



## Switch Amplifier KFA6-SR-2.3L

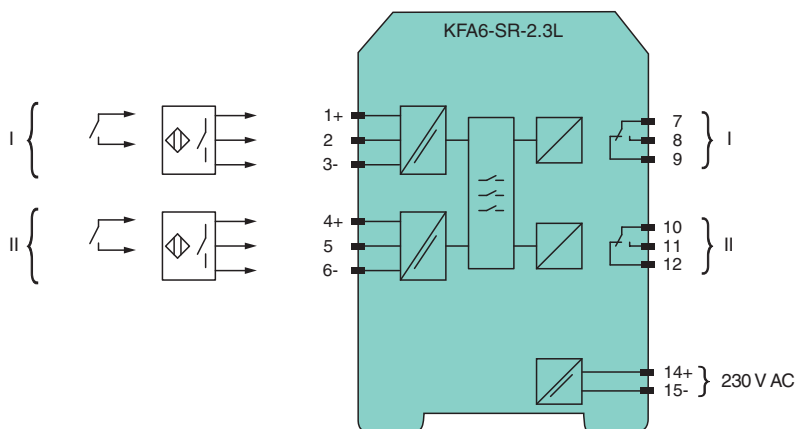
- 2-channel signal conditioner
- 115/230 V AC supply
- 3-wire PNP/NPN sensor or push-pull input
- Relay contact output
- DIP switch selectable functions
- Minimum/maximum control
- Up to SIL 2 acc. to IEC/EN 61508 / IEC/EN 61511

# CE SIL2

### Function

This signal conditioner provides the galvanic isolation between field circuits and control circuits. The device transfers the status of 2-wire and 3-wire sensors to the relay contact output. The device has 2 inputs and 2 relay contact outputs. The device can be used either as dual channel signal conditioner or as a two-point level controller. The device is easily configured by the use of DIP switches. A fault is signalized by LEDs.

### Connection



### Technical Data

#### General specifications

Signal type	Digital Input
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#### Functional safety related parameters

Safety Integrity Level (SIL)	SIL 2
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#### Supply

Connection	terminals 14, 15
Rated voltage	$U_r$ 90 ... 253 V AC , 45 ... 65 Hz
Rated current	$I_r$ ≤ 150 mA
Power dissipation	2.5 W
Power consumption	max. 7 W

#### Input

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

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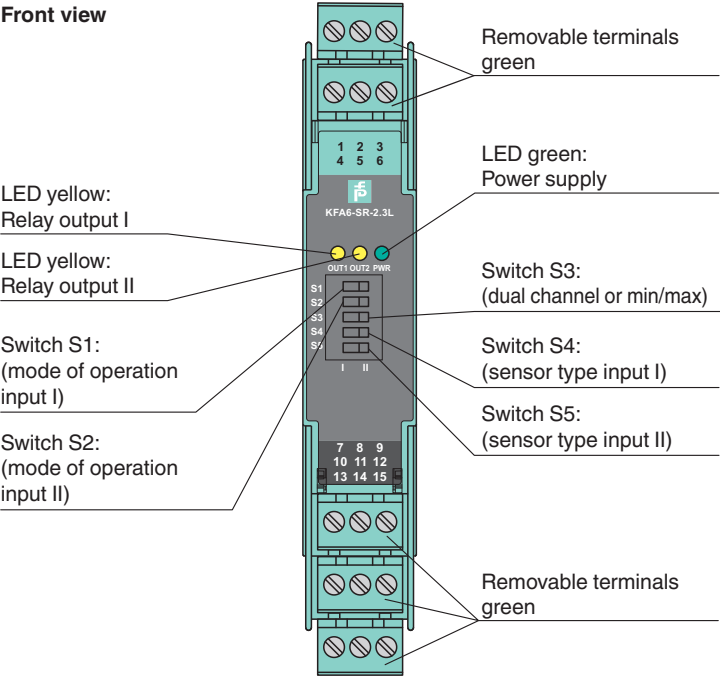
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## Technical Data


