

Technical data sheet

Diffuse sensor with background suppression

Part no.: 50150356

HT33CL1/LG-M8



For illustration purposes only

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Technical data

Basic data

Series	33C
Operating principle	Diffuse reflection principle with background suppression

Optical data

Black-white error	< 10% up to 250 mm
Operating range	Guaranteed operating range
Operating range, white 90%	0.005 ... 0.6 m
Operating range, gray 18%	0.015 ... 0.5 m
Operating range, black 6%	0.02 ... 0.45 m
Operating range limit	0.005 ... 0.6 m
Operating range limit	Typical operating range
Adjustment range	50 ... 600 mm
Beam path	Collimated
Light source	Laser, Red
Wavelength	650 nm
Laser class	1, IEC/EN 60825-1:2014
Max. laser power	0.0043 W
Transmitted-signal shape	Pulsed
Pulse duration	4.5 µs
Light spot size [at sensor distance]	3 mm x 5 mm [1,000 mm]
Type of light spot geometry	elliptic
Shift angle	Typ. ± 1.5°

Electrical data

Protective circuit	Polarity reversal protection Short circuit protected
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Performance data

Supply voltage U_B	10 ... 30 V, DC, Incl. residual ripple
Residual ripple	0 ... 15 %, From U_B
Open-circuit current	0 ... 20 mA

Outputs

Number of digital switching outputs	2 Piece(s)
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Switching outputs

Voltage type	DC
Switching current, max.	100 mA
Switching voltage	high: $\geq(U_B - 2.5V)$ low: $\leq 2.5 V$

Switching output 1

Assignment	Connection 1, pin 4
Switching element	Transistor, Push-pull
Switching principle	IO-Link / light switching (PNP)/dark switching (NPN)

Switching output 2

Assignment	Connection 1, pin 2
Switching element	Transistor, Push-pull
Switching principle	Dark switching (PNP)/light switching (NPN)

Time behavior

Switching frequency	2,500 Hz
Response time	0.2 ms
Readiness delay	300 ms

Interface

Type	IO-Link
IO-Link	
COM mode	COM2
Profile	Smart sensor profile
Min. cycle time	COM2 = 2.3 ms
Frame type	2.5
Specification	V1.1
Device ID	6105
SIO-mode support	Yes

Connection

Connection 1

Function	Signal IN Signal OUT Voltage supply
Type of connection	Connector
Thread size	M8
Type	Male
Material	Stainless steel
No. of pins	4 -pin

Mechanical data

Dimension (W x H x L)	18.8 mm x 52.8 mm x 32.4 mm
Housing material	Stainless steel
Material of operational control	Plastic (POM Hostaform C9021, copoly-ester Tritan TX1001), non-diffusive
Housing roughness	$R_a \leq 0.8$, Typical value for the stainless steel housing
Stainless steel housing	AISI 316L, DIN X2CrNiMo17132, W. No1.4404
Lens cover material	Plastic (PMMA+) with scratch-resistant Indium protective coating
Net weight	120 g
Housing color	Silver
Type of fastening	Housing fit
Compatibility of materials	CleanProof+ ECOLAB Johnson Diversey

Operation and display

Type of display	LED
Number of LEDs	2 Piece(s)
Operational controls	Multiturn potentiometer
Function of the operational control	Range adjustment

Environmental data

Ambient temperature, operation	-40 ... 70 °C
Ambient temperature, storage	-40 ... 70 °C

