

Transmitters, Head-mounted Transmitters, Trip Amplifiers, Switch Amplifiers, RC Unit Snubber

For the conversion of sensor signals to current signals and protection of contacts against overload

Type ELM

KSR KUEBLER GmbH • Datasheet ELM

Applications

- Accessories for use with sensors and switches

Special features

- Explosion protection optional for some units

Description

Transmitters

Transmitters convert a resistance input into a proportional analogue respectively digital output. They can be installed in the sensor head (head-mounted) or in a cabinet (rail-mounted). Transmitters are used with level sensors.

Trip amplifiers

The set point relays monitor trip limits in measurements using current/voltage signals. These signals can be generated by level transmitters. Set point relays can be configured using DIP switches and potentiometers

Switch amplifiers

Switch amplifiers are used to switch higher currents. A binary switch connected to the control circuit on the input triggers the relay with a higher contact rating. This increases service life considerably. The output relay is voltage-free. Inputs are safely separated from outputs and supply voltage. Switch amplifiers are temperature stabilised and guarantee reliable switching operation.



RC Unit Snubbers

RC-unit snubbers are used to suppress voltage peaks in AC circuits. They protect the contacts of a float switch or magnetic switch.



Overview Transmitters, rail-mounted






Type	T15.R-ZZ-LVL Page 5	T15.R-AI-LVL Page 5	 T32.3S.000-LVL Page 6	T32.3S.01S-LVL Page 6	
Mounting	Cabinet DIN rail				
Voltage supply	DC 8 V ... 35 V	DC 30 V	DC 10.5 V ... 42 V	DC 10.5 V ... 30 V	
Input	1 kOhm...50 kOhm Potentiometer		10 kOhm...100 kOhm Potentiometer		
Output	4 mA ... 20 mA		4 mA ... 20 mA, HART 5 (HART 7 optional)		
Temperature	-40 °C ... +85 °C				
Ex approval		Ex ia IIC		Ex ia IIC	
Dimensions	17.5 mm x 99 mm x 113,6 mm				
additional features	programmable				

Type	MUL-D21 Page 7	MUL-D23 Page 7	MUL-D41 Page 8	MUL-D43 Page 8
Mounting	Cabinet DIN rail			
Voltage supply	DC 18 V ... 36 V	AC 230 V	DC 18 V ... 36 V	AC 230 V
Input	1 kOhm...100 kOhm Potentiometer			
Output	4 mA ... 20 mA 2x Contact SPST AC 230 V, 2 A		4 mA ... 20 mA 4x Contact SPST AC 230 V, 2 A	
Temperature	0 °C ... +55 °C			
Ex approval				
Dimensions	45 mm x 75 mm x 110 mm		55 mm x 75 mm x 110 mm	
additional features	programmable, LED display			

Overview Transmitters, head-mounted



Type	T15.H-ZZ-LVL Page 9	T15.H-AI-LVL Page 9	 T32.1S.000-LVL Page 10	T32.1S.0IS-LVL Page 10
Mounting	Sensor head			
Voltage supply	DC 8 V ... 35 V	DC 30 V	DC 10.5 V ... 42 V	DC 10.5 V ... 30 V
Input	1 kOhm...50 kOhm Potentiometer		10 kOhm...100 kOhm Potentiometer	
Output	4 mA ... 20mA		4 mA ... 20mA, HART 5 (HART 7 optional)	
Temperature	-40 °C ...+85 °C		-40 °C ...+85 °C	
Ex approval		Ex ia IIC		Ex ia IIC
Dimensions	OD 44 mm H 22.5 mm		OD 49.5 mm H 28.5 mm	
additional features			programmable	

