HRTL 96B — Laser light scanner with background suppression

Part No. 501 09888

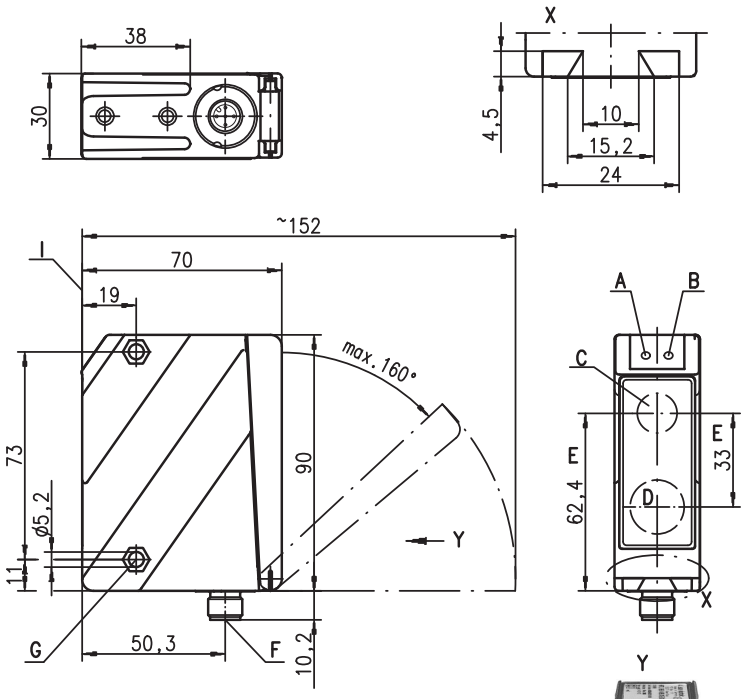
50 … 6,500 mm

18 - 30 V DC

- Laser scanner with large detection range for universal application (visible red light)
- Light propagation time measurement makes use possible under extreme environmental conditions (brightness, light, interfering contours)
- Extremely simple operation, teachable switching points
- Time lock prevents unintentional changing of the switching points
- Automatic reserve and hysteresis ensure reliable switching behaviour
- Switching behaviour independent of the direction of movement
- Optimised for positioning tasks and reliable object detection (e.g. compartment occupancy monitoring, horizontal positioning)
- Diagnostic function

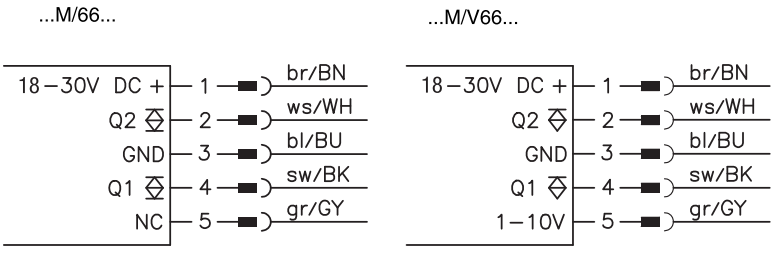
IEC 60947... IEC 60947... IP 69K IP 67

Dimensioned drawing



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 Scanning range adjustment Q1/Q2
L Yellow indicator diodes for switching outputs Q1/Q2

Electrical connection



Accessories:

(available separately)

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

Specifications

Optical data

Typ. scanning range limit (white 90%) [1]		50 … 6500mm
Scanning range [2]		100 … 6000mm
Adjustment range / teach range		150 … 6000mm / 6 … 90% diffuse reflection
Light source		laser (red light)
Light spot diameter		1m:6mm / 3m:5mm / 5m:4mm / 7m:4mm
Wavelength		658nm
Laser warning notice		see remarks

Timing

Switching frequency		100Hz
Response time		5ms
Delay before start-up		≤ 200ms

Electrical data

Operating voltage U_B		18 … 30VDC (incl. residual ripple)
Residual ripple		≤ 15% of U_B
Open-circuit current		≤ 120mA
Switching output	…/66…	2 push-pull switching outputs [3] PNP light switching, NPN dark switching
Analogue output	configurable:	0 … 10V / 1 … 10V (default) / 0 … 5V / 1 … 5V
Signal voltage high/low		≥ (U_B-2V)/≤ 2V
Output current		max. 100mA

Indicators

Sensor front	
Green LED	ready
Yellow LED	reflection (Q_1)
Sensor back	see table

Mechanical data — **Metal housing**

Housing	diecast zinc
Optics cover	glass
Weight	380g
Connection type	M12 connector, 5-pin

Environmental data

Ambient temp. (operation/storage)	-30°C … +50°C/-35°C … +70°C
Protective circuit [4]	1, 2, 3, 4
VDE safety class [5]	II, all-insulated
Protection class	IP 67, IP 69K [6]
Standards applied	IEC 60947-5-2

1) Typ. scanning range limit: max. attainable range without performance reserve
2) Scanning range: recommended range with performance reserve
3) The push-pull switching outputs must not be connected in parallel
4) 1=transient protection, 2=polarity reversal protection, 3=short circuit protection for all outputs, 4=interference blanking
5) Rating voltage 250VAC
6) IP 69K test acc. to DIN 40050 part 9 simulated, high pressure cleaning conditions without the use of additives, acids and bases are not part of the test

- **Approved purpose**:
  The diffuse reflection light scanners are optoelectronic sensors for optical, contactless detection of objects.

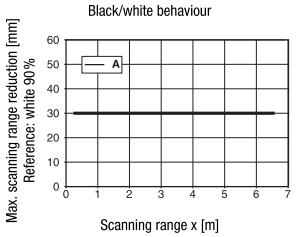
Order guide

Selection table Equipment ↓	Order code →	HRTL 96BM/66.01S-S12 Part No. 501 08889	HRTL 96BM/V66.02S-S12 Part No. 501 10728	HRTL 96BM/V66.01S-S12 Part No. 501 10952	
Housing	metal	●	●	●	
Light source	red light/laser	●	●	●	
Connection	M12 connector, 5-pin	●	●	●	
Outputs	3 switching points				
	2 switching points	●	●	●	
	2 x push-pull, PNP light switching	●	●	●	
	2 x push-pull, PNP dark switching				
	teachable switching points	●	●	●	
	analogue / voltage (range = 100 … 1500)		●		
	analogue / voltage (range = 100 … 6000)			●	

Tables

Switching points	no reflection	object detected
Yellow LED Q 1	off	on
Yellow LED Q 2	off	on

Diagrams



A 6 … 90% diffuse reflection

Remarks

- Setting switching points: Align sensor with object, press respective teach button for at least 2s, then release the button. Object is detected if the corresponding Q1/Q2 indicator illuminates.
- Reserve: For the reliable detection of objects with low reflectance, a reserve is automatically added during the teach event. This is constant over the entire teach range.
  Object is detected:
  distance to sensor ≤ teach 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 point + reserve + hysteresis.
- Factory setting:
  reserve: approx. 50mm
  hysteresis: approx. 50mm
- Object detection:
  resolution < 5mm, standard deviation ±10mm at ±3 Sigma
- Edge detection/horizontal positioning: repeatability < 1mm
- With the set scanning range, a tolerance of the upper scanning range limit is possible depending on the reflection properties of the material surface.
- Scanning range/reflectivity:

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