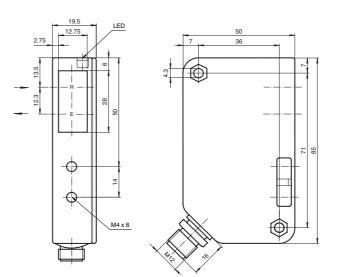
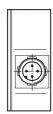
## **Retroreflective sensor**

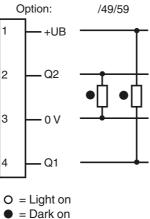








#### **Electrical connection**



Indicators/operating means

3



**Pinout** 



О

#### Functional display red 1 2 Optical axis Receiver 3 Optical axis Transmitter

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

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419060\_eng.xml Release date: 2015-02-05 10:18 Date of issue: 2015-02-05

CE **Model Number** 

### RL91-6-IR/49/59/73c

Retroreflective sensor with 4-pin, M12 x 1 plastic connector

#### **Features**

- Retroreflective sensor for single-• beam closing edge protection
- Narrow housing suitable for small ٠ gaps
- Sturdy plastic housing .
- Various possibilities for mounting •
- Version with infrared light .
- Version for supply voltage of up to 30 • V DC
- Dark on version

## **Product information**

Concentration on the essentials is the hallmark of the 91 series. As ac/dc supply devices, these economical, reliable and easy-to-use photoelectric sensors can be used almost universally. Their narrow design means that they can be used in any environment.

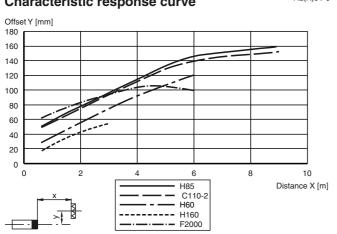
The single-beam photoelectric sensors of the 91 series are suitable for closing-edge monitoring for elevators, barriers and doors, as well as for object detection and object tracking in material handling systems.