Certifications

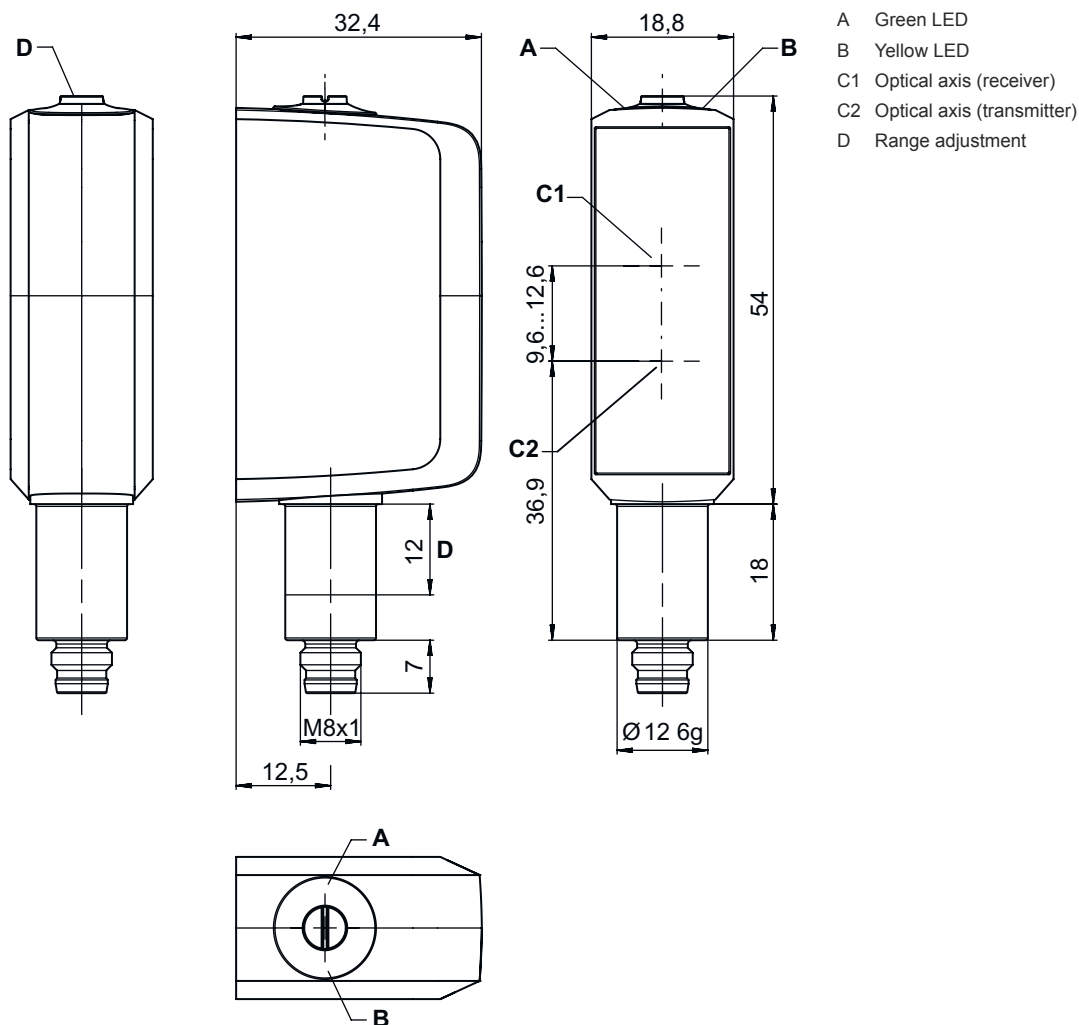
Degree of protection	IP 67 IP 68 IP 69K
Protection class	III
Approvals	c UL US
Standards applied	IEC 60947-5-2

Technical data

Customs tariff number	85365019
ECLASS 5.1.4	27270904
ECLASS 8.0	27270904
ECLASS 9.0	27270904
ECLASS 10.0	27270904
ECLASS 11.0	27270904
ECLASS 12.0	27270903
ECLASS 13.0	27270903
ECLASS 14.0	27270903
ECLASS 15.0	27270903
ETIM 5.0	EC002719
ETIM 6.0	EC002719
ETIM 7.0	EC002719
ETIM 8.0	EC002719
ETIM 9.0	EC002719
ETIM 10.0	EC002719

Dimensioned drawings

All dimensions in millimeters

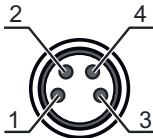


Electrical connection

Connection 1

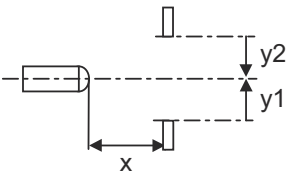
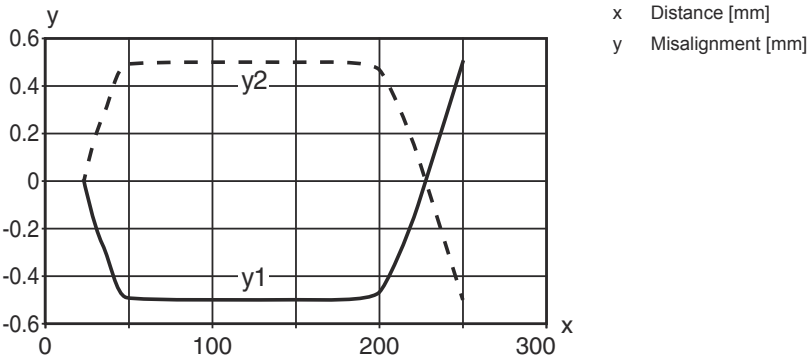
Function	Signal IN
	Signal OUT
	Voltage supply
Type of connection	Connector
Thread size	M8
Type	Male
Material	Stainless steel
No. of pins	4 -pin

