

Retroreflective sensor with polarization filter for clear object detection

# 

#### **Function**

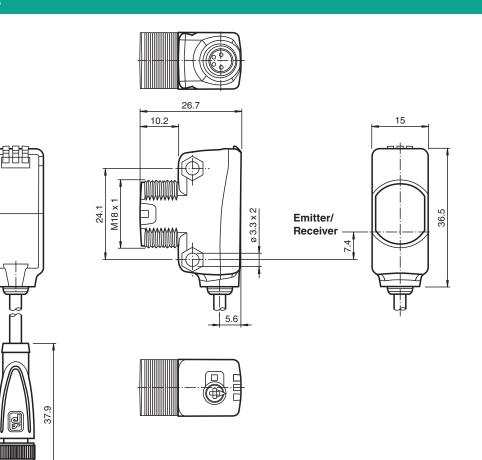
The R103 series miniature optical sensors are the first devices of their kind to offer an end-to-end solution in a small single standard design from thru-beam sensor through to a distance measurement device. As a result of this design, the sensors are able to perform practically all standard automation tasks.

The entire series enables sensors to communicate via IO-Link. The DuraBeam laser sensors are durable and can be used in the same way as a standard sensor.

The use of Multi Pixel Technology gives the standard sensors a high level of flexibility and enables them to adapt more effectively to their operating environment.



## **Dimensions**



## **Technical Data**

M8 x 1

0 3.5 m in TEACH mode ; 0 4 m at switch position "N"
0 3.5 m in TEACH mode ; 0 4 m at switch position "N"
5 m
H85-2 reflector
LED
modulated visible red light
exempt group
approx. 170 mm at a distance of 3.5 m
approx. 5 °
EN 60947-5-2
600 a
20 a
0 %
LED green: constantly on - power on flashing (4Hz) - short circuit flashing with short break (1 Hz) - IO-Link mode
Yellow LED: Permanently lit - light path clear Permanently off - object detected Flashing (4 Hz) - insufficient operating reserve

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

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Germany: +49 621 776 1111 fa-info@de.pepperl-fuchs.com Singapore: +65 6779 9091 fa-info@sg.pepperl-fuchs.com

