

# Background suppression sensor SBL-8-H-900-IR-SL-V-4288



- Background suppression sensor for roller conveyors
- For installation between the rollers on a roller conveyor
- Very small black-white difference
- Adjustable detection range
- Can be connected in series
- 3 in 1: Sensor, pneumatic valve and integrated control logic

Congested track scanner, background suppression sensor, 900 mm adjustable detection range, infrared light, dark on, 1 PNP output, M12 plug and fixed cable with M12 socket

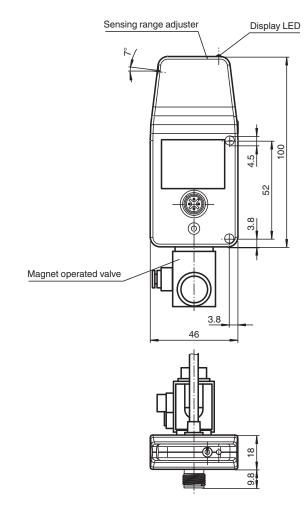
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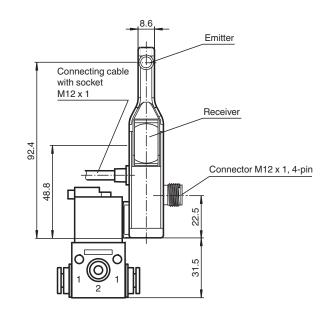
#### **Function**

Sensors of the SBL serie are used to easily control material flow on roller conveyors in material handling and other branches. The SBL series is a precise background suppression sensor according to the 3 element method. The sensor features superior background suppression and a very good ambient light immunity.

Material and transport container of all colors and opacities are reliably detected. The special design allows the sensor to be mounted between the rollers of a roller conveyor or any other conveying unit. Mounting between the rollers is easy and protects the sensor.