Type	T53.10.01S Page 11	TS Page 12	TE Page 12	 TLEH Page 13	
Mounting	Sensor head				
Voltage supply	DC 8 V... 32 V AC 8 V ... 28 V	DC 11 V ... 30 V		DC 11 V ... 30 V	
Input	1 kOhm...100 kOhm Potentiometer	1 kOhm ... 100 kOhm Potentiometer		1 kOhm ... 100 kOhm Potentiometer	
Output	PROFIBUS FOUNDATION Fieldbus	4 mA ... 20mA		4 mA ... 20mA, HART- compatible	
Temperature	-40 °C ...+85 °C	-20 °C ...+65 °C	-20 °C ...+130 °C	-20 °C ...+130 °C	
Ex approval	Ex ia IIC		Ex ia IIC	Ex ia IIC	
Dimensions	OD 44 mm H 25 mm	OD 44 mm H 20 mm		OD 60 mm H 28 mm	
additional features				programmable, LCD display	

Overview Trip Amplifiers, rail-mounted

Type	Trip amplifier KFD2-GS-1.2W Page 14
Mounting	Cabinet DIN rail
Voltage supply	DC 20 V ... 30 V
Input	0 mA ... 20 mA , 4 mA ... 20 mA 0 V ... 10 V , 2 V ... 10 V
Output	2x Contact SPDT AC 250 V, 4 A
Temperature	0 °C ... +50 °C
Ex approval	
Dimensions	20 mm x 124 mm x 150 mm
additional features	

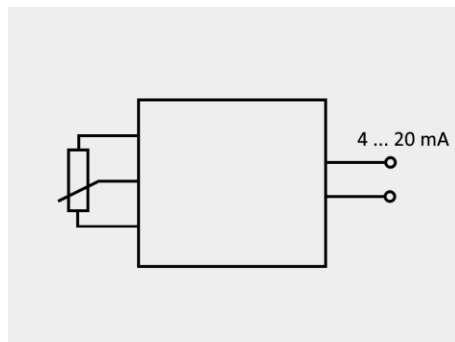
Overview Switch Amplifiers, rail-mounted

Type	KFA6-ER-1.6 Page 15	KFD2-ER-1.6 Page 15	KFA6-SR2-Ex2.W Page 16	KFD2-SR2-Ex2.W Page 16
Mounting	Cabinet DIN rail			
Voltage supply	AC 207 V ... 253 V	DC 20 V ... 30 V	AC 207 V ... 253 V	DC 20 V ... 30 V
Input	1 channel Max. AC 10 V (approx. 1 Hz) Max 5 mA		2 channels DC 8 V 8 mA	
Output	1x Contact SPDT AC 253 V / 2 A DC 40 V / 2 A		2x Contact SPDT AC 253 V / 2 A DC 40 V / 2 A	
Temperature	-20 °C ... +60 °C		-20 °C ... +60 °C	
Ex approval			Ex ia IIC	
Dimensions	20 mm x 107 mm x 115 mm		20 mm x 119 mm x 115 mm	
additional features				

Overview RC Unit Snubbers

Type	A3/24 Page 17	A3/230 Page 17	B3/115 Page 17	B3/230 Page 17
Resistance	100 Ohm	1000 Ohm	470 Ohm	820 Ohm
Capacitance	0,33µF			
Voltage	AC 24V	AC 230V	AC 115 V	AC 230 V
Ex approval				
Dimensions	Ø20 x 42 mm			
additional features	for contacts 10 – 40VA		for contacts 40 – 100 VA	