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1

Effective detection range     0 6 m       Reflector distance     0 6 m       Threshold detection range     9 m       Reference target     H85-2 reflector       Light type     modulated infrared light       Diameter of the light spot     approx. 230 mm at a distance of 6000 mm       Angle of divergence     approx. 2.5 °       Ambient light limit     90000 Lux       Functional safety related parameters     MTTF       MTTF     1083.4 a       Indicators/operating means     E       Function indicator     LED red, flashes when failing short of the stability control       Electrical specifications     0 (10 mA       Output     12 30 V DC       No-load supply current     log < 100 mA       Output     1 NPN, 1 PNP synchronized-switching, short-circuit protect reverse polarity protected       Switching voltage     max. 30 V DC       Switching urrent     20 mA       Ambient conditions     Ambient conditions       Ambient conditions     20 ms       Ambient conditions     20 ms       Compliance with standards and directives       Victal face     Luran       Housing     Luran       Optical face     Luran       Mass     100 g       Compliance with standards and directives       Victa face	General specifications		
Reflector distance     0 6 m       Threshold detection range     9 m       Reference target     H85-2 reflector       Light source     LED       Light type     modulated infrared light       Diameter of the light spot     approx. 230 nm at a distance of 6000 mm       Angle of divergence     approx. 200 nm at a distance of 6000 mm       Angle of divergence     approx. 230 nm at a distance of 6000 mm       Angle of divergence     approx. 230 nm at a distance of 6000 mm       Angle of divergence     approx. 230 nm at a distance of 6000 mm       MTTFq     1083.4 a       Indicators/operating means     E       Function indicator     LED red, flashes when falling short of the stability control       Electrical specifications     Operating voltage       Optating voltage     UB     12 30 V DC       No-load supply current     Io     < 100 mA       Switching voltage     max. 30 V DC       Switching requency     f     25 Hz       Response time     20 ms       Ambient temperature     -20 75 °C (-4 131 °F)       Storage temperature     -20 75 °C (-4 167 °F)       Mechanical specifications     Degree of protection       Degree of protection     Livran       Optical face     Luran       Housing     Luran <t< th=""><th>•</th><th></th><th>) 6 m</th></t<>	•		) 6 m
Threshold detection range     9 m       Reference target     H85-2 reflector       Light source     LED       Light source     approx. 230 mm at a distance of 6000 mm       Angle of divergence     approx. 2.5 °       Ambient light limit     90000 Lux       Functional safety related parameters     mTFrd       MTTFd     083.4 a       Indicators/operating means     E       Function indicator     LED red, flashes when falling short of the stability control       Electrical specifications     Operating voltage       Operating voltage     UB     12 30 V DC       No-load supply current     Io     < 100 mA       Output     Switching type     dark on       Signal output     1 NPN, 1 PNP synchronized-switching, short-circuit protect reverse polarity protected       Switching current     200 mA       Switching current     200 mA       Mobient conditions     Ambient conditions       Ambient conditions     Conditions       Material     Housing     Luran       Housing     Luran       Optical face     Luran       Mass     100 g       Compliance with standards and directi-ties       Vical gaperival     CVC approval       CCC approval     CCC approval       CCC approval     CUL	•		
Reference target     H85-2 reflector       Light type     modulated infrared light       Diameter of the light spot     approx. 230 mm at a distance of 6000 mm       Angle of divergence     approx. 25 °       Ambient light limit     90000 Lux       Functional safety related parameters     INTFd       MTTFd     1083.4 a       Indicators/operating means     ED red, flashes when falling short of the stability control       Electrical specifications     Operating voltage       Operating voltage     UB     12 30 V DC       No-load supply current     I_0<<100 mA       Output     TNPN, 1 PNP synchronized-switching, short-circuit protect reverse polarity protected       Switching voltage     max. 30 V DC       Switching requency     f       Star     20 mA       Switching requency     f       Z S Hz     Response time       Page of protection     JP65       Connection     4-pin, M12 x 1 connector       Mass     100 g       Compliance with standards and directives       Verail     EN 60947-5-2:2007       IEC 60947-5-2:2007     IEC 60947-5-2:2007       Approval     cULus       CCC approval     CCC approval / marking not required for products rated s3       Curves/Diagrams     CCC approval / marking not required for products rated s3<			
