

# **Conductive Switch Amplifier** KFA5-ER-1.W.LB

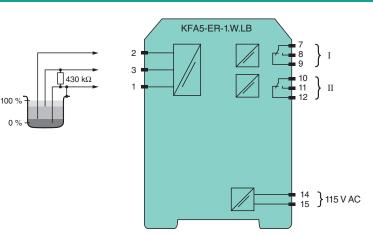
- 1-channel signal conditioner
- 115 V AC supply
- Level sensing input
- Adjustable range 1 kΩ ... 150 kΩ
- Relay contact output
- Fault relay contact output
- Adjustable time delay up to 10 s
- Minimum/maximum control
- Line fault detection (LFD)



This signal conditioner provides the AC measuring voltage for the level sensing electrodes. Once the measured medium reaches the electrodes, the unit reacts by energizing a form C changeover relay contact. The module is voltage and temperature stabilized and guarantees a defined switching characteristic. It can be used for on/off control or minimum/maximum control. A signal delay feature is available and is adjustable between 0.5 s and 10 s.

This module can also monitor the field circuit for lead breakage (LB). LB is indicated by a red LED. If LB monitoring is selected, output II serves as the fault signal output; otherwise, it will follow the function of output I.

### Connection



#### **Technical Data**

General specifications		
Signal type		Digital Input
Supply		
Connection		terminals 14, 15
Rated voltage	Ur	103.5 126 V AC , 45 65 Hz
Rated current	l <sub>r</sub>	12 mA
Power consumption		< 1.2 W
Input		
Connection side		field side
Connection		terminals 1 (mass), 2 (min), 3 (max)

