TLS 600

Installation and Operation Manual

CE (RoHS)

English   Pages 2 - 12

CEDES

Contents

1. About this manual

This 'TLS 600 Installation and Operation Manual', with metric and US measurements is the original version.

The version number is printed at the bottom of each page.

To make sure you have the latest version, visit www.cedes.com from where this manual and related documents can be downloaded.

1.1 Measurements

Unless stated otherwise, measurements are given in mm (non-bracketed numbers) and inches (numbers in brackets).

1.2 Related documents

TLS 600 datasheet en
incl. ordering information
Part No. 001 193 en

TLS 600 Quickguide en de fr it es pl zh
Part No. 112 016

1.3 CEDES headquarters

CEDES AG
Science Park
CH-7302 Landquart
Switzerland

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2. Safety information

IMPORTANT!
READ BEFORE INSTALLATION!

The TLS 600 was developed and manufactured using state-of-the-art systems and technologies. However, injury and damage to the sensor can still occur.

To ensure safe operating conditions:

▸ Read all enclosed instructions and information.
▸ Follow the instructions given in this manual carefully.
▸ Observe all warnings included in the documentation and attached to the sensor.
▸ Do not use the sensor if it is damaged in any way.
▸ Keep the instruction manual on site.

The TLS 600 should only be installed by authorized and fully trained personnel! The installer or system integrator is fully responsible for the safe integration of the sensor. It is the sole responsibility of the planner and/or installer and/or buyer to ensure that this product is used according to all applicable standards, laws and regulations in order to ensure safe operation of the whole application.

Any alterations to the device by the buyer, installer or user may result in unsafe operating conditions. CEDES is not responsible for any liability or warranty claim that results from such manipulation.

Failure to follow instructions given in this manual and/or other documents related to the TLS 600 may cause customer complaints, serious call backs, damage, injury or death.

2.1 Non-intended use

The TLS 600 **must not** be used for:

• The safeguarding of dangerous machines
• Equipment in explosive atmospheres
• Equipment in radioactive environments

Use only specific and approved safety devices for such applications, otherwise serious injury or death or damage to property may occur!

3. Symbols, safety messages

Symbol	Meaning
▸	Single instruction or measures in no specific order
1. **2.** **3.**	Instructions in specific order
•	List, in no order of importance
→	Reference to a chapter, illustration or table within this document
Important:	Important information for the correct use of the sensor

3.1 Safety message categories

Warning of serious health risks

⚠ **WARNING** **Serious health risks**
Highlights critical information for the safe use of the sensor. **Disregarding these warnings can result in serious injury or death.** ▸ Follow the measures highlighted by the triangle-shaped arrows ▸ Consult the safety information in Chapter 2 of this manual

Caution of possible health risks

⚠ **CAUTION** **Possible health risks**
Highlights critical information for the safe use of the sensor. **Disregarding these warnings can result in injury.** ▸ Follow the measures highlighted by the triangle-shaped arrows ▸ Consult the safety information in Chapter 2 of this manual

Notice of damage risk

NOTICE **Risk of damage**
Disregarding these notices can lead to damage to the sensor, the controller and/or other devices. ▸ Follow the measures highlighted by the triangle-shaped arrows

4. Introduction

There is a rapidly-increasing global trend towards improving accessibility for elderly and disabled people within buildings using automatic doors. The TLS 600 offers the perfect solution. Its wide detection area and ultra reliable operation make it the ideal choice as door sensor. With aesthetics playing an increasing role in architectural design, the TLS 600's compact and elegant design allows it to easily blend into all types of door frames.

The TLS 600 is the ideal door-opening sensor for automatic doors. It offers a larger, elliptical-shaped detection area to ensure effective detection of approaching people and/or objects. At a typical mounting height of 2.3 m (7.5 ft), a single TLS 600 provides a 1 m × 0.3 m (3.3 ft × 1 ft) monitored area, providing reliable door-opening for sliding doors, including telescopic sliding doors.

It measures 62 × 18 × 32 mm (2.4 × 0.7 × 1.3 in) with the mounting bracket discreetly merged into the sensor housing. This elegant design allows it to blend in perfectly with any application's surroundings. Easy mounting and alignment, combined with robust construction and automatic blanking of stationary objects, means the TLS 600 offers a very impressive price/performance ratio.