Light source     LED       Light source     LED       Light type     modulated infrared light       Diameter of the light spot     approx. 230 mm at a distance of 6000 mm       Angle of divergence     approx. 25 °       Ambient light limit     90000 Lux       Functional safety related parameters     MTTFq       MTTFq     1083.4 a       Indicators/operating means     ED red, flashes when falling short of the stability control       Electrical specifications     Operating voltage       Operating voltage     Ug     12 30 V DC       No-load supply current     lo     < 100 mA       Output     Switching type     dark on       Signal output     1 NPN, 1 PNP synchronized-switching, short-circuit protect reverse polarity protected       Switching type     max. 30 V DC       Switching type     garx       Besponse time     20 mA       Switching requency     f       Storage temperature     -20 55 °C (-4 131 °F)       Storage temperature     -20 75 °C (-4 131 °F)       Bechanical specifications     Degree of protection       Pesponse time     20 ms       Ambient conditions     Luran       Material     Uapproval       Housing     Luran       Optical face     Luran       V	5		
Light type modulated infrared light Diameter of the light spot Angle of divergence Approx. 230 mm at a distance of 6000 mm Angle of divergence Approx. 2.5 ° Ambient light limit 90000 Lux Functional safety related parameters MTTF <sub>a</sub> 1083.4 a Indicators/operating means Function indicator LED red, flashes when falling short of the stability control Electrical specifications Operating voltage UB 12 30 V DC No-load supply current lo < 100 mA Output Switching voltage max. 30 V DC Switching voltage MTTF Response time 200 mA Ambient light frequency f 25 Hz Response time 20 ms Ambient light Storage temperature -20 75 °C (-4 131 °F) Storage temperature -20 75 °C (-4 167 °F) Mechanical specifications Degree of protection 4-pin, M12 x 1 connector Material Housing Luran Optical face Luran Mas 100 g Compliance with standards and directives Standard conformity Product standard EN EVEN EVEN EXERCISE CCC approval EL(K)91-6 EL(	-		
Diameter of the light spot     approx. 230 mm at a distance of 6000 mm       Angle of divergence     approx. 2.5 °       Ambient light limit     90000 Lux       Functional safety related parameters     Indicators/operating means       Function indicator     LED red, flashes when falling short of the stability control       Electrical specifications     Operating voltage     UB       Operating voltage     UB     12 30 V DC       No-load supply current     Io     < 100 mA	-		
Angle of divergence       approx. 2.5 °         Ambient light limit       90000 Lux         Functional safety related parameters       MTTFq         MTTFq       1083.4 a         Indicators/operating means       Eucricol indicator         Function indicator       LED red, flashes when falling short of the stability control         Electrical specifications       Operating voltage         Operating voltage       Up       12 30 V DC         No-load supply current       lo       <100 mA         Output       Switching type       dark on         Signal output       1 NPN, 1 PNP synchronized-switching, short-circuit protect reverse polarity protected         Switching voltage       max. 30 V DC         Switching current       200 mA         Switching requency       f       25 Hz         Response time       20 ms         Ambient conditions       Ambient conditions         Ambient specifications       Degree of protection         Degree of protection       IP65         Connection       4-pin, M12 x 1 connector         Material       Housing       Luran         Housing       Luran         Optical face       Luran         Ves       Standard conformity	• ,		-
Ambient light limit     90000 Lux       Functional safety related parameters     1083.4 a       Indicators/operating means     LED red, flashes when falling short of the stability control       Electrical specifications     0       Operating voltage     UB     12 30 V DC       No-load supply current     Io     4 ark on       Signal output     1 NPN, 1 PNP synchronized-switching, short-circuit protect reverse polarity protected       Switching voltage     max. 30 V DC       Switching frequency     f     25 Hz       Response time     200 mA       Switching frequency     f     25 Hz       Response time     20 ms       Ambient conditions     -20 55 °C (-4 131 °F)       Storage temperature     -20 75 °C (-4 167 °F)       Mechanical specifications     -20 75 °C (-4 167 °F)       Degree of protection     IP65       Connection     4-pin, M12 x 1 connector       Material	• •		