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

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Technical

	Technical Data		
Output         Connection side         control side           Connection side         control side         Connection           Switching power         max. 192 W, 2000 VA           Output         Felay           Contact loading         253 V AC/2 A/cos $\phi > 0.7; 40 V DC/2 A$ resistive load           Time constant for signal damping         0.5 s, 2 s, 5 s, 10 s           Galvanic isolation         Feinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V <sub>eff</sub> Input/Doutput         Feinforced 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> Indicators/settings         IEC/EN 61010-1, rated insulation voltage 300 V <sub>eff</sub> Control elements         LEDs           Control elements         IED Powitch           potentiometer         Via potentiometer           Labeling         space for labeling at the front           Directive 2014/30/EU         EN 61326-1:2013 (industrial locations)           Low voltage         Via yother           Directive 2014/30/EU         EN 61326-1:2013 (industrial locations)           Low voltage         Via yother           Degree of protection         IEC 60529:2001           Ambient temperature	Control input	min./max. control system: terminals 1, 2, 3 on/off control system: terminals 1, 3	
Connection side         control side           Connection         Eterminals 7, 8, 9; 10, 11, 12           Switching power         max. 192 W, 2000 VA           Output         relay           Connection         253 V AC/2 A/cos $\varphi > 0.7; 40 V DC/2 A resistive load           Time constant for signal damping         0.5 s, 2 s, 5 s, 10 s           Galvanic isolation         Input/Output           Input/Output         reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 Vett           Input/Output         reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 Vett           Input/Output         reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 Vett           Indicators/settings         IEDs           Configuration         LEDs           Configuration         Via DIP switch           potentiometer         Display elements           Directive conformity         Electromagnetic compatibility           Directive 2014/30/EU         EN 61326-1:2013 (industrial locations)           Low voltage         Eventomagnetic compatibility           Directive 2014/33/EU         EN 61010-1:2010           Conformity         Electomagnetic compatibility           Degree of protection         IEC 60529:2001           Ambient confitiones$	Response sensitivity	1 150 k $\Omega$ , adjustable via potentiometer	
Connection         terminals 7, 8, 9; 10, 11, 12           Switching power         max. 192 W, 2000 VA           Output         relay           Contact loading         2853 VAC/2 A/cos qb > 0.7; 40 V DC/2 A resistive load           Time constant for signal damping         0.5 s, 2 s, 5 s, 10 s           Galvanci isolation         reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V <sub>eff</sub> Input/Dower 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> Duput/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> Duput/power supply         reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V <sub>eff</sub> Duput/power supply         reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V <sub>eff</sub> Duput/power supply         reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V <sub>eff</sub> Duput/power supply         ueinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V <sub>eff</sub> Duput/power supply         EDS           Control elements	Output		
Switching power         max. 192 W, 2000 VA           Output         relay           Contact loading         253 V AC/2 A/cos φ > 0.7; 40 V DC/2 A resistive load           Time constant for signal damping         0.5 s, 2 s, 5 s, 10 s           Galvanic isolation         Input/Output           Input/Output         Inifer constant for signal damping           Input/Output         Inifer constant for signal damping           Output/Dower supply         reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V <sub>eff</sub> Indicators/settings         Inifer constant for signal damping           Display elements         IEDS           Control elements         IDP switch           Potentiometer         Via DIP switch           Via DIP switch         Via DIP switch           Output/Solution         via DIP switch           Directive conformity         Electromagnetic compatibility           Directive 2014/30/EU         EN 61326-1:2013 (industrial locations)           Low voltage         Electromagnetic compatibility           Directive 2014/30/EU         EN 61326-1:2013 (industrial locations)           Low voltage         IEC 60529:2001           Ambient temperature         20 60 °C (-4 140 °F) extended ambient temperature range up to 70 °C (158 °F), refer to manual for meceseasary mounting condition	Connection side	control side	
Output         relay           Contact loading         253 V AC/2 A/cos \$> 0.7; 40 V DC/2 A resistive load           Time constant for signal damping         0.5 s, 2 s, 5 s, 10 s           Galvanci isolation         Input/Output           Input/Output         reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V <sub>att</sub> Input/Output         reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V <sub>att</sub> Output/power supply         reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V <sub>att</sub> Input/Outpower supply         reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V <sub>att</sub> Output/power supply         reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V <sub>att</sub> IndicatorSystettings         LEDs           Control elements         DIP switch           Output voltage         DIP switch           Directive 2014/30/EU         EN 61326-1:2013 (industrial locations)           Low voltage         EN 61010-1:2010           Directive 2014/35/EU         EN 61010-1:2010           Conformity         EV:2006           Degree of protection         IEC 60529:2001           Ambient compatibility         NE 21:2006           Degree of protection         IP20           Connec	Connection	terminals 7, 8, 9; 10, 11, 12	