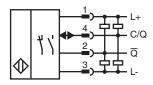
Control elementsImage: Control elementsControl elements5-step rotary switch for operating modes selectionContrast detection levels18 % - clean, water filed PET bottes 18 % - clean, water filed PET bottes 19 % - clean file	Technical Data		
Control elements         5-step rotary switch for operating modes selection           Contrad detection levels         10% - clean, water filles PP toothes Adjustable via rotary switch           Electrical specifications         10% - clean, water filles PP toothes Adjustable via rotary switch           Operating voltage         Us         10	Control elements		Teach-In key
18 % -clear glass bottles Ad % - color glass or opague materials Ad % - color glass or opage materials Ad % - color % (d 180 °F), movable cable	Control elements		
Operating voltageU_a10 30 V DCRipplemax. 10 %No-load supply currentIoProtection classIIIInterfaceIIIInterface typeO-Link (via C/Q = pin 4)IO-Link rovisionIOIO-Link voltageO-Link (via C/Q = pin 4)IO-Link rovisionIIIProcess data input 2 BitProcess data input 2 BitOutputIIISwitching typeYesCompatible master port typeAOutputSignal outputIIII max. 30 V DCSignal outputIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	Contrast detection levels		18 % - clear glass bottles 40 % - colored glass or opaque materials
Ripple         max. 10 %           No-load supply corrent         %         < 25 mA at 24 V supply voltage	Electrical specifications		
No-load supply current         Ip         < 25 mA at 24 V supply voltage           Protection class         III           Interface         III           Interface type         IO-Link (via C/O = pin 4)           ID-Link revision         III           Device ID         ON10A03 (116875)           Transfer rate         ON10A03 (116875)           Transfer rate         ON10A03 (116875)           Process data width         Process data input 2 Bit           Process data width         Process data input 2 Bit           Process data width         Yes           Compatible master port type         I           Signal output         Yes           Compatible master port type         I           Signal output         Process data input 2 Bit           Syntching votage         Ime switching type of the sensor is adjustable. The default setting is:           Signal output         Process data output 2 Bit           Syntching votage         Ima switching votage / fight-on, PNP normal/ opeen / data-on, PNP	Operating voltage	U <sub>B</sub>	10 30 V DC
Protection class         III           Interface         Interface View           Interface type         IO-Link (via C/Q = pin 4 )           IO-Link revision         1.1           Device ID         Ox110A03 (1116675)           Transfer rate         COM2 (28 4 kB/v)s)           Min. cycle time         2.3 ms           Process data width         Process data input 2 Bit           Process data width         yes           Compatible master port type         A           Output         Still measter port type           Switching type         The switching type of the sensor is adjustable. The default setting is: C/Q = Pink*. NPN normally closed / agit-on, PNP normally closed / light-on, IO-Link           Signal output         2 pust-NPN Normally closed / agit-on, PNP normally closed / light-on, IO-Link           Signal output         2 pust-NPN Normally closed / agit-on, PNP normally closed / light-on, IO-Link           Signal output         2 pust-NPN Normally closed / agit-on, PNP normally closed / light-on, IO-Link           Signal output         2 pust-NPN Normally closed / agit-on, PNP normally closed / light-on, IO-Link           Signal output         2 pust-NPN Normally closed / agit-on, PNP normally closed / light-on, IO-Link           Signal output         2 pust-NPN Normally closed / agit-on, PNP normally closed / light-on, IO-Link           Switching votage	Ripple		max. 10 %
Interface         UPU (vi G/Q = pin 4)           IO-Link revision         0-Link (vi G/Q = pin 4)           IO-Link revision         0.11 (AOOA) (1116675)           Device ID         0.x110.AO3 (1116675)           Transfer rate         COM2 (08.4 kB/v)s)           Min. cycle time         2.3 ms           Process data input 2 Bit         Process data input 2 Bit           Process data width         Process data input 2 Bit           Compatible master port type         A           Output         Statis input 2 Bit           Compatible master port type         A           Output         Statis input 2 Bit           Strip of the sensor is adjustable. The default setting is:         C/Q - Pin/4. NPN