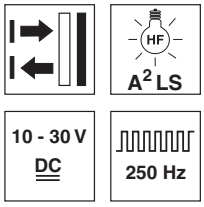
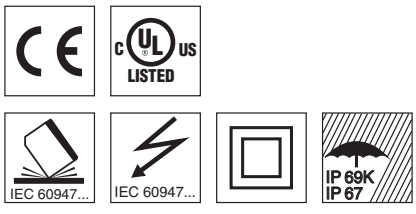
HT49C — Diffuse reflection sensor with background suppression

en 01-2016/06 50134384



5 … 3000 mm
1200 mm with black-white error < 10%

- Sensor with adjustable background suppression in red light and infrared light version
- Reliable detection of objects with different surface structures
- Robust plastic housing, degree of protection IP 67 and IP 69K for universal, industrial application
- Large adjustment range and minimal zero distance for optimum adaptation to the application
- Light/dark switching and time module activation via teach button for time-saving integration in existing evaluation environment
- Space-saving installation thanks to front access to the connection compartment
- Extremely time-saving connection by means of spring terminals (up to 1.5 mm²)
- A²LS - Active Ambient Light Suppression

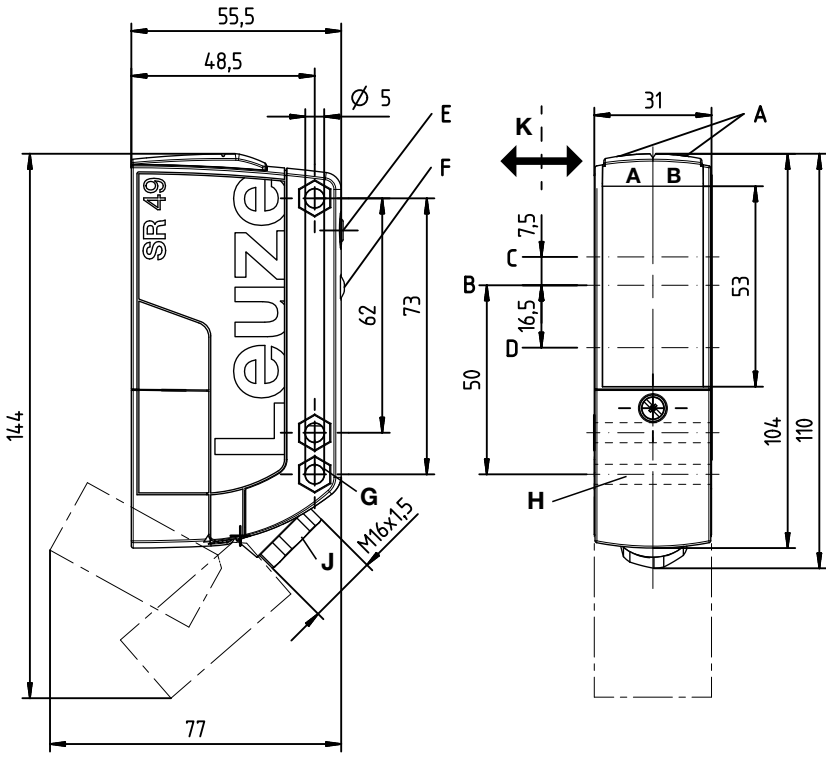


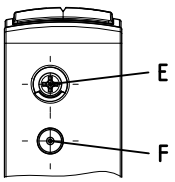
Accessories:

(available separately)

- Mounting systems (BTU 460, BT 96, BT 96.1, BT 450.1-96)

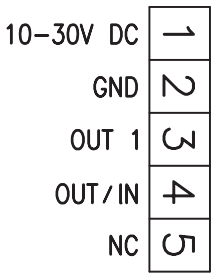
Dimensioned drawing





A_A	Green indicator diode
A_B	Yellow indicator diode
B	Optical axis
C	Receiver
D	Transmitter
E	Scanning range adjustment
F	Teach button for light/dark switching / time module activation
G	Countersinking for SK nut M5, 4.2 deep
H	Connection compartment with spring terminals
J	Cable entry with M16x1.5 screw fitting for Ø5 … 10 mm
K	Preferred entry direction

Electrical connection



Selection of terminal 4

OUT	IN
OUT 2	Active
Warn	
NC	

Technical data

		HT49C…	HT49CI…
Optical data			
Typ. scanning range limit (white 90 %) [1]		5 … 3000 mm	
Scanning range [2]		See diagrams	
Black-white error		<10 % up to 1200 mm	
Adjustment range		120 … 3000 mm	
Light source		LED (modulated light)	
Wavelength		630 nm (red light)	860 nm (infrared light)
Timing			
Switching frequency		250 Hz	
Response time		2 ms	
Readiness delay		≤ 300 ms	
Electrical data			
Operating voltage U_B [3]		10 … 30 VDC (incl. residual ripple)	
Residual ripple		≤ 15 % of U_B	
Open-circuit current		≤ 20 mA	
Switching outputs/functions [4]	/4P	2 PNP switching outputs, antivalent	
	/4X	1 PNP switching output, light switching	
	/4W	1 PNP switching output, light switching, 1 PNP warning output	
	/48	1 PNP switching output, light switching, 1 activation input	
	/PX	1 PNP switching output, dark switching	
	/2N	2 NPN switching outputs, antivalent	
Signal voltage high/low		≥ (U_B-2V)/≤ 2V	
Output current		Max. 100 mA	
Indicators			
Green LED		Ready	
Yellow LED		Reflection	
Mechanical data			
Housing		Polycarbonate	
Optics cover		Plastic	
Weight		150 g	
Connection type		Spring terminals, max. wire cross section 1.5 mm²	
Environmental data			
Ambient temp. (operation/storage)		-40 °C … +60 °C/-40 °C … +70 °C	
Protective circuit [5]		1, 2, 3	
VDE safety class [6]		II, all-insulated	
Degree of protection		IP 67, IP 69K [7]	
Light source		Exempt group (in acc. with EN 62471)	
Standards applied		IEC 60947-5-2	
Certifications		UL 508, CSA C22.2 No.14-13 [3] [8]	
Additional functions			
Switching function (teach level 1)		Light switching (factory setting) or dark switching	
Time module (teach level 2)		Active: dropout delay 500 ms Not active: no dropout delay (factory setting)	
Warning output		PNP transistor, counting principle	
Signal voltage high/low		≥ (U_B-2V)/≤ 2V	
Output current		Max. 100 mA	
Activation input			
Transmitter active/not active		≥ 8V/≤ 2V	
Activation/disable delay		≤ 1 ms/≤ 2 ms	
Input resistance		10kΩ ± 10 %	