Figure 1: A typical TLS 600 application environment

4.1 Features of the TLS 600

- Intelligent, infrared-based diffuse-reflective sensor
- Excellent detection capability
- PNP or NPN output
- Small and sleek design
- Plug-and-play
- Operating range up to 4 m (13 ft)
- Easy mounting
- Insensitive to direct sunlight up to 100,000 Lux
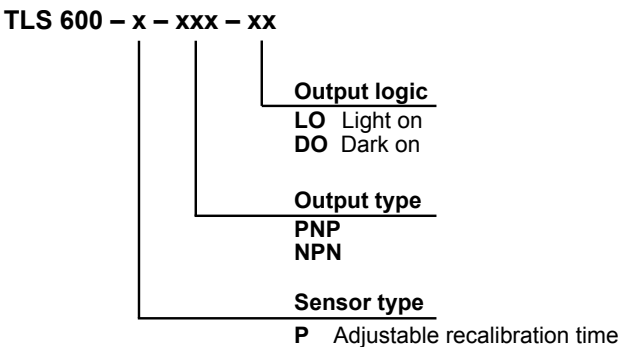
4.2 Type description

TLS 600 – x – xxx – xx

Output logic
LO Light on
DO Dark on

Output type
PNP
NPN

Sensor type
P Adjustable recalibration time

Figure 2: TLS 600 type description

5. Overview

The TLS 600 measures the reflection from objects compared with background reflection. Any change in the values is detected as an object and the output switches.

During startup the TLS 600 takes a background light measurement and saves this as a reference value. When an object enters the detection area, the reflection value changes. The bigger the difference in light reflection between the object and the background, the easier it is to detect said object.

High contrast between objects and background results in high sensitivity.

⚠️ **CAUTION**
Damage to the eye

Although the TLS 600 does not emit dangerous amounts of infrared light, long exposure to intense infrared light sources can result in damage to the eyes.
To avoid any risks:
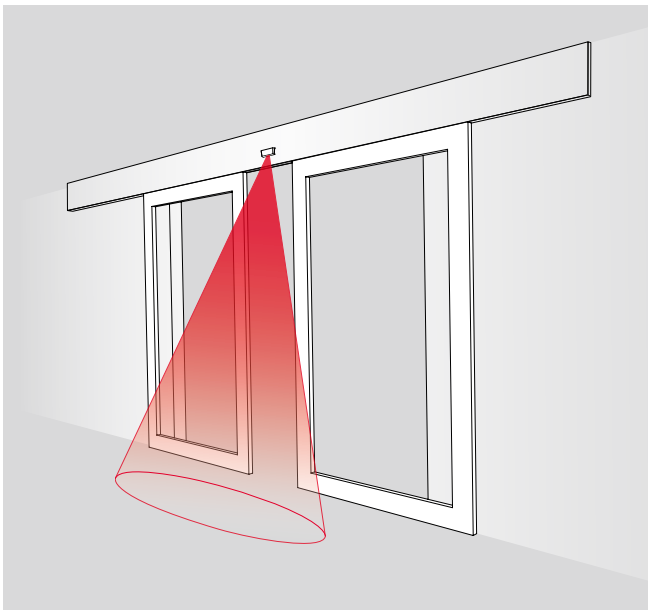▸ Never look directly into the active infrared emitter from a close distance.

Figure 3: TLS 600 in angeled mounting monitoring the approach area of a sliding door
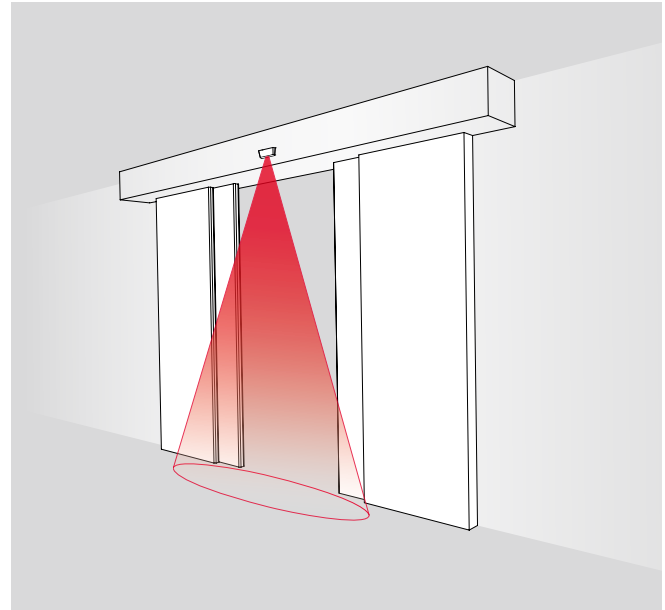