normally codes / distr-on, PNP normally codes / distr-on, PNP normally codes / distr-on, PNP normally codes / distr-on, OL-Link /Q - Pin/4. NPN normally codes / distr-on, PNP normally codes / distr-on, OL-Link /Q - Pin/4. NPN normally codes / distr-on, PNP normally codes / distr-on, OL-Link /Q - Pin/4. NPN normally codes / distr-on, PNP normally codes / distr-on, OL-Link /Q - Pin/4. NPN normally codes / distr-on, PNP normally codes / distr-on, OL-Link /Q - Pin/4. NPN normally codes / distr-on, PNP normally codes / distr-on, OL-Link /Q - Pin/4. NPN normally codes / distr-on, PNP normally codes / distr-on, OL-Link /Q - Pin/4. NPN normally codes / distr-on, PNP normally codes / distr-on, OL-Link /Q - Pin/4. NPN normally codes / distr-on, PNP normally codes / distr-on, OL-Link /Q - Pin/4. NPN normally codes / distr-on, PNP normally codes / distr-on, PNP normally codes / distr-on, P	No-load supply current	I <sub>0</sub>	< 25 mA at 24 V supply voltage
Interface type         IO-Link ( via CIQ = pin 4 )           IO-Link revision         I.1           Device ID         Ox10003 (1116675)           Transfer rate         COM2 (38.4 kBr/s)           Min. cycle time         2.3 ms           Process data width         Process data output 2 Bit           Process data width         yes           SIO mode support         yes           Compatible master port type         A           Output         Sid mode support           Switching type         Q use (Social Figure 2 Gocial Figur	Protection class		III
IO-Link revision     1.1       Device ID     0x110A03 (1116675)       Transfer rate     COM2 (38.4 kB/k)       Min. cycle time     2.3 ms       Process data width     Process data input 2 Bit Process data input 2 Bit       SIO mode support     yes       Compatible master port type     A       Output     The switching type of the sensor is adjustable. The default setting is: C(G - Pink: NPN normally coped / dark-on. PNP normally cosed / light-on. OL-Link (G - Pink: NPN normally coped / dark-on. PNP normally cosed / light-on.       Signal output     2 push-pull (4 in 1) outputs, short-circuit protected, reverse polarity protected, overvoltage protected       Switching voltage     max. 30 V DC       Switching voltage     max. 30 V DC       Switching voltage     max. 30 V DC       Switching requency     f 500 Hz       Response time     1 ms       Communication interface     EC 61131-9       Product standard     E 87056, cULus Listed, class 2 power supply, type rating 1       Ambient conditions     2060 °C (4 140 °F), movable cable not appropriate for conveyor chains Storage temperature       Ambient conditions     Ifez / IP69 / IP69K       Connoncion     Ifez / IP69 / IP69K       Connoncin <t< td=""><td>Interface</td><td></td><td></td></t<>	Interface		
Device ID         0x110A03 (1116675)           Transfer rate         CCOM2 (38.4 KBI/s)           Min. cycle time         2.3 ms           Process data width         Process data input 2 Bit Process data output 2 Bit           SiO mode support         yes           Compatible master port type         A           Output         The switching type of the sensor is adjustable. The default setting is: C/C - Pir4: NPN normally coper/ dark-on. PNP normally cosed / light-on. (O-Link // C - Pir4: NPN normally coper / dark-on. PNP normally cosed / light-on. (O-Link // C - Pir4: NPN normally coper / dark-on. PNP normally cosed / light-on. (O-Link // C - Pir4: NPN normally coless / light-on. (O-Link // C - Pir4: NPN normally coless / light-on. (O-Link // C - Pir4: NPN normally coless / light-on. (O-Link // C - Pir4: NPN normally coless / light-on. (O-Link // C - Pir4: NPN normally coless / light-on. (O-Link // C - Pir4: NPN normally coless / light-on. (O-Link // C - Pir4: NPN normally coless / light-on. (O-Link // C - Pir4: NPN normally coless / light-on. (O-Link // C - Pir4: NPN normally coless / light-on. (O-Link // C - Pir4: NPN normally coless / light-on. (O-Link // C - Pir4: NPN normally coless / light-on. (O-Link // C - Pir4: NPN normally coless / light-on. (O-Link // C - Pir4: NPN normally coless / light-on. (O-Link // C - Pir4: NPN normally coless / light-on. (O-Link // C - Pir4: NPN normally coless / light-on. (O-Link // C - Pir4: NPN normally coless / light           Switching voltage         max. 100 mA , resistive load           Usage category         U_0           Voltage atrop         U_0           Switching frequency         f E C 6	Interface type		IO-Link (via $C/Q = pin 4$ )