Functional safety related parameters         MTTF <sub>d</sub> 1083.4 a         Indicators/operating means         Function indicator         LED red, flashes when falling short of the stability control         Electrical specifications         Operating voltage       UB       12 30 V DC         No-load supply current       Io       <100 mA         Output         Switching type       dark on         Signal output       1 NPN, 1 PNP synchronized-switching, short-circuit protect reverse polarity protected         Switching voltage       max. 30 V DC         Switching requency       f       25 Hz         Response time       200 mA         Switching frequency       f       25 Hz         Response time       20 ms         Ambient conditions       Portection         Ambient conditions       Portection         Mechanical specifications       Portection         Degree of protection       IP65         Connection       4-pin, M12 x 1 connector         Material       Housing         Housing       Luran         Mass       100 g         Compliance with standards and directi-ves       Sandard conformity <th></th> <th>:</th> <th>90000 Lux</th>		:	90000 Lux
MTTF <sub>d</sub> 1083.4 a         Indicators/operating means       E         Function indicator       LED red, flashes when falling short of the stability control         Electrical specifications       Operating voltage       U <sub>B</sub> Operating voltage       U <sub>B</sub> 12 30 V DC         No-load supply current       I <sub>0</sub> < 100 mA	-	meters	
Indicators/operating means Function indicator LED red, flashes when falling short of the stability control Electrical specifications Operating voltage U <sub>B</sub> 12 30 V DC No-load supply current I <sub>0</sub> < 100 mA Output Switching type dark on Signal output 1 NPN, 1 PNP synchronized-switching, short-circuit protect reverse polarity protected Switching outgae max. 30 V DC Switching requency f 25 Hz Response time 200 mA Switching frequency f 25 Hz Ambient conditions Ambient conditions Ambient conditions Degree of protection IP65 Connection 4-pin, M12 x 1 connector Material Housing Luran Mass 100 g Compliance with standards and directi- ves Standard conformity Product standard EN 60947-5-2:2007 IEC 60947-5-2:2007 IEC 60947-5-2:2007 Standard conformity Product standard CULus CCC approval CCC approval Marking not required for products rated <3 Curves/Diagrams			1083.4 a
Function indicator       LED red, flashes when falling short of the stability control         Electrical specifications       0         Operating voltage       UB       12 30 V DC         No-load supply current       I0          Switching type       dark on          Signal output       1 NPN, 1 PNP synchronized-switching, short-circuit protect reverse polarity protected         Switching voltage       max. 30 V DC         Switching requency       f       25 Hz         Response time       200 mA         Switching frequency       f       25 Hz         Response time       20 ms         Ambient conditions       Ambient conditions         Ambient conditions       -20 55 °C (-4 131 °F)         Storage temperature       -20 75 °C (-4 167 °F)         Mechanical specifications       -20 75 °C (-4 167 °F)         Degree of protection       IP65         Connection       4-pin, M12 x 1 connector         Material       -         Housing       Luran         Optical face       Luran         Uran       Optical face         UL approval       EN 60947-5-2:2007         IEC 60947-5-2:2007       IEC 60947-5-2:2007         IEC 6			
Electrical specifications       UB       12 30 V DC         No-load supply current       I0       < 100 mA	• •		LED red, flashes when falling short of the stability control
Operating voltage       UB       12 30 V DC         No-load supply current       I0       < 100 mA			
No-load supply current       Io       < 100 mA	•	UR	12 30 V DC
Output       Switching type       dark on         Signal output       1 NPN, 1 PNP synchronized-switching, short-circuit protect reverse polarity protected         Switching voltage       max. 30 V DC         Switching current       200 mA         Switching frequency       f         Paesponse time       20 ms         Ambient conditions       Ambient conditions         Ambient apperitications       -20 55 °C (-4 131 °F)         Storage temperature       -20 75 °C (-4 167 °F)         Mechanical specifications       Degree of protection         Degree of protection       IP65         Connection       4-pin, M12 x 1 connector         Material		2	
Switching type       dark on         Signal output       1 NPN, 1 PNP synchronized-switching, short-circuit protect reverse polarity protected         Switching voltage       max. 30 V DC         Switching current       200 mA         Switching frequency       f       25 Hz         Response time       20 ms         Ambient conditions       -20 55 °C (-4 131 °F)         Storage temperature       -20 75 °C (-4 167 °F)         Mechanical specifications		v	
Signal output       1 NPN, 1 PNP synchronized-switching, short-circuit protect reverse polarity protected         Switching voltage       max. 30 V DC         Switching frequency       f         Switching frequency       f         State       20 mA         Ambient conditions       20 ms         Ambient conditions       20 55 °C (-4 131 °F)         Storage temperature       -20 75 °C (-4 167 °F)         Mechanical specifications       Degree of protection         Degree of protection       IP65         Connection       4-pin, M12 x 1 connector         Material       -         Housing       Luran         Optical face       Luran         Mass       100 g         Compliance with standards and directives         VE Gog47-5-2:2007         IEC 60947-5-2:2007         IEC 60947-5-2:2007         IEC 60947-5-2:2007         IEC 60947-5-2:2007         VL approval       cULus         CCC approval       CCC approval         CCC approval       CCC approval / marking not required for products rated <3	•		dark on
