



[ENG]

KIT-3D-SENSOR

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INSTALLATION GUIDE

Vega 3D System is a door protection system that provides enhanced 3D detection in the landing zone. The system uses microwave radar technology for 3D detection. It is fully compliant to the 2019 update to ASME A17.1 both with light curtains (Approaching Object + Object in the door path) and as stand-alone device (only Approaching Object).

IMPORTANT: Read carefully this manual before the installation

3D SYSTEM KIT:

SYSTEM CODE	COMPONENT CODE	DESCRIPTION
KIT-3D-SENSOR-VG-V60	3D-CONTROLLER-E	Power supply unit (115-230 Vac 50/60Hz, 12-48 Vdc) compliant with Vega light curtain B-LIFT-V-60
	3D-SENSOR-VG	Radar Sensor
	B-LIFT-V-60	Light Curtains
KIT-3D-SENSOR-VG-E	3D-CONTROLLER-E	Power supply unit (115-230 Vac 50/60Hz, 12-48 Vdc) compliant with Vega light curtain B-LIFT-V-60
	3D-SENSOR-VG	Radar Sensor
KIT-3D-SENSOR-VG-D	3D-CONTROLLER-D	Power supply unit (115-230 Vac 50/60Hz, 12-48 Vdc) compliant with Vega light curtain B-LIFT EVO series
	3D-SENSOR-VG	Radar Sensor

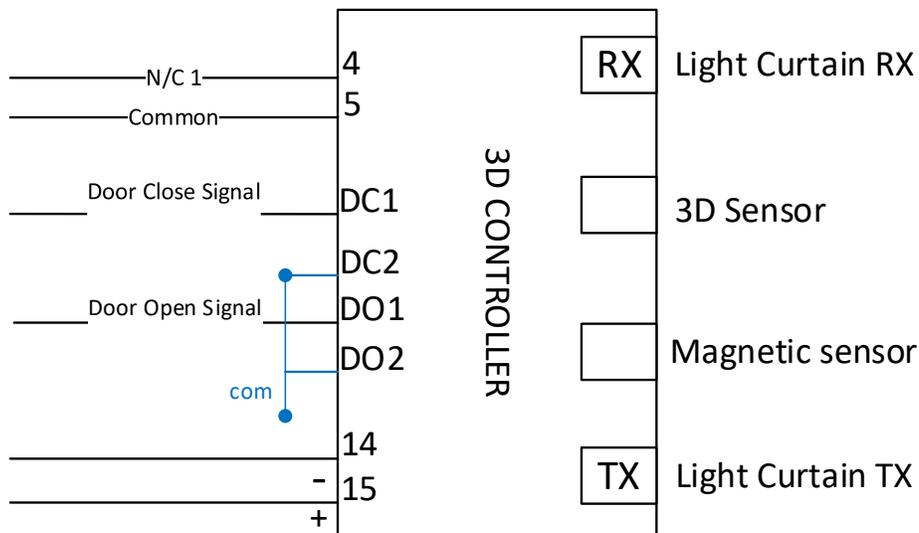
3D Monitoring & Protection System uses microwave radar technology which results in a significant reduction in these three main causes of false triggers.

- It is not affected by reflected ambient light.
- The sensor can ignore stationary objects within the 3D zone while still detecting if/ when someone approaches the doors.
- The sensor can discriminate between people passing through the 3D zone from the sides and people who are approaching the doors.

