

## HRT 96

## Diffuse reflection light scanner with background suppression



100 ... 2500mm



10 - 30 V

DC



- 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



IEC 60947...



IEC 60947...

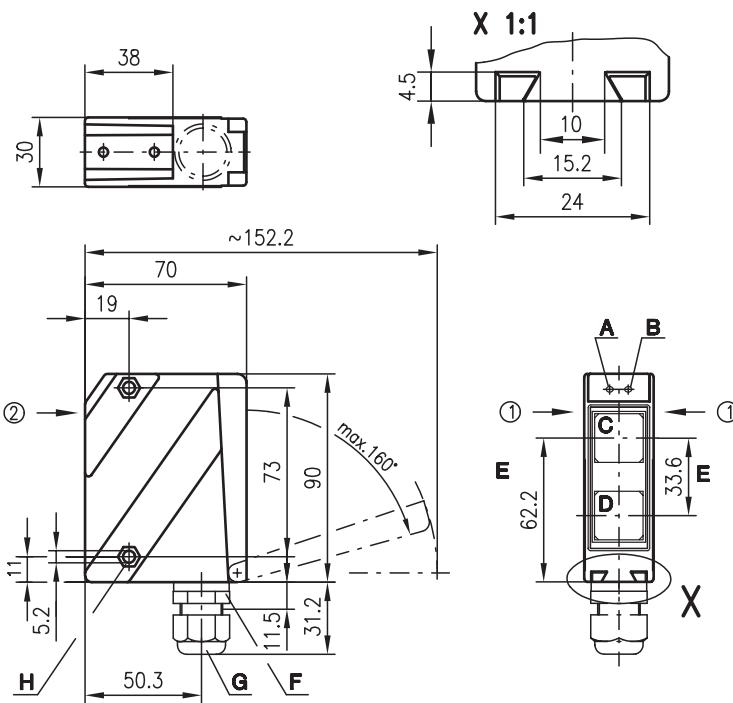


## Accessories:

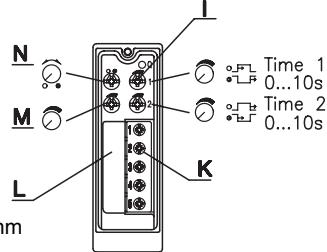
(available separately)

- 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

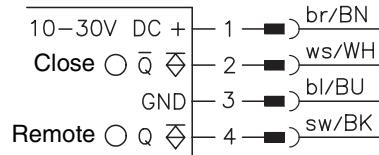
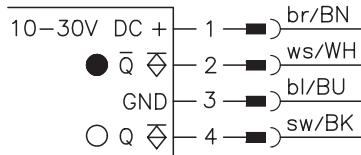


**A** Indicator diode green  
**B** Indicator diode yellow  
**C** Transmitter  
**D** Receiver  
**E** Optical axis  
**F** Device plug M12x1  
**G** Screwed cable gland M16x1.5 for Ø 5 ... 10mm  
**H** Countersinking for SK nut M5, 4.2 deep  
**I** Output with option switching delay  
**K** Connection 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%) 1)  
Scanning range 2)  
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)

≥  $(U_B - 2V) / 2V$

max. 100mA

### Indicators

Sensor front  
LED green  
LED yellow

Sensor back  
LED red/green

ready  
reflection

ready

### Metal housing

diecast zinc

glass

380g

terminals or M12 connector

see table

reflection

### Mechanical data

Housing  
Optics cover  
Weight

Connection type

-20°C ... +60°C/-40°C ... +70°C

1, 2, 3, 4

II, all-insulated

IP 67, IP 69K 5)

1 (acc. to EN 60825-1)

IEC 60947-5-2

### Environmental data

Ambient temp. (operation/storage)

Protective circuit 3)

VDE safety class 4)

Protection class

LED class

Standards applied

1, 2, 3, 4

II, all-insulated

IP 67, IP 69K 5)

1 (acc. to EN 60825-1)

IEC 60947-5-2

### Options

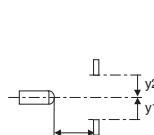
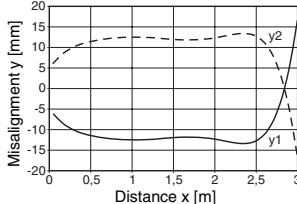
Switching delay (slow oper./release)

0 ... 10s (separately adjustable)

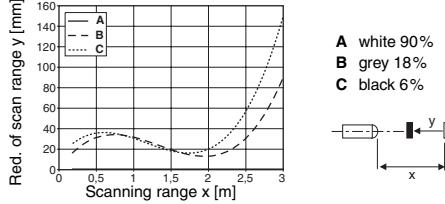
- 1) Typ. scanning range limit: max. attainable range without performance reserve
- 2) Scanning range: recommended range with performance reserve
- 3) 1=transient protection, 2=polarity reversal protection, 3=short circuit protection for all outputs, 4=interference blanking
- 4) Rating voltage 250VAC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

Typ. response behaviour (white 90%)



Typ. black/white behaviour



## Order guide

### Selection table

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

## 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