Switching current 200 mA Switching frequency f 25 Hz Response time 20 ms Ambient conditions Ambient temperature 20 55 °C (-4 131 °F) Storage temperature -20 75 °C (-4 167 °F) Mechanical specifications Degree of protection IP65 Connection 4-pin, M12 x 1 connector Material Housing Luran Optical face Luran Mass 100 g Compliance with standards and directi- ves Standard conformity Product standard EN 60947-5-2:2007 IEC 60947-5-2:2007 Approvals and certificates UL approval cULus CCC approval CULus CCC approval CULus CCC approval CULus CCC approval CCC approval / marking not required for products rated ≤3 Curves/Diagrams RL(K)91-6 Offset Y [mm]	•		1 NPN, 1 PNP synchronized-switching, short-circuit protected, reverse polarity protected
Switching frequency       f       25 Hz         Response time       20 ms         Ambient conditions       Ambient temperature       -20 55 °C (-4 131 °F)         Storage temperature       -20 75 °C (-4 167 °F)         Mechanical specifications       Degree of protection       IP65         Connection       4-pin, M12 x 1 connector       Material         Housing       Luran       Optical face       Luran         Optical face       Luran       0 g       Compliance with standards and directives         Ves       Standard conformity       Product standard       EN 60947-5-2:2007         Approvals and certificates       UL approval       CULus       CCC approval / marking not required for products rated <3	Switching voltage	1	max. 30 V DC
Response time       20 ms         Ambient conditions	Switching current	:	200 mA
Ambient conditions         Ambient temperature       -20 55 °C (-4 131 °F)         Storage temperature       -20 75 °C (-4 167 °F)         Mechanical specifications       IP65         Degree of protection       IP65         Connection       4-pin, M12 x 1 connector         Material       Iuran         Housing       Luran         Optical face       Luran         Mass       100 g         Compliance with standards and directives       Standard conformity         Product standard       EN 60947-5-2:2007         IEC 60947-5-2:2007       IEC 60947-5-2:2007         Approvals and certificates       UL approval         CCC approval       CCC approval / marking not required for products rated <3         Curves/Diagrams       RL(K)91-6         Oftset Y [mm]       RL(K)91-6	Switching frequency	f	25 Hz
Ambient temperature       -20 55 °C (-4 131 °F)         Storage temperature       -20 75 °C (-4 167 °F)         Mechanical specifications       Degree of protection         Degree of protection       IP65         Connection       4-pin, M12 x 1 connector         Material       Housing         Housing       Luran         Optical face       Luran         Mass       100 g         Compliance with standards and directives       Standard conformity         Product standard       EN 60947-5-2:2007         IEC 60947-5-2:2007       IEC 60947-5-2:2007         Approvals and certificates       UL approval         UL approval       cULus         CCC approval       CCC approval / marking not required for products rated <3         Curves/Diagrams       RL(K)91-6         Offset Y [mm]       FL(K)91-6	Response time	:	20 ms
Storage temperature       -20 75 °C (-4 167 °F)         Mechanical specifications       IP65         Connection       4-pin, M12 x 1 connector         Material       Iuran         Housing       Luran         Optical face       Luran         Mass       100 g         Compliance with standards and directives       Standard conformity         Product standard       EN 60947-5-2:2007 IEC 60947-5-2:2007 IEC 60947-5-2:2007         VL approvals and certificates       ULus         VCC approval       CCC approval / marking not required for products rated <3         Curves/Diagrams       RL(K)91-6         Oftset Y [mm]       RL(K)91-6	Ambient conditions		
Mechanical specifications       IP65         Degree of protection       IP65         Connection       4-pin, M12 x 1 connector         Material       Intervention         Housing       Luran         Optical face       Luran         Mass       100 g         Compliance with standards and directives       Standard conformity         Product standard       EN 60947-5-2:2007 IEC 60947-5-2:2007         Approvals and certificates       UL approval         UL approval       cULus         CCC approval       CCC approval / marking not required for products rated ≤3         Curves/Diagrams       RL(K)91-6         Offset Y [mm]       RL(K)91-6	Ambient temperature		-20 55 °C (-4 131 °F)