Transmitter T15.R, rail-mounted

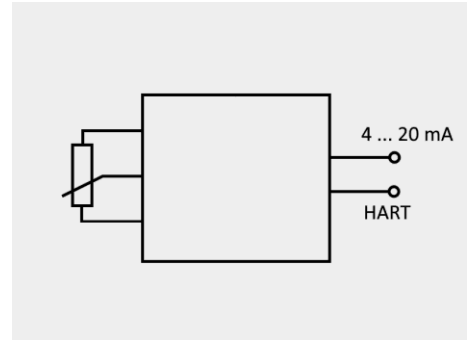


Technical data		Type T15.R-ZZ-LVL	Type T15.R-AI-LVL
Voltage supply	Supply voltage	DC 8 V ... 35 V	DC 30 V
	Power consumption		ia 800 mW ic 750 mW
Input	Potentiometer resistance	1 kOhm...50 kOhm	
Max values acc. to Declaration of conformity	Approval number Group, category, ignition protection type Max. Voltage U ₀ Max. Current I ₀ Max. Power P ₀		BVS 15 ATEX E 139 X II 1G Ex ia IIC II 1D Ex ia IIIC DC 30 V 6.1 mA 46 W
		Output	Available designs
Galvanic Isolation	Input – Output	Available	
	Input – Mains/ Output - Mains	Available	
Ambient conditions	Operating temperature	-40 °C ...+85 °C	-40 °C ...+85 °C (T4) -40 °C ...+70 °C (T5) -40 °C ...+55 °C (T6)
	Ingress protection	IP 20	
Mechanical data	Design	Terminal case in plastic	
	Dimensions Mounting Connection terminal Weight	W x H x D 17.5 mm x 99 mm x 113,6 mm 35 mm DIN rail Screw terminal 0.14 ... 2.5 mm ² approx. 200 g	
Article number		14154577	14350799

Application

Generation of a 4-20mA signal on FLR and BLR and mounting in a cabinet. Settings can be changed using the WIKAssoft-TT software and the programming unit PU-448 or PU-548. The output signal is passive and an external power supply is required.

Transmitters T32.3S, rail-mounted HART Protocol

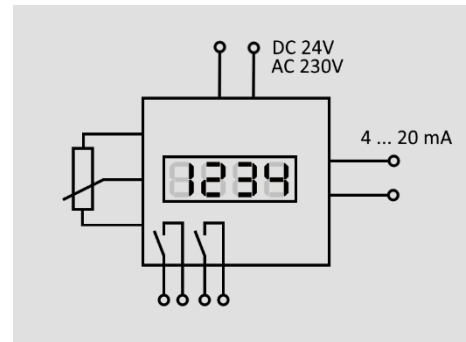


Technical data		Type T32.3S.000-LVL	Type T32.3S.01S-LVL
Voltage supply	Supply voltage	DC 10.5 V ... 42 V	DC 10.5 V ... 30 V
Input	Potentiometer resistance	10 kOhm...100 kOhm	
Max values acc. to Declaration of conformity	Approval number Group, category, ignition protection type Max. Voltage U ₀ Max. Current I ₀ Max. Power P ₀		BVS 08 ATEX E 019 X II 1G Ex ia IIC II 1D Ex iaD 20 6.5 V DC 9.3 mA 15.2 mW
Output	Available designs	4 mA ... 20 mA, HART 5 (HART 7 optional)	
Galvanic Isolation	Input – Output Input – Mains/ Output - Mains	Available Available	
Ambient conditions	Operating temperature	-40 °C ...+85 °C	-40 °C ...+85 °C (T4) -40 °C ...+75 °C (T5) -40 °C ...+60 °C (T6)
	Ingress protection	IP 20	
Mechanical data	Design Dimensions Mounting Connection terminal Weight	Terminal case in plastic W x H x D 17.5 mm x 99 mm x 113,6 mm 35 mm DIN rail Screw terminal 0.14 ... 2.5 mm ² approx. 200 g	
Additional features		programmable	
Article number		14350806	14350808

Application

Generation of a 4-20mA signal with HART on FLR and BLR and mounting in a cabinet. The output signal can be adjusted to any tank shape. Settings can be changed using HART. The output signal is passive and an external power supply is required.

Transmitters MUL-D2x, rail-mounted LED display, 2 switch points



Technical data		Type MUL-D21	Type MUL-D23
Voltage supply	Supply voltage Power consumption	DC 18 V... 36 V approx. 2,4 W	AC 230 V approx. 3,2 VA
Input	Potentiometer resistance	1 kOhm...100 kOhm	
Analogue output	Current output max load Voltage output	0 mA ... 20 mA , 4 mA ... 20 mA ≤ 400 Ohm 0 V ... 10 V	
Switch output		2x Contact SPST AC 230 V, 2 A	
Display		4 digit display 7-segment LED	
Ambient conditions	Operating temperature Ingress protection	0 °C ...+55 °C Casing IP 40 Terminals IP 20	
Mechanical data	Design Dimensions Mounting Weight	Casing ABS, light grey, UL94-HB W x H x D 45 mm x 75 mm x 110 mm 35 mm DIN rail approx. 320g	
Additional features		programmable	
Attention!		Use shielded circuit only (EMC)	
Article number		128710	130741