#### Dimensions





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

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## **Technical Data**

Delection range     40900 mm       Delection range mix.     40900 mm       Adjustment range max.     40900 mm       Adjustment range max.     940900 mm       Adjustment range max.     940900 mm 200 mm.       Adjustment range max.     940900 mm 200 mm.       Adjustment range max.     940900 mm.       Light source     IRED       Light source     IRED       Light source     IRED       Diameter of the light spot     approx60 mm at detection range 900 mm       Cascadability     continuous light 30000 Lux. Floorescent lamp 5000 Lux       Functional safety related parameters     continuous light 30000 Lux. Floorescent lamp 5000 Lux       Functional safety related parameters     continuous light 30000 Lux. Floorescent lamp 5000 Lux       Function indicator     continuous light 30000 Lux. Floorescent lamp 5000 Lux       Function indicator     continuous light 30000 Lux. Floorescent lamp 5000 Lux       Function indicator     Light yelew: light swhen object is detected       Control alements     max. 10 %       Electrical specification     max. 10 %       No-load supply current     lo     max. 10 %       Norbing triple </th <th>General specifications</th> <th></th> <th></th>	General specifications			
Detection range max.40 900 mmAdjustment rangeS340 900 mmAdjustment rangeS340 900 mmLight sourceIEEDLight sourceIEEDBack-white difference (6 %/80 %)< 10 %			40 900 mm	
Detection range max.4440000 mmAdjustment range340900 mm340900 mmLight sourceistandard while 200 mm x 200 mmLight sourceimediated infrared light800 mBlack-while difference (8 %/80 %)<	Detection range min.		40 340 mm	
Peterence targetstandard while 200 mm x 200 mmLight topemodulated infrared light, 880 nmBlack-while difference (6 %/90 %)< 10 %	-		40 900 mm	
Light sourceIREDLight typemodulated infrared light, 880 nmBack while difference (6 %90 %)<10 %	-		340 900 mm	
Light type     modulated infrared light, 880 nm       Black-white difference (6 %90 %)     C     <10 %	Reference target		standard white 200 mm x 200 mm	
Black-white difference (6 %/90 %)< < 10 %Diameter of the light spotseprox. 60 mm at detection range 900 mmCascadabilityAt 20°C; max. 38 sensors per lineAmbient light limitcontinuous light 3000 Lux, Fluorescent lamp 5000 LuxFunctional safety related parameters100 aMTTF,100 aMTTF,0 %MTTG,0 %Indicators/operating meansLED yellow: lights when object is detectedControl elementsLD yellow: lights when object is detectedSwitching voltageUsVitching troupedIn max. 10 %No-load supply currentIn max. 10 %Switching voltageIn max. 200 mASwitching roupedIn max. 200 mASwitching roupedIn the singet resistencePreumatic outputIn the singet resistencePreumatic outputIn the singet resistencePreumatic outputIn the singet resistenceProduct standardIn the	Light source		IRED	
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Cascadability     At 20°C: max 38 sensors per line       Ambient light limit     continuous light 30000 Lux, Fluorescent lamp 5000 Lux       Functional safety related parameters     Itio a       MTTFr,     100 a       Mission Time (T <sub>M</sub> )     20 a       Diagnostic Coverage (DC)     0%       Indicator     LED yellow: lights when object is detected       Control elements     Sensing range adjuster       Electrical specifications     Up       Operating voltage     Up       Operating voltage     Up       Operating voltage     max. 10 %       No-load supply current     max. 30 VDC       Switching voltage     max. 30 VDC       Switching voltage     max. 30 VDC       Switching voltage     max. 30 VDC       Switching resure     currentless closed       Operating resure     sma       Pago nating resure     sma       Type of valve     currentless closed       Operating resure     Q       Switching voltage     Sma       Product standard     EN 69047-52       Contomity     EIC / EN 60068-26. Sinus. 10 - 1000 Hz, 10 g i	Black-white difference (6 %/90 %)		<10 %	