Contact loading         253 V AC/2 A/cos φ > 0.7; 40 V DC/2 A resistive load           Trme constant for signal damping         0.5 s, 2 s, 5 s, 10 s           Galvanic isolation         reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V <sub>eff</sub> Input/Output         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> Indicators/settings         IEDs           Control elements         LEDs           Configuration         via DIP switch potentionmeter           Labeling         space for labeling at the front           Directive conformity         EN 61326-1:2013 (industrial locations)           Low voltage         EN 61326-1:2013 (industrial locations)           Low voltage         EN 61010-1:2010           Conformity         EN 61010-1:2010           Conditions         .           Ambient temperature         -20 60 °C (-4 140 °F) extended ambient temperature range up to 70 °C (158 °F), refer to manual for necessary mounting conditions           Mase         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           Masing         approx. 150 g           Dimensions         .20 x 119 x 11	Switching power	max. 192 W , 2000 VA	
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Galvanic isolation       Input/Output       If reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V <sub>ett</sub> Input/Output       reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V <sub>ett</sub> Output/power supply       reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V <sub>ett</sub> Indicators/settings       UEDs         Display elements       LEDs         Control elements       DIP switch sign of the potentionmeter         Via DIP switch sign of the potentionmeter       Via DIP switch sign of the front         Directive conformity       Electonagnetic compatibility         Directive 2014/30/EU       EN 61326-1:2013 (industrial locations)         Low voltage       If the front         Directive 2014/30/EU       EN 61326-1:2013 (industrial locations)         Low voltage       If the front Sign of the front         Directive 2014/35/EU       EN 61326-1:2013 (industrial locations)         Low voltage       If the front Sign of the fro	Contact loading	253 V AC/2 A/cos $\phi$ > 0.7; 40 V DC/2 A resistive load	
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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> Indicators/settings         IEC/EN 61010-1, rated insulation voltage 300 V <sub>eff</sub> Display elements         IEDs           Configuration         IEDs           Configuration         IEDs           Configuration         Via DIP switch potentiometer           Labeling         space for labeling at the front           Directive conformity         Electromagnetic compatibility           Directive 2014/30/EU         EN 61326-1:2013 (industrial locations)           Low voltage         Electromagnetic compatibility           Directive 2014/35/EU         EN 61010-1:2010           Conformity         Electromagnetic compatibility         NE 21:2006           Degree of protection         IEC 60529:2001           Ambient temperature         -20 60 °C (-4 140 °F) extended ambient temperature range up to 70 °C (158 °F), refer to manual for necessary mounting conditions           Mechanical specifications         IP20           Connection         Screw erminals, max 2.5 mm <sup>2</sup> Mass         approx. 150 g         20 x 119 x 115 mm (0.8 x 4.7 x 4.5 inch) (W x H x D), housing type B2           Mounting <td>Galvanic isolation</td> <td></td>	Galvanic isolation		
Output/power supply       reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V <sub>eff</sub> Indicators/settings       Display elements         Display elements       DIP switch potentiometer         Control elements       DIP switch potentiometer         Configuration       via DIP switches via potentiometer         Labeling       space for labeling at the front         Directive conformity       Electromagnetic compatibility         Directive 2014/30/EU       EN 61326-1:2013 (industrial locations)         Low voltage       EN 61010-1:2010         Oroformity       EN 61010-1:2010         Electromagnetic compatibility       NE 21:2006         Degree of protection       IEC 60529:2001         Ambient conditions       -20 60 °C (-4 140 °F) extended ambient temperature range up to 70 °C (158 °F), refer to manual for necessary mounting conditions         Mechanical specifications       Degree of protection         Degree of protection       IP20         Connection       screw terminals , max. 2.5 mm²         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         Mounting       on 35 mm DIN mounting rail acc. to EN 60715:2001	Input/Output	reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 $V_{\text{eff}}$	
Indicators/settings         LEDs           Display elements         LEDs           Control elements         DIP switch potentiometer           Configuration         via DIP switches via potentiometer           Labeling         space for labeling at the front           Directive conformity         Electromagnetic compatibility           Directive 2014/30/EU         EN 61326-1:2013 (industrial locations)           Low voltage         Electromagnetic compatibility           Directive 2014/35/EU         EN 61010-1:2010           Conformity         EN 61010-1:2010           Conformity         Electromagnetic compatibility           Degree of protection         EC 60529:2001           Ambient conditions         -20 60 °C (-4 140 °F) extended ambient temperature range up to 70 °C (158 °F), refer to manual for necessary mounting conditions           Mechanical specifications         -20 60 °C (-4 140 °F) extended ambient temperature range up to 70 °C (158 °F), refer to manual for necessary mounting conditions           Mass         approx. 150 g           Degree of protection         IP20           Connection         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           General information         Supplementary information	Input/power supply	reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 $V_{\text{eff}}$	
Display elements       LEDs         Control elements       DIP switch potentiometer         Labeling       space for labeling at the front         Directive conformity       Electromagnetic compatibility         Directive 2014/30/EU       EN 61326-1:2013 (industrial locations)         Low voltage       Image: Compatibility         Directive 2014/35/EU       EN 61326-1:2013 (industrial locations)         Low voltage       Electromagnetic compatibility         Directive 2014/35/EU       EN 61010-1:2010         Conformity       Electromagnetic compatibility         Electromagnetic compatibility       NE 21:2006         Degree of protection       IEC 60529:2001         Ambient conditions       -20 60 °C (-4 140 °F) extended ambient temperature range up to 70 °C (158 °F), refer to manual for necessary mounting conditions         Mechanical specifications       -20 60 °C (-4 140 °F) extended ambient temperature range up to 70 °C (158 °F), refer to manual for necessary mounting conditions         Masi       approx. 150 g         Degree of protection       IP20         Connection       screw terminals , max. 2.5 mm²         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         Mounting       on 35 mm DIN mounting rai acc. to EN 6075:2001<	Output/power supply	reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 $V_{\text{eff}}$	