Figure 4: TLS 600 in vertical mounting monitoring the closing area of a sliding door

5.1 Delivery package

Typical delivery package contains:

- 1 × TLS 600 sensor
- 1 × mounting bracket
- 2 × mounting screws
- 1 × blue screwdriver
- 1 × quick installation guide

Figure 5: TLS 600 components
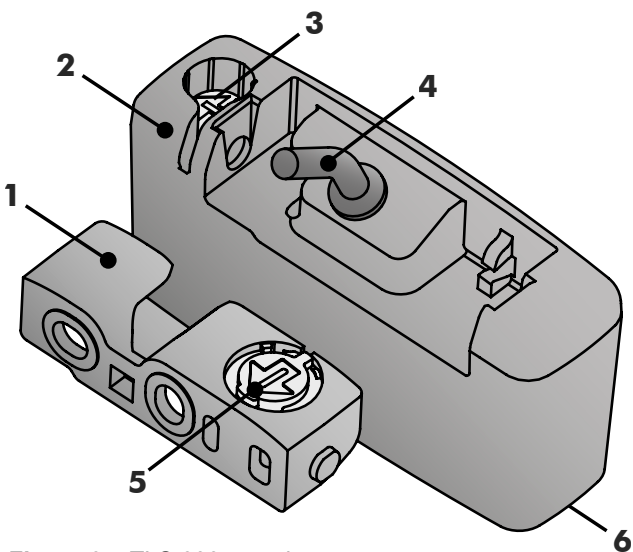
5.2 TLS 600 product overview

Figure 6: TLS 600 overview

1 Mounting bracket
2 TLS 600 sensor
3 Potentiometer
4 Connection cable
5 Adjusting screw
6 Optical window

5.3 Detection area dimensions

The detection area dimensions of the sensor depend on the distance to the object or background. **All measurements in mm (normal numbers) and inches (in brackets).**
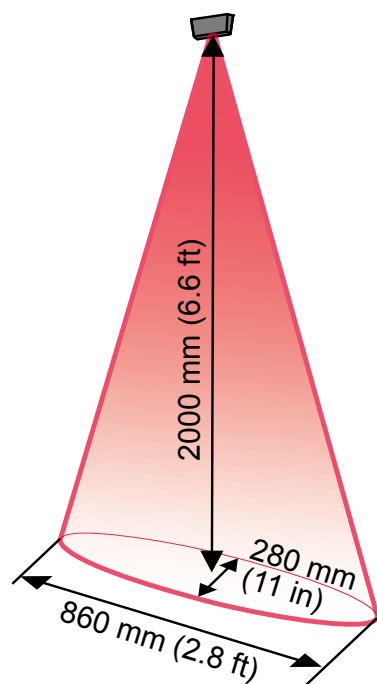

Figure 7: Detection area dimensions at 2 m (6.6 ft)

6. Configuration

NOTICE
Mechanical damage to the TLS 600
‣ Do not turn the potentiometer beyond its mechanical limit

The recalibration time can be adjusted from 3 s up to 180 s by turning the potentiometer.
Recalibration time means the time until an immobile person or object is accepted by the sensor as background.
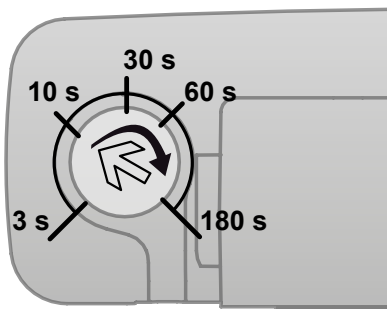

Figure 8: Configuring the TLS 600 P-type (in seconds)

6.1 Background influence

TLS 600 has a maximal operating range of 4 m (13 ft) on Kodak white. However, different floor materials and colors influence the effective operating range. See table below for reference.

Material	Max. detection range
Kodak white	4 m (13 ft)
Bright wood	2.8 ... 3.2 m (9 ... 10.5 ft)
Brown cardboard	2.8 ... 3.2 m (9 ... 10.5 ft)
Kodak grey	2.4 m (8 ft)
Bright concrete	2.4 ... 3.2 m (8 ... 10.5 ft)
Dark carpet	1.2 ... 2 m (4 ... 6.5 ft)

Applies only when beam axis is perpendicular to surface

7. Installation

WARNING
Electrical and mechanical hazards

Electrical shock and unexpected mechanical movement can cause serious injury or death.

