

## Switch Amplifier, Timer Relay KFU8-SR-1.3L.V

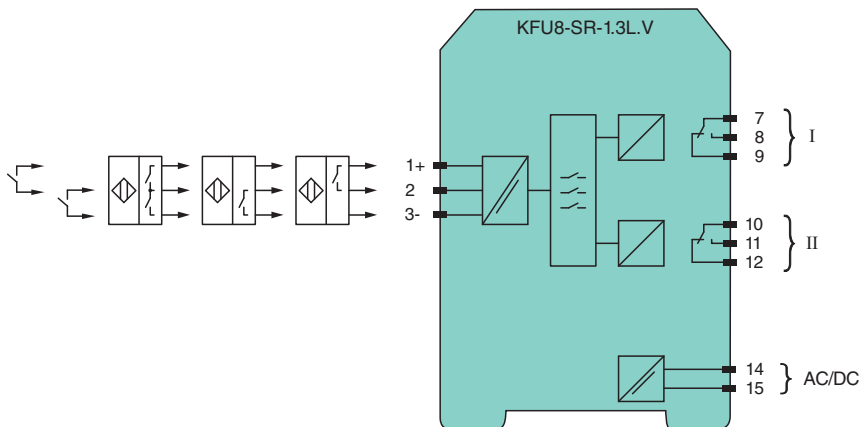
- 1-channel signal conditioner
- Universal usage at different power supplies
- 3-wire PNP/NPN sensor or push-pull input
- 2 relay contact outputs
- Adjustable energized/de-energized delay
- Up to SIL 2 (SC 3) acc. to IEC/EN 61508



### Function

This signal conditioner converts the state of 3-wire sensors (PNP or NPN) or sensors with push-pull output stages into two relay outputs. It has one input and two form C changeover relay outputs. The switch amplifier has an adjustable energized/de-energized delay for the relay outputs. The start-up time of the device is as long as the time setting value + 500 ms.

### Connection



### Technical Data

#### General specifications

Signal type Digital Input

#### Functional safety related parameters

Safety Integrity Level (SIL) SIL 2

Systematic capability (SC) SC 3

#### Supply

Connection terminals 14, 15

Rated voltage  $U_r$  20 ... 48 V DC or 90 ... 253 V AC , 45 ... 65 Hz

Rated current  $I_r$  ≤ 230 mA

Power dissipation 2.3 W

Power consumption max. 4.5 W

#### Input

## Technical Data

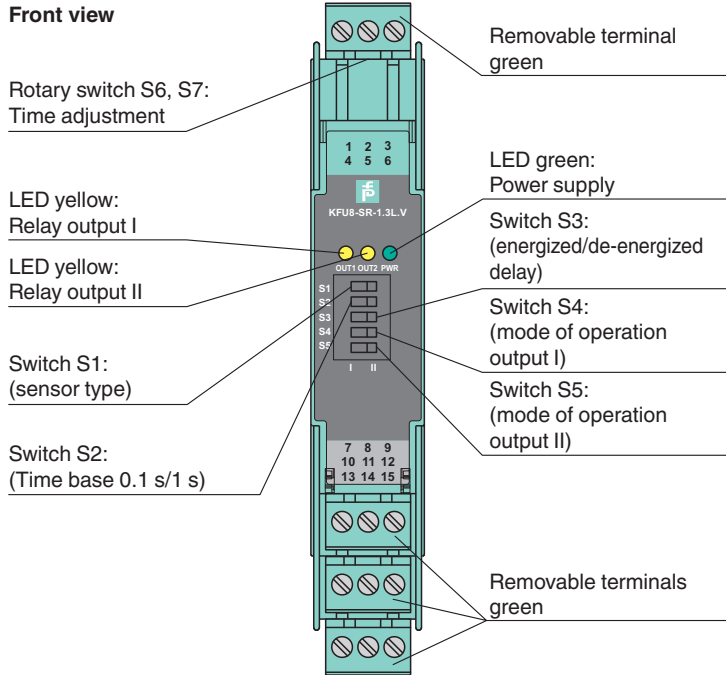
Connection side	field side
Connection	terminals 1+, 2, 3-
Rated values	22 ... 24 V DC / 100 mA , see additional information
Short-circuit current	max. 125 mA
Switching point	PNP: 0-signal: < 12.5 V 1-signal: > 13.5 V NPN and push-pull output: 0-signal: < 4.5 V 1-signal: > 5.5 V
<b>Output</b>	
Connection side	control side
Connection	output I: terminals 7, 8, 9 output II: terminals 10, 11, 12
Output I, II	signal, relay
Contact loading	250 V AC / 2 A / $\cos \phi \geq 0.7$ ; 125 V AC/4 A/ $\cos \phi > 0.7$ ; 40 V DC / 2 A
Mechanical life	20 x 10 <sup>6</sup> switching cycles
Electrical life	0.2 x 10 <sup>6</sup> switching cycles (40 V DC, 2 A, ohmic) 0.4 x 10 <sup>6</sup> switching cycles (253 V AC, 2 A, $\cos \phi = 1$ ) 0.25 x 10 <sup>9</sup> switching cycles (253 V AC, 2 A, $\cos \phi = 0.7$ )
Minimum load	50 mW, 5 V DC
Energized/De-energized delay	≤ 90 ms / ≤ 90 ms
<b>Transfer characteristics</b>	
Switching frequency	≤ 5 Hz for delay 0 s adjustable energized/de-energized delay: 0 ... 79 s
<b>Galvanic isolation</b>	
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>
<b>Indicators/settings</b>	
Display elements	LEDs
Control elements	DIP switch
Configuration	via DIP switches
Labeling	space for labeling at the front
<b>Directive conformity</b>	
Electromagnetic compatibility	
Directive 2014/30/EU	EN 61326-1:2013 (industrial locations)
Low voltage	
Directive 2014/35/EU	EN 61010-1:2010
<b>Conformity</b>	
Electromagnetic compatibility	NE 21:2012
Degree of protection	IEC 60529:2001
<b>Ambient conditions</b>	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
<b>Mechanical specifications</b>	
Degree of protection	IP20
Connection	screw terminals
Mass	approx. 166 g
Dimensions	20 x 119 x 115 mm (0.8 x 4.7 x 4.5 inch) (W x H x D) , housing type B2
Mounting	on 35 mm DIN mounting rail acc. to EN 60715:2001
<b>Data for application in connection with hazardous areas</b>	
Supply	48 V DC
Certificate	PF 10 CERT 1417 X
Marking	⊕ II 3G Ex nA nC IIC T4 Gc
Output I, II	