Ambient light limit     continuous light 30000 Lux, Fluorescent lamp 5000 Lux       Ambient light limit     continuous light 30000 Lux, Fluorescent lamp 5000 Lux       MTFs     1100 a       Mission Time (Tw)     20 a       Diagnostic Coverage (DC)     0%       Indicators/operating means     E       Function indicator     ED yellow: lights when object is detected       Control elements     Sensing range adjuster       Electrical specifications     max. 10 %       Operating voltage     Vg     24 VD £ 20 %       Mission Tippe     max. 10 %       No-load supply current     b     max. 10 %       No-load supply current     b     max. 30 V DC       Switching voltage     f     100 Hz       Switching current     max. 30 V DC     max. 30 V DC       Switching requescy     f     100 Hz       Response time     S mas     32 way value       Type of value     currentiess closed       Operating pressure     EN 60947-52       Conformity     EC / EN 80068-24. Sinus. 10 -1000 Hz, 10 gin each X, Y and Z directions       Typoori valis and cart cesistance     EC / E	Diameter of the light spot		approx. 60 mm at detection range 900 mm	
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Control elementsISensing range adjusterElectrical specificationsFilpplemax. 10 %No-load supply currentlgmax. 10 %No-load supply currentlgmax. 115 mAOutputumax. 10 %Switching typeIPNP, short-circuit protected, reverse polarity protectedSwitching voltagemax. 30 VDCSwitching currentmax. 30 VDCSwitching frequencyf100 HzResponse timemax. 200 mAPneumatic outputf3/2 way valveType of valvecurrentless closedOperating pressureG0 4 bar (0 58 psi)MediumairControlProduct standardEN 60947-5-2ContormityEC / EN 60068. half-sine, 40 g in each X, Y and Z directionsShock and impact resistanceEC / EN 60068. half-sine, 40 g in each X, Y and Z directionsVibration resistanceEC / EN 60068. Pal-fise, 40 g in each X, Y and Z directionsVibration resistanceEC / EN 60068. Pal-fise, 40 g in each X, Y and Z directionsVibration resistanceEC / EN 60068. Pal-fise, 40 g in each X, Y and Z directionsVibration resistanceEC / EN 60068. Pal-fise, 40 g in each X, Y and Z directionsUL approvalCullus Listed, Class 2 Power Source, Type 1 enclosureCoc approval marking not required for poducts rated sla6 VAmbient temperatureels 0 cic (22 140 °F)Ambient temperatureels 0 cic (22 140 °F)Housing widh18 mmHousing widh6 0 (10 mm	Indicators/operating means			
Electrical specifications     UB     24 V DC ± 20 %       Pipple     max. 10 %       No-load supply current     0     max. 115 mA       Output     max. 115 mA     max. 10 %       Switching type     0     dark-on       Signal output     1 PNP, short-circuit protected, reverse polarity protected       Switching voltage     10     dark-on       Switching voltage     100 Mz     max. 200 mA       Switching requency     f     100 Hz       Response time     5 ms     max. 200 mA       Operating pressure     5 ms     max. 200 mA       Operating pressure     6     3/2 way valve       Type of valve     currentless closed     0.0       Operating pressure     6.0     .4 bar (0 58 psi)       Medium     air     Compliance with standards and tirectives       Standard conformity     EC / EN 60068. half-sine, 40 g in each X, Y and Z directions       Shock and inpact resistance     [EC / EN 60068. half-sine, 40 g in each X, Y and Z directions       Vibration resistance     [EC / EN 60068. half-sine, 40 g in each X, Y and Z directions       Vibration resistance	Function indicator		LED yellow: lights when object is detected	
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Ripple     max. 10 %       No-load supply current     Io     max. 115 mA       Output      max. 115 mA       Switching type     Gark-on     Switching type (ark-on)       Signal output     1 PNP, short-circuit protected, reverse polarity protected       Switching routage     max. 30 V DC       Switching frequency     f     100 Hz       Response time     5 ms       Pneumatic output     3/2 way valve       Type of valve     currentless closed       Operating pressure     6     0 4 bar (0 58 psi)       Medium     air     Conformity       Product standard     EN 60947-5-2       Compliance with standards and directives     EC / EN 60068. half-sine, 40 g in each X, Y and Z directions       Shadard conformity     IEC / EN 60068. half-sine, 40 g in each X, Y and Z directions       Vibraton resistance     IEC / EN 60068. half-sine, 40 g in each X, Y and Z directions       Vibraton resistance     CulLus Listed, Class 2 Power Source, Type 1 enclosure       Cocc approval     cULus proval     CulLus Listed, Class 2 Power Source, Type 1 enclosure       Cocc approval     cULus pro* (c.2 140 °F)     so 6 °C (c.2 140	Electrical specifications			