▸ Before installing and configuring the TLS 600 make sure the controller and all relevant devices are powered off
▸ Use only specific and approved tools
▸ Follow all applicable safety measures
▸ Do not over-tighten the mounting screws
▸ Do not drill holes into the TLS 600
▸ If the TLS 600 must be readjusted, the main power supply must be switched off and marked as out of service

Carry out the system installation according to the following steps:

1. Switch off main power for the installation area and mark it clearly with "OUT OF SERVICE".

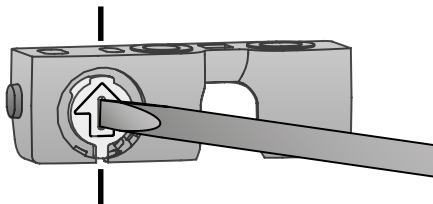2. Turn the adjusting screw to vertical position using a screwdriver.

Figure 9:   Turn the adjusting screw to vertical position

3. Fix the mounting bracket onto to the chosen location using the mounting screws.
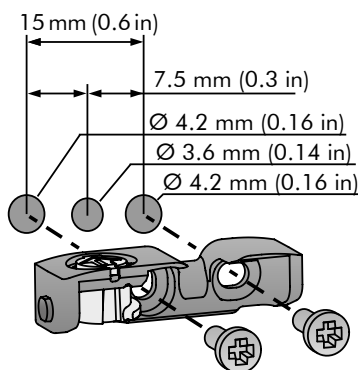

15 mm (0.6 in)
7.5 mm (0.3 in)
Ø 4.2 mm (0.16 in)
Ø 3.6 mm (0.14 in)
Ø 4.2 mm (0.16 in)

Figure 10:   Mounting bracket fixing

4. Set the recalibration time by adjusting the potentiometer using the screwdriver provided → Chapter 6.
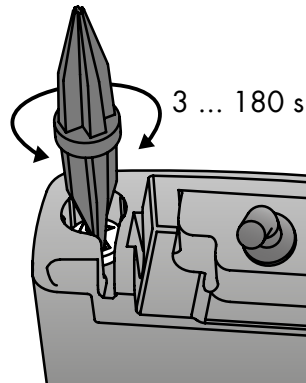

3 ... 180 s

Figure 11:   Potentiometer adjusting on TLS 600

5. Snap the TLS 600 into the mounting bracket.

Figure 12:   Snapping on the TLS 600 mounting bracket
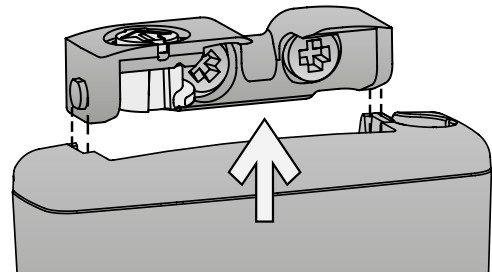
6. Set the alignment of the TLS 600 by turning the adjusting screw until the correct angle is set.
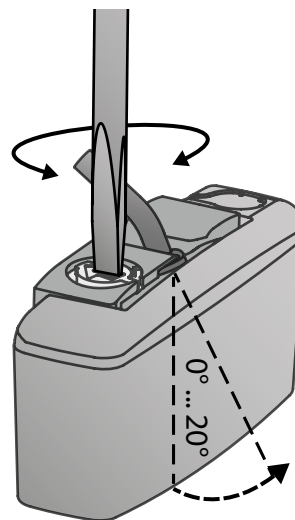