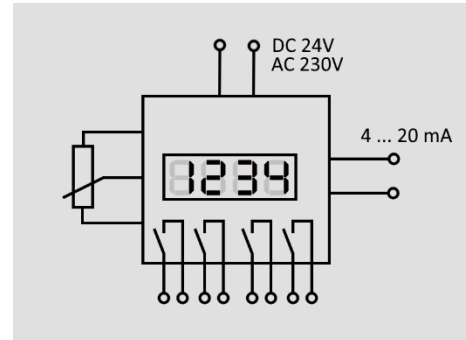
Application

Generation of a 4-20mA signal on FLR and BLR and mounting in a cabinet. In addition, the unit features a digital display and 2 programmable switch points. Settings can be changed via push buttons on the front panel.

As an option the output signal can be adjusted to any tank shape. The output is then proportional to the volume.

Transmitters MUL-D4x, rail-mounted

LED display, 4 switch points



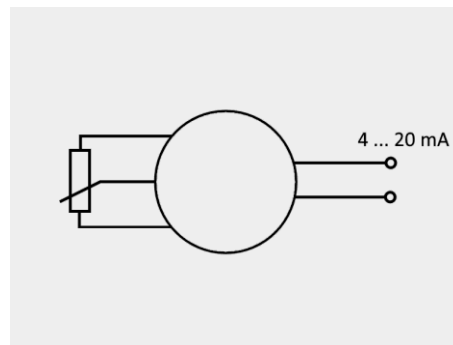
Technical data		Type MUL-D41	Type MUL-D43
Voltage supply	Supply voltage Power consumption	DC 18 V... 36 V approx. 2,4 W	AC 230 V approx. 3,2 VA
Input	Potentiometer resistance	1 kOhm...100 kOhm	
Analogue output	Current output max. load Voltage output	0 mA ... 20 mA , 4 mA ... 20 mA ≤ 400 Ohm 0 V ... 10 V	
Switch output		4x Contact SPST AC 230 V, 2 A	
Display		4 digit display 7-segment LED	
Ambient conditions	Operating temperature Ingress protection	0 °C ...+55 °C Casing IP 40 Terminals IP 20	
Mechanical data	Design Dimensions Mounting Weight	Casing ABS, light grey, UL94-HB W x H x D 55 mm x 75 mm x 110 mm 35 mm DIN rail approx. 320g	
Additional features		programmable	
Attention!		Use shielded circuit only (EMC)	
Article number		129049	129484

Application

Generation of a 4-20mA signal on FLR and BLR and mounting in a cabinet. In addition, the unit features a digital display and 4 programmable switch points. Settings can be changed via push buttons on the front panel.

As an option the output signal can be adjusted to any tank shape. The output is then proportional to the volume.

