ODSL 30 Ex

Optical laser distance sensors

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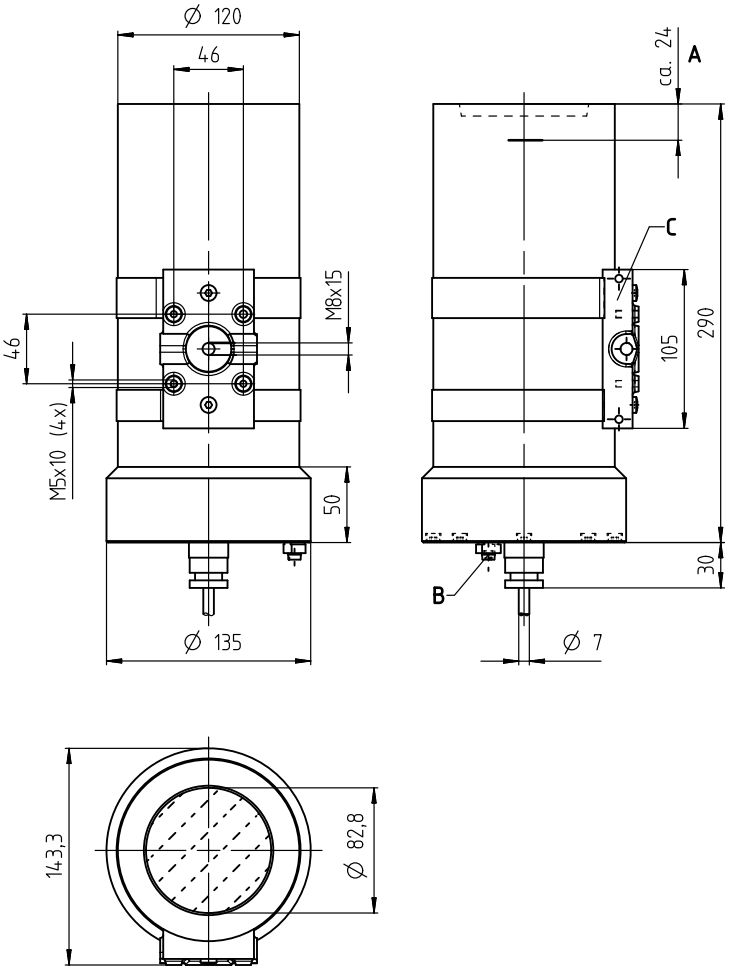
For Illustration purposes only

0.2 … 30 m

- Reflection-independent distance information
- High accuracy through referencing
- Depending on the version, analog current and voltage output or up to three digital switching outputs
- Parameterization via LC display and key pad (the sensor must be removed from the Ex housing for this purpose)
- EC type examination EPS 14 ATEX 1 696
- Ⓔx II 2G Ex db IIA T3 Gb
- Ⓔx II 2D Ex tb IIIC T80°C Db
- Cable 15 m, 8-wire

Dimensioned drawings



A Reference edge for the measurement (distance zero point)
B Earthing
C Mounting base

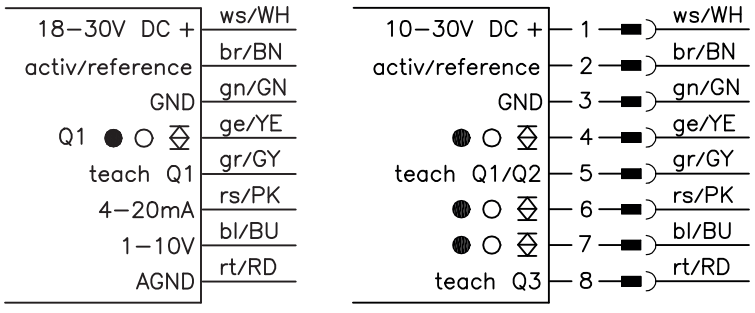
All dimensions in millimeters

Accessories:

(available separately)

- for optimum measuring conditions: cooperative target CTS 100x100 (diffuse reflectance 50 … 90 %)