Transfer rate     COM2 (38.4 kBit/s)       Min. cycle time     2.3 ms       Process data width     Process data output 2 Bit Process data width 2 Bit       SIO node support     yes       Compatible master port type     C A       Output     E       Switching type     C A       Signal output     2 pubp-hormally open / dark-on, PNP normally closed / light-on, PNP	IO-Link revision		1.1
Min. cycle ime         2.3 m6           Process data width         Process data input 2 Bit           Process data width         yes           Compatible master port type         Compatible master port type           Switching type         Compatible master port type           Switching type         Compatible master port type           Switching type         The switching type of the sensor is adjustable. The default setting is: C/G = Prid: NPN normally closed // light-on, NPN n	Device ID		0x110A03 (1116675)
Process data width         Process data input 2 Bit Process data output 2 Bit           SIO mode support         yes           Compatible master port type         (a)           Switching type         (a)           Switching type         (b)           Switching type         (c)           Switching type         (c)           Signal output         (c)           Signal output         (c)           Signal output         (c)           Switching voltage         (c)           Switching voltage         (c)           Switching voltage         (c)           Switching frequency         (c)           Max. 30 V DC         (c)           Contromity         (c)           Communication interface         (c)           Product Standard         (c)           Storage temperature         (c)	Transfer rate		COM2 (38.4 kBit/s)
Forcess data output 2 BitSIO mode supportyesCompatible master port typeAOutputThe switching type of the sensor is adjustable. The default closed / light-on, D-Link /O - Pinz: NPN normally open / dark-on, PNP normally open / dark-onSwitching votageImage: Switching type of the sensor is adjustable. The default closed / light-on, D-Link /O - Pinz: NPN normally open / dark-on, PNP normally open / dark-onSwitching votageImage: Switching votage of the sensor is adjustable. The default closed / light-on, D-Link /O - Pinz: NPN normally open / dark-onSwitching votageImage: Switching votage of the sensor is adjustable. The default closed / light-on, D-Link /O - Pinz: NPN normally open / dark-onSwitching votageImage: Switching votage of the sensor is adjustable. The default closed / light-on, D-Link /O - Pinz: NPN normally open / dark-onSwitching votageImage: Switching votage of the sensor is adjustable. The default closed / light-on, D-Link /O - Pinz: NPN normally open / dark-onSwitching votageImage: Switching votage of the sensor is adjustable. The default closed / light-on, D-Link /O - Pinz: NPN normally open / dark-onSwitching votageImage: Switching votage of the sensor is adjustable. The default closed / light-on, D-Link /O - 12 and DC-13Votage categoryImage: Switching votage of the sensor is adjustable. The default closed / light closed /	Min. cycle time		2.3 ms
Compatible master port type         A           Output         Compatible master port type         A           Switching type         Compatible master port type         Compatible sensor is adjustable. The default setting is: CO - Pin4: NPN normally open / dark-on, PNP normally closed / light-on, IO-Link /O - Pin2: NPN normally closed / light-on, PNP normally copen / dark-on           Signal output         Subsching voltage         max. 30 V DC           Switching voltage         max. 30 V DC         max. 30 V DC           Switching requency         f         500 Hz         max. 30 V DC           Voltage drop         Ug         ≤1.5 V DC         max. 30 V DC           Switching frequency         f         500 Hz         max. 30 V DC           Switching frequency         f         500 Hz         max. 30 V DC           Switching frequency         f         500 Hz         max. 30 V DC           Switching frequency         f         500 Hz         max. 30 V DC           Switching type data data         DC-12 and DC-13         DC-12 and DC-13           Output         g         Store         Store         Store           Output         g         Store         Store         Store           Output store         IEC 61131-9         Store         Store         Store	Process data width		