1 STARTUP GUIDE

- 1) Connect the 3DSensor to the 3D controller.
- 2) Connect Light Curtains to the 3D controller (optional).
- 3) Connect Magnetic Sensor to the 3D controller (optional).
- 4) Connect the relays used to stop the closing of the doors.
- 5) Connect the door opening/closing door signals.
- 6) Connect power supply and turn on.
- 7) Activate the 3D Sensor by menu 3D Settings and choose options according to the installation conditions.
- 8) Activate the Light Curtains by 2D Settings Menu (only if Light Curtains are connected).
- 9) Activate the Magnetic Sensor by the menu: 3D settings -> 3D shut off -> external signal (only if Magnetic Sensor is connected)

1.1 3D-System connection

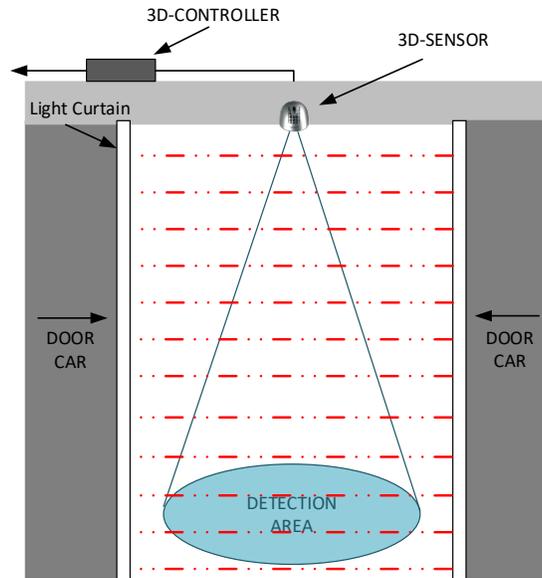


2 MECHANICAL INSTRUCTIONS

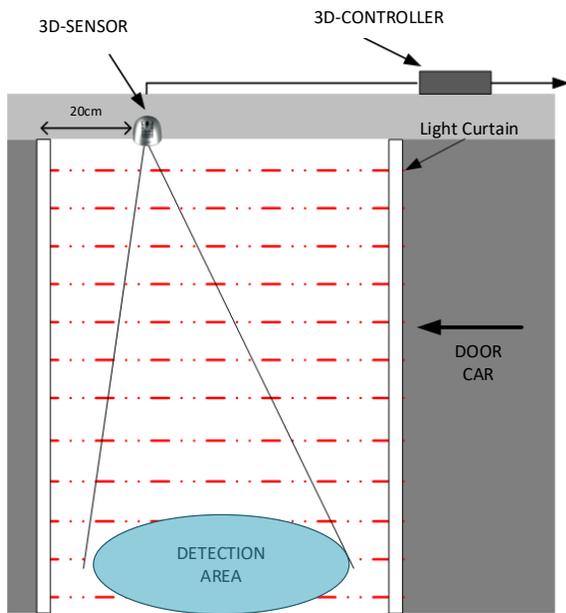
Consult the images listed below for the correct installation of the **3D-Sensor**

