



## HRT 96

## Diffuse reflection light scanner with background suppression



100 ... 2500mm



- Scanner with adjustable background suppression
- Two switching points
- Individual adaptation to applications by means of programming and diagnosis software
- Universal sensor application through optional foreground suppression or exact edge detection
- General light/dark switching or complementary switching/output, scanning range adjustment and delay before start-up for optimal adaptation to the application
- Robust metal housing with glass cover, protection class IP 67/IP 69K for industrial application

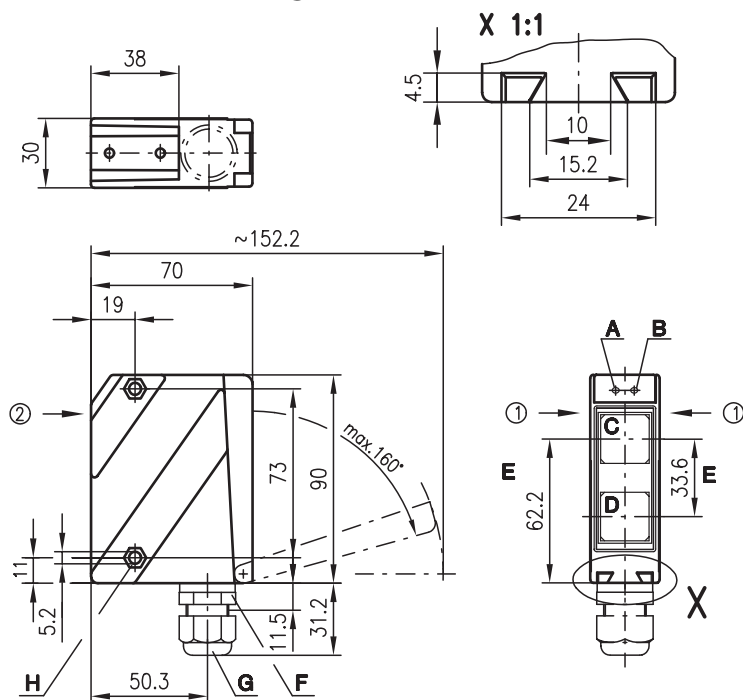


### Accessories:

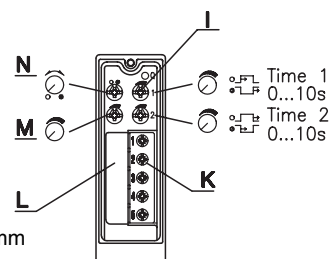
(available separately)

- Mounting systems (BT 96, BT 96.1, BT 450.1-96, UMS 96)
- Programming device UPG-2, Programming software
- M12 connectors (KD ...)
- Ready-made cables (K-D ...)

### Dimensioned drawing

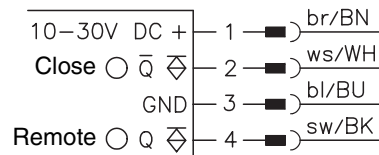
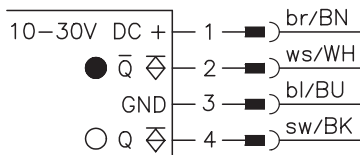


- A** Indicator diode green  
**B** Indicator diode yellow  
**C** Transmitter  
**D** Receiver  
**E** Optical axis  
**F** Device plug M12x1  
**G** Screwed cable gland M16x1.5 for Ø 5 ... 10mm  
**H** Countersinking for SK nut M5, 4.2 deep  
**I** Output with option switching delay  
**K** Connection terminals  
**L** Cable entry  
**M** Scanning range adjustment  
**N** Light/dark switching  
 Preferred entry direction for objects ① + ②



### Electrical connection

42



see remarks !

