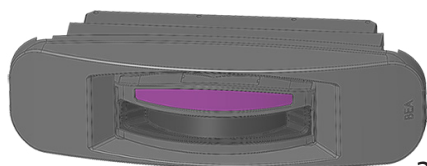# LZR®-FLATSCAN REV PZ

Compact, laser scanner for the safety of revolving doors

Visit website for available languages of this document.
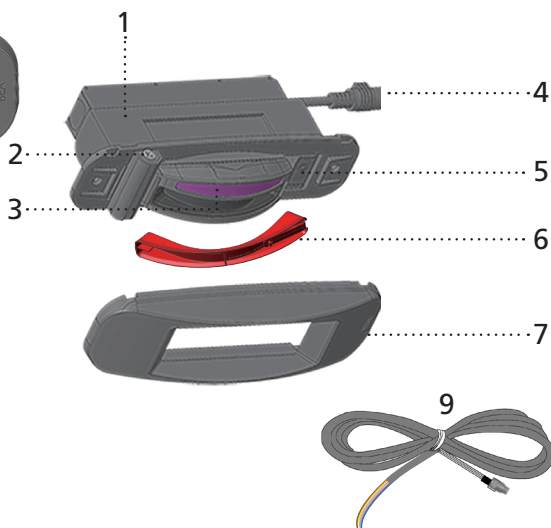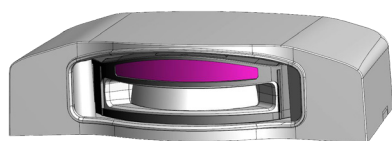
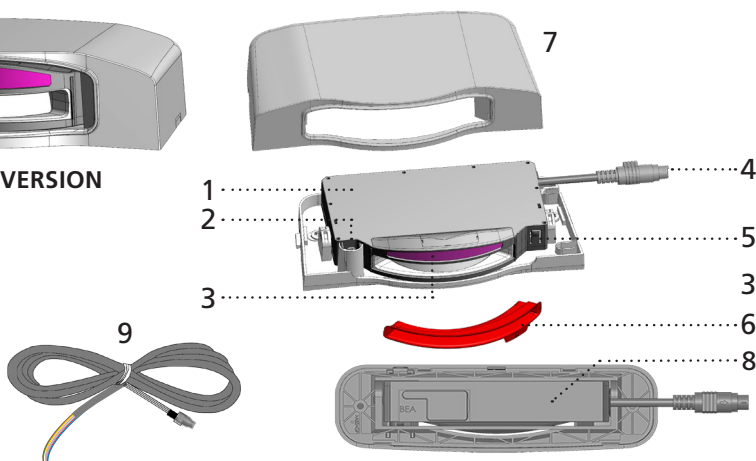**RECESSED VERSION**

OPTIONAL SPACER ACCESSORY (recessed version only)

If the LZR-FLATSCAN REV PZ recessed does not entirely fit into the door canopy, use the spacer to hide the prominent part.

1 sensor
2 angle adjustment screw
3 laser window
4 connector
5 push button

6 laser window protection
7 front cover
8 DIP switch *(back side of sensor)*
9 power cable

SURFACE VERSION

DESCRIPTION

The LZR®-FLATSCAN REV PZ is a LASER-based safety sensor for automatic, revolving doors.

MOUNTING OPTION A

When integrated into a stationary ceiling, it covers the entry point area.

MOUNTING OPTION B

When integrated into a rotating ceiling, it covers the area along the face or leading edge of the revolving door.

LED INDICATIONS

- right detection zone
- left detection zone
- calculation in progress *exit the area and wait*
- LED flashes
- LED flashes red-green
- LED flashes slowly
- LED flashes quickly
- LED flashes x times
- LED is off

SYMBOLS USED IN THIS USER'S GUIDE

- Caution! Laser radiation
- Remote control sequence
- Possible remote control adjustments
- Factory values
- Attention
- Note

BEA, INC. INSTALLATION/SERVICE COMPLIANCE EXPECTATIONS

BEA, Inc., the sensor manufacturer, cannot be held responsible for incorrect installations or incorrect adjustments of the sensor/device; therefore, BEA, Inc. does not guarantee any use of the sensor/device outside of its intended purpose.