Electrical connection



Leuze electronic GmbH + Co. KG
In der Braike 1, 73277 Owen

info@leuze.com • www.leuze.com
Phone: +49 7021 573-0 • Fax: +49 7021 573-199

Technical data

Optical data

Measurement range/working range [1]	0.2 … 30 m (18 … 90 % diffuse reflection) 0.2 … 20 m (6 … 90 % diffuse reflection)
Resolution [2]	0.1 mm/1 mm (factory setting)
Light source	Laser
Laser class	2 acc. to IEC 60825-1:2014
Wavelength	655 nm
Max. output power	4.5 mW
Mean power	< 1 mW
Impulse duration and modulation frequencies	290 ns at 0.9 MHz 73 ns at 3.4 MHz 18 ns at 13.7 MHz 1.6 ns at 315 MHz
Light spot	Collimated, ∅ 6 mm at 10 m

Error limits for current output, relative to measurement range end value [3]

Accuracy [1]	Measurement range up to 2.5 m: ± 2% without referencing, ± 1% with referencing Measurement range 2.5 m up to 5 m: ± 1.5% without referencing, ± 1% with referencing Measurement range 5 m up to 30 m: ± 1% without referencing, ± 1% with referencing
Reproducibility [4]	± 0.5% of measurement value
Systematic measurement error	6 mm (owing to glass pane)
Temperature drift	Typ. 0.5 mm/°C (without referencing)

Time behavior

Measurement time [5]	30 … 100 ms (factory setting: 100 ms)
Readiness delay	≤ 1 s

Electrical data

Operating voltage U_B	18 … 30 V DC (incl. residual ripple) Version with three switching outputs: 10 … 30 V DC
Residual ripple	≤ 15 % of U_B
Power consumption	≤ 4 W
Switching outputs	PNP transistor, high active (default), NPN transistor or push-pull through parameterization
Signal voltage high/low	≥ (U_B-2 V)/≤ 2 V
Analog output	R_L ≥ 2 kΩ (voltage) R_L ≤ 500 Ω (current)

Indicators

Green LED	continuous light	Ready
	off	No voltage
Yellow LED	continuous light	Object within teach-in measurement distance
	off	Object outside the teach-in measurement distance

Mechanical data

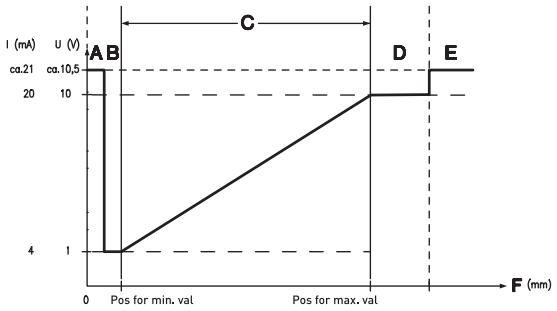
Housing	Metal
Optics cover	Glass
Weight	Approx. 6500 g
Connection type	Cable 15 m, 8-wire

Environmental data

Ambient temp. (operation/storage)	-10 °C … +45 °C/-40 °C … +70 °C
Protective circuit [6]	2, 3
VDE protection class [7]	II, all-insulated
Degree of protection	IP 65
Standards applied	IEC 60947-5-2

1) Temperature range 0 °C … +45 °C
2) Display and output resolution 0.1 mm configurable
3) In temperature range from 0 °C … +45 °C, measurement object ≥ 50x50 mm², with factory settings; different error limits apply at temperatures < 0 °C
4) Same object, identical environmental conditions
5) Configurable, depends on the object diffuse reflectance and on the max. detection range
6) 2=polarity reversal protection, 3=short circuit protection for all outputs
7) Rating voltage 250 V AC

Characteristic output curve for version with analog output



A Short range (no signal)
B Object present
C Measurement range
D Object present
E No object present (no signal)
F Measurement distance

Notes

- **Analog output (for the version with analog output only):**
  The analog output is factory-set to 200 to 5000 mm with calibrated current output. To adapt the parameterization, the sensor must be removed from the Ex housing.
- **Teaching procedure (factory setting):**
  Position the measurement object at the desired measurement distance. Apply +U_B to the teach input. Take teach input back to GND, switching output has now been taught.
  Edge on line teach Q1 teaches output Q1.
  During the teaching of Q1, yellow LED Q1 will flash.
- **Activation/referencing input:**
  Referencing is carried out by applying the voltage (for a duration of about 300 ms).
  If this process is activated before the measurement, the highest possible accuracy is achieved.