0° ... 20°

Figure 13:   Adjusting the alignment of TLS 600

7. Connect the other end of the cable (open wires) to the controller. For detailed controller wiring → Chapter 8.

8. Verify your settings by switching on the power and performing a test run → Chapter 10.1.
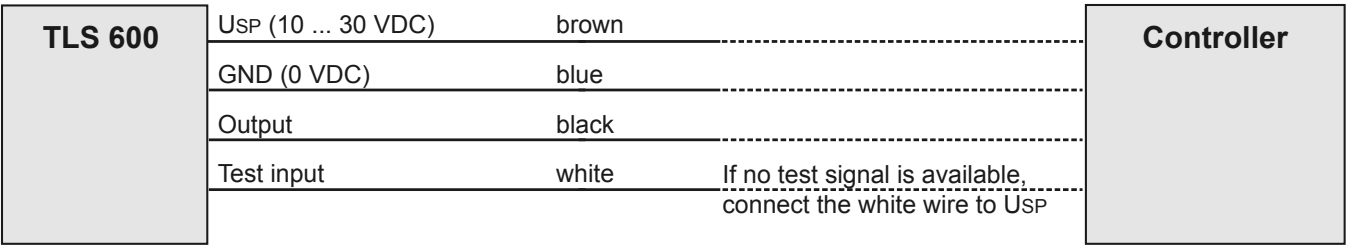
8. Electrical connection

TLS 600	U$_{SP}$ (10 ... 30 VDC)	brown		**Controller**
	GND (0 VDC)	blue		
	Output	black		
	Test input	white	If no test signal is available, connect the white wire to U$_{SP}$	

Figure 14: TLS 600 connection diagram

8.1 Semiconductor output

The TLS 600 is available as a PNP or NPN version with either a dark-on (DO) or light-on (LO) type.
The DO output is ON when an object or person is detected, OFF if the detection area is free. The LO output is OFF when an object or person is detected, ON if the detection area is free → Chapter 9.

> *NOTICE*
> **Possible damage to the semiconductor output**
>
> ▸ PNP outputs need a pull-down resistor (10 ... 47 kΩ)
> ▸ NPN outputs need a pull-up resistor (10 ... 47 kΩ)

8.2 Test input

TLS 600 performs a test cycle as follows: The illumination is switched off and the sensor recognizes the change and switches the output.

Important: Please be aware that the TLS 600 must always have a background (floor).
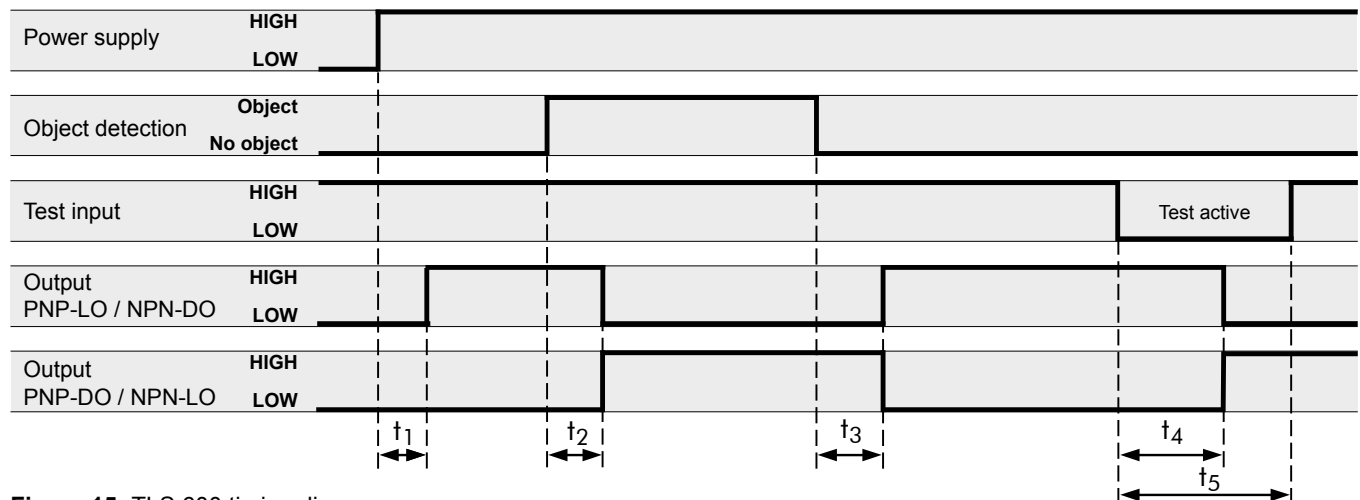
9. Timing diagram

Figure 15: TLS 600 timing diagram

	Time	Value
Power-up time	t_1	< 150 ms
Response time	t_2	< 150 ms
Release time	t_3	< 150 ms
Response time test input	t_4	< 150 ms
Time at test	t_5	> t_4

Table 1: TLS 600 timing table

	Value
Output HIGH	≥ U_{SP} - 4 V
Output LOW	< 4 V

Table 2: TLS 600 value table

10. Start-up

1. Switch on mains and/or power up the controller.

2. Check if LED lights up → Chapter 11.

3. Perform a test run with the controller using the test input → Chapter 10.1.

Important: Check the detection area of the sensor. If adjustments to the sensor calibration are needed, switch off main power and/or the controller again for your own safety.

