## **HRTL 96B**



en 01-2011/03 50113487

50 ... 6,500mm

## 18 - 30 V <u>DC</u>

- Laser light scanner based on the principle of light propagation time measurement – simple operation using teachable switching points
- Sensor performance allows reliable detection of both glossy and less-reflective objects at extreme angles
- Automatic reserve and hysteresis ensure reliable switching behavior
- Optimized for positioning applications and reliable object detection (e.g. compartment occupation check, shelf positioning, pushthrough monitoring)
- External teach input for precise referencing (detection and storage of distance to the object)
- Teach input allows external selection of the sensor performance (e.g. switching from compartment occupation check to push-through monitoring)
- Deactivation input for checking the switch function and resetting to output mode (status before teach-in)



## **Accessories:**

#### (available separately)

- Mounting systems (BT 96, BT 96.1, UMS 96, BT 450.1-96)
- M12 connectors (KD ...)
- Ready-made cables (K-D ...)

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## Laser light scanner with background suppression

## **Dimensioned drawing**









Ti Ti

В

κ

- A Green indicator diode
- **B** Yellow indicator diode
- **C** Transmitter
- **D** Receiver
- E Optical axis
- F Device plug M12x1
- **G** Countersinking for SK nut M5, 4.2 deep
- H Key pad
- I Reference edge for the measurement (cover glass)
- **K** OUT1 scanning range adjustment
- L Indicator diodes yellow for OUT1 switching output

## **Electrical connection**



...M/6.49.02S...



Pin 2 = Teach input

## $\begin{array}{l} \mbox{Pin 2} = \mbox{Teach input} \\ \mbox{Pin 5} = \mbox{Deactivation input} \end{array}$

## **Specifications**

#### **Optical data**

Typ. scanning range limit (white 90%) 1) Scanning range 2) Adjustment range / teach-in range Light source Light spot diameter Wavelength Max. output power Pulse duration

#### Timina

Switching frequency Response time Delay before start-up

#### **Electrical data**

Operating voltage U<sub>B</sub> Residual ripple Open-circuit current Switching output

Signal voltage high/low Output current

#### Indicators

Sensor front Green LED Yellow LED Sensor back

#### Mechanical data

Housing Optics cover Weight Connection type

#### **Environmental data**

Ambient temperature (operation<sup>4)</sup>/storage) Protective circuit 5 VDE safety class 6) Protection class Standards applied

50 ... 6500mm 100 ... 6000mm 150 ... 6000mm / 6 ... 90 % diffuse reflection laser (red light), pulsed 1m:6mm / 3m:5mm / 5m:4mm / 7m:4mm 658 nm < 248mW 6.5ns

100Hz 5ms ≤ 200ms

..../6....

18 ... 30VDC (incl. residual ripple)  $\leq$  15 % of  $U_{\rm B}$ ≤ 120mA 1 push-pull switching output <sup>3)</sup> PNP light switching, NPN dark switching  $\geq$  (U<sub>B</sub>-2V)/ $\leq$  2V max. 100 mA

ready reflection (Q1 = OUT1) see table

#### Metal housing diecast zinc

glass 380 g M12 connector, 5-pin

-40°C ... +50°C / -35°C ... +70°C 1, 2, 3, 4 II, all-insulated IP 67, IP 69K 7) IEC 60947-5-2

- Typ. scanning range limit: max. attainable range without performance reserve
- 2) Scanning range: recommended range with performance reserve
- The push-pull switching outputs must not be connected in parallel 3)
- Down to -30°C: Without restriction. Below -30°C: Sensor for voltage supply remains in place, the sensor becomes 4) fully functional again approx. 3 min. following reactivation of the voltage supply, if necessary, repeat the activation procedure
- 1=transient protection, 2=polarity reversal protection, 3=short circuit protection for all outputs, 4=interference 5) blanking
- 6)
- Rating voltage 250VAC IP 69K test in accordance with DIN 40050 part 9 simulated, high pressure cleaning conditions without the use 7) of additives, acids and bases are not part of the test

#### Approved purpose:

This product may only be used by qualified personnel and must only be used for the approved purpose. This sensor is not a safety sensor and is not to be used for the protection of persons.