Transmitters T15.H, head-mounted

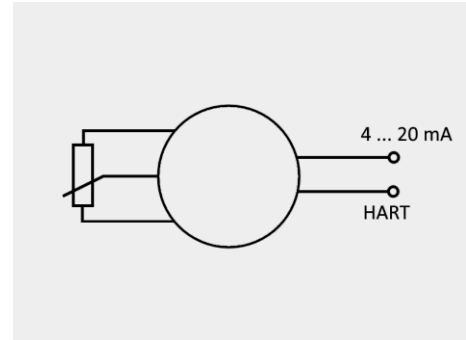


Technical data		Type T15.H-ZZ-LVL	Type T15.H-AI-LVL
Voltage supply	Supply voltage Power consumption	DC 8 V... 35 V	DC 30 V ia 800 mW ic 750 mW
Input	Potentiometer resistance	1 kOhm...50 kOhm	
Max values acc. to Declaration of conformity	Approval number Group, category, ignition protection type Max. Voltage U ₀ Max. Current I ₀ Max. Power P ₀		BVS 15 ATEX E 139 X II 1G Ex ia IIC II 1D Ex ia IIIC DC 30 V 6.1 mA 46 W
Output	Available designs	4 mA ... 20 mA	
Galvanic Isolation	Input – Output Input – Mains/ Output - Mains	Available Available	
Ambient conditions	Operating temperature	-40 °C ...+85 °C)	-40 °C ...+85 °C (T4) -40 °C ...+70 °C (T5) -40 °C ...+55 °C (T6)
Mechanical data	Design Dimensions Connection terminal Weight	Terminal case in plastic OD 44 mm H 22.5 mm Screw terminal 0.14 ... 2.5 mm ² approx. 45g	
Article number		14350784 (with mounting base for A105)	14350792 (with mounting base for A105)

Application

Generation of a 4-20mA signal on FLR and BLR and mounting in the sensor head. Settings can be changed using the WIKAsoft-TT software and the programming unit PU-448 or PU-548.

Transmitters T32.1S, head-mounted HART Protocol

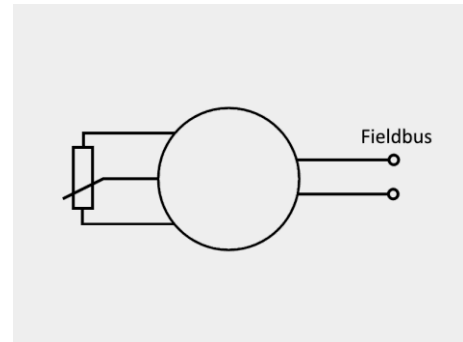


Technical data		Type T32.1S.000-LVL	Type T32.1S.01S-LVL
Voltage supply	Supply voltage	DC 10.5 V ... 42 V	DC 10.5 V ... 30 V
Input	Potentiometer resistance	10 kOhm...100 kOhm	
Max values acc. to Declaration of conformity	Approval number Group, category, ignition protection type Max. Voltage U_0 Max. Current I_0 Max. Power P_0		BVS 08 ATEX E 019 X II 1G Ex ia IIC II 1D Ex iaD 20 6.5 V DC 9.3 mA 15.2 mW
Output	Available designs	4 mA ... 20 mA, HART 5 (HART 7 optional)	
Galvanic Isolation	Input – Output Input – Mains/ Output - Mains	Available Available	
Ambient conditions	Operating temperature	-40 °C ...+85 °C	-40 °C ...+85 °C (T4) -40 °C ...+75 °C (T5) -40 °C ...+60 °C (T6)
Mechanical data	Design Dimensions Connection terminal Weight	Terminal case in PBT, glass-fibre reinforced OD 49.5 mm H 28.5 mm Screw terminal 0.14 ... 2.5 mm ² approx. 70g	
Additional features		programmable	
Article number		14350804 (with mounting base for A105)	14350805 (with mounting base for A105)

Application

Generation of a 4-20mA signal with HART on FLR and BLR and mounting in the sensor head. The output signal can be adjusted to any tank shape. The output is then proportional to the volume. Settings can be changed using HART.

Transmitters T53.10. head-mounted Profibus, Foundation Fieldbus

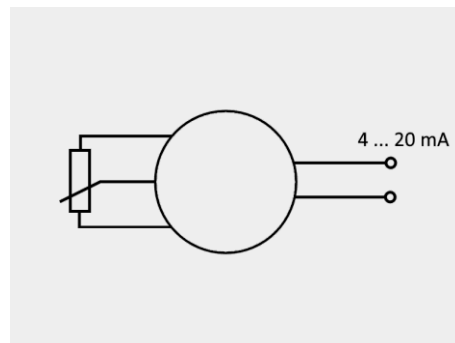


Technical data		Type T53.10.01S
Voltage supply	Supply voltage	DC 8 V... 32 V AC 8 V ... 28 V
Input	Potentiometer resistance	1 kOhm...100 kOhm
Max values acc. to Declaration of conformity	Approval number Group, category, ignition protection type Max. Voltage U_0 Max. Current I_0 Max. Power P_0	KEMA 06 ATEX 0148 See WIKA datasheet TE 53.01
Output	Available designs	FOUNDATION Fieldbus PROFIBUS
Galvanic Isolation	Input – Output Input – Mains/ Output - Mains	Available Available
Ambient conditions	Operating temperature	See WIKA datasheet TE 53.01
Mechanical data	Design Dimensions Connection terminal Weight	Terminal case in PBT, glass-fibre reinforced OD 44 mm H 25 mm Screw terminal 0.14 ... 1.5 mm ² approx. 50g
Article number		025727 (without mounting base)

Application

Generation of a bus signal for FOUNDATION Fieldbus or Profibus on FLR and BLR and mounting in the sensor head. Settings can be changed using the bus.