2.1 Positioning

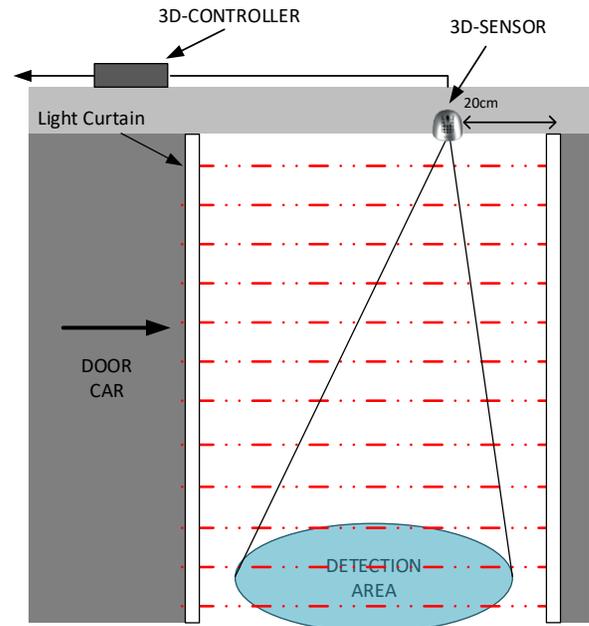
Central-Opening Door



Side-Opening Door: Left Side



Side-Opening Door: Right Side



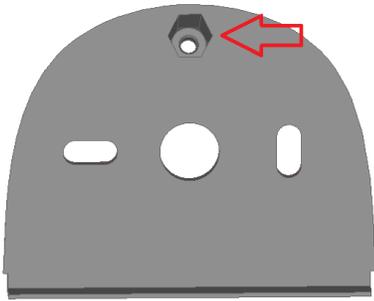
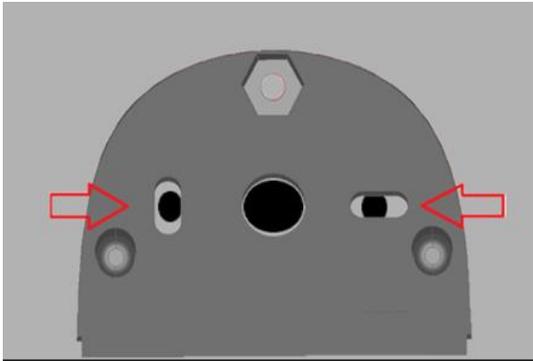
ATTENTION: For the side opening, you need to change the settings in the menu, consult the image as if you are inside the car.

Central Opening Door

The sensor must be positioned in the middle with the back facing the interior of the cab.

Side Opening Door

The sensor must be positioned in the corner, 20 cm (8 inches) from the door closing point. The back must be facing the interior of the cab.

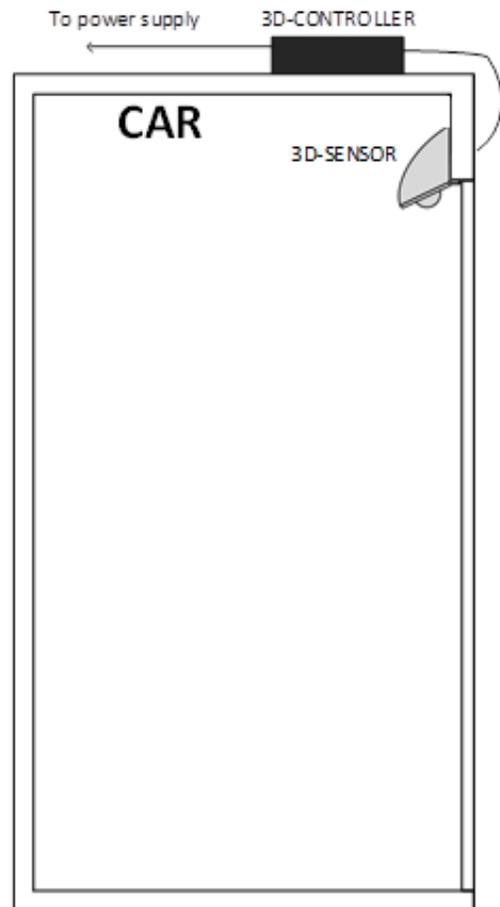
2.2 Mounting procedure	
Instructions	Image
<p>Insert the nut into the slot on the base.</p>	
<p>Make an hole in the car header to pass the cable outside and place the base with the screws.</p>	

KIT 3D SENSOR

Insert the cover and fix with the screw.



Connect 3D-Sensor with 3D-Controller placed on the roof of the car.