BEA, Inc. strongly recommends that installation and service technicians be AAADM-certified for pedestrian doors, IDA-certified for doors/gates, and factory-trained for the type of door/gate system.
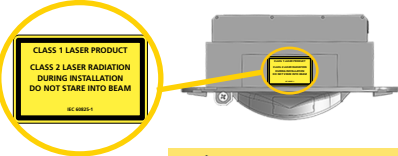
Installers and service personnel are responsible for executing a risk assessment following each installation/service performed, ensuring that the sensor/device system performance is compliant with local, national, and international regulations, codes, and standards.

Once installation or service work is complete, a safety inspection of the door/gate shall be performed per the door/gate manufacturer's recommendations and/or per AAADM/ANSI/DASMA guidelines (where applicable) for best industry practices. Safety inspections must be performed during each service call – examples of these safety inspections can be found on an AAADM safety information label (e.g. ANSI/DASMA 102, ANSI/DASMA 107, UL294, UL325, and International Building Code).

Verify that all appropriate industry signage, warning labels, and placards are in place.

SAFETY TIPS

CLASS 1 LASER PRODUCT

CLASS 2 LASER RADIATION DURING INSTALLATION DO NOT STARE INTO BEAM

IEC 60825-1

The device emits invisible (IR) and visible laser radiations. The visible laser beams can be activated during the installation process to adjust the position of the detection field.

Do not stare directly into the visible red beams.

The visible laser beams are inactive during normal functioning.

CAUTION! Use of controls, adjustments, or performance of procedures other than those specified herein may result in hazardous radiation exposure.
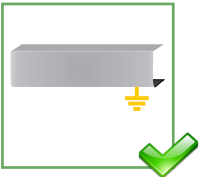
The door control system and the header cover profile must be correctly grounded.

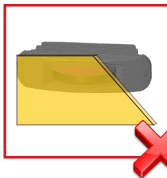Only trained and qualified personnel may install and adjust the sensor.
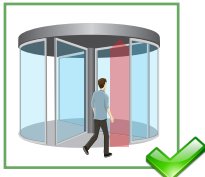
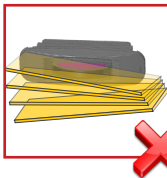Always test the proper operation of the installation before leaving the premises.

INSTALLATION AND MAINTENANCE

Avoid extreme vibrations.

Do not cover the front windows. Remove the laser window protection before use.
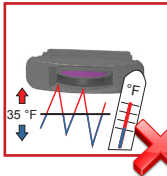
Avoid moving objects and light sources in the detection field.

Avoid the presence of smoke and fog in the detection field.
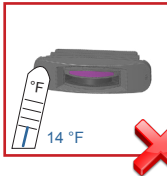
Avoid condensation.

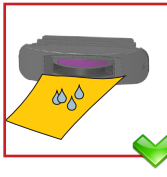Avoid exposure to sudden and extreme temperature changes.

Keep the sensor permanently powered in environments where the temperature can drop below 14° F.

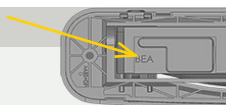Avoid direct exposure to high pressure cleaning.

Do not use aggressive products to clean the front window.

When needed, wipe the laser window only with a soft, clean, damp, microfiber cloth.

1 DIP SWITCH

Adjust DIP switch settings before mounting the sensor.

		ON	OFF	Notes
DIP 1	OUTPUT CONFIGURATION	NC/NC	NO/NO	
DIP 2	ENVIRONMENT	standard	critical	Switch to CRITICAL when external disturbances are likely to cause unwanted detections.
DIP 3	BACKGROUND	on	off	Switch to OFF when there is no background (e.g. glass floor).
DIP 4	MONITORING	active low	active high	
DIP 5	(NOT USED)	-	-	

⚠️ After changing a DIP switch, the orange LED flashes.
A LONG push on the push button confirms the settings.