OutputSwitching typeThe switching type of the sensor is adjustable. The default setting is: $C^{0} - Pin4$ . NPN normally closed / light-on, PNP normally closed / light-on, O-Link $1/0 - Pin2$ : NPN normally closed / light-on, PNP normally closed / light-on Signal outputSignal output2 push-pull (4 in 1) outputs, short-circuit protected, reverse polarity protected, overvoltage protectedSwitching voltageImax. 30 V DCSwitching currentmax. 30 V DCUsage categoryDC -12 and DC -13Voltage dropU_a $\leq 1.5$ V DCSwitching frequencyff500 HzResponse timeThe Switching type rating 1ConformityImasUL approvalEN 60947-5-2Approvals and certificatesIEC 61131-9Product standardEN 60947-5-2ApprovalC 2-0 60 °C (-4 140 °F), movable cable not appropriate for conveyor chains storage temperatureArbient conditions-20 60 °C (-4 140 °F), movable cable not appropriate for conveyor chains storage temperatureDegree of protectionIP67 / IP69 / IP69 KConnectionIf stord cable 300 mm with M8 x 1 male connector; 4-pinMaterialImage: Storage temperatureHousingQOptical facePMMAMassapprox.17 gImage: StorageImage: StorageMaterialImage: StorageHeight36.5 mmWidth15 mmDepreh26.7 mm	SIO mode support		yes
Switching type         The switching type of the sensor is adjustable. The default setting is: C/G - Pin4: NPN normally open / dark-on, PNP normally open / dark-on, PNP normally obead / light-on, PNP normaly obead /	Compatible master port type		A
C/Q - Pira': NPN normally open / dark-on, PNP normally open / dark-on         Signal output       2 push-pull (4 in 1) outputs, short-circuit protected, reverse polarity protected, overvoitage protected         Switching voltage       max. 30 V DC         Switching current       max. 30 V DC         Usage category       0 DC-12 and DC-13         Voltage drop       U_d       \$1.5 V DC         Switching frequency       f       500 Hz         Response time       1 ms       Tool (1)         Conformity       E       EC 61131-9         Product standard       1 EC 61131-9       ES 80056, cULus Listed, class 2 power supply, type rating 1         Amprovals and certificates       E 805056, cULus Listed, class 2 power supply, type rating 1         Multit temperature       -20 60 °C (-4 140 °F), movable cable not appropriate for conveyor chains         Storage temperature       1 E0 7 (Peg / IP69 / IP69K         Connection       1 Eix cable 300 FMA         Gonection       1 Eix cable 300 FMA         Gonection       1 Eix cable 300 FMA         Material       I Eix FMA	Output		
Switching voltage         overvoltage protected           Switching vorrent         max. 30 V DC           Watching current         max. 100 mA, resistive load           Usage category         DC-12 and DC-13           Voltage drop         U <sub>d</sub> ≤ 1.5 V DC           Switching frequency         f         500 Hz           Response time         1 ms         Conformity           Communication interface         IEC 61131-9           Product standard         EN 60947-5-2           Approvals and certificates         EN 60947-5-2           UL approval         EN 80506, cULus Listed, class 2 power supply, type rating 1           Ambient conditions         EN 60°C (-4 140 °F), movable cable not appropriate for conveyor chains           Storage temperature         -20 60 °C (-4 140 °F), movable cable not appropriate for conveyor chains           Storage temperature         -20 60 °C (-4 140 °F), movable cable not appropriate for conveyor chains           Storage temperature         -106 °C (-4 140 °F), movable cable not appropriate for conveyor chains           Storage temperature         -1076 °C (PO/C 158 °F)           Bergee of protection         fixed cable 300 mm with M8 x 1 male connector; 4-pin           Material         -106 °C (Polycarbonate)           Optical face         PMMA	Switching type		C/Q - Pin4: NPN normally open / dark-on, PNP normally closed / light-on, IO-Link
Switching current         max. 100 mA, resistive load           Usage category         DC-12 and DC-13           Voltage drop         U <sub>d</sub> ≤ 1.5 V DC           Switching frequency         f         500 Hz           Response time         1 ms         Tos           Conformity         EC 61131-9         Product standard           Product standard         EC 61131-9         Product standard           Approvals and certificates         EC 61056, cULus Listed , class 2 power supply , type rating 1           Ambient conditions         20 60 °C (-4 140 °F) , movable cable not appropriate for convey or chains           Storage temperature         -20 60 °C (-4 140 °F) , movable cable not appropriate for convey or chains           Storage temperature         -20 60 °C (-4 140 °F) , movable cable not appropriate for convey or chains           Storage temperature         -20 60 °C (-4 140 °F) , movable cable not appropriate for convey or chains           Storage temperature         -20 60 °C (-4 140 °F) , movable cable not appropriate for convey or chains           Storage temperature         -20 60 °C (-4 140 °F) , movable cable not appropriate for convey or chains           Storage temperature         -20 60 °C (-4 140 °F) , movable cable not appropriate for convey or chains           Degree of protection         IP67 /IP69 /IP69K           C	Signal output		