10.1 Test run

It is recommended to perform a test run with the controller:

1. Switch the test input to LOW.

2. Check the output's response → Chapter 9.

11. LED signals

The TLS 600 uses a red LED to indicate its status.

LED glows brightly	Object detected
LED glows softly	No object detected
LED blinks	Reflective background

Table 3: LED signals

12. Sensor recalibration

The TLS 600 cannot differentiate between an object and a person. Therefore any object entering the detection field is also detected.

When an object or person does not move for more than the set recalibration time, the TLS 600 accepts this object as background and switches the output back to „No object detected".
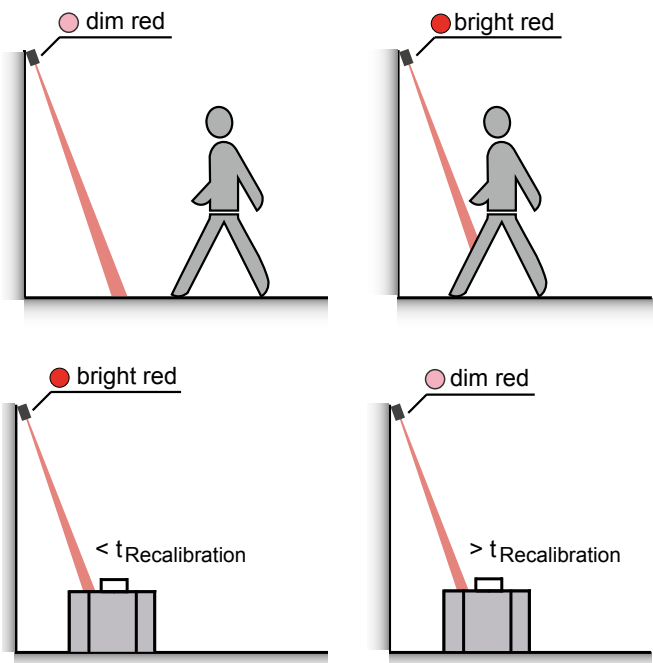

Figure 16: Sensor recalibration

13. Troubleshooting

Sensor status	Action
Object is in detection area but the LED indicates 'no object'	▸ Check the sensors detection capability in relation to the background influence → Chapter 6.1
No LED visible	▸ Check electrical connections
LED is blinking	▸ Make sure that the sensor is not facing a reflective background and no other light sources interfere
Detection area is free but the LED displays 'object detected'	▸ Make sure ambient light is stable and no other light sources interfere ▸ Check if the sensor is inactivated from permanent test signal ▸ Wait for the chosen recalibration time and then check if the sensor works normally

If a problem persists, please contact your local CEDES representative. Visit www.cedes.com for contact data.

14. Maintenance

Although the TLS 600 does not need regular maintenance, a periodical functional check is strongly recommended as follows:

▸ Check the mounting position and detection area of the sensor.
▸ Clean the optical window with a soft towel and a little soapy water.

NOTICE
Damage to the optical window

▸ Never use any solvents, cleaners or mechanically abrasive towels or high-pressure water to clean the sensor.

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15. Disposal

The TLS 600 should only be replaced if a similar protection device is installed. Disposal should be carried out using the most up-to-date recycling technology according to local regulations and laws. There are no harmful materials used in the design and manufacture of the sensor. Traces of such dangerous materials may be found in the electronic components but not in quantities that are harmful.

16. Technical data

Optical

Max. operating range (on Kodak white)	4 m (13 ft)
Detection area at 2 m (6.5 ft) distance	860 mm × 280 mm (34 in × 11 in)
Min. distance to background	0.2 m (7.9 in)
Adjustable recalibration time	3 ... 180 s
Max. ambient light	100,000 Lux

Mechanical

Dimensions (w × h × d)	62 × 18 × 32 mm (2.4 × 0.7 × 1.3 in)
Housing material	Polycarbonate, ABS
Housing color	Black
Enclosure rating	IP40
Temperature range	−20 °C ... +60 °C (−4 °F ... +140 °F)
Mounting bracket - angle adjustment	0° ... 20°