> 3 sec.

2 MOUNTING LOCATION PREP

Installation procedures are different for the recessed and surface versions of the product. Please observe the applicable set of instructions for your installations.

Prepare the mounting location using one of the provided mounting templates.

─── RECESSED VERSION ───

Before beginning installation, observe that the ceiling thickness is a minimum of ⁵⁄₁₆" for the sensor bracket.

1. Place the template in the desired position.
2. Mark and drill two 2.3mm (³⁄₃₂") pilot holes for mounting screws.
3. Cut the area according to the cut line on the template.
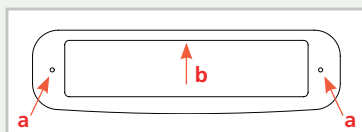
a = mounting holes
b = cut line

─── SURFACE VERSION ───
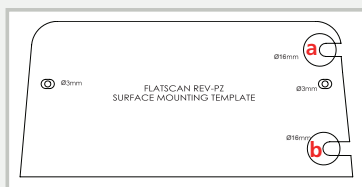
1. Place the template in the desired position.
2. Mark and drill two 3mm (⅛") pilot holes for mounting screws.
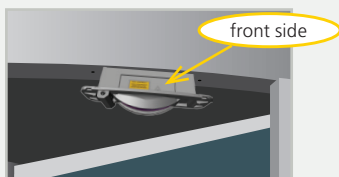3. Mark and drill one 16mm (⅝") pass-thru hole (a or b, according to the structure of the door).
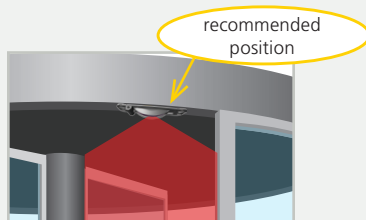
2 SENSOR INSTALLATION

Install the sensor at the correct position and secure it with the screws.
Ensure that the sensor is mounted securely.

RECESSED VERSION

MOUNTING OPTION A: Recessed on the stationary ceiling

front side

recommended position

Make sure the front side of the sensor (yellow sticker showing) faces toward the outside of the revolver.

Make sure the distance between the detection curtain is within 3" from the outer edge of the rotating wing.

MOUNTING OPTION B: Recessed on the moving ceiling

front side

recommended position
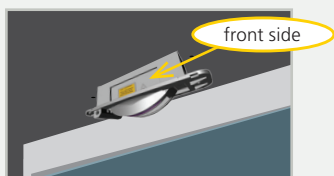
Make sure the front side of the sensor (yellow sticker showing) faces toward the rotation axis of the door.
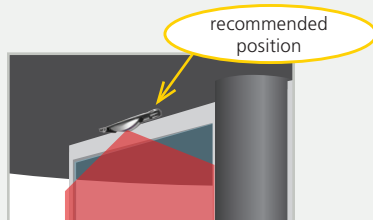
Make sure the detection curtain is positioned directly in front of the leading edge.

SURFACE VERSION

Remove the cover with a screwdriver.
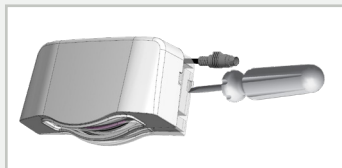
Pass the cable through the pass-thru hole (a or b).

a

b

Secure the sensor firmly. If you are installing the sensor on a curved surface, make sure the screws are not too tight.

---

3 WIRING

Wire the sensor to the door control according to the diagram.

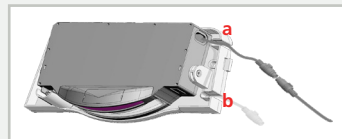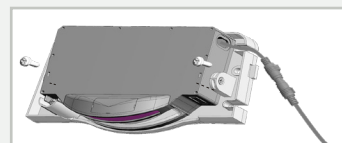| WIRE COLOR		From: SENSOR	To: DOOR CONTROLLER
green		POWER SUPPLY 12 – 24 VDC	POWER SUPPLY +
brown		POWER SUPPLY 12 – 24 VDC	POWER SUPPLY -
yellow		OUTPUT 1: COM*	INPUT 1
white		OUTPUT 1: NC*	INPUT 1
pink		OUTPUT 2 (opto): COM*	INPUT 2
gray		OUTPUT 2 (opto): NC*	INPUT 2
red		TEST / MONITORING	TEST / MONITORING
blue		TEST / MONITORING	TEST / MONITORING

see output configuration (page 8)

⚠️ Refer to the Technical Specifications (page 12) to verify output current ratings.
Exceeding the current can damage the sensor.

