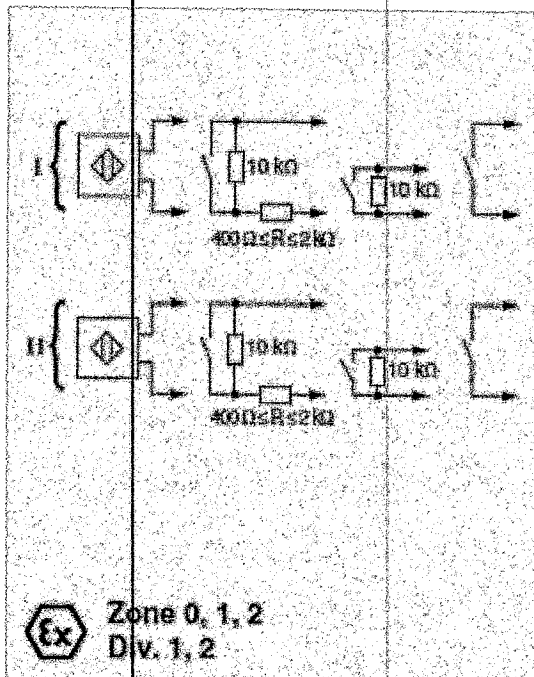
**FISA TEHNICA**

**Modul de amplificare tip KFD2-SR2-Ex2.W  
Switch Amplifier**

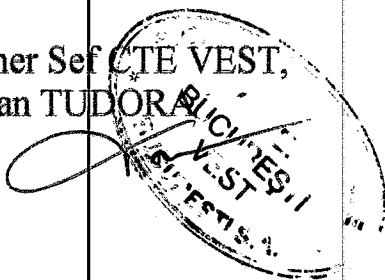
**Date tehnice:**

Fabricant:	PEPPERL+FUCHS
Tip:	KFD2-SR2-Ex2.W
Tip semnal:	digital
Bariera izolata pe 2 canale	
Releu de contact output	
Alimentare	24 Vcc (power Rail)
Tensiune nominala $U_r$	20.... 30V cc
Curent nominal $I_r$	$\leq 50$ mA
Contact uscat / NAMUR inputs	
Mod reversibil de functionare	
<b>Intrare</b> Conexiuni:	terminalele 1+,2+,3- ; 4+,5+, 6-
Tensiune circ deschis/	aproximativ 8 V CC/
Curent de scurtcircuit	aproximativ 8 mA
<b>Iesire</b> Conexiuni:	output I : terminalele 7, 8, 9
	output II: terminalele 10,11,12
Curent min de comutare	2 mA / 24 VCC
Conditii ambientale:	-20°C...60°C
Grad de protectie:	IP 20
Greutate:	~ 150 g
Dimensiuni:	20x119x115 mm





Inginer Sef CTE VEST,  
Dan TUDORA



Sef sectie Ciclu Combinat,  
Costin ZISU

## Features

- 2-channel isolated barrier
- 24 V DC supply (Power Rail)
- Dry contact or NAMUR inputs
- Relay contact output
- Line fault detection (LFD)
- Reversible mode of operation
- Up to SIL 2 acc. to IEC 61508

## Function

This isolated barrier is used for intrinsic safety applications. It transfers digital signals (NAMUR sensors/mechanical contacts) from a hazardous area to a safe area.

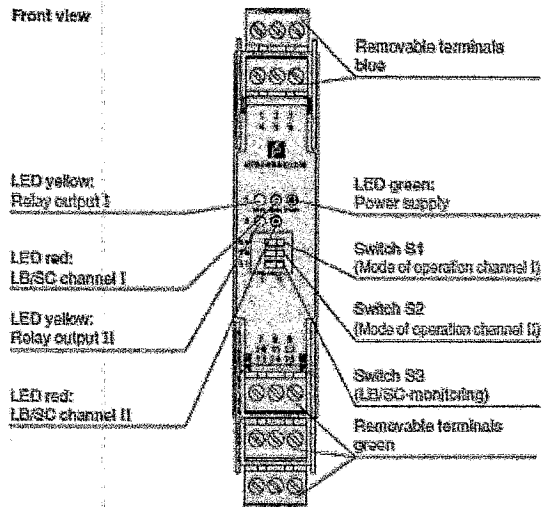
The proximity sensor or switch controls a form C changeover relay contact for the safe area load. The normal output state can be reversed using switches S1 and S2. Switch S3 is used to enable or disable line fault detection of the field circuit.