Pin	Pin assignment
1	V+
2	OUT 2
3	GND
4	IO-Link / OUT 1



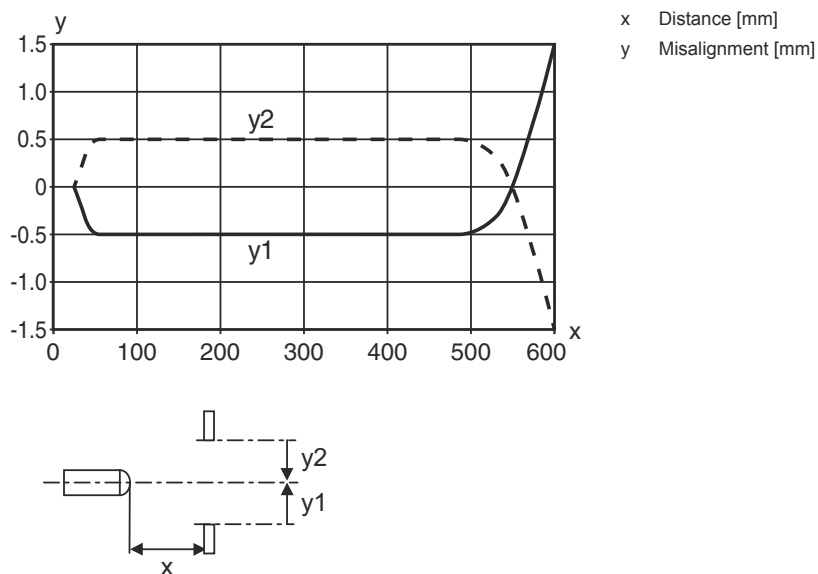
Diagrams

Typ. response behavior (focusing distance 250 mm)

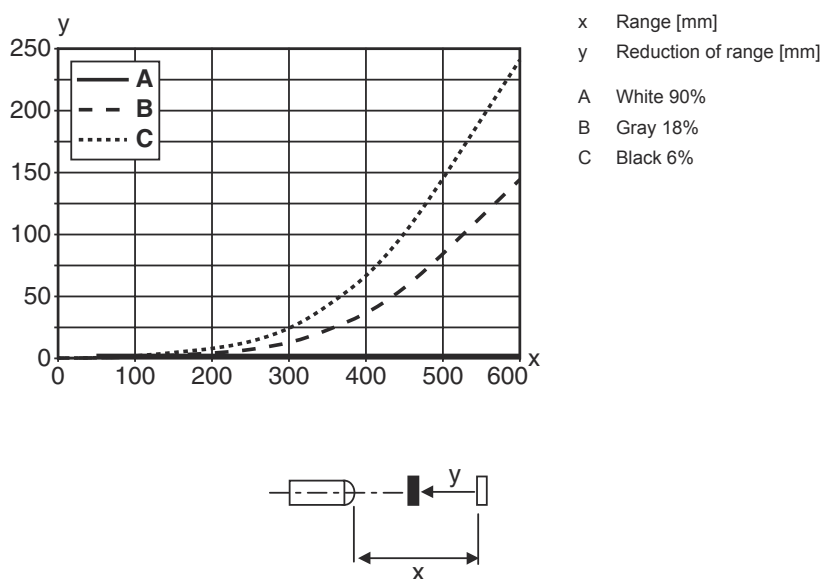


Diagrams

Typ. response behavior (focusing distance 600 mm)



Typ. black/white behavior



Operation and display

LED	Display	Meaning
1	Green, continuous light	Operational readiness
2	Yellow, continuous light	Object detected