Connection side		field side
Connection		Input I: terminals 1+, 2, 3-; Input II: terminals 4+, 5, 6-
Rated values		22 ... 24 V DC / 100 mA, see notes
NPN sensor		
Switching point		4 ... 13 V
PNP sensor		
Switching point		4 ... 13 V
Short-circuit current		110 mA
Switching point		0-signal: < 5 V 1-signal: > 13 V
<b>Output</b>		
Connection side		control side
Connection		output I: terminals 7, 8, 9 output II: terminals 10, 11, 12
Output I, II		
Contact loading		250 V AC / 4 A / $\cos \phi > 0.7$ ; 40 V DC / 2 A resistive load
Energized/De-energized delay		max. 6 ms
Mechanical life		10 <sup>7</sup> switching cycles
<b>Transfer characteristics</b>		
Switching frequency		≤ 10 Hz
<b>Galvanic isolation</b>		
Input/Output		safe galvanic isolation per EN 50178, voltage peak value 253 V
Input/power supply		safe galvanic isolation per EN 50178, voltage peak value 253 V
Output/power supply		safe galvanic isolation per EN 50178, voltage peak value 253 V
Output/Output		basic insulation acc. to EN 50178, rated insulation voltage 253 V <sub>eff</sub>
<b>Indicators/settings</b>		
Display elements		LEDs
Labeling		space for labeling at the front
<b>Directive conformity</b>		
Electromagnetic compatibility		
Directive 2004/108/EC		EN 61326-1:2006
Low voltage		
Directive 2006/95/EC		EN 50178:1997
<b>Conformity</b>		
Galvanic isolation		EN 50178
Electromagnetic compatibility		NE 21
Degree of protection		IEC 60529
<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. 150 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
<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



Matching System Components

	<b>K-DUCT-GY</b>	Profile rail, wiring comb field side, gray
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Accessories

	<b>KF-ST-5GN</b>	Terminal block for KF modules, 3-pin screw terminal, green
	<b>KF-CP</b>	Red coding pins, packaging unit: 20 x 6

## Additional Information

### Function

The device has two inputs and two relay outputs (change-over contact) and is usable either as dual channel isolated amplifier or as two-point control (min/max control).

The inputs are designed in a way, that the signals of sensors which have PNP or NPN output transistors as well as push-pull outputs, can be processed. In the case of sensors with push-pull outputs the switches S4 or S5 have to be set to position I. For sensors with PNP or NPN output transistors, the switches S4 or S5 have to be set to position II. The operating behaviour of the sensor can be selected: NO S1/S2 in position I; NC S1/S2 in position II.

### Dual channel switching amplifier for binary sensors or contacts

With this function (S3 in position I) contact or sensor signals from the input are transmitted to the relay output.

Parallel operation (1 input, 2 outputs)

A signal duplication can be realized by the following measures:

- Jumper terminal 2 to terminal 5.
- One sensor to input I or II.

### Two-point control (min/max control) with storage of status

On this setting (S3 in position II) the information from the two inputs is combined.

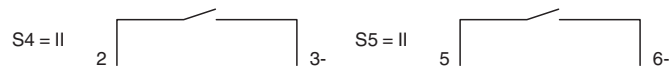
When the supply voltage is switched on, relay 1 is energised until input 2 is activated (reset input). Input 1 works as an set input.