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#### **HRTL 96B**

#### Tables

Switching points	no reflection	object detected
Yellow LED Q 1	off	on
Yellow I FD 0 2	-	-

#### Diagrams



#### Remarks

- Setting the switching points: Point the sensor towards the object Q1: Hold teach button 1 down for approx. 2s, release when the LED starts flashing, teach in of switching
- point complete. The object has been detected when Q1 indicator lights up.
- Reserve: For the reliable . detection of objects with low reflectance, a reserve is automatically added during the teach-in event. This is constant over the entire teach-in range. Object is detected: distance to sensor  $\leq$  teach-in point + reserve
- Hysteresis: To ensure continuous object detection in the switching point, the sensor has a switch-off hysteresis. Object is no longer detected if: distance to sensor > teach-in point + reserve + hysteresis.
- Factory settings: Compartment occupation check Reserve: approx. 50 mm hysterese: approx. 50mm Push-through monitoring Reserve: approx. 25 mm hysterese: approx. 15mm
- Object detection: resolution < 5 mm, standard deviation  $\pm 10$  mm at  $\pm 3$  Sigma
- Edge detection/horizontal positioning: repeatability  $< 1 \, \text{mm}$
- With the set scanning range, a tolerance of the upper scanning range limit is possible depending on the reflection properties of the material surface.
- Window function: Object is detected at distance switching point ± window width
- Scanning range/reflectivity:

Object/ diffuse reflection	
6 90%	0.15 6 m (standard)

## **HRTL 96B**

## Laser light scanner with background suppression

### Part number code

		HB	TL	96	B /	6.	49	0 2	S -	S 1 2
			-   -	1-1-	1-1.	1-1-		1-1-		
									Γ	
Operating	principle									
HRT	Diffuse reflection light scanners with background suppression									
Operating	principle									
L	Laser (red light)									
Construct	ion/version									
96B	96B Series									
Switching	output/function (OUT 1: Pin 4, OUT 2: Pin 2)									
/6	1 x push-pull transistor output, OUT 1: light switching									
Switching	input									
.4	Teach input (Pin 2)									
.9	Deactivation input (Pin 5)									
Equipmen	t									
.02	Customized configuration									
Light-spot	t geometry									
S	Small light spot								-	
Electrical	connection									
-S12	M12 connector, 5-pin (plug)									-

#### **Order guide**

The sensors listed here are preferred types; current information at www.leuze.com

Order code	Part No.	Features
HRTL 96B/6.4.02S-S12	50111815	1 x push-pull switching output, 1 x teach input
TINTE 900/0.49.020-012	30112003	Tx push-puil switching output, Tx teach input, Tx deactivation input

# HRTL 96B/6.4.02S-S12 window teach-in - stop palette movement of high-bay storage device



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HRTL 96B

## **Application examples**

#### Combined compartment occupation check and push-through monitoring with HRTL 96B M/6.49.02S-S12 (50112803)

#### Process:

- High-bay storage device has reached its target position (X/Y).
- The HRTL 96 is in compartment occupancy mode (scanning range can be defined using the teach button, e.g. standard distance to palette in depth 2).
- No detection of palette signifies fork not extended. Possible cause:
  - No palette present
  - Palette outside of tolerance range (e.g. not set down properly during the bring procedure)
    OUT1 switching output (Pin 4) = inactive
- Palette detected:
  - Switch sensor over from compartment occupancy mode to push-through mode
    > External teach-in via teach input (Pin 2)
    The actual distance to the palette is measured and stored (set > 20ms input).
  - Window teach-in, thus a window of approx. ± 30mm is set automatically around the teach point.
  - -> Teach-in okay: OUT1 output (Pin 4) = active
- Start fork cycle:
  - In the event of a crash between fork and palette, the distance to the sensor changes:
  - Distance of sensor to palette > (teach distance + window) -> OUT1 switching output (Pin 4) inactive -> Stop fork, prevent the palette from falling
  - Distance from sensor to palette does not change
  - -> Fork cycle is concluded and palette is set down on high-bay storage device.
- Resetting of sensor:
- -> Set deactivation input (Pin 5 = active)
- Approach next target...



#### Push-through monitoring with HRTL 96B M/6.4.02S-S12 (50111815) via external teach-in

#### Process:

- High-bay storage device has reached its position
- Set teach input for > 20 ms
  - -> External teach-in via teach input (Pin 2)
  - The actual distance to the palette is measured and stored.
  - Window teach-in, thus a window of approx.  $\pm$  30mm is set automatically around the teach point.
  - -> Teach-in okay: OUT1 output (Pin 4) = active
- Start fork cycle:
  - In the event of a crash between fork and palette, the distance to the sensor changes:
  - Distance of sensor to palette > (teach distance + window)
  - -> OUT1 switching output (Pin 4) inactive -> Stop fork, prevent the palette from falling
  - Distance from sensor to palette does not change
  - -> Fork cycle is concluded and palette is set down on high-bay storage device.

