



100 ... 1200mm

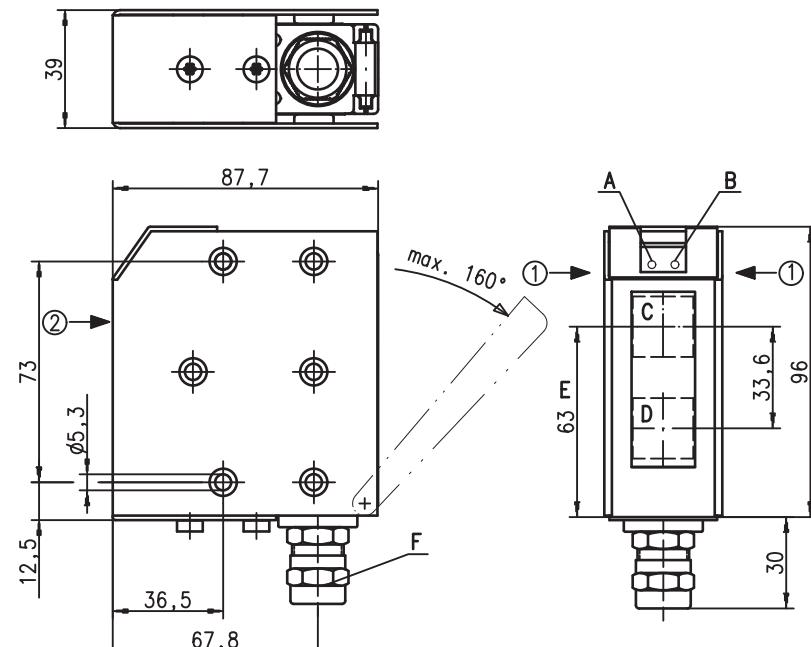
- Diffuse sensor with adjustable background suppression using visible red light
  - Robust metal housing with shock-resistant optical window, degree of protection IP 67/ IP 69K for industrial application
  - Complementary switching outputs, range adjustment and delay before start-up for optimal adaptation to the application
  - Switching delay for optimal adaptation to the application
  - Connection via comfortable terminal compartment
  - ATEX certification:
    -  II 3G Ex ec IIB T4 Gc
    -  II 3D Ex tc IIIC T70 °C Dc
  - IECEEx BVS 21.0054:
    - Ex ec IIB T4 Gc
    - Ex tc IIIC T70 °C Dc

## Accessories:

(available separately)

- Mounting systems  
(BT 96, BT 96.1, UMS 96, BT 450.1-96)

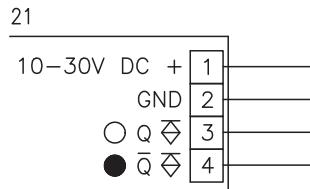
## Dimensioned drawing



- A** Green indicator diode
  - B** Yellow indicator diode
  - C** Transmitter
  - D** Receiver
  - E** Optical axis
  - F** Screwed cable gland M16x1.5 for Ø 5 ... 9mm
  - G** Connection terminals
  - H** Cable entry
  - I** Range adjustment
  - K** Light/dark switching

Preferred entry direction for objects: + (2)

## Electrical connection



## Technical data

### Optical data

Typ. maximum range (white 90%) <sup>1)</sup>  
Operating range <sup>2)</sup>

Adjustment range  
Light source  
Wavelength

Red light  
100 ... 1200mm  
See tables  
100 ... 800mm  
LED (modulated light)  
660nm

### Time behavior

Switching frequency  
Response time  
Delay before start-up

300Hz  
1.67ms  
≤ 200ms

### Electrical data

Operating voltage  $U_B$

Residual ripple

Open-circuit current

Switching output

Function

Signal voltage high/low

Output current

10 ... 30VDC (incl. residual ripple)  
≤ 15% of  $U_B$   
≤ 35mA  
PNP transistor  
Light or dark switching (changeover-capable)  
 $\geq (U_B - 2V)/2V$   
Max. 100mA

### Indicators

Green LED

Yellow LED

### Mechanical data

Housing

Optics cover

Weight

Connection type

Screwed cable gland

Ready

Reflection

### Metal housing

Diecast zinc

Glass

380g

Terminals, cable diameter 5 ... 9mm

Wire cross section 0.5 ... 1.5 mm<sup>2</sup>

EEx e II clamping torque 3.5Nm

Terminal clamping torque 0.5Nm

### Environmental data

Ambient temp. (operation/storage)