Control elements       DIP switch potentiometer         Configuration       Via DIP switches via potentiometer         Labeling       space for labeling at the front         Directive conformity         Electromagnetic compatibility       Electromagnetic compatibility         Directive 2014/30/EU       EN 61326-1:2013 (industrial locations)         Low voltage       Electromagnetic compatibility         Directive 2014/35/EU       EN 61010-1:2010         Conformity       Electromagnetic compatibility         Degree of protection       IEC 60529:2001         Ambient conditions       Electromagnetic contromity         Degree of protection       IEC 0.60 °C (-4 140 °F) extended ambient temperature range up to 70 °C (158 °F), refer to manual for necessary mounting conditions         Mechanical specifications       -20 60 °C (-4 140 °F) extended ambient temperature range up to 70 °C (158 °F), refer to manual for necessary mounting conditions         Mechanical specifications       Electromagnetic conditions         Degree of protection       IP20         Connection       Screw terminals , max. 2.5 mm²         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         Mounting       on 35 mm DIN mounting rait acc. to EN 60715:2001	Indicators/settings		
Potentiometer           Configuration         via DIP switches via potentiometer           Labeling         space for labeling at the front           Directive conformity         Electromagnetic compatibility           Directive 2014/30/EU         EN 61326-1:2013 (industrial locations)           Low voltage         EN 61010-1:2010           Conformity         EN 61010-1:2010           Conformity         Electromagnetic compatibility           Directive 2014/35/EU         EN 61010-1:2010           Conformity         Electromagnetic compatibility           Electromagnetic compatibility         NE 21:2006           Degree of protection         IEC 60529:2001           Ambient conditions         -20 60 °C (-4 140 °F)           extended ambient temperature range up to 70 °C (158 °F), refer to manual for necessary mounting conditions           Mechanical specifications         IP20           Connection         IP20           Connection         Screw terminals , max. 2.5 mm²           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           Mounting         on 35 mm DIN mounting rail acc. to EN 60715:2001           Supplementary information         Observe the certificates, declarations of conformity, instruction manuals, and manua	Display elements	LEDs	
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Directive conformity         Electromagnetic compatibility       EN 61326-1:2013 (industrial locations)         Directive 2014/30/EU       EN 61326-1:2013 (industrial locations)         Low voltage       EN 61010-1:2010         Directive 2014/35/EU       EN 61010-1:2010         Conformity       Electromagnetic compatibility         Electromagnetic compatibility       NE 21:2006         Degree of protection       IEC 60529:2001         Ambient conditions       -20 60 °C (-4 140 °F)         Ambient temperature       -20 60 °C (-4 140 °F)         extended ambient temperature range up to 70 °C (158 °F), refer to manual for nection         Degree of protection       IP20         Connection       screw terminals , max. 2.5 mm²         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         Mounting       on 35 mm DIN mounting rail acc. to EN 60715:2001         General information       Supplementary information	Configuration		
Electromagnetic compatibility       EN 61326-1:2013 (industrial locations)         Low voltage       EN 61326-1:2013 (industrial locations)         Directive 2014/35/EU       EN 61010-1:2010         Conformity         Electromagnetic compatibility       NE 21:2006         Degree of protection       IEC 60529:2001         Ambient conditions         Ambient temperature         -20 60 °C (-4 140 °F) extended ambient temperature range up to 70 °C (158 °F), refer to manual for necessary mounting conditions         Mechanical specifications         Degree of protection         IP20       Connection         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         Mounting       on 35 mm DIN mounting rail acc. to EN 60715:2001         General information         Supplementary information       Observe the certificates, declarations of conformity, instruction manuals, and manuals	Labeling	space for labeling at the front	
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Conformity       NE 21:2006         Electromagnetic compatibility       NE 21:2006         Degree of protection       IEC 60529:2001         Ambient conditions	Low voltage		
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Ambient conditions         Ambient temperature       -20 60 °C (-4 140 °F) extended ambient temperature range up to 70 °C (158 °F), refer to manual for necessary mounting conditions         Mechanical specifications       IP20         Connection       IP20         Connection       screw terminals , max. 2.5 mm²         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         Mounting       on 35 mm DIN mounting rail acc. to EN 60715:2001         General information       Observe the certificates, declarations of conformity, instruction manuals, and manuals	Electromagnetic compatibility	NE 21:2006	
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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         Mounting       on 35 mm DIN mounting rail acc. to EN 60715:2001         General information       Supplementary information dobserve the certificates, declarations of conformity, instruction manuals, and manuals	Degree of protection	IP20	
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         General information       Supplementary information         Supplementary information       Observe the certificates, declarations of conformity, instruction manuals, and manuals	Connection	screw terminals , max. 2.5 mm <sup>2</sup>	
Mounting       on 35 mm DIN mounting rail acc. to EN 60715:2001         General information       Supplementary information         Observe the certificates, declarations of conformity, instruction manuals, and manuals	Mass	approx. 150 g	
General information           Supplementary information         Observe the certificates, declarations of conformity, instruction manuals, and manuals	Dimensions	20 x 119 x 115 mm (0.8 x 4.7 x 4.5 inch) (W x H x D) , housing type B2	
Supplementary information Observe the certificates, declarations of conformity, instruction manuals, and manuals	Mounting	on 35 mm DIN mounting rail acc. to EN 60715:2001	
	General information		
	Supplementary information	Observe the certificates, declarations of conformity, instruction manuals, and manuals where applicable. For information see www.pepperl-fuchs.com.	

