

**HT3C**

**Diffuse reflection sensor with background suppression**

en 01-2016/06 50130052



**5 ... 450mm**  
220mm with  
black-white error < 10%



- Diffuse reflection sensor with visible red light and adjustable background suppression
- Large scanning range, very good black/white behavior and reliable switching nearly independent of object or background properties
- Small and compact construction with robust plastic housing, degrees of protection IP 67 and IP 69K, tested in accordance with Ecolab for industrial application
- Short response time and low jitter for the detection of fast events
- **NEW:** Housing variant with two integrated M3 metal threaded sleeves
- **NEW:** Housing variant with integrated slotted-hole mounting sleeve made of metal

We reserve the right to make changes • DS\_HT3C\_Standard\_en\_50130052.fm

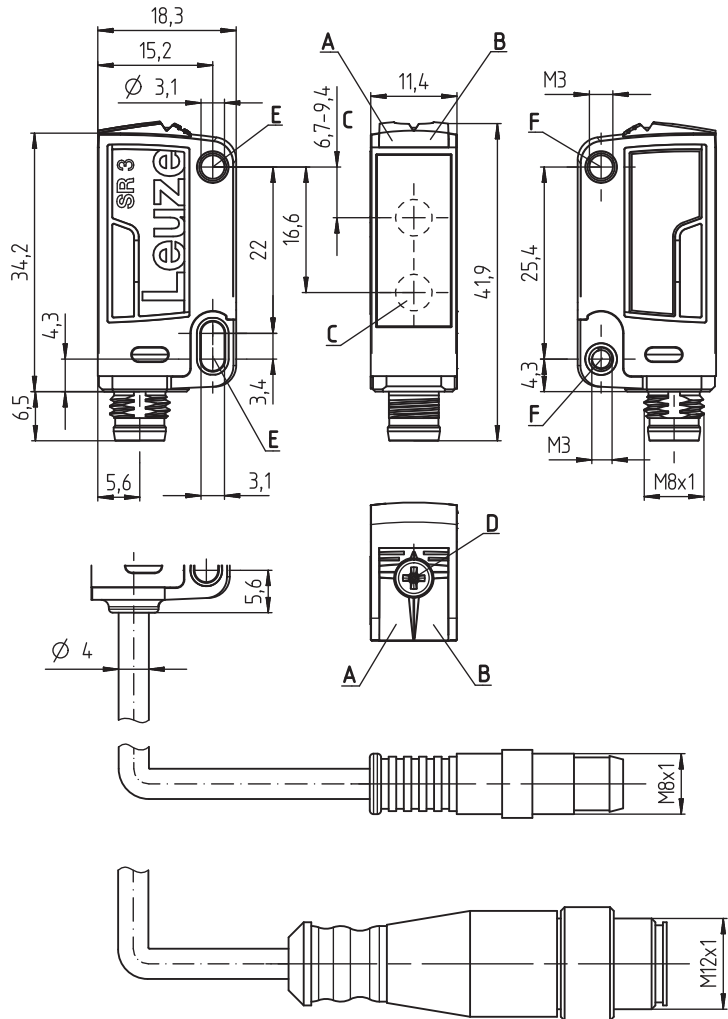


**Accessories:**

(available separately)

- Mounting systems (BT ...)
- Cables with M8 or M12 connector (K-D ...)

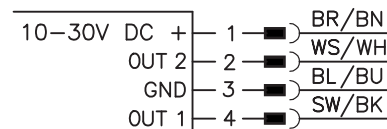
**Dimensioned drawing**



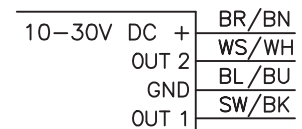
- A** Green indicator diode
- B** Yellow indicator diode
- C** Optical axis
- D** 8-turn potentiometer for scanning range adjustment
- E** Mounting sleeve (standard)
- F** Threaded sleeve (HT3C....B...)

**Electrical connection**

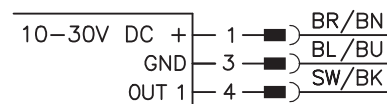
Connector, 4-pin



Cable, 4 wires



Connector, 3-pin



**Technical data**

**Optical data**

Typ. scanning range limit <sup>1)</sup> 5 ... 450mm  
 Scanning range <sup>2)</sup> see tables  
 Adjustment range <sup>1)</sup> 15 ... 450mm  
 Black/white error < 10% up to 220mm  
 Light beam characteristic focussed at 200mm  
 Light source <sup>3)</sup> LED (modulated light)  
 Wavelength 633nm (visible red light)

**Timing**

Switching frequency 1,000Hz  
 Response time 0.5?ms <sup>4)</sup>  
 Response jitter 166µs  
 Readiness delay ≤ 300ms (acc. to. IEC 60947-5-2)