Transmitters TS / TE, head-mounted

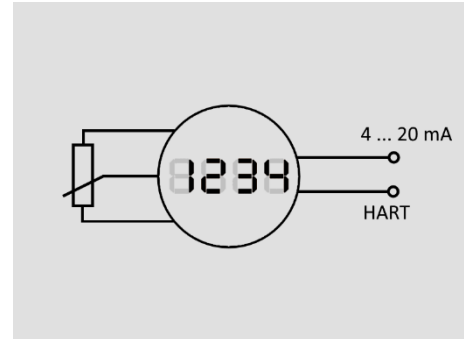



Technical data		Type TS	Type TE
Voltage supply	Supply voltage	DC 11 V ... 30 V	
Input	Potentiometer resistance	1 kOhm...100 kOhm	
Output	Output signal max. load	4 mA ... 20 mA 1000 Ohm U _B DC 30 V 700 Ohm U _B DC 24 V 50 Ohm U _B 12 V DC	
	Zero point setting	± 5 %	
	Measurement range setting	75 % ... 100 %	
	Accuracy	0.15 %	
Approval			LCIE 05 ATEX 6006 X II 1G Ex ia IIC T6 ... T4 U _i < 30 V I _i < 101 mA P _i < 758 mW or U _i < 28.4 V I _i < 116 mA P _i < 824 mW
Ambient conditions	Ambient temperature	-20 °C ... +60 °C	max. 80 °C (T6) max. 95 °C (T5) max. 130°C (T4)
	Ingress protection	IP 20	
Mechanical data	Design Dimensions Mounting Weight	Fully potted OD 44 mm H 20 mm Head-mounted approx. 40 g	
Attention!		Use shielded circuit only (EMC)	
Article number		005894 (without mounting base) 112971 (with mounting base A105)	014832 (without mounting base) 112969 (with mounting base A105)

Application

Generation of a 4-20mA signal on FLR and BLR and mounting in the sensor head. Settings can be changed using potentiometers.

Transmitters TLEH, head-mounted

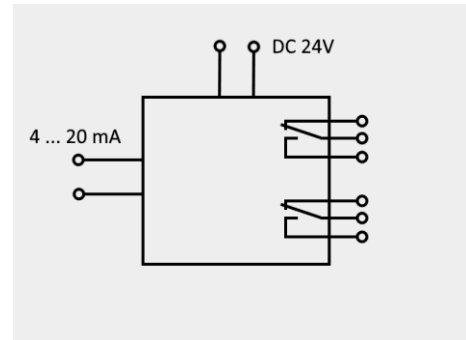
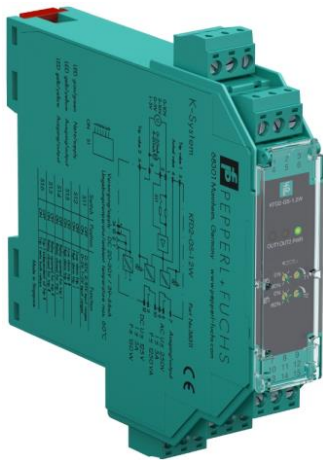