Usage categoryImage categoryImage categoryVoltage dropUd<1.5 V DC	Switching voltage		max. 30 V DC
Voltage drop         Ud         ≤ 1.5 V DC           Switching frequency         f         500 Hz           Response time         1 ms           Conformity         IEC 61131-9           Communication interface         IEC 61131-9           Product standard         6           Approvals and certificates         IEC 61131-9           UL approval         6           Ambient conditions         IES 6505, cULus Listed , class 2 power supply , type rating 1           Ambient temperature         -20 60 °C (-4 140 °F) , movable cable not appropriate for conveyor chains           Storage temperature         -40 70 °C (-40 158 °F)           Mechanical specifications         IP67 / IP69 / IP69K           Connection         IP67 / IP69 / IP69/ IP69K           Connection         IP67 / IP69 / IP69K           Material         PMMA           Material         PMMA           Mass         approx.17 g           Dimensions         PMMA           Mass         approx.17 g           Dimensions         Storage temperature         Storage temperature           Width         15 mm	Switching current		max. 100 mA , resistive load
Switching frequency         f         500 Hz           Response time         1 ms           Conformity         EC 61131-9           Product standard         IEC 61131-9           Product standard         EN 60947-5-2           Approvals and certificates         EX 7056 , cULus Listed , class 2 power supply , type rating 1           Ambient conditions         -20 60 °C (-4 140 °F) , movable cable not appropriate for conveyor chains           Storage temperature         -20 60 °C (-4 140 °F) , movable cable not appropriate for conveyor chains           Storage temperature         -40 70 °C (-40 158 °F)           Mechanical specifications         IP67 / IP69 / IP69K           Connection         IP67 / IP69 / IP69K           Connection         PC (Polycarbonate)           Optical face         PMMA           Mass         approx. 17 g           Dimensions         36.5 mm           Width         15 mm           Width         15 mm	Usage category		DC-12 and DC-13
Response time       1 ms         Conformity       EC 61131-9         Product standard       EN 60947-5-2         Approvals and certificates       EX 60947-5-2         UL approval       EX 87056, cULus Listed, class 2 power supply, type rating 1         Ambient conditions       -20 60 °C (-4 140 °F), movable cable not appropriate for conveyor chains storage temperature         Ambient temperature       -20 60 °C (-4 140 °F), movable cable not appropriate for conveyor chains storage temperature         Degree of protection       IP67 / IP69 / IP69 / I         Connection       IP67 / IP69 / IP69 / IP69 / I         Material       IP67 / IP69 / IP69 / IP69 / I         Mousing       PC (Polycarbonate)         Optical face       PMMA         Mass       approx. 17 g         Dimensions       If 5 mm         Width       15 mm         Width       15 mm         Depth       26.7 mm	Voltage drop	$U_d$	≤ 1.5 V DC
Conformity         IEC 61131-9           Product standard         IEC 61131-9           Product standard         EN 60947-5-2           Approvals and certificates         IEC 61000000000000000000000000000000000000	Switching frequency	f	500 Hz
Communication interfaceIEC 61131-9Product standardEN 60947-5-2Approvals and certificatesE87056, cULus Listed, class 2 power supply, type rating 1Ambient conditionsE87056, cULus Listed, class 2 power supply, type rating 1Ambient temperature-20 60 °C (-4 140 °F), movable cable not appropriate for conveyor chains storage temperatureStorage temperature-40 70 °C (-40 158 °F)Mechanical specificationsIP67 / IP69 / IP69KConnectionfixed cable 300 mm with M8 x 1 male connector; 4-pinMaterialPC (Polycarbonate)Optical facePMMAMassapprox. 17 gDimensions36.5 mmWidth15 mmDepth62.7 mm	Response time		1 ms
Product standardEN 60947-5-2Approvals and certificatesE87056, cULus Listed, class 2 power supply, type rating 1UL approvalE87056, cULus Listed, class 2 power supply, type rating 1Ambient conditions-2060 °C (-4 140 °F), movable cable not appropriate for conveyor chains conveyor chains °F)Methanical specifications-2060 °C (-4 158 °F)Degree of protectionIP67 / IP69 / IP69 KConnectionIP67 / IP69 / IP69 KMaterial	Conformity		