3 DEVICE CONNECTION

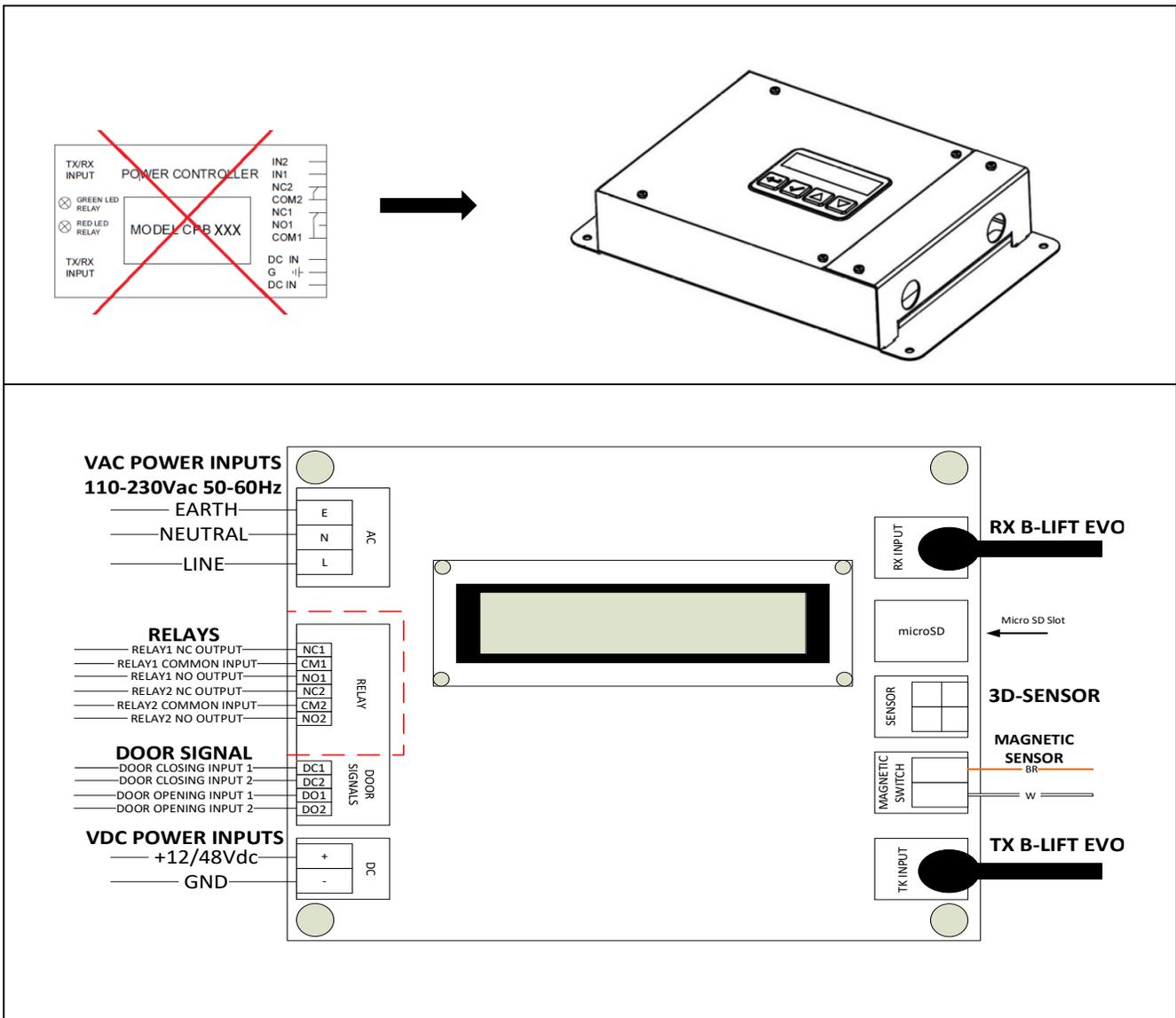
3D-Sensor can be installed with *Vega* light curtains as complete Protection System or with third part light curtains as Stand-Alone Device.

3.1 3D-Controller variants

Two variants of 3d-Controller are available to be compliant both with Vega light curtains EVO Series and V60 model. Please, refer to the Code Table (page 3) for more info.