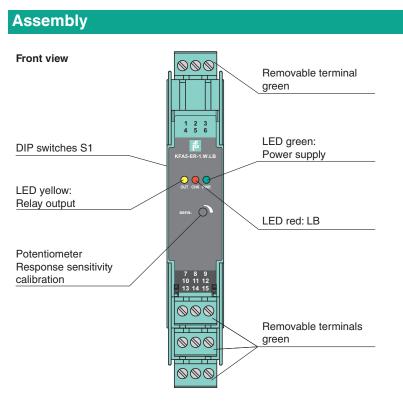
 Refer to "General Notes Relating to Pepperl+Fuchs Product Information".

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# **Matching System Components**

K-DUCT-GY

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Profile rail, wiring comb field side, gray

## Accessories

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

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

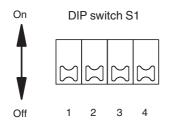
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## Application

The device is equipped with lead breakage detection (current free relay in event of failure). For this purpose, the enclosed 430 k $\Omega$  resistance must be switched between the maximum and reference electrode. This function can be deactivated by DIP switches.

#### Configuration

#### DIP switch function on side of device



Switches	Position	Function
1	Off On	open circuit current closed circuit current
2	Off On	LB deactivated LB activated

Switch 3	Switch 4	Time constant for signal damping
Off	Off	0.5 s
Off	On	2 s
On	Off	5 s
On	On	10 s

- Open circuit current principle: In open circuit current principle the relay becomes active when the limit is reached.
- Closed circuit current principle: In closed circuit current principle, the relay is activated when power is applied. The relay is deactivated when the limit is reached.

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