**Technical Data**

Contact loading	50 V AC/2 A/cos φ > 0.7; 40 V DC/1 A resistive load
Directive conformity	
Directive 2014/34/EU	EN 60079-0:2012+A11:2013 , EN 60079-15:2010
<b>General information</b>	
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> .

**Assembly**

**Front view**



Release date: 2023-11-13 Date of issue: 2023-11-13 Filename: 213968\_eng.pdf

**Additional Information**

**Function**

The single-channel switch amplifier has one input and two relay outputs (change-over contacts). The input circuit can process signals from sensors that have either PNP/NPN output transistors or push-pull outputs. If sensors have NPN or push-pull outputs, switch S1 must be set to position I. If sensors have PNP output transistors, switch S1 must be set to position II.

The output switching characteristics (switch S4 for output I, switch S5 for output II) can be selected:

- Relay activated for closed sensor contact (for pull-push outputs, contact between terminals 2 and 3 closed) – switch S4 or S5 in position I.
- Relay deactivated for open sensor contact (for pull-push outputs, contact between terminals 2 and 3 open) – switch S4 or S5 in position II.

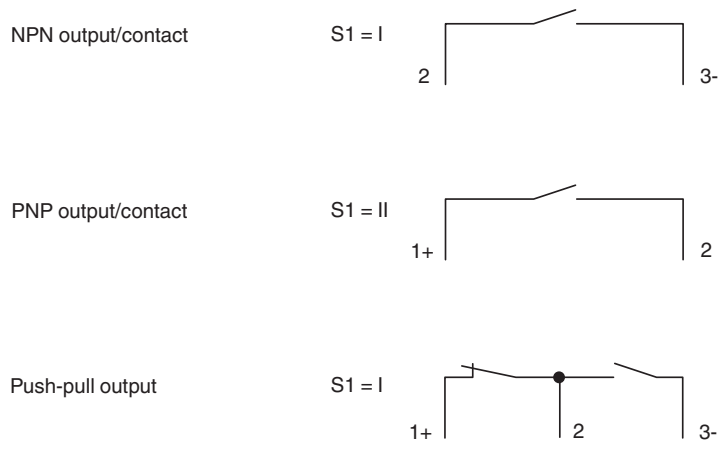
The switch amplifier has an adjustable energized/de-energized delay for the relay outputs.

Switch S3 = I activates the energized delay and switch S3 = II activates the de-energized delay. Depending on switch S2 (default time setting 0.1 s/1 s), the delay time can be set to between approx. 0.1 s and 7.9 s (for S2 = I) or between approx. 1 s and 79 s for (S2 = II) using switches S6 and S7.

The delay times add up to the shortest possible response times and have a tolerance of 10 %.