Protective circuit <sup>3)</sup>

VDE protection class <sup>4)</sup>

Protection class

Light source

Standards applied

-20°C ... +50°C/-30°C ... +55°C

1, 2

II, all-insulated

IP 67, IP 69K <sup>5)</sup>

Exempt group (in acc. with EN 62471)

IEC 60947-5-2

### Options

Switching delay (slow oper./release)

### Explosion protection

Certification ATEX:

Certification IECEx:

0 ... 10s (separately adjustable)

Ex II 3G Ex ec IIB T4 Gc

Ex II 3D Ex tc IIIC T70 °C Dc

Ex ec IIB T4 Gc

Ex tc IIIC T70 °C Dc

1) Typ. range limit: max. attainable range without function reserve

2) Scanning range: recommended range with function reserve

3) 1=transient protection, 2=polarity reversal protection

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

## Tables

### Red light

1	100	800	1200
2	100	770	1140
3	100	730	1050

1 White 90%

2 Gray 18%

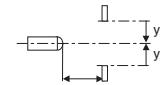
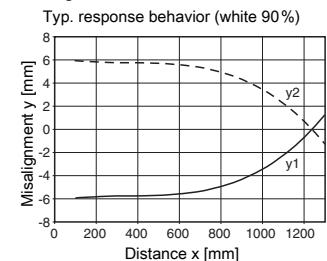
3 Black 6%

Range [mm]

Typ. maximum range [mm]

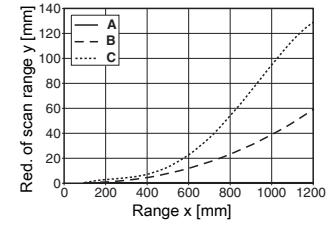
## Diagrams

### Red light

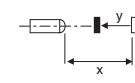


### Red light

#### Typ. black/white behavior



A White 90%  
B Gray 18%  
C Black 6%



## Remarks

### Operate in accordance with intended use!

- ↳ This product is not a safety sensor and is not intended as personnel protection.
- ↳ The product may only be put into operation by competent persons.
- ↳ Only use the product in accordance with its intended use.

- With the set detection range, a tolerance of the upper scanning range limit is possible depending on the reflection properties of the material surface.

## Order guide

	Designation	Part no.
With switching delay	HRT 96M/P-1639-800-21 Ex n	50111087
	HRT 96M/P-1649-800-21 Ex n	50111089

## Notices for the safe use of sensors in potentially explosive areas

This document is valid for devices with the following classifications according to the ATEX certification:

Device group	Device category	Equipment protection level	Zone
II	3G	Gc	Zone 2
II	3D	Dc	Zone 22

### ⚠ ATTENTION!



- Check whether the equipment classification corresponds to the requirements of the application.
- The devices are not suited for the protection of persons and may not be used for emergency shutdown purposes.
- A safe operation is only possible if the equipment is used properly and for its intended purpose.
- Electrical equipment may endanger humans and (where applicable) animal health, and may threaten the safety of goods if used incorrectly or under unfavorable conditions in potentially explosive areas.
- The applicable national regulations (e.g. EN 60079-14) for the configuration and installation of explosion-proof systems must be observed without fail.

### Installation and Commissioning

- The devices must only be installed and commissioned by trained electricians. They must be aware of the regulations and operation of explosion-proof equipment.
- Devices with terminal compartment lid (e.g. Series 96) must only be commissioned if the terminal compartment lid of the device is properly sealed.
- Connection cables and connectors must be protected from excessive or unintended pulling or pushing strain.
- Prevent dust deposits from forming on the devices.
- Metallic parts (e.g. housing, mounting devices) are to be integrated into the potential equalization to prevent electrostatic charge.

### Maintenance

- No changes may be made to explosion-proof devices.
- Repairs may only be performed by a person trained for such work or by the manufacturer.
- Defective devices must be replaced immediately.
- Cyclical maintenance is generally not necessary.
- Depending on the environmental conditions, it may occasionally be necessary to clean the optical surfaces of the sensors. This cleaning must only be performed by persons trained for performing this task. We recommend the use of a soft and damp cloth. Cleaning agents containing solvents must not be used.

### Chemical resistance

- The sensors demonstrate good resistance against diluted (weak) acids and bases.
- Exposure to organic solvents is possible only under certain circumstances and only for short periods of time.
- Resistance to chemicals must be examined on a case by case basis.