### Truth table (min/max control)

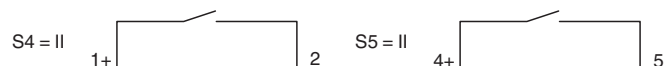
Conditions	Inputs		Outputs relay I and II
	E I	E II	
Activation of the supply voltage	not activated	not activated	relay energised
	activated	not activated	relay energised
	activated	activated	relay de-energised
Normal operation	activated	transition: not activated/activated	relay de-energising
	transition: activated/not activated	not activated	relay energising

### Sensor connection

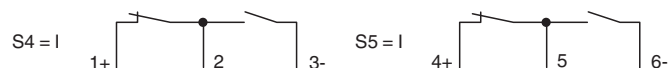
#### NPN output stage/contact



#### PNP output stage/contact



#### Push-pull output stage



### Function of the DIP switches

Function	Switch function	Switch/position
Operating behaviour of the sensor input	input 1 is activated if sensor 1 is closed	S1/I
	input 1 is activated if sensor 1 is open	S1/II
	input 2 is activated if sensor 2 is closed	S2/I
	input 2 is activated if sensor 2 is open	S2/II
Dual channel or min/max	dual channel independent	S3/I
	min/max function with storage of the status	S3/II
Sensor type	input 1: push-pull output stage, NO	S4/I
	input 1: PNP/NPN, NO	S4/II
	input 2: push-pull output stage, NO	S5/I
	input 2: PNP/NPN, NO	S5/II

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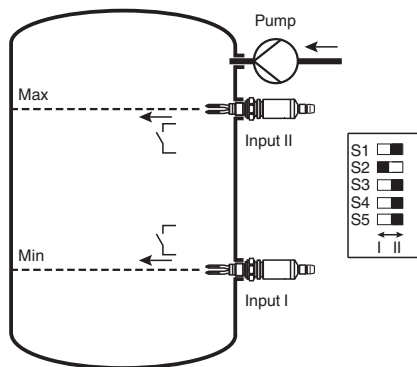
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**Example 1: filling of a vessel (two-point level control, S3 in position II)**

Min contact or min sensor is connected to input 1 (set), max contact or max sensor is connected to input 2 (reset). Switch S1 is in position I and switch S2 is in position II. A filling pump is connected to output 1 or 2 (terminals 7/8 or 10/11).

All data refer to NO sensors.



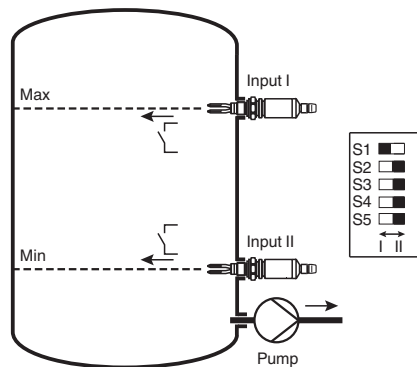
with vibration limit switch

When the supply voltage of the KFA6-SR-2.3L is switched on, the pump will also switched on as long as the Max contact is not activated. During operation the pump is switched off as soon as the level has reached max position. If the level reach min position, the pump is switched on. If the KFA6-SR-2.3L has no power supply, the pump is switched off.

**Example 2: emptying of a vessel (two-point level control, S3 in position II)**

Max contact or max sensor is connected to input 1 (set), min contact or min sensor is connected to input 2 (reset). Switch S1 is in position II and switch S2 is in position I. An emptying pump is connected to output 1 or 2 (terminals 7/9 or 10/12).

All data refer to NO sensors.



with vibration limit switch

When the supply voltage of the KFA6-SR-2.3L is switched on, the pump will also switched on, if max contact is activated. During operation the pump is switched off as soon as the level has reached min position. If the level reach max position, the pump switched on. If the KFA6-SR-2.3L has no power supply, the pump is switched on.

**Comments:**

1. NO with push-pull output stage means that the closing contact or transistor is connected to terminal 2 and 3 (5 and 6).  
NC with push-pull output stage means that the opening contact or transistor is connected to terminal 2 and 3 (5 and 6).
2. In dip switch position S3/I (dual channel, independent) an output relay is activated if the corresponding input is activated.

**Derating of the sensor currents in dependence of the ambient temperature**

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



**Attention**

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