No-load supply currentInmax. 115 mAOutputSwitching typeIm<	Operating voltage	UB	24 V DC ± 20 %	
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Switching current max. 200 mA   Switching frequency f 100 Hz   Response time 5 ms   Pneumatic output 5 ms   Pneumatic output 3/2 way valve   Type of valve currentless closed   Operating pressure 0 4 bar (0 58 psi)   Medium air   Conformity Product standard   Product standard EN 60947-5-2   Compliance with standards and directives EN 60947-5-2   Standard conformity EI EC / EN 60068. half-sine, 40 g in each X, Y and Z directions   Vibration resistance IE C / EN 60068. class 2. Sinus. 10 - 1000 Hz, 10 g in each X, Y and Z directions   Approvals and certificates UL us Listed, Class 2 Power Source, Type 1 enclosure   CC capproval CC Capproval / marking not required for products rated <36 V	Signal output		1 PNP, short-circuit protected, reverse polarity protected	
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Response time   5 ms     Pneumatic output   3/2 way valve     Type of valve   currentless closed     Operating pressure   0 4 bar (0 58 psi)     Medium   air     Conformity     Product standard   EN 60947-5-2     Compliance with standards and directives     Standard conformity   EIC / EN 60068. half-sine, 40 g in each X, Y and Z directions     Standard conformity   IEC / EN 600682.6. Sinus. 10 -1000 Hz, 10 g in each X, Y and Z directions     Vibration resistance   IEC / EN 60068-2.6. Sinus. 10 -1000 Hz, 10 g in each X, Y and Z directions     Vibration resistance   IEC / EN 60068-2.6. Sinus. 10 -1000 Hz, 10 g in each X, Y and Z directions     Vibration resistance   IEC / EN 60068-2.6. Sinus. 10 -1000 Hz, 10 g in each X, Y and Z directions     Vibration resistance   IEC / EN 60068-2.6. Sinus. 10 -1000 Hz, 10 g in each X, Y and Z directions     Vibration resistance   IEC / EN 60068-2.6. Sinus. 10 -1000 Hz, 10 g in each X, Y and Z directions     Approval   CULus Listed, Class 2 Power Source, Type 1 enclosure     CCC approval   CCC approval / marking not required for products rated ≤36 V     Ambient temperature   -15 50 °C (5 122 °F)     Storage temperature   -30 60 °C (-22 140 °F)	Switching current		max. 200 mA	
Pneumatic output 3/2 way valve   Type of valve currentless closed   Operating pressure 04 bar (058 psi)   Medium air   Conformity   Product standard EN 60947-5-2   Compliance with standards and directives   Standard conformity EIC / EN 60068. half-sine, 40 g in each X, Y and Z directions   Standard conformity IEC / EN 600682.6. Sinus. 10 -1000 Hz, 10 g in each X, Y and Z directions   Vibration resistance IEC / EN 60068-2.6. Sinus. 10 -1000 Hz, 10 g in each X, Y and Z directions   Approvals and certificates IEC / EN 60068-2.6. Sinus. 10 -1000 Hz, 10 g in each X, Y and Z directions   UL approval cULus Listed, Class 2 Power Source, Type 1 enclosure   CCC approval CCC approval / marking not required for products rated ≤36 V   Ambient temperature c15 50 °C (5 122 °F)   Storage temperature c30 60 °C (-22 140 °F)   Mechanical specifications -15 50 °C (-22 140 °F)   Housing width 18 mm   Housing height 100 mm	Switching frequency	f	100 Hz	
Type of valve   currentless closed     Operating pressure   04 bar (058 psi)     Medium   air     Conformity     Product standard   EN 60947-5-2     Compliance with standards and directives     Standard conformity   EN 60947-5-2     Standard conformity   EIC / EN 60068. half-sine, 40 g in each X, Y and Z directions     Vibration resistance   IEC / EN 60068. half-sine, 40 g in each X, Y and Z directions     Vibration resistance   EIC / EN 60068. half-sine, 40 g in each X, Y and Z directions     Vibration resistance   IEC / EN 60068. half-sine, 40 g in each X, Y and Z directions     Approvals and certificates   EC / EN 60068. half-sine, 40 g in each X, Y and Z directions     UL approval   CULus Listed, Class 2 Power Source, Type 1 enclosure     CC approval   CC approval / marking not required for products rated ≤36 V     Ambient conditions   -15 50 °C (5 122 °F)     Ambient specifications   -30 60 °C (-22 140 °F)     Mechanical specifications   -30 60 °C (-22 140 °F)     Housing width   18 mm     Housing height   100 mm	Response time		5 ms	