During an error condition, the relays revert to their de-energized state and the LEDs indicate the fault according to NAMUR NE44.

A unique collective error messaging feature is available when used with the Power Rail system.

## Assembly

Front view

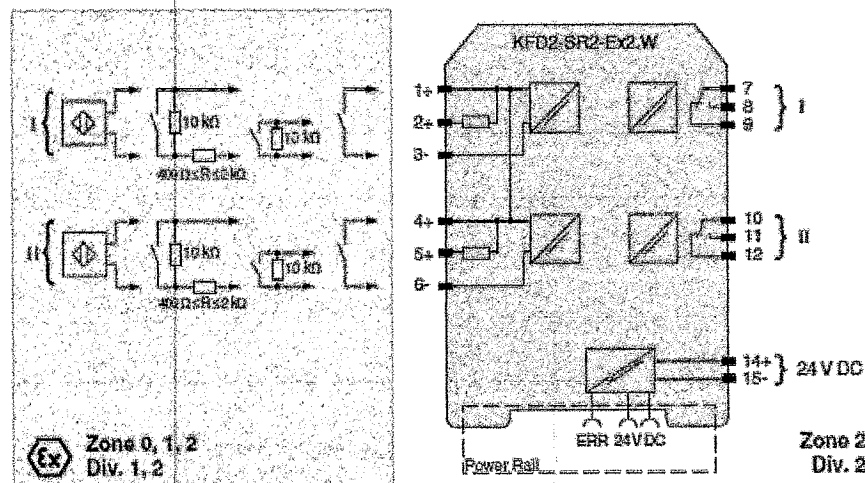


CE



SIL 2

## Connection



Release date: 2018-06-15 07:42 Date of issue: 2018-06-15 13:502\_eng2.mxd

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General specifications		
Signal type		Digital Input
Functional safety related parameters		
Safety Integrity Level (SIL)		SIL 2
Supply		
Connection		Power Rail or terminals 14+, 15-
Rated voltage	$U_i$	20 ... 30 V DC
Ripple		$\leq 10\%$
Rated current	$I_i$	$\leq 50\text{ mA}$
Power dissipation		1 W
Power consumption		$< 1.3\text{ W}$
Input		
Connection side		field side
Connection		terminals 1+, 2+, 3-, 4+, 5+, 6-
Rated values		acc. to EN 60947-5-6 (NAMUR)
Open circuit voltage/short-circuit current		approx. 8 V DC / approx. 8 mA
Switching point/switching hysteresis		1.3 ... 2.1 mA / approx. 0.2 mA
Line fault detection		breakage $I \leq 0.1\text{ mA}$ , short-circuit $I > 6\text{ mA}$
Pulse/Pause ratio		$\geq 20\text{ ms} / \geq 20\text{ ms}$
Output		
Connection side		control side
Connection		output I: terminals 7, 8, 9; output II: terminals 10, 11, 12
Output I, II		signal, relay
Contact loading		253 V AC/2 A/cos $\phi > 0.7$ ; 126.5 V AC/4 A/cos $\phi > 0.7$ ; 40 V DC/2 A resistive load
Minimum switch current		2 mA / 24 V DC
Energized/De-energized delay		approx. 20 ms / approx. 20 ms
Mechanical life		$10^7$ switching cycles
Transfer characteristics		
Switching frequency		$\leq 10\text{ Hz}$
Galvanic isolation		
Input/Output		reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V <sub>eff</sub>
Input/power supply		reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V <sub>eff</sub>
Output/power supply		reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V <sub>eff</sub>
Output/Output		reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V <sub>eff</sub>
Indicators/settings		
Display elements		LEDs
Control elements		DIP-switch
Configuration		via DIP switches
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 21:2005
Degree of protection		IEC 60529:2001
Input		EN 60947-5-6:2000
Ambient conditions		
Ambient temperature		-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications		
Degree of protection		IP20
Connection		screw terminals
Mass		approx. 150 g
Dimensions		20 x 119 x 115 mm (0.8 x 4.7 x 4.5 inch), housing type B2
Mounting		on 35 mm DIN mounting rail acc. to EN 60715:2001
Data for application in connection with hazardous areas		
EU-Type Examination Certificate		PTB 00 ATEX 2080
Marking		Ⓢ II (1)G [Ex ia Ga] IIC Ⓢ II (1)D [Ex ia Da] IIC Ⓢ I (M1) [Ex ia Ma] I
Input		Ex ia
Voltage	$U_o$	10.5 V
Current	$I_o$	13 mA