⚠️ If monitoring is not connected, the cable must be wired to the power cable (not polarity-sensitive).

4 VISIBLE SPOTS AND CURTAIN ADJUSTMENT

Quickly press the push button twice to activate the visible spots, and then adjust the tilt angle (0 to 5°) with the screwdriver until the visible spots are at the correct position.

⚠️ Do not stare into the visible beams!
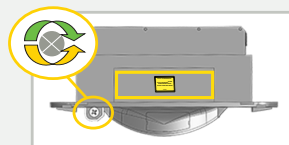
clockwise = away from wing
counter-clockwise = closer to wing

MOUNTING OPTION A

ANSI *156.27 COMPLIANCE*
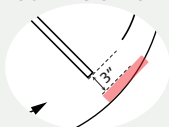
Refer to section 22 of ANSI 156.27.
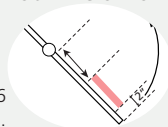
Refer to section 16 of ANSI 156.27.

MOUNTING OPTION B

5 DETECTION FIELDS

The detection field can be established either through an automatic teach-in **OR** manually using the *BEA Universal Remote Control*.

AUTOMATIC TEACH-IN

Performs a "Detection Field Teach-in" which learns the width (A and C) and height (B).

MANUAL TEACH-IN

Performs an "Environment Teach-in" which learns the height (B). Width must be manually programmed using the **BEA Universal Remote Control**.
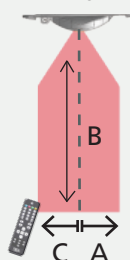
Please observe the applicable set of instructions for your installation on the following page.

AUTOMATIC

B

C A

MANUAL

B

C A

5 DETECTION FIELDS

DETECTION FIELD = Detection Zone + UNCOVERED ZONE

Each **DETECTION FIELD** (width A, width C, height B) includes both detection zone <u>and</u> **UNCOVERED ZONE**.

- detection zone = the area in which you want detection to occur
- **UNCOVERED ZONE** = the perimeter of the detection zones that will prevent false detection caused by environmental factors such as leaves, snow, debris, enclosure wall

  See next page for more information on DETECTION FIELDS and UNCOVERED ZONE.

FOR INSTANCE: If your **DETECTION FIELD** A is set to 20 cm, and your **UNCOVERED ZONE** is at default (6 cm), the detection zone is only 14 cm. *See illustration, right.*

To create a detection zone to cover the entirety of the wing or enclosure, you must add the measurement of the UNCOVERED ZONE to your detection zone to create your **DETECTION FIELD**. E.g. If you desire a right-width detection zone of 20 cm and your **UNCOVERED ZONE** is 2 cm, you must enter 22 cm as your **DETECTION FIELD**.

14 cm   6 cm

DETECTION FIELD A = 20 cm

AUTOMATIC TEACH-IN

1. To launch a teach-in, either press the push button for 2 seconds **OR** press 🔒🖊️0 on the Universal Rmeote Control to launch a detection field teach-in.
   The sensor will quickly flash red-green while it learns the installation height.

2. Once the sensor flashes green, stretch out your arm in front of you and make an up-down movement to define the left limit of the detection field. The LED flashes red while calculating.

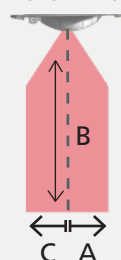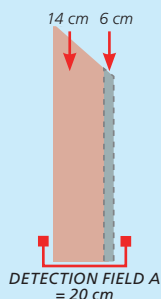3. Once the sensor flashes green again, stretch out your arm in front of you and make an up-down movement to define the right limit of the detection field. The LED flashes red while calculating.