Operating pressure0 4 bar (0 58 psi)MediumairConformityEN 60947-5-2Product standardEN 60947-5-2Compliance with standards and directivesEN 60947-5-2Standard conformityEN 60968. half-sine, 40 g in each X, Y and Z directionsStandard conformityIEC / EN 60068. half-sine, 40 g in each X, Y and Z directionsVibration resistanceIEC / EN 60068. class 2 Power Source, Type 1 enclosureQL approvalcULus Listed, Class 2 Power Source, Type 1 enclosureCc capprovalcUC capproval / marking not required for products rated ≤36 VAmbient temperature-15 50 °C (5 122 °F)Storage temperature-30 60 °C (-22 140 °F)Housing width18 mmHousing height100 mm	Pneumatic output		3/2 way valve	
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Product standard   EN 60947-5-2     Compliance with standards and directives     Standard conformity     Shock and impact resistance   IEC / EN 60068. half-sine, 40 g in each X, Y and Z directions     Vibration resistance   IEC / EN 60068. half-sine, 40 g in each X, Y and Z directions     Approvals and certificates   IEC / EN 60068-2-6. Sinus. 10 -1000 Hz, 10 g in each X, Y and Z directions     UL approval   cULus Listed, Class 2 Power Source, Type 1 enclosure     CCC approval   CCC approval / marking not required for products rated ≤36 V     Ambient conditions   -15 50 °C (5 122 °F)     Storage temperature   -30 60 °C (-22 140 °F)     Mechanical specifications   -30 60 °C (-22 140 °F)     Housing width   18 mm     Housing height   100 mm	Medium		air	
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Approvals and certificates     UL approval   cULus Listed, Class 2 Power Source, Type 1 enclosure     CCC approval   CCC approval / marking not required for products rated ≤36 V     Ambient conditions   -15 50 °C (5 122 °F)     Ambient temperature   -30 60 °C (-22 140 °F)     Mechanical specifications   -30 60 °C (-22 140 °F)     Housing width   18 mm     Housing height   100 mm	Shock and impact resistance		IEC / EN 60068. half-sine, 40 g in each X, Y and Z directions	
UL approval   cULus Listed, Class 2 Power Source, Type 1 enclosure     CCC approval   CCC approval / marking not required for products rated ≤36 V     Ambient conditions   CCC (5 122 °F)     Ambient temperature   -15 50 °C (5 122 °F)     Storage temperature   -30 60 °C (-22 140 °F)     Mechanical specifications   18 mm     Housing width   18 mm     Housing height   100 mm			IEC / EN 60068-2-6. Sinus. 10 -1000 Hz, 10 g in each X, Y and Z directions	
CCC approval   CCC approval / marking not required for products rated ≤36 V     Ambient conditions   Ambient temperature     Ambient temperature   -15 50 °C (5 122 °F)     Storage temperature   -30 60 °C (-22 140 °F)     Mechanical specifications   I8 mm     Housing width   18 mm     Housing height   100 mm	Approvals and certificates			
Ambient conditionsAmbient temperature-15 50 °C (5 122 °F)Storage temperature-30 60 °C (-22 140 °F)Mechanical specificationsHousing width18 mmHousing height100 mm	UL approval		cULus Listed, Class 2 Power Source, Type 1 enclosure	
Ambient temperature     -15 50 °C (5 122 °F)       Storage temperature     -30 60 °C (-22 140 °F)       Mechanical specifications     18 mm       Housing width     18 mm       Housing height     100 mm	CCC approval		CCC approval / marking not required for products rated $\leq$ 36 V	
Storage temperature -30 60 °C (-22 140 °F)   Mechanical specifications -30 60 °C (-22 140 °F)   Housing width 18 mm   Housing height 100 mm	Ambient conditions			
Mechanical specifications   Housing width 18 mm   Housing height 100 mm	Ambient temperature			
Housing width18 mmHousing height100 mm	Storage temperature		-30 60 °C (-22 140 °F)	
Housing height 100 mm	Mechanical specifications			
	Housing width			
Housing depth 46 mm	Housing height		100 mm	
	Housing depth			
Degree of protection IP65	Degree of protection		IP65	
Connection   4-pin, M12 x 1 connector ; Connecting cable with Socket, straight M12 x 1 ; Length:     1930 mm	Connection			