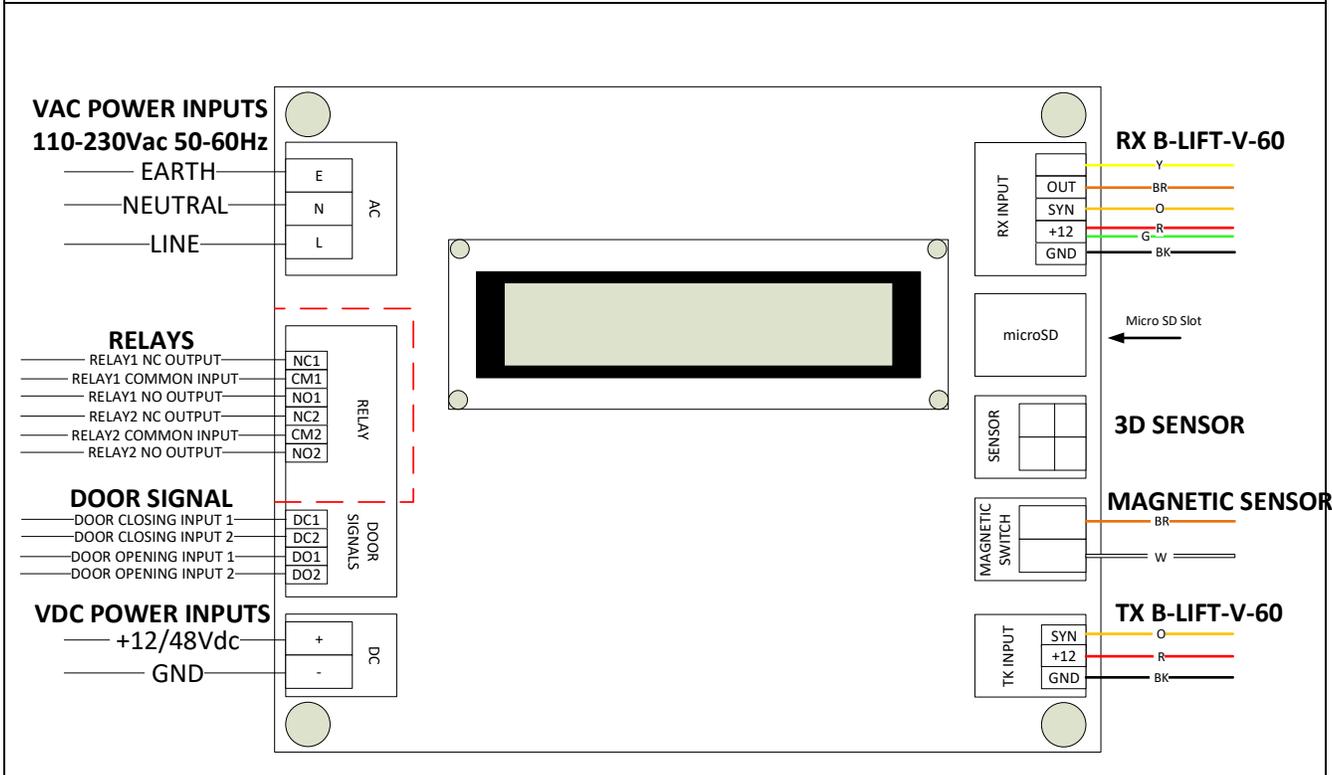
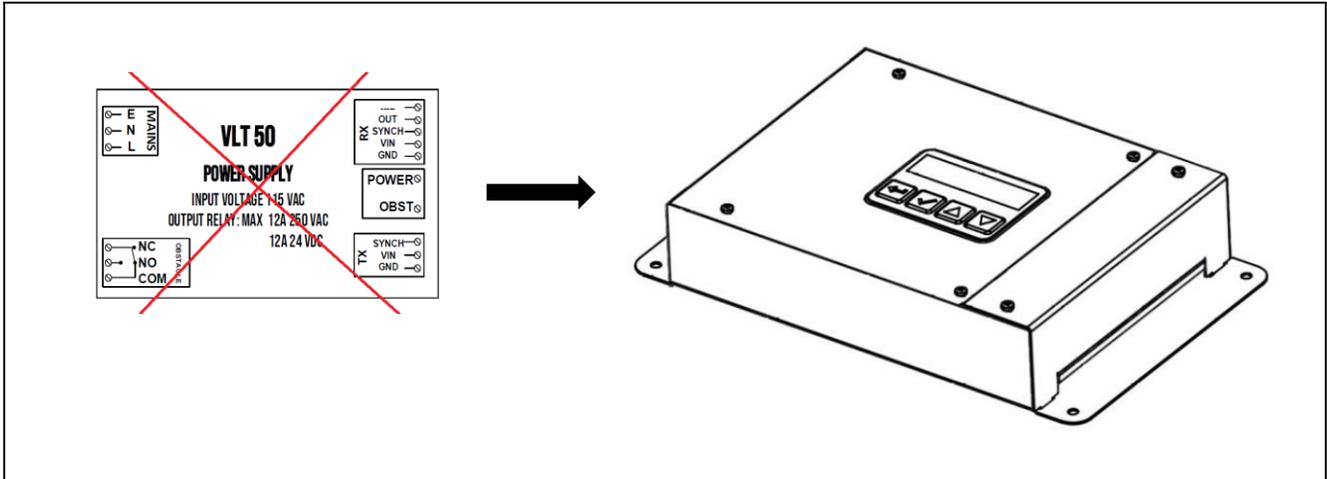
3D-CONTROLLER-D