4. The LED turns off when the teach-in is finished.

⚠️ If the LED blinks orange before the teach-in is finished, adjust the tilt angle of the laser curtain and launch a new teach-in.

2 sec.
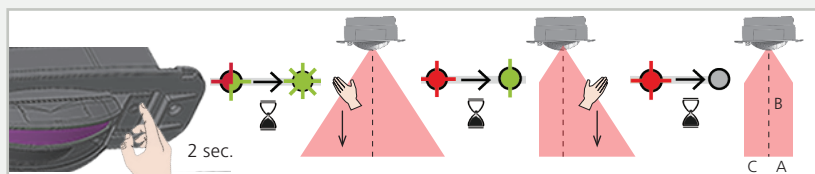
5. Walk-test to confirm that your detection zone is set to suit the application's needs.

MANUAL WITH REMOTE

1. Set the left width (C) and the right width (A).*
   See next page, "Detection Field."
   REMINDER: Be sure to subtract the width of the Uncovered Zone from your Detection Field.

2. Launch an Environment Teach-in via *BEA Universal Remote Control*: 🔒🖊️1

3. The LED turns off when the teach-in is finished.

4. Walk-test to confirm that your detection zone is set to suit the application's needs.

Left detection zone   Right detection zone

C   A
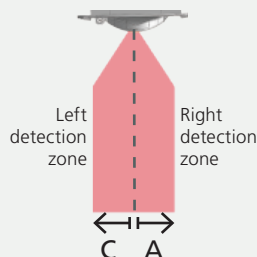
6 REPLACE COVER

Snap on the cover to finish the installation.

recessed   *surface*
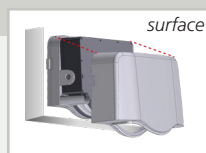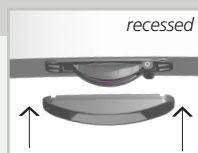
PARAMETER SETTINGS

The FLATSCAN REV PZ sensor is configured to understand metric measurements.
If necessary, convert your measurements from US Customary (USC) inch measurements to cenitmeter by multiplying your USC measurements by 0.39.

DETECTION FIELD

(detection zone + uncovered zone)

A new teach-in overwrites these values.

WIDTH (right) A⯈ ↦ 0 0 0 0 0 1 – 0 7 0
no field · 1 cm (³⁄₈") · to · 70 cm (27 ⁹⁄₁₆")

HEIGHT B⯈ ↔ 0 0 0 0 0 1 – 5 0 0
no field · 1 cm (³⁄₈") · to · 500 cm (196 ⁷⁄₈")

WIDTH (left) C⯇ ↤ 0 0 0 0 0 1 – 0 7 0
no field · 1 cm (³⁄₈") · to · 70 cm (27 ⁹⁄₁₆")

UNCOVERED ZONE

UNCOVERED ZONE: Increase in case of snow, dead leaves, etc.

Confirm that DIP 2 is set to ON to change these settings using the *BEA Universal Remote Control*.

F2	1	2	3	4	5	6	7	8	9
	2 cm (³⁄₄")	4 cm (1 ¹⁄₂")	6 cm (3 ¹⁄₃")	8 cm (3 ¹⁄₈")	10 cm (4")	12 cm (4 ³⁄₄")	14 cm (5 ¹⁄₂")	16 cm (6 ³⁄₈")	18 cm (7 ¹⁄₈")

Measured in specific conditions and dependant on application and installation.

NOTE: In case of false detection, buttons **1** and **2** are not recommended.

NOTE: When DIP2 is OFF, **F2** changes automatically to **5** (10 cm).

OUTPUT REDIRECTION

Left detection zone 🟢
Right detection zone 🔴 **

OUTPUT REDIRECTION function dictates the OUTPUT CONFIGURATION function.