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

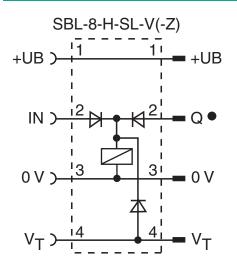
 Pepperl+Fuchs Group
 USA: +1 330 486 0001
 General General

Germany: +49 621 776 1111 fa-info@de.pepperl-fuchs.com

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Technical Data		
Material		
Housing	plastic	
Optical face	plastic lens	
Mass	approx. 200 g	

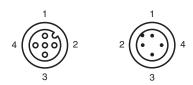
### **Connection Assignment**



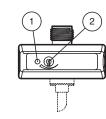
O = Light on

• = Dark on

## **Connection Assignment**

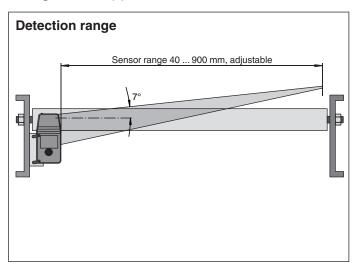


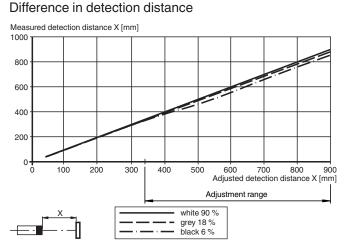
## Assembly



1	Signal display	yellow
2	Sensing range adju	uster

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





#### Accessories

<b>H</b>	OMH-SBL-01	Mounting bracket for sensors of SBL series
<i>s</i> /	V1-G-2M-PVC	Female cordset single-ended M12 straight A-coded, 4-pin, PVC cable grey
ø /	V1-G-5M-PVC	Female cordset single-ended M12 straight A-coded, 4-pin, PVC cable grey
<b>«</b>	V1-W-2M-PUR	Female cordset single-ended M12 angled A-coded, 4-pin, PUR cable grey
<b>«</b> //	V1-W-5M-PUR	Female cordset single-ended M12 angled A-coded, 4-pin, PUR cable grey
	V1S-TEE-V1/V1S	T-Splitter M12 plug to M12 plug / M12 socket 4-pin A-coded

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

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#### **System Description**

#### **Options:**

Sensors with the **version -V** are equipped with a solenoid valve and can directly control a 3/2 way pneumatic actuator, without any-interaction of an external system controlling unit (PLC). As soon as conveyed goods are detected, the diffuse mode sensor gives an electrical-signal to the pneumatic solenoid valve, which is then activated.

Sensors with the control logic **option -SL-(V)** allows up to 50 diffuse mode sensors to be connected-to each other (data and power), depending on the current consumption of sensor and solenoid valve. An additional supply power and data bus cable is used to interconnect the sensors with control logic option -SL. All necessary functions for controlling the material flow of conveyed goods are supported, such as: single feed, single release, slug release, external motor and solenoid valve control. It is also possible to energize the valves of all sensors included in the cascade by slug release (VT). To do this, apply the positive supply voltage (+UB) on the input VT of the first sensor.

Sensors with timing **function -Z** features the adjustment of the ON- and OFF delay of the output independently. This optimizes control of the solenoid valve. A zero pressure accumulation of the conveyed goods can be realized with application of time ON- and OFF delay of the output. The ON- and OFF delay to control the switching of the solenoid valve may be adjusted between 0 and 2 seconds.

Additional power supply between every 20 to 25 sensors can be realized by the use of the power in feed junction V1S-TEE-V1/V1S in combination with a cable V1-G-...-PVC. This features to practically connect any number of SBL sensors in series. Attention should be paid to the maximum rated current of the cable and the connectors which usually is max. I = 4 A. For more details on the maximum rated current of single components, please refer to our datasheet values. For the electrical supply of the sensors the country specific standards have to be considered.

#### Accessories

#### Note:

Use a screwdriver to adjust the sensing range. We strongly recommend to use the screwdriver given in the accessories section.