Release date: 2015-09-10 07:42 Date of issue: 2015-09-10 13:29:00 (ongoing)

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Power Supply	$P_D$	34 mW (linear characteristic)
Maximum safe voltage	$U_m$	253 V AC / 125 V DC (Attention! $U_m$ is no rated voltage.)
Output		
Contact loading		253 V AC/2 A/cos $\phi > 0.7$ ; 126.5 V AC/4 A/cos $\phi > 0.7$ ; 40 V DC/2 A resistive load
Maximum safe voltage	$U_m$	253 V AC (Attention! The rated voltage can be lower.)
Fault indication output		
Maximum safe voltage	$U_m$	40 V DC (Attention! $U_m$ is no rated voltage.)
Certificate		PF 08 CERT 0803
Marking		Ⓢ II (3)G [Ex ic Ga] IIC
Input		Ex ic
Voltage	$U_o$	10.5 V
Current	$I_o$	13 mA
Power	$P_o$	34 mW (linear characteristic)
Output		
Contact loading		253 V AC/2 A/cos $\phi > 0.7$ ; 126.5 V AC/4 A/cos $\phi > 0.7$ ; 40 V DC/2 A resistive load
Certificate		TÜV 99 ATEX 1493 X
Marking		Ⓢ II SG Ex nA nC IIC T4
Output		
Contact loading		50 V AC/4 A/cos $\phi > 0.7$ ; 40 V DC/2 A resistive load
Galvanic isolation		
Input/Output		safe electrical isolation acc. to IEC/EN 60079-11, voltage peak value 375 V
Input power supply		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, EN 60079-15:2010
International approvals		
FM approval		
Control drawing		116-0035
UL approval		
Control drawing		116-0145
CSA approval		
Control drawing		116-0047
IECEx approval		IECEx PTB 11.0034
Approved for		[Ex ia Ga] IIC, [Ex ia Da] IIC, [Ex ia Ma] I
General information		
Supplementary information		Observe the certificates, declarations of conformity, instruction manuals, and manuals where applicable. For information see <a href="http://www.pepperl-fuchs.com">www.pepperl-fuchs.com</a> .

Release date 2018-06-19 07:42 Data of facts 2018-06-19 13:09:50\_eng.wml

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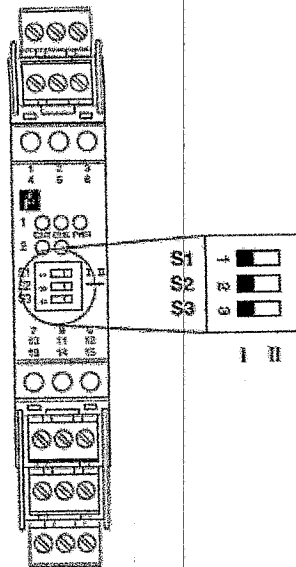
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## Configuration



## Switch position

S	Function	Position
1	Mode of operation Output I (relay) energized	with high input current I
		with low input current II
2	Mode of operation Output II (relay) energized	with high input current I
		with low input current II
3	Line fault detection	ON I
		OFF II

## Operating status

Control circuit	Input signal
Initiator high impedance/ contact opened	low input current
Initiator low impedance/ contact closed	high input current
Lead breakage, lead short-circuit	Line fault

Factory settings: switch 1, 2 and 3 in position I

## Accessories

### Power feed module KFD2-EB2

The power feed module is used to supply the devices with 24 V DC via the Power Rail. The fuse-protected power feed module can supply up to 150 individual devices depending on the power consumption of the devices. Collective error messages received from the Power Rail activate a galvanically-isolated mechanical contact.

### Power Rail UPR-03

The Power Rail UPR-03 is a complete unit consisting of the electrical insert and an aluminium profile rail 35 mm x 15 mm. To make electrical contact, the devices are simply engaged.

### Profile Rail K-DUCT with Power Rail

The profile rail K-DUCT is an aluminum profile rail with Power Rail insert and two integral cable ducts for system and field cables. Due to this assembly no additional cable guides are necessary.



*Power Rail and Profile Rail must not be fed via the device terminals of the individual devices!*

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

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