F1	0	1	2	3	4	5
OUTPUT 1	right	left or right	*	left	left or right	left or right
OUTPUT 2 (OPTO)	left	*	left or right	right	left	right

* Output disabled.
** The LED is also red when a detection in both zones occurs

OUTPUT CONFIGURATION

Confirm that DIP 1 is set to ON to change these settings using the *BEA Universal Remote Control*.

🔀	1	2	3	4	NO = normally open / NC = normally closed
OUTPUT 1	NO	NC	NC	NO	
OUTPUT 2 {OPTO}	NC	NO	NC	NO	

NO POWER / NO DETECTION / DETECTION — NO / NC

OUTPUT HOLD TIME

Note: Hold time starts after loss of detection.

①	0	1	2	3	4	5	6	7	8	9	
	0.1	0.3	0.5	1	1.5	2	3	5	7	9	sec

HOW TO USE THE *BEA UNIVERSAL REMOTE CONTROL*

After unlocking, the red LED flashes and the sensor can be adjusted with the remote control.

If the red LED flashes quickly after unlocking, you must enter an access code from 1 to 4 digits. If you do not know the access code, **cut and restore the power supply**. After 1 minute, you can access the sensor without entering an access code.

To end an adjustment session, always lock the sensor.

When there are several sensors, it is recommended to use a different access code for each sensor in order to avoid changing settings on all of them at the same time.

ADJUSTING ONE OR MORE PARAMETERS

CHECKING A VALUE

x = number of flashes = value of the parameter

2x 1x 3x 1x 5x = field width: 2.35 m

DETECTION FIELD ADJUSTMENT

increase/decrease the detection field by 1 cm (³⁄₈")
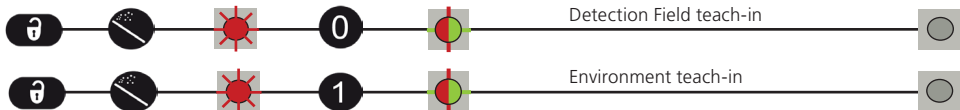
TEACH-IN

Detection Field teach-in

Environment teach-in

LED ACTIVATION/DEACTIVATION

enable/ disable the LED when there is a detection
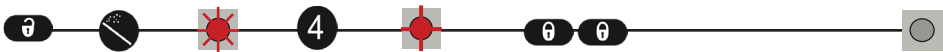
VISIBLE SPOTS

turn on/ off the visible spots

SERVICE MODE

Disabling the output and LED for during 15 minutes and can be useful during an installation, a mechanical teach-in of the door, or maintenance work.

RESET TO FACTORY SETTINGS

factory reset of all values

factory reset of all values except field dimensions, output redirection, and output configuration

HOW TO USE THE PUSH BUTTONS
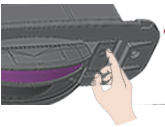
Press twice quickly	to activate or deactivate the visible laser spots
Press and hold for 2 sec.	to launch a teach-in
Press and hold for 3 sec.	to confirm the setting after changing the DIP switch
Press and hold for 5 sec.	to acknowledge the flashing-6x error message and confirm that you want the sensor to be mounted higher than 13'.

TROUBLESHOOTING

In case of unwanted reactions of the door, verify whether the problem is caused by the sensor or the controller. To do so, activate the service mode (see page 10) and activate the revolving door. If the door cycle is completed successfully, check the sensor. If not, verify the door controller or the wiring.