Technical data		Type TLEH 
Voltage supply	Supply voltage	DC 11 V ... 30 V
Input	Potentiometer resistance	1 kOhm...100 kOhm
Output	Output signal max. load Zero point setting Measurement range setting Accuracy	4 mA ... 20 mA, HART-compatible 1000 Ohm U_B DC 30 V 700 Ohm U_B DC 24 V 50 Ohm U_B 12 V DC $\pm 5\%$ 75 % ... 100 % 015 %
Approval		LCIE 05 ATEX 6006 X II 1G Ex ia IIC T6 ... T4 $U_i < 30\text{ V}$ $I_i < 101\text{ mA}$ $P_i < 758\text{ mW}$ or $U_i < 28,4\text{ V}$ $I_i < 116\text{ mA}$ $P_i < 824\text{ mW}$
Ambient conditions	Ambient temperature Ingress protection	-20 °C ... +60 °C (T6 ... T4) IP 20
Mechanical data	Design Dimensions Mounting Weight	Fully potted OD 60 mm H 28 mm Head-mounted approx. 70 g
Additional features		programmable
Attention!		Use shielded circuit only (EMC)
Article number		021104

Application

Generation of a 4-20mA signal with HART on FLR and BLR and mounting in the sensor head. Settings can be changed using HART or the buttons and switches on the front panel.

Trip Amplifiers KFD2-GS-1.2W, rail-mounted

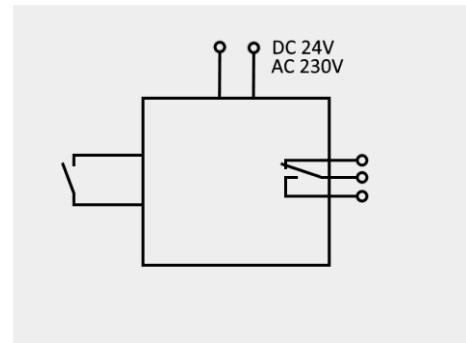
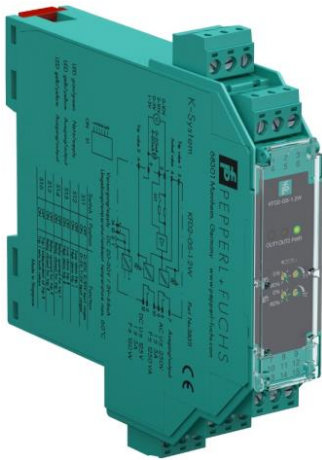


Technical data		Type KFD2-GS-1.2W
Voltage supply	Supply voltage	DC 20 V ... 30 V
	Power consumption	approx. 2,25 W
Input	Current input	0 mA ... 20 mA , 4 mA ... 20 mA
	Voltage input	0 V ...10 V , 2 V ...10 V
Output	Contact rating	2x Contact SPDT AC 250 V, 4 A
Ambient conditions	Operating temperature	0 °C ...+50 °C
	Storage temperature	-30 °C ...+70 °C
	Ingress protection	IP 20
Mechanical data	Design	Casing ABS, UL94 HB / 1,6
	Dimensions	W x H x D 20 mm x 124 mm x 150 mm
	Mounting	35 mm DIN rail or wall-mount with 2 screws
	Weight	approx. 320g
Article number		123805

Application

Generation of switch points out of a 4-20mA signal from a FLR or BLR. The unit will be mounted in a cabinet. Settings can be changed using potentiometers and DIP switches on the front panel.