### Specifications

#### Optical data

Typ. scanning range limit (white 90%) <sup>1)</sup>  
 Scanning range <sup>2)</sup>  
 Adjustment range  
 Light source  
 Wavelength

#### HRT...1600...

100 ... 2500mm  
 see tables  
 150 ... 2000mm  
 LED (modulated light)  
 880nm

#### HRT...3604...

10 ... 2500mm  
 see tables  
 150 ... 2000mm

#### Timing

Switching frequency  
 Response time  
 Delay before start-up

300Hz  
 1.67ms  
 ≤ 200ms

#### Electrical data

Operating voltage  $U_B$   
 Residual ripple  
 Bias current  
 Switching output  
 Function characteristics  
 Signal voltage high/low  
 Output current

10 ... 30VDC (incl. residual ripple)  
 ≤ 15% of  $U_B$   
 ≤ 35mA  
 PNP transistor  
 light/dark switching (reversible)  
 $\geq (U_B - 2V) \leq 2V$   
 max. 100mA

#### Indicators

##### Sensor front

LED green  
 LED yellow

ready  
 reflection

ready

##### Sensor back

LED red/green

see table

reflection

#### Mechanical data

Housing  
 Optics cover  
 Weight  
 Connection type

#### Metal housing

diecast zinc  
 glass  
 380g  
 terminals or M12 connector

#### Environmental data

Ambient temp. (operation/storage)  
 Protective circuit <sup>3)</sup>  
 VDE safety class <sup>4)</sup>  
 Protection class  
 LED class  
 Standards applied

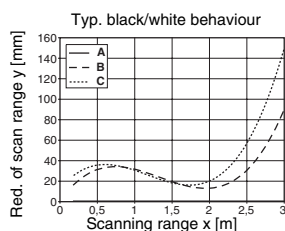
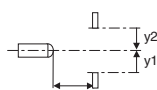
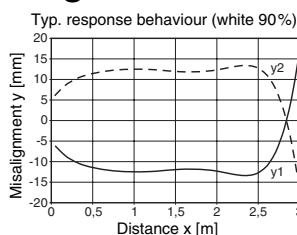
-20°C ... +60°C/-40°C ... +70°C  
 1, 2, 3, 4  
 II, all-insulated  
 IP 67, IP 69K <sup>5)</sup>  
 1 (acc. to EN 60825-1)  
 IEC 60947-5-2

#### Options

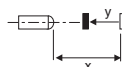
**Switching delay** (slow oper./release) 0 ... 10s (separately adjustable)

- 1) Typ. scanning range limit: max. attainable range without performance reserve
- 2) Scanning range: recommended range with performance reserve
- 3) 1=transient protection, 2=polarity reversal protection, 3=short circuit protection for all outputs, 4=interference blanking
- 4) Rating voltage 250VAC
- 5) 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

### Diagrams



A white 90%  
 B grey 18%  
 C black 6%



### Order guide

Selection table		Order code →					
Equipment ↓		HRT 96M/P-1600-2000-42 Part No. 500 60857	HRT 96M/P-3604-2000-42 Part No. 500 60858				
Housing	metal	●	●				
Light source	infrared light (2000mm)	●	●				
Connection	M12 connector	●	●				
Features	short range		●				
	2 switching points		●				
	switching delay	●	●				
	complementary switching outputs	●					

HRT 96 M/P-1600-2000-42 - 05  
 HRT 96 M/P-3604-2000-42 - 05

### Tables

1	100	2000	2500
2	100	1990	2470
3	100	1980	2430

1	white 90%
2	grey 18%
3	black 6%

Scanning range [mm]  
 Typ. scanning range limit [mm]

#### Light switching

Switching points	LED red	LED green	LED yellow
no detection (reflection on background)	on	off	off
detection distant range	off	on	on
detection close range	on	on	on

#### Dark switching

- **LED red/green:**  
see Light switching
- **LED yellow:**  
inverted

### Remarks

- **General**  
With the set scanning range, a tolerance of the upper scanning range limit is possible depending on the reflection properties of the material surface.
- **Reference scanner**  
Scanner for safe detection of objects under most difficult environmental conditions (e. g. black object on white background). Is set through re-parameterisation of the standard HRT 96...3604... sensor via Software "Lupo".

#### HRT 96...3604...

- **Switching points**  
Fixed ratio between short and distant range  
s.r. ~0.5xd.r. Adjusting the distant range also sets the short range.
- **Switching output**  
Pin/terminal  
4/3=distant range  
2/4=short range (standard)  
2/4=programmable (e.g. activation input, compl. switching output)

#### HRT 96...1600...

- **Switching output**  
Pin/terminal  
4/3=switching output  
2/4=compl. switching output
- Available as a set together with cable socket KD 095