1) Typ. scanning range limit: max. attainable range without function reserve
2) Scanning range: recommended range with function reserve
3) For UL applications: for use in class 2 circuits only
4) See part number code
5) 1=transient protection, 2=polarity reversal protection, 3=short circuit protection for all transistor outputs
6) Rating voltage 50V
7) 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
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)

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.

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

Tables

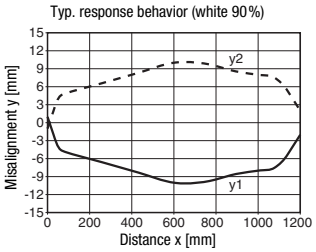
1	5	3000
2	20	2000
3	50	1500

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

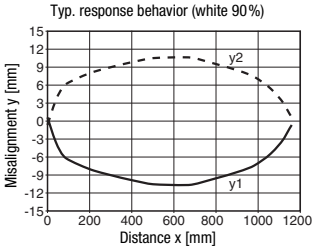
Scanning range [mm]

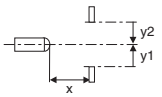
Diagrams

HT49C… with red light

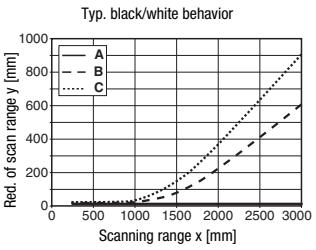


HT49CI… with infrared light

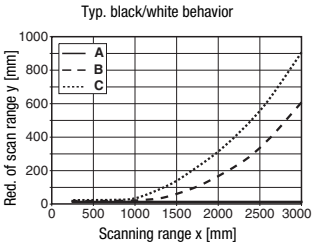




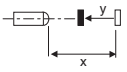
HT49C… with red light



HT49CI… with infrared light



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



HT49C Diffuse reflection sensor with background suppression

Part number code

H	T	4	9	C	I		/	4	P	-	T	B

Operating principle

HT	Diffuse reflection sensor with background suppression

Series

49C	49C series

Light type

Free	Red light
I	Infrared light

Setting

Free	Scanning range adjustment via mechanical adjusting spindle

Pin assignment OUT1 (terminal 3)

2	NPN, light switching
N	NPN, dark switching
4	PNP, light switching
P	PNP, dark switching

Pin assignment OUT/IN (terminal 4)

X	Not used
2	NPN, light switching
N	NPN, dark switching
4	PNP, light switching
P	PNP, dark switching
8	Activation input (active high)
W	Warning output, PNP light switching

Connection technology

TB	Terminal block - terminal compartment with spring terminals (5 x 1.5 mm^2)

Order guide

The sensors listed here are preferred types; current information at www.leuze.com.

Red-light diffuse reflection sensor with background suppression	Designation	Part no.
Terminal compartment with spring terminals (5 x 1.5 mm^2)		
OUT1: PNP light switching; OUT2: PNP dark switching	HT49C/4P-TB	50134461
OUT1: PNP light switching; IN: activation input active high	HT49C/48-TB	50134463
OUT1: NPN light switching; OUT2: NPN dark switching	HT49C/2N-TB	50134462

Infrared-light diffuse reflection sensor with background suppression	Designation	Part no.
Terminal compartment with spring terminals (5 x 1.5 mm^2)		
OUT1: PNP light switching; OUT2: PNP dark switching	HT49CI/4P-TB	50134464

Teach procedure for sensor

Note

Factory setting:**light switching,**
time module not active

Light/dark switching

Adjusting the switching behavior

Teach level 1	**Press teach button** (2 to 7 s) until both LEDs (green/yellow) **flash synchronously**. Release teach button – switchover is complete. The **yellow LED** then indicates the **current setting of the switching output** for **3 s**: **ON** = **light switching** = output **OUT1** (terminal 3) **light switching** output **OUT2** (terminal 4) **dark switching** **OFF** = **dark switching** = output **OUT1** (terminal 3) **dark switching** output **OUT2** (terminal 4) **light switching**

Activation/deactivation of the time module

Setting a dropout delay

Teach level 2	**Press teach button** (7 to 12 s) until both LEDs (green/yellow) **flash alternately**. Release teach button – activation/deactivation is complete. The **yellow LED** then indicates the **current setting of the dropout delay** for **3 s**: **ON** = **time module not active** = **no dropout delay** **OFF** = **time module active** = **dropout delay: 500 ms** [1)] 1) Additional models on request

Dropout delay: if the object is no longer present, the output switches with a time delay.