NOTE

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.

Order guide

	Designation	Part no.
With connection cable 15m, 8-wire	ODSL 30/V-30M Ex d	50122319
With connection cable 15m, 8-wire	ODSL 30/24-30M Ex d	50151466

Notices for the safe use of sensors in potentially explosive areas

Intended application range

The distance sensors of the ODSL 30 Ex d series contactlessly detect objects located in the light beam or that move through the light beam and measure the distance to these objects.

Validity

The sensors have a housing that features pressure-proof encapsulation and can be used in these areas with these classifications:

Device group	Device category	Equipment protection level	Zone
II	2G	Gb	Zone 1
II	2D	Db	Zone 21

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, commissioning

ATTENTION!

- Electrical equipment may endanger humans and (where applicable) animal health, and may threaten the safety of goods if used incorrectly and under unfavorable conditions in potentially explosive areas.
- A safe operation in potentially explosive areas is only possible if the equipment is used properly and for its intended purpose.
- The distance sensors of the ODSL 30 Ex d model must only be installed and maintained by trained electricians.
- When installing the sensors in Ex zones 1 and 21, the connection cable must be connected in a connection space with increased safety Ex e, or outside the Ex area.
- The housing must be connected at the marked external connection unit to the protective conductor system.
- The respective applicable national regulations for the installation of electrical equipment in potentially explosive areas must be observed.

Maintenance

No changes may be made to the devices of the ODSL 30 Ex d model for potentially explosive areas.

Repairs to the sensors may only be performed by persons trained for such work or by the manufacturer. Defective devices must be replaced immediately.

The housing must not be opened while the power is on! After switching off power, wait at least 10 min. before opening the housing.

Cyclical maintenance of the sensors is not necessary.

Depending on the environmental conditions, it may occasionally be necessary to clean the light-emission surfaces of the sensors. This cleaning must only be performed by persons trained for performing this task. A soft, damp cloth should be used for this purpose. Cleaning agents that contain solvents must not be used.

Chemical resistance

The sensors of the ODSL 30 Ex d model demonstrate good resistance against many diluted acids and bases.

Exposure to organic solvents is possible only under certain circumstances and only for short periods of time.

Resistance to chemicals should be examined on a case by case basis.

Laser safety notices

⚠ ATTENTION, LASER RADIATION – CLASS 2 LASER PRODUCT

Do not stare into beam

The device satisfies the requirements of IEC/EN 60825-1:2014 safety regulations for a product of **laser class 2** 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.

- Never look directly into the laser beam or in the direction of reflected laser beams!
  If you look into the beam path over a longer time period, there is a risk of injury to the retina.
- Do not point the laser beam of the device at persons!
- Interrupt the laser beam using a non-transparent, non-reflective object if the laser beam is accidentally directed towards a person.
- When mounting and aligning the device, avoid reflections of the laser beam off reflective surfaces!
- **CAUTION!** Use of controls or adjustments or performance of procedures other than specified herein may result in hazardous light exposure.
- 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.
- The laser radiation emitted from the device is collimated. The laser is operated at various modulation frequencies. For light spot size, pulse power, pulse duration, modulation frequencies and wavelength, see Technical data.

NOTE

Affix laser information and warning signs!

Laser warning and laser information signs are affixed to the device (see ①). In addition, self-adhesive laser warning and information signs (stick-on labels) are supplied in several languages (see ②).

- Affix the laser information sheet to the device in the language appropriate for the place of use.
  When using the device in the US, use the stick-on label with the "Complies with 21 CFR 1040.10" notice.
- Affix the laser information and warning signs near the device if no signs are attached to the device (e.g. because the device is too small) or if the attached laser information and warning signs are concealed due to the installation position.
  Affix the laser information and warning signs so that they are legible without exposing the reader to the laser radiation of the device or other optical radiation.

①

A Laser aperture
B Laser warning sign
C Laser information sign with laser parameters

②