Approvals and certificates         E87056, cULus Listed, class 2 power supply, type rating 1           UL approval         E87056, cULus Listed, class 2 power supply, type rating 1           Ambient conditions         -20 60 °C (-4 140 °F), movable cable not appropriate for conveyor chains           Ambient temperature         -20 60 °C (-4 140 °F), movable cable not appropriate for conveyor chains           Storage temperature         -40 70 °C (-40 158 °F)           Mechanical specifications         IP67 / IP69 / IP69 K           Connection         1           Material         IP67 / IP69 / IP69 K           Material         PC (Polycarbonate)           Optical face         PMMA           Mass         approx. 17 g           Dimensions         36.5 mm           Width         15 mm           Width         15 mm	Communication interface		IEC 61131-9
UL approval       E87056, cULus Listed, class 2 power supply, type rating 1         Ambient conditions       -20 60 °C (-4 140 °F), movable cable not appropriate for conveyor chains         Storage temperature       -20 60 °C (-4 140 °F), movable cable not appropriate for conveyor chains         Storage temperature       -40 70 °C (-40 158 °F)         Mechanical specifications       IP67 / IP69 / IP69K         Connection       IP67 / IP69 / IP69K         Connection       Ifixed cable 300 mm with M8 x 1 male connector; 4-pin         Material       IPC (Polycarbonate)         Optical face       PMMA         Mass       approx. 17 g         Dimensions       36.5 mm         Width       15 mm         Vidth       26.7 mm	Product standard		EN 60947-5-2
Ambient conditionsAmbient temperatureColor C (-4 140 °F), movable cable not appropriate for conveyor chains -40 70 °C (-40 158 °F)Storage temperature-40 70 °C (-40 158 °F)Mechanical specificationsIP67 / IP69 / IP69KConnectionIP67 / IP69 / IP69KConnectionImage (Image Color C) (-40 158 °C)MaterialImage C)HousingPC (Polycarbonate)Optical facePMMAMassapprox. 17 gDimensionsS6.5 mmWidth15 mmDepth26.7 mm	Approvals and certificates		
Ambient temperature-20 60 °C (-4 140 °F) , movable cable not appropriate for conveyor chainsStorage temperature-40 70 °C (-40 158 °F)Mechanical specificationsIP67 / IP69 / IP69KConnectionIP67 / IP69 / IP69KConnectionfixed cable 300 mm with M8 x 1 male connector; 4-pinMaterialPC (Polycarbonate)Optical facePMMAMassapprox. 17 gDimensions36.5 mmWidth15 mmDepth26.7 mm	UL approval		E87056 , cULus Listed , class 2 power supply , type rating 1
Storage temperature-40 70 °C (-40 158 °F)Mechanical specificationsDegree of protectionIP67 / IP69 / IP69KConnectionimage of fixed cable 300 mm with M8 x 1 male connector; 4-pinMaterialPC (Polycarbonate)Optical facePMMAMassoptrox. 17 gDimensionsImage of fixed cable 300 mm with M8 x 1 male connector; 4-pinWidth15 mmOptical face16.7 mm	Ambient conditions		
Mechanical specificationsDegree of protectionIP67 / IP69 / IP69KConnectionif ixed cable 300 mm with M8 x 1 male connector; 4-pinMaterialPC (Polycarbonate)Motional facePC (Polycarbonate)Optical facePMMAMassapprox. 17 gDimensions36.5 mmWidth15 mmDepth62.7 mm	Ambient temperature		-20 60 °C (-4 140 °F) , movable cable not appropriate for conveyor chains
Degree of protectionIP67 / IP69 / IP69KConnectionfixed cable 300 mm with M8 x 1 male connector; 4-pinMaterialMaterialHousingPC (Polycarbonate)Optical facePMMAMassapprox. 17 gDimensions36.5 mmWidth15 mmDepth26.7 mm	Storage temperature		-40 70 °C (-40 158 °F)
ConnectionIf ixed cable 300 mm with M8 x 1 male connector; 4-pinMaterialHousingPC (Polycarbonate)Optical facePMMAMassapprox.17 gDimensionsHeight36.5 mmWidth15 mmDepth26.7 mm	Mechanical specifications		
MaterialHousingPC (Polycarbonate)Optical facePMMAMassapprox. 17 gDimensions36.5 mmWidth15 mmDepth26.7 mm	Degree of protection		IP67 / IP69 / IP69K
HousingPC (Polycarbonate)Optical facePMMAMassapprox. 17 gDimensions36.5 mmWidth15 mmDepth26.7 mm	Connection		fixed cable 300 mm with M8 x 1 male connector; 4-pin
Optical facePMMAMassapprox.17 gDimensions36.5 mmHeight36.5 mmWidth15 mmDepth26.7 mm	Material		
Mass     approx.17 g       Dimensions     36.5 mm       Height     36.5 mm       Width     15 mm       Depth     26.7 mm	Housing		PC (Polycarbonate)
Dimensions     36.5 mm       Height     36.5 mm       Width     15 mm       Depth     26.7 mm	Optical face		PMMA
Height         36.5 mm           Width         15 mm           Depth         26.7 mm	Mass		approx. 17 g
Width     15 mm       Depth     26.7 mm	Dimensions		
Depth 26.7 mm	Height		36.5 mm
	Width		15 mm
Cable length 0.3 m	Depth		26.7 mm
	Cable length		0.3 m