Degree of protection       IP65         Connection       4-pin, M12 x 1 connector         Material       Iuran         Housing       Luran         Optical face       Luran         Mass       100 g         Compliance with standards and directives         Standard conformity       Froduct standard         Product standard       EN 60947-5-2:2007 IEC 60947-5-2:2007         Approvals and certificates       UL approval         UL approval       cULus         CCC approval       CCC approval / marking not required for products rated ≤3         RL(K)91-6         Offset Y [mm]       RL(K)91-6	Storage temperature		-20 75 °C (-4 167 °F)
Connection       4-pin, M12 x 1 connector         Material	Mechanical specifications		
Material       Luran         Optical face       Luran         Mass       100 g         Compliance with standards and directives       Standard conformity         Product standard       EN 60947-5-2:2007 IEC 60947-5-2:2007         Approvals and certificates       UL approval         UL approval       cULus         CCC approval       CCC approval / marking not required for products rated ≤3         Curves/Diagrams       RL(K)91-6         Offset Y [mm]       RL(K)91-6	Degree of protection		P65
Housing     Luran       Optical face     Luran       Mass     100 g       Compliance with standards and directives       Standard conformity     V       Product standard     EN 60947-5-2:2007 IEC 60947-5-2:2007       Approvals and certificates     UL approval       UL approval     cULus       CCC approval     CCC approval / marking not required for products rated ≤3       Curves/Diagrams     RL(K)91-6       Offset Y [mm]     RL(K)91-6	Connection		4-pin, M12 x 1 connector
Optical face     Luran       Mass     100 g       Compliance with standards and directives       Standard conformity     Standard conformity       Product standard     EN 60947-5-2:2007 IEC 60947-5-2:2007       Approvals and certificates     UL approval       UL approval     cULus       CCC approval     CCC approval / marking not required for products rated ≤3       Curves/Diagrams       RL(K)91-6       Offset Y [mm]	Material		
Mass       100 g         Compliance with standards and directives       Image: Standard conformity         Standard conformity       EN 60947-5-2:2007         Product standard       EN 60947-5-2:2007         Approvals and certificates       IEC 60947-5-2:2007         UL approval       cULus         CCC approval       CCC approval / marking not required for products rated ≤3         Curves/Diagrams       RL(K)91-6         Offset Y [mm]       RL(K)91-6	Housing		Luran
Compliance with standards and directives         Standard conformity         Product standard       EN 60947-5-2:2007         IEC 60947-5-2:2007         Approvals and certificates         UL approval       cULus         CCC approval       CCC approval / marking not required for products rated ≤3         Curves/Diagrams         Characteristic response curve       RL(K)91-6         Offset Y [mm]       CHARACTERS	Optical face		Luran
ves         Standard conformity         Product standard       EN 60947-5-2:2007         IEC 60947-5-2:2007         Approvals and certificates         UL approval       cULus         CCC approval       CCC approval / marking not required for products rated ≤3         Curves/Diagrams         Characteristic response curve         Offset Y [mm]       RL(K)91-6			100 g
Product standard       EN 60947-5-2:2007 IEC 60947-5-2:2007         Approvals and certificates       UL approval         UL approval       cULus         CCC approval       CCC approval / marking not required for products rated ≤3         Curves/Diagrams         RL(K)91-6         Offset Y [mm]       RL(K)91-6	ves	nd directi-	
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UL approval     cULus       CCC approval     CCC approval / marking not required for products rated ≤3       Curves/Diagrams       Characteristic response curve       Offset Y [mm]     RL(K)91-6	Product standard		
CCC approval       CCC approval / marking not required for products rated ≤3         Curves/Diagrams       Characteristic response curve       RL(K)91-6         Offset Y [mm]       RL(K)91-6       RL(K)91-6	Approvals and certificates		
Curves/Diagrams Characteristic response curve Offset Y [mm] RL(K)91-6	UL approval		cULus
Characteristic response curve RL(K)91-6 Offset Y [mm]	CCC approval		CCC approval / marking not required for products rated $\leq$ 36 \
Characteristic response curve RL(K)91-6 Offset Y [mm]	Curves/Diagrams		
Offset Y [mm]			51 ///24 2
		c respo	nse curve



pical applications

- Closing-edge monitoring for elevators, barriers and industrial doors
- Detecting and tracking objects in material handling

## etection area



# ccessories

MH-91

ounting bracket

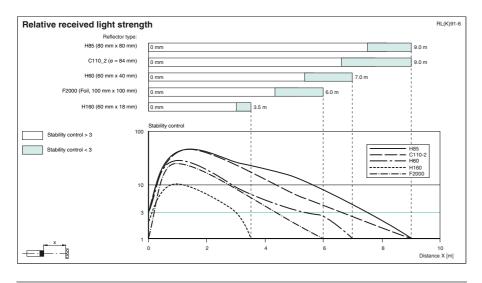
her suitable accessories can be found at vw.pepperl-fuchs.com

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Germany: +49 621 776 4411 fa-info@de.pepperl-fuchs.com





#### **Operating principle**

The retroreflective sensor contains the transmitter and receiver in a single housing. The light from transmitter is beamed back from a reflector to the receiver. If an object interrupts the light beam the switching function is initiated.