Switch Amplifiers KF..-ER-1.6, rail-mounted

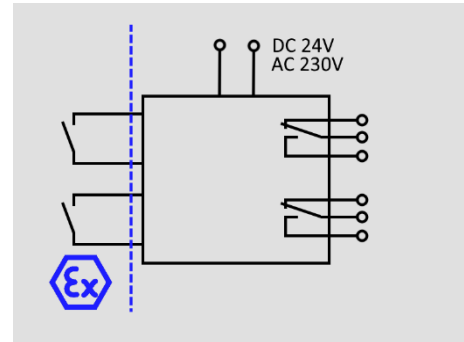


Technical data		Type KFA6-ER-1.6	Type KFD2-ER-1.6
Voltage supply	Supply voltage Power consumption	AC 207 ... 253 V, 45 Hz ... 65 Hz ≤ 0.8 W	DC 20 ... 30 V ≤ 0.8 W
Input	Max. Voltage Max. Current	1 channel (ON/OFF) or dual input (Min-Max) AC 10 V (approx. 1 Hz) 5 mA	
Output	Contact rating AC Contact rating DC Time delay	1x Contact SPDT AC 253 V / 2 A / $\cos\phi > 0.7$ DC 40 V / 2 A approx. 1 s	
Transfer properties	Switching frequency	≤ 10 Hz	
Galvanic Isolation	Mains - Output Mains - Input Input - Output	Safe galvanic isolation acc. to DIN 106 Rated insulation voltage 253 V _{eff}	
Ambient conditions	Operating temperature Ingress protection	-20 °C ... +60 °C IP 20	
Mechanical data	Mounting Dimensions Connection terminal Weight	35 mm DIN rail W x H x D 20 mm x 107 mm x 115 mm max. 2.5 mm ² approx. 110g	
Article number		124341	123806

Application

Switch amplifiers as protection for reed contacts or to increase the contact rating. The unit is especially suited for use with FLS, CLS, MSA and BGU. It will be mounted in a cabinet. It can either be used for simple switch action or min-max control.

Switch Amplifiers KF..-SR2-Ex2.W, rail-mounted



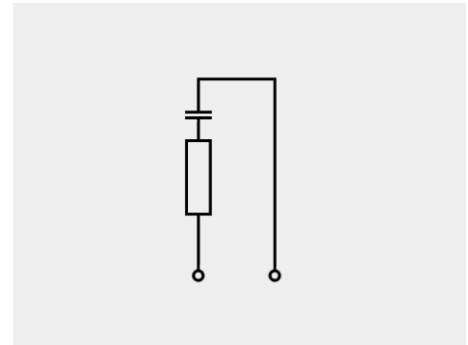
Technical data		Type KFA6-SR2-Ex2.W	Type KFD2-SR2-Ex2.W
Voltage supply	Supply voltage Power consumption	AC 207 ... 253 V, 45 ... 65 Hz ≤ 1,3 W	DC 20 V ... 30 V ≤ 1,3 W
Input	Open circuit voltage Short-circuit current	2 channels (ON/OFF) approx. DC 8 V approx. 8 mA	
Max values acc. to Declaration of conformity	Approval number Group, category, ignition protection type Max. Voltage U ₀ Max. Current I ₀ Max. Power P ₀	PTB 00 ATEX 2081 II (1)G [Ex ia Ga] IIC II (1)D [Ex ia Da] IIIC I (M1) [Ex ia Ma] I 10.6 V 19.1 mA 51 mW	PTB 00 ATEX 2080 II (1)G [Ex ia Ga] IIC II (1)D [Ex ia Da] IIIC I (M1) [Ex ia Ma] I 10.5 V 13 mA 34 mW
Output	Contact rating AC Contact rating DC Mechanical life time Time delay	2x Contact SPDT AC 253 V / 2 A / cosφ > 0.7 DC 40 V / 2 A / resistive load 10 ⁷ switch cycles ≥ 20ms	
Ambient conditions	Operating temperature Ingress protection	-20 °C ... +60 °C IP 20	
Mechanical data	Mounting Dimensions Connection terminal Weight	35 mm DIN rail W x H x D 20 mm x 119 mm x 115 mm max. 2.5 mm ² approx. 150g	
Article number		123794	124344

Application

Switch amplifiers as protection for reed contacts in intrinsically safe circuits. The unit is especially suited for use with FLS, CLS, MSA and BGU. It will be mounted in a cabinet.

RC Unit Snubber

To suppress voltage peaks



Technical data	Type A3/24	Type A3/230	Type B3/115	Type B3/230
Resistance	100 Ohm	1000 Ohm	470 Ohm	820 Ohm
Capacitance	0,33 μ F			
Voltage	AC 24V	AC230V	AC 115 V	AC 230 V
Usage	for contacts 10 – 40VA		for contacts 40 – 100 VA	
Dimensions	OD20 x 42 mm Flying leads PVC AWG 18/19, 100/150 mm long			
Article number	124504	119814	126529	126530

Application

Suppression of voltage peaks in circuits with inductive load. Suitable for reed contacts 10VA to 100VA

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