Part number code

Part designation: **AAA33C d EE.GGH/iJ-K**

AAA33C	Operating principle LS33C: Throughbeam photoelectric sensor transmitter LE33C: Throughbeam photoelectric sensor receiver PRK33C: Retro-reflective photoelectric sensor with polarization filter HT33C: Diffuse reflection sensor with background suppression DRT33C: Dynamic reference diffuse sensor
d	Light type n/a: red light I: infrared light
EE	Light source n/a: LED PP: Power PinPoint® LED L1: laser class 1
GG	Equipment A: Autocollimation principle (single lens) D: Detection of stretch-wrapped objects X: extended model XL: Extra long light spot TT: autocollimation principle (single lens) for highly transparent bottles with tracking R: greater operating range XXR: super power transmitter
H	Operating range adjustment 1: 270° potentiometer 2: multiturn potentiometer 3: teach-in via button
i	Switching output/function OUT 1/IN: Pin 4 or black conductor X: pin not used 8: activation input (activation with high signal) L: IO-Link interface (SIO mode: PNP light switching, NPN dark switching)
J	Switching output / function OUT 2/IN: pin 2 or white conductor T: teach-in via cable G: Push-pull switching output, PNP dark switching, NPN light switching X: pin not used
K	Electrical connection M8: M8 connector, 4-pin (plug)

Note



↗ A list with all available device types can be found on the Leuze website at www.leuze.com.

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.



ATTENTION! LASER RADIATION – CLASS 1 LASER PRODUCT



- The device satisfies the requirements of IEC/EN 60825-1:2014 safety regulations for a product of **laser class 1** and complies with 21 CFR 1040.10 except for conformance with IEC 60825-1 Ed. 3., as described in Laser Notice No. 56, dated May 8, 2019.
- ↗ Observe the applicable statutory and local laser protection regulations.
 - ↗ The device must not be tampered with and must not be changed in any way.
There are no user-serviceable parts inside the device.
Repairs must only be performed by Leuze electronic GmbH + Co. KG.

Further information

- Ambient temperature, operation: +70 °C permissible only briefly (≤ 15min)
- IP 69K only with internal tube installation of M8 connector
- Light source: Average life expectancy 50,000h at an ambient temperature of 25 °C
- Sum of the output currents for both outputs 100 mA

Accessories

Connection technology - Connection unit

	Part no.	Designation	Article	Description
	50144900	MD 798i-11-82/L5-2222	IO-Link master	Type: IO-Link master Current consumption, max.: 11,000 mA Switching outputs for each sensor connection: 1 Piece(s) Switching output: Transistor, PNP Interface: IO-Link, Automatic protocol detection, EtherNet IP, Modbus TCP, PROFINET Connections: 12 Piece(s) Sensor connections: 8 Piece(s) Connections for voltage supply: 2 Piece(s) Interface connections: 2 Piece(s) Degree of protection: IP 67, IP 65, IP 69K

Connection technology - Connection cables

	Part no.	Designation	Article	Description
	50106153	K-D M8A-4P-5m-FAB	Connection cable	Connection 1: Connector, M8, Axial, Female, 4 -pin Connector, LED: No Connection 2: Open end Shielded: No Cable length: 5.000 mm Sheathing material: PVC
	50148346	KD U-M8-4A-T0-020 F+B	Connection cable	Connection 1: Connector, M8, Axial, Female, A-coded, 4 -pin Connector, LED: No Connection 2: Open end Shielded: No Cable length: 2.000 mm Sheathing material: TPE
	50148347	KD U-M8-4A-T0-050 F+B	Connection cable	Connection 1: Connector, M8, Axial, Female, A-coded, 4 -pin Connector, LED: No Connection 2: Open end Shielded: No Cable length: 5.000 mm Sheathing material: TPE
	50130850	KD U-M8-4A-V1-050	Connection cable	Connection 1: Connector, M8, Axial, Female, 4 -pin Connector, LED: No Connection 2: Open end Shielded: No Cable length: 5.000 mm Sheathing material: PVC

Accessories

Mounting technology - Other

	Part no.	Designation	Article	Description
	50145361	BTU 053M.5F-D12-T	Mounting system	Design of mounting device: Mounting system Fastening, at system: Screw type Mounting bracket, at device: For 12 mm rod Type of mounting device: Turning, 360°, Adjustable Material: Stainless steel

Note	
	A list with all available accessories can be found on the Leuze website in the Download tab of the article detailed page.