3D-System with 3D-Controller-D variant is suitable with Vega light curtains EVO Series: B-LIFT-200\400\700. If another power box (CPB12-24/CPB12-24-G/220) is previously used with B-LIFT-200/400/700 EVO, it can be replaced by 3D-Controller-D. Light curtains and 3D-Sensor must relate to the same controller.



3D-CONTROLLER-E

3D-System with 3D-Controller-E variant is suitable with Vega light curtains B-LIFT-V-60. If another power box (VLT50) is previously used with B-LIFT-V-60, it can be replaced by 3D-Controller-E. Light curtains and 3D-Sensor must relate to the same controller.



3.2 Installation instructions



1. To access the connectors, it is necessary to open the metal box of the controller

2. Remove the right cover



3. Remove the left cover

4. Pass all the cables that must be connected to the terminals on the left of the controller through the appropriate cable gland holes in the cover

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5. Connect the cable on the left side (Power supply, relay, door contacts).



6. Place the cover of the 3D-Controller and secure it with the screws.



7. Connection of the light curtains, the optional magnetic switch and the 3D sensor.



8. Close the panel.

ATTENTION: To use 3D-Sensor in residential environment, the cable must be wrapped around the snap ferrite for one round. Snap ferrite sold separately (code: FER-CLP-03).

3.3 3D-Sensor as Stand-Alone Device

3D-Sensor can be also used in stand-alone mode. For this installation both 3D-CONTROLLER-E and 3D-CONTROLLER-D are good option, and third-part light curtains can be used (refers to 4.1 to see Relay connection).

After the 3D-Sensor has been properly placed on the car header, use the connection cable to connect 3D-Controller with 3D-Sensor. Use nut and washer to ensure the earth connection.



3.4 Optional Magnetic switch

Optional magnetic switch for static installations of the 3D Sensor can be installed to provide a position door signal to the 3D-Controller. Thanks to this signal 3D-Sensor can be turned off when doors are near to close (this function is requested by ASME A17.1). Otherwise, 3D-Sensor will be turned according to the menu 3D-Settings -> Shut-off 3D (see paragraph 6).