🔴🟢	The red or green LED is ON sporadically or permanently, and the door does not react as expected.	Bad teach-in	Launch a new teach-in.
		Unwanted detections (due to environment or external conditions)	1. Make sure the laser curtain is in the correct position. 2. Check the laser window. If it is dirty, clean it carefully with a damp and clean microfiber cloth. Attention: The surface of the laser window is delicate. 3. Switch DIP 2 to off (critical environment).
⚪	The sensor does not react at power-on.	Inverted power supply	Check wiring (green +, brown -).
		Faulty cable	Replace cable.
		Faulty sensor	Replace sensor.
⚪	The sensor does not react when powered.	Test error	Check voltage between red and blue wires.
		Service mode is activated	Exit the service mode.
📺	It is not possible to adjust a setting with the *BEA Universal Remote Control*.	Incorrect DIP switch position	Adjust the required DIP switches to ON.
		Sensor is password protected	Enter the correct password. If unknown, cut and restore the power supply to access the sensor without entering a password (after1 minute).
🟡	ORANGE LED on permanently	Sensor encounters a memory problem	Replace sensor.
🟡	ORANGE LED flashes quickly	DIP switch setting awaiting confirmation	Confirm the DIP switch setting (long push on the push button).
🟡1	ORANGE LED flashes 1x every 3 seconds	Sensor signals an internal fault	Cut and restore power supply. If orange LED flashes again, replace sensor.
🟡2	ORANGE LED flashes 2x every 3 seconds	Power supply is out of range	1. Check power supply (tension, capacity). 2. Reduce the cable length or change cable.
🟡3	ORANGE LED flashes 3x every 3 seconds	Sensor signals an internal fault	Cut and restore power supply. If orange LED flashes again, replace sensor.
🟡4	ORANGE LED flashes 4x every 3 seconds	Something close to the sensor is masking part of the detection field	1. Make sure the laser window is not scratched. If it is, replace sensor. 2. Remove all possible masking causes (insects, spider web, flexible tube, laser window protection, etc). 3. Check the laser window. If it is dirty, clean it with compressed air, then wipe it carefully with a damp and clean microfiber cloth. Attention: The surface of the laser window is delicate.
		Sensor does not see its background	Switch DIP 3 to off (deactivates background).
🟡5	ORANGE LED flashes 5x every 3 seconds	Teach-in error	1. Check whether all teach-in requirements are fulfilled and launch a new teach-in. 2. Adjust the tilt angle of the laser curtain and launch a new teach-in. 3. Make sure there are no objects on the ground during teach-in and launch a new teach-in.
🟡6	ORANGE LED flashes 6x every 3 seconds	Sensor installed too high	Press and hold the push button for at least 5 seconds to confirm the installation height of sensor is higher than 13 ft.

TECHNICAL SPECIFICATIONS

TECHNOLOGY / PERFORMANCE

Technology	LASER scanner, time-of-flight measurement
Detection mode	Presence
Mounting height	min: 6'6" max: 13'
Field of view	90°
Angular resolution	0.23° (400 spots within 90°)
Tilt angles	0 – 5°
Optical characteristics (IEC 60825-1:2014)	wavelength 905 nm; output power < 0.1 mW; CLASS 1 wavelength 635 nm; output power < 1 mW; CLASS 2 - visible spot

ELECTRICAL

Supply voltage*	12 – 24 VDC ±15%
Power consumption	≤ 2.2 W
Response time	max. 90 ms
Relay output 1*	1 relay (free of potential change-over contact)
max. contact voltage	42V DC/AC peak
max. contact current	1.0A (resistive)
Optofet output 2*	1 optocoupler (galvanic isolation - polarity free)
max. switching voltage	42V DC/AC peak
max. switching current	100 mA
Test input	30 VDC (max. switching voltage) low < 1 V, high > 10 V (max. 30 V)

PHYSICAL

Dimensions

recessed version	7" (L) × 3" (H) × 2" (D) [178 mm (L) × 85 mm (H) × 53 mm (D)]
surface version	6 ⅝" (L) × 3 ⅝" (H) × 1 ⅝" (D) [168 mm (L) × 93 mm (H) × 42.5 mm (D)]
Material - Color	PC/ABS - black or aluminum
Protection degree	IP54 (IEC 60529)
LED signals	1 bi-colored LED: detection/output status
Temperature range	-22 – 140 °F (if powered)
Humidity	0 – 95% non-condensing
Vibrations	< 2 G

COMPLIANCE

Compliance	ISO 13849-1 Pl "d"/ CAT2; IEC 60825-1; IEC 62061 SIL 2

* External electrical sources must be within specified voltages, max 15W and ensure double insulation from primary voltages.

Specifications are subject to change without prior notice.
All values are measured in specific conditions.

BEA

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