

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



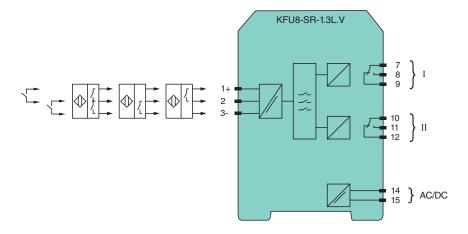


Function

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.

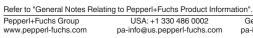
Connection



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	Ur	20 48 V DC or 90 253 V AC , 45 65 Hz
Rated current	l _r	≤ 230 mA
Power dissipation		2.3 W
Power consumption		max. 4.5 W
Input		

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 / $\cos \varphi \ge 0.7$; 125 V AC/4 A/ $\cos \varphi > 0.7$; 40 V DC / 2 A Mechanical life 20 x 10 ⁶ switching cycles Electrical life 0.2 x 10 ⁶ switching cycles (40 V DC, 2 A, ohmic) 0.4 x 10 ⁶ switching cycles (253 V AC, 2 A, $\cos \varphi = 1$) 0.25 x 10 ⁶ switching cycles (253 V AC, 2 A, $\cos \varphi = 1$) 0.25 x 10 ⁶ switching cycles (253 V AC, 2 A, $\cos \varphi = 0.7$) Minimum load 50 mW, 5 V DC Energized/De-energized delay ≤ 90 ms / ≤ 90 ms Transfer characteristics Switching frequency ≤ 5 Hz for delay 0 s adjustable energized/de-energized delay: 0 79 s Galvanic isolation Input/Output reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 Vel Input/power supply reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 Vel Output/power supply reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 Vel Output/Output reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 Vel Output/Output reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 Vel Output/Output reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 Vel Output/Output reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 Vel Output/Output reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 Vel Output/Output reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 Vel Output/Output	Technical Data	
Rated values 22 24 V DC / 100 mA , see additional information Switching point PRP	Connection side	field side
Rated values 22 24 V D C / 100 mA , see additional information max 125 mA max 125 mA Panel Pa		terminals 1+, 2, 3-
Short-circuit current		
### Switching point PNP-		
Connection control side Connection output I: terminals 7, 8, 9 output I: terminals 10, 11, 12 Output I, II signal, relay Contact loading 250 V AC/ 2 A / cos φ ≥ 0.7; 125 V AC/4 A / cos φ > 0.7; 40 V DC / 2 A Mechanical life 20 x 10° switching cycles (40 V DC, 2 A, chmic) Electrical life 0.2 x 10° switching cycles (253 V AC, 2 A, cos φ = 1) Minimum load 50 mW, 5 V DC Energized/De-energized delay ≤ 90 ms / ≤ 90 ms Transfer characteristics Strip of delay 0 salpistable energized (de-energized delay: 0 79 s Salvanic isolation Input/Output reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V _{eff} (hiput-power supply) reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V _{eff} (hiput-power supply) reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V _{eff} (hiput-power supply) reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V _{eff} (hiput-power supply) reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V _{eff} (hiput-power supply) reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V _{eff} (hiput-power supply) reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V _{eff} (hiput-power supply) reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V _{eff} (hip	Switching point	0-signal: < 12.5 V 1-signal: > 13.5 V NPN and push-pull output: 0-signal: < 4.5 V
Connection Couput I, Iseminals 7, 8, 9 Couput II, Iseminals 7, 11, 12	Output	
Coutput I, II Signal, relay	Connection side	control side
Contact loading 250 ∨ AC / 2 A / cos φ ≥ 0.7; 125 ∨ AC /4 A / cos φ > 0.7; 40 ∨ DC / 2 A Mechanical life 20 x 10° switching cycles (40 ∨ DC, 2 A, obmic) Electrical life 0.2 x 10° switching cycles (253 ∨ AC, 2 A, cos φ = 0.7) Minimum load 50 mW, 5 ∨ DC Energized/De-energized delay ≤ 90 ms / ≤ 90 ms Transfer characteristics Transfer characteristics Switching frequency ≤ 5 Hz for delay 0 s adjustable energized delay: 0 79 s Galvanic isolation Input/Output Input/Output reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V _e reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V _e output/power supply Output/Output reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V _e output/power supply Output/Output reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V _e output/power supply Output/Output reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V _e output/power supply Output/Output reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V _e output/power supply Display elements LEDs Control elements DIP switch Labeling space for	Connection	
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Output I, II		€ II 3G Ex nA nC IIC T4 Gc

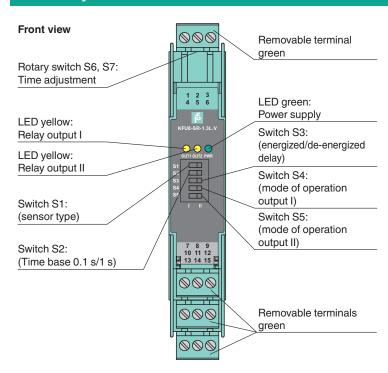


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5PEPPERL+FUCHS

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

Assembly



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.

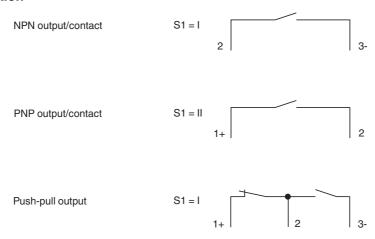
The switch amplifier has an adjustable energized/de-energized delay for the relay outputs.

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



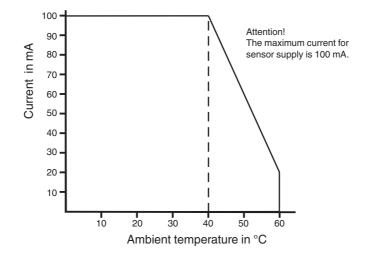
Characteristic curve

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.

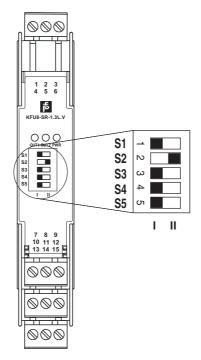


The device measures the ambient temperature and limits the sensor currents accordingly (see figure). An inadmissibly high ambient temperature can limit the function of the sensors.



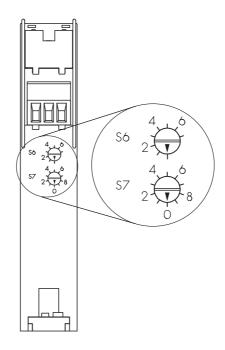
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Function of the DIP switch



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

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



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