**Electrical data**

Operating voltage U<sub>B</sub> <sup>5)</sup> 10 ... 30VDC (incl. residual ripple)  
 Residual ripple ≤ 15% of U<sub>B</sub>  
 Open-circuit current ≤ 15mA  
 Switching output see part number code on page 3  
 Function light/dark switching, see part number code on page 3  
 Signal voltage high/low ≥ (U<sub>B</sub>-2V)/≤ 2V  
 Output current max. 100mA <sup>6)</sup>  
 Scanning range adjustable via 8-turn potentiometer

**Indicators**

Green LED ready  
 Yellow LED object detected - reflection

**Mechanical data**

Housing plastic (high-strength PC-ABS);  
 2x diecast zinc mounting sleeves or  
 2x M3 brass threaded sleeves  
 Optics cover plastic (PMMA)  
 Weight with connector: 10g  
 with 200mm cable and connector: 20g  
 with 2m cable: 50g  
 Connection type cable 2m (cross section 4x0.20mm<sup>2</sup>),  
 connector M8, metal,  
 cable 0.2m with connector M8 or M12

**Environmental data**

Ambient temp. (operation/storage) -40°C ... +60°C/-40°C ... +70°C  
 Protective circuit <sup>7)</sup> 2, 3  
 VDE safety class III  
 Degree of protection IP 67 IP 69K  
 Light source exempt group (in acc. with EN 62471)  
 Standards applied IEC 60947-5-2  
 Certifications UL 508, CSA C22.2 no.14-13 <sup>5)</sup> 8)

- 1) Typ. scan. range limit/adjustment range: max. achievable scanning range/adjustment range for light objects (white 90%)
- 2) Scanning range: recommended scanning range for objects with different diffuse reflection
- 3) Average life expectancy 100,000h at an ambient temperature of 25°C
- 4) For short decay times, an ohmic load of approx. 5kOhm is recommended
- 5) For UL applications: use is permitted exclusively in Class 2 circuits according to NEC
- 6) Sum of the output currents for both outputs, 50mA for ambient temperatures > 40°C
- 7) 2=polarity reversal protection, 3=short circuit protection for all transistor outputs
- 8) These proximity switches shall be used with UL Listed Cable assemblies rated 30V, 0.5A min, in the field installation, or equivalent (categories: CYJV/CYJV7 or PVVA/PVVA7)

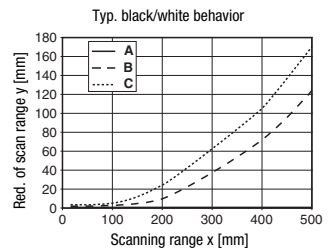
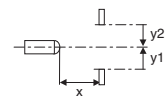
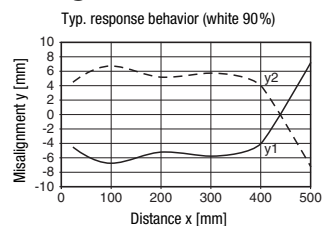
**Tables**

1	5	450
2	10	340
3	15	220

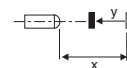
1	white 90%
2	gray 18%
3	black 6%

Scanning range [mm]

**Diagrams**



- A white 90%
- B gray 18%
- C black 6%



**Notes**

**Observe 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.

# HT3C

# Diffuse reflection sensor with background suppression

## Part number code

HT3C - XXXX.X / 4P - 200 - S12

<b>Operating principle</b>	
HT	Diffuse reflection sensor with background suppression
<b>Construction/version</b>	
3C	SR3C series
<b>Light type</b>	
N/A	Red light
I	Infrared light
<b>Radiation source</b>	
N/A	LED
<b>Pre-set scanning range (optional)</b>	
XXXX	Pre-set scanning range [mm]
<b>Equipment</b>	
N/A	Standard
B	Housing model with two M3 threaded sleeves (brass)
S	Small light spot
L	Long light spot
XL	Extra long light spot
V	V-optics
F	Permanently set scanning range
<b>Scanning range adjustment</b>	
N/A	Scanning range adjustable via 8-turn potentiometer
1	270° potentiometer
<b>Switching output/function OUT 1/IN: Pin 4 or black conductor</b>	
2	NPN transistor output, light switching
N	NPN transistor output, dark switching
4	PNP transistor output, light switching
P	PNP transistor output, dark switching
X	not connected (n. c.)
<b>Switching output/function OUT 2/IN: Pin 2 or white conductor</b>	
2	NPN transistor output, light switching
N	NPN transistor output, dark switching
4	PNP transistor output, light switching
P	PNP transistor output, dark switching
X	Not connected (n. c.)
<b>Electrical connection</b>	
N/A	Cable, PVC, standard length 2000mm, 4-wire
M8	M8 connector, 4-pin (plug)
M8.3	M8 connector, 3-pin (plug)
200-M8	Cable, PVC, length 200mm with M8 connector, 4-pin, axial (plug)
200-M8.3	Cable, PVC, length 200mm with M8 connector, 3-pin, axial (plug)
200-M12	Cable, PVC, length 200mm with M12 connector, 4-pin, axial (plug)