Electrical

Supply voltage U_{SP}	10 ... 30 VDC
Max. current consumption at 24 VDC	40 mA
Output	PNP or NPN
Max. response time	150 ms

Connection cable and electrical connection

Length	2 m
Diameter	Ø 3.4 mm (0.13 in)
Material	PVC, black
Wires	AWG26
• brown	U_{SP} (10 ... 30 VDC)
• blue	GND (0 V)
• black	Output
• white	Test input

General

EMC emission	EN 61000-6-3:2007
EMC immunity	EN 61000-6-2:2005
Shock	EN 60068-2-27:2009
Vibration	EN 60068-2-6:2008
RoHS	2011/65/EU
Certificate	CE

17. Dimensions

Metric measurements (all dimensions in mm)
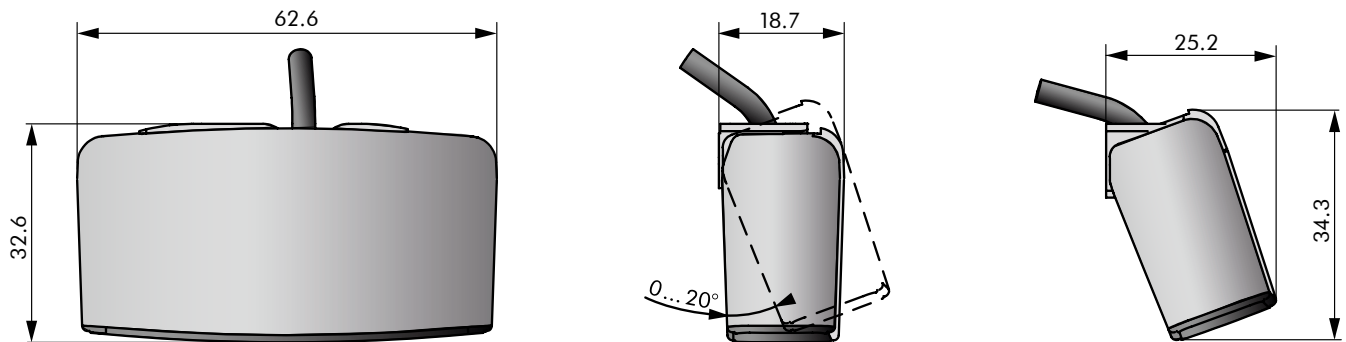

Figure 17: TLS 600 dimensions (metric)
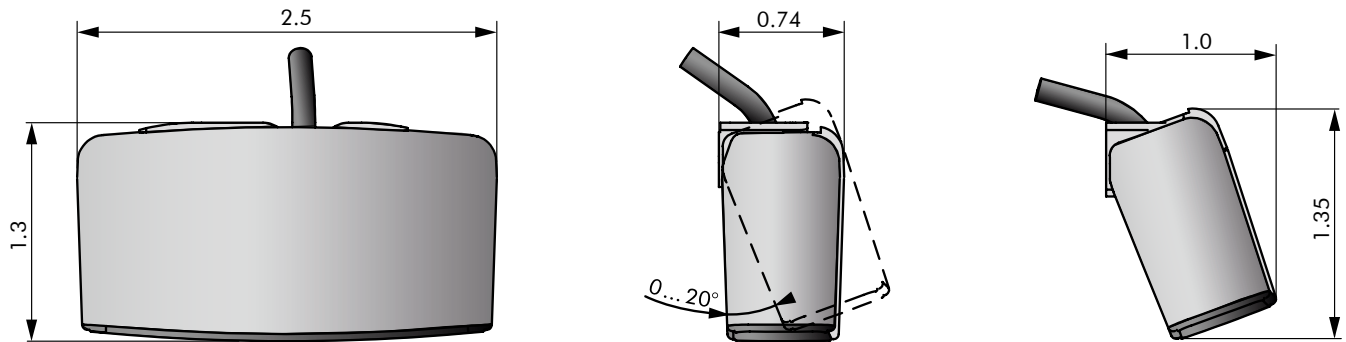
US measurements (all dimensions in inches)

Figure 18: TLS 600 dimensions (US)

17.1 Mounting bracket scaled plan

Dimensions in mm and inches (in brackets) and to scale

15 mm (0.6 in)

7.5 mm (0.3 in)

Ø 4.2 mm (0.16 in)
Ø 3.6 mm (0.14 in)
Ø 4.2 mm (0.16 in)

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