Code: KIT-MAGNETIC-SWITCH-01 (not included)

Main features:

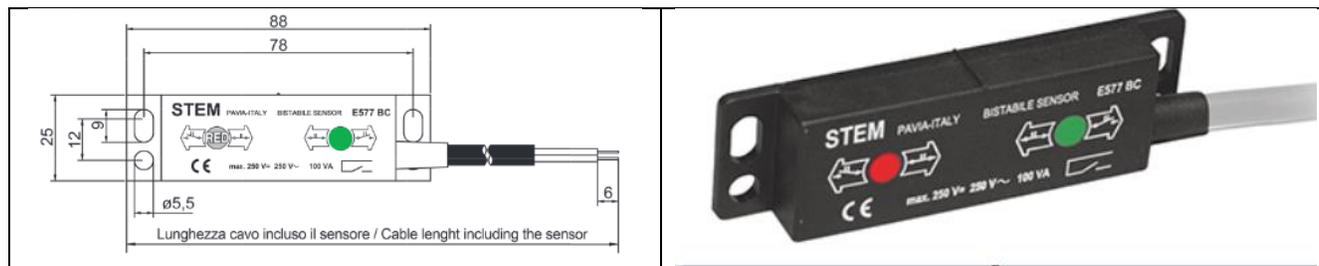
Sensor housing: rectangular, laestra housing

Contact type: bistable

Voltage and power maximum rating: 250V AC-DC, 100W

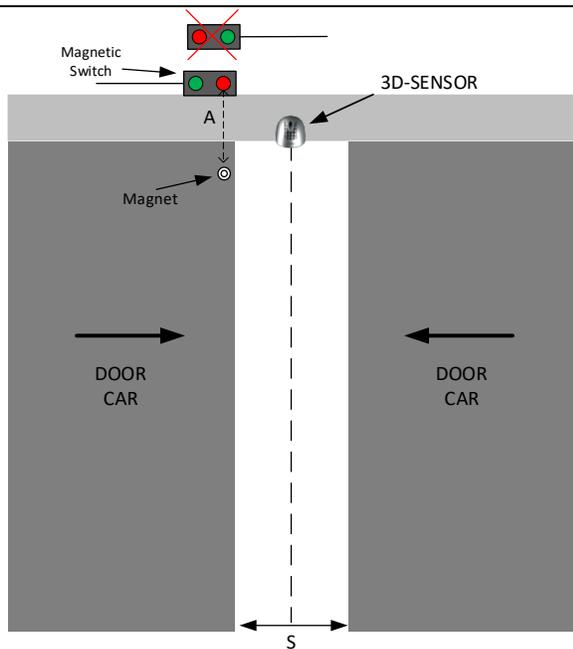
Door Opening to Magnet Range distance: "S" 30/40cm

Magnetic Switch to Magnet distance: "A" – 30/40cm

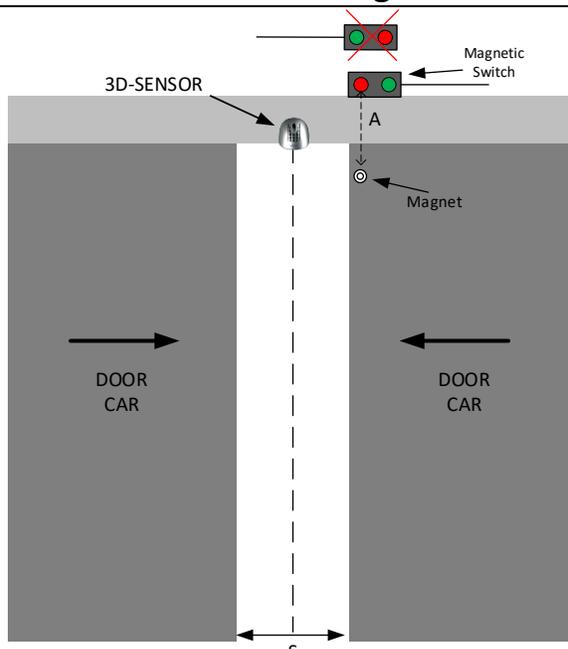


Central Opening