Switch S6 has a value range of 0 to 7, which is used to set the decimal power of the delay; switch S7 has a value range of 0 ... 9, which is used to set the single power of the delay. If the default time setting of S2 = I, S6 = 0 and S7 = 0, the response time constant of the switch amplifier for the undelayed slope (see switch position S3) is < 20 ms and for the delayed slope < 90 ms. These are the shortest possible response times.

**Sensor connection**



**Characteristic curve**

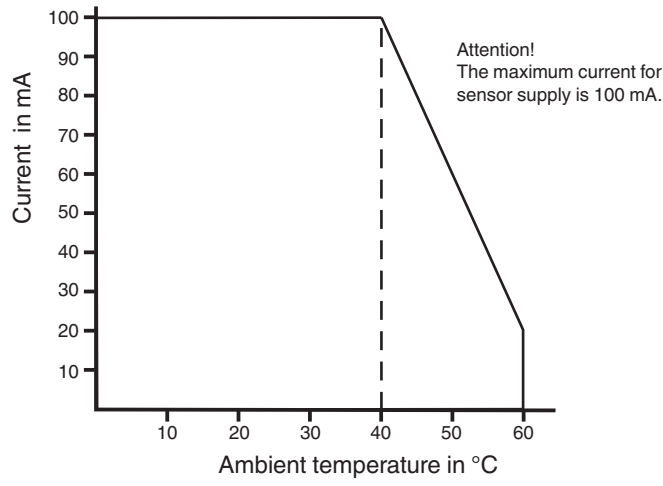
**The sensor currents are derated in line with the ambient temperature**

The maximum value of the sensor currents is controlled by a thermal overload protection on the device.



*The device measures the ambient temperature and limits the sensor currents accordingly (see figure). An inadmissibly high ambient temperature can limit the function of the sensors.*

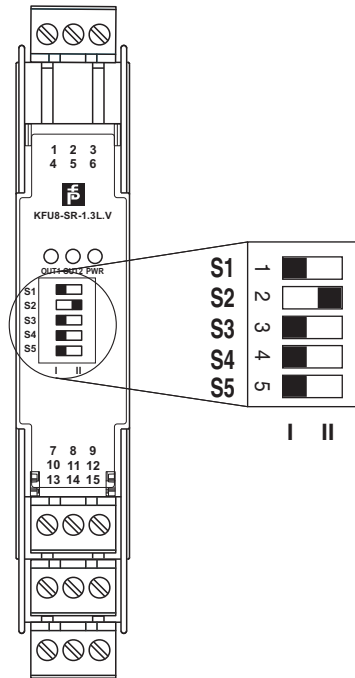
Release date: 2023-11-13 Date of issue: 2023-11-13 Filename: 213968\_eng.pdf



Release date: 2023-11-13 Date of issue: 2023-11-13 Filename: 213968\_eng.pdf

**Configuration**

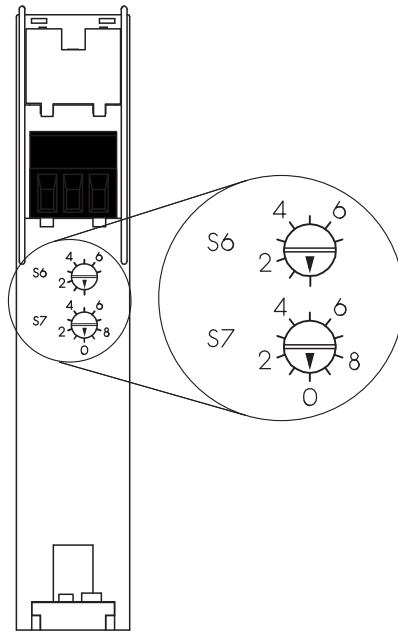
**Function of the DIP switch**



S	Function	Position
1	Sensor type	Input: Push-pull output, NO contact, NPN
		Input: PNP, NO contact
2	Default time	Default time = 0.1 s x (time setting value of switches S6 and S7)
		Default time = 1 s x (time setting value of switches S6 and S7)
3	Operating mode	ON delay, minimum input pulse length
		OFF delay, minimum output pulse length
4	Direction detection	Output I activated if sensor closed
		Output I activated if sensor open
5	Direction detection	Output II activated if sensor closed
		Output II activated if sensor open

Default setting: switches 1, 3, 4 and 5 to position I and switch 2 to position II

Function of the rotary switch



S	Function		Position
6	Time setting	Decimal value 0 ... 7 x 10 x (default time setting value of switch S2)	0 ... 7
7	Time setting	Decimal value 0 ... 9 x (default time setting value of switch S2)	0 ... 9

Default setting: switches 6 and 7 to position 0