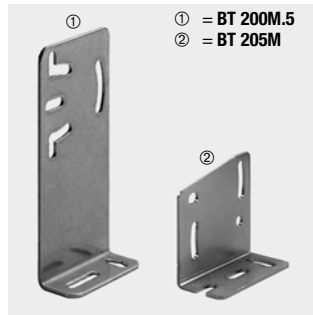
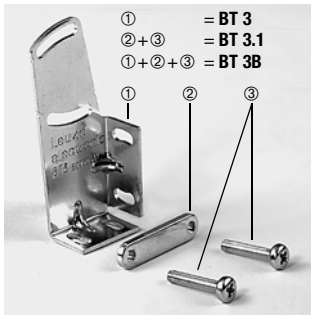
## Order guide

The sensors listed here are preferred types; current information at [www.leuze.com](http://www.leuze.com)

Sensors with through-holes		Sensors with threaded sleeves		Accessories mounting systems	
Order code	Part no.	Order code	Part no.	Order code	Part no.
HT3C/4P-M8	50129375	HT3C.B/4P-M8	50133594	<b>For sensors with through-holes:</b>	
HT3C/4-M8.3	50133590	HT3C.B/4P	50133595	BT 3	50060511
HT3C/4P	50129376	HT3C.B/4P-200-M12	50133596	BT 3.1 <sup>1)</sup>	50105585
HT3C/4P-200-M12	50129377	HT3C.B/4P-200-M8	50133597	BT 3B	50105546
HT3C/4P-200-M8	50129378			<b>For sensors with threaded sleeves:</b>	
HT3C-350F/4P-200-M8	50133593			BT 200M.5	50118542
HT3C/2N-M8	50133592			BT 205M <sup>1)</sup>	50124651
HT3C/2N	50133591			BTU 200M-D10	50117256
				BTU 200M-D12	50117255
				BTU 200M.5-D12	50120426
				BTU 200M-D14	50117254

1) Packaging unit: PU = 10 pcs.

## Mounting systems

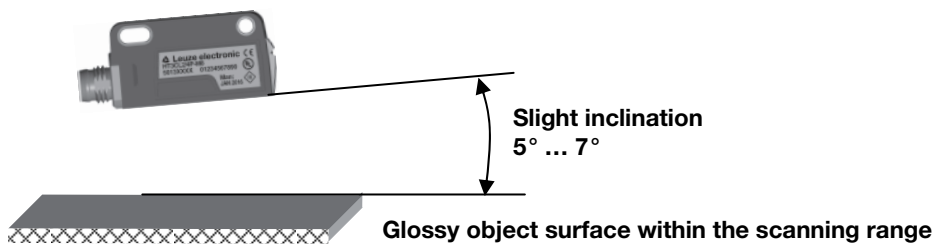


## Application notes



● **Detection of glossy surfaces within the scanning range:**

When detecting glossy surfaces (e.g. metals), the light beam should not hit the object surface at a right angle. A slight inclination is enough to detect the object reliably. The following applies: the smaller the scanning range, the greater the angle of inclination (approx. 5° to 7°).



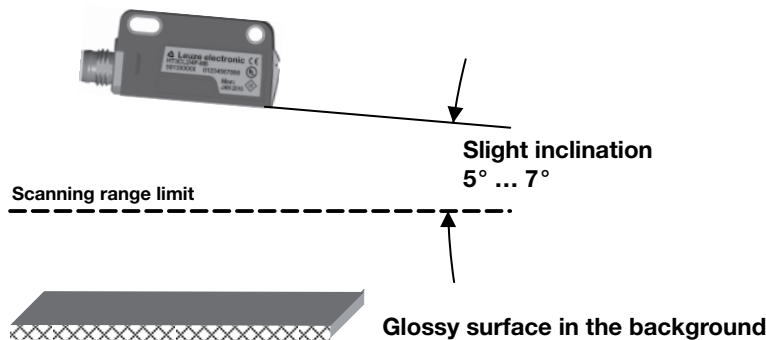
● **Avoiding interference from glossy surfaces in the background:**

If a glossy surface is in the background (distance larger than scanning range limit), reflections may cause interfering signals. They may be avoided by mounting the device at a slight inclination (see figure below).



**Attention!**

It is imperative to note the task and the associated inclination of the sensor of approx. 5° ... 7°.



- Objects should only be moved in laterally from the right or left. Moving in objects from the connector side or operating side is to be avoided.
- Outside of the scanning range, the sensor operates as an energetic diffuse reflection sensor. Light objects can still be reliably detected up to the scanning range limit.
- The sensors are equipped with effective measures for the maximum avoidance of mutual interference should they be mounted opposite one another. Opposite mounting of multiple sensors of the same type should, however, absolutely be avoided.