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

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# **Connection Assignment**



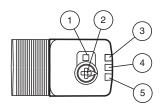
# **Connection Assignment**

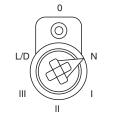


#### Wire colors in accordance with EN 60947-5-2

1	BN	(brown)
2	WH	(white)
3	BU	(blue)
4	BK	(black)

### Assembly





1	Teach-in button
2	Mode rotary switch
3	Operating indicator / dark on
4	Signal indicator
5	Operating indicator / light on

Ν	Normal mode
Ι	10 % contrast detection
П	18 % contrast detection
	40 % contrast detection
L/D	Switching type
0	Keylock

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

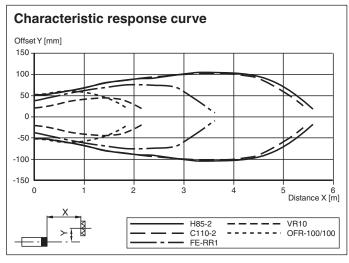
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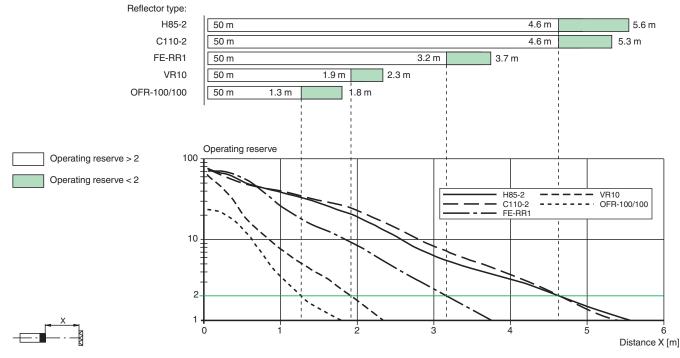
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## **Characteristic Curve**



#### **Relative received light strength**



## Commissioning

#### Teach-in

Use the rotary switch to select the required operating mode: Normal mode (N) or contrast level I - III.

To teach in a threshold or activate an operating mode, press the "TI" button until the yellow and green LEDs flash in phase (approx. 1 s). Release the "TI" button. Teach-in starts.

Successful teach-in is indicated by alternating flashing (2.5 Hz) of the yellow and green LEDs. The sensor will now operate in the selected operating mode with the taught-in threshold. An unsuccessful teach-in is indicated by rapidly alternating flashing (8 Hz) of the yellow and green LEDs. After an unsuccessful teach-in, the

An unsuccessful teach-in is indicated by rapidly alternating flashing (8 Hz) of the yellow and green LEDs. After an unsuccessful teach-in, the sensor continues to operate with the previous valid setting after the relevant visual fault signal is issued. Every taught-in switching threshold can be re-taught (overwritten) by pressing the "TI" button again.

Note: To ensure that the device functions reliably in Contrast mode, the device must be powered on at least 30 s before teach-in.

#### Setting the Device to Maximum Sensitivity

1. Use the rotary switch to select the Normal mode (N) position.

2. Press the "TI" button for > 4 s. The yellow and green LEDs will go out.

- 3. Release the "TI" button.
- The settings will be reset to maximum sensitivity. After successfully resetting, the yellow and green LEDs will flash alternately (2.5 Hz).

#### Switching between light on/dark on

1. Use the rotary switch to select the light on/dark on (L/D) position.

- 2. Press the "TI" button for > 1 s. The respective operating indicator LED (L/D) will illuminate green and the switching type will change.
- 3. To reset the switching type, press the "TI" button for > 4 s. The respective operating indicator LED (L/D) will illuminate green and the operating indicator will be reset to the most recently active switching type.

#### Reset to Default Settings

1. Use the rotary switch to select the O position.

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# Commissioning

- 2. Press the "TI" button for > 10 s. The yellow and the green LEDs will both switch off.
- 3. Release the "TI" button. The yellow LED is on. After resetting, the sensor will operate with the following default settings:
- Normal mode (N)
- Maximum sensitivity adjustment
- Dark on
- Pin 2 (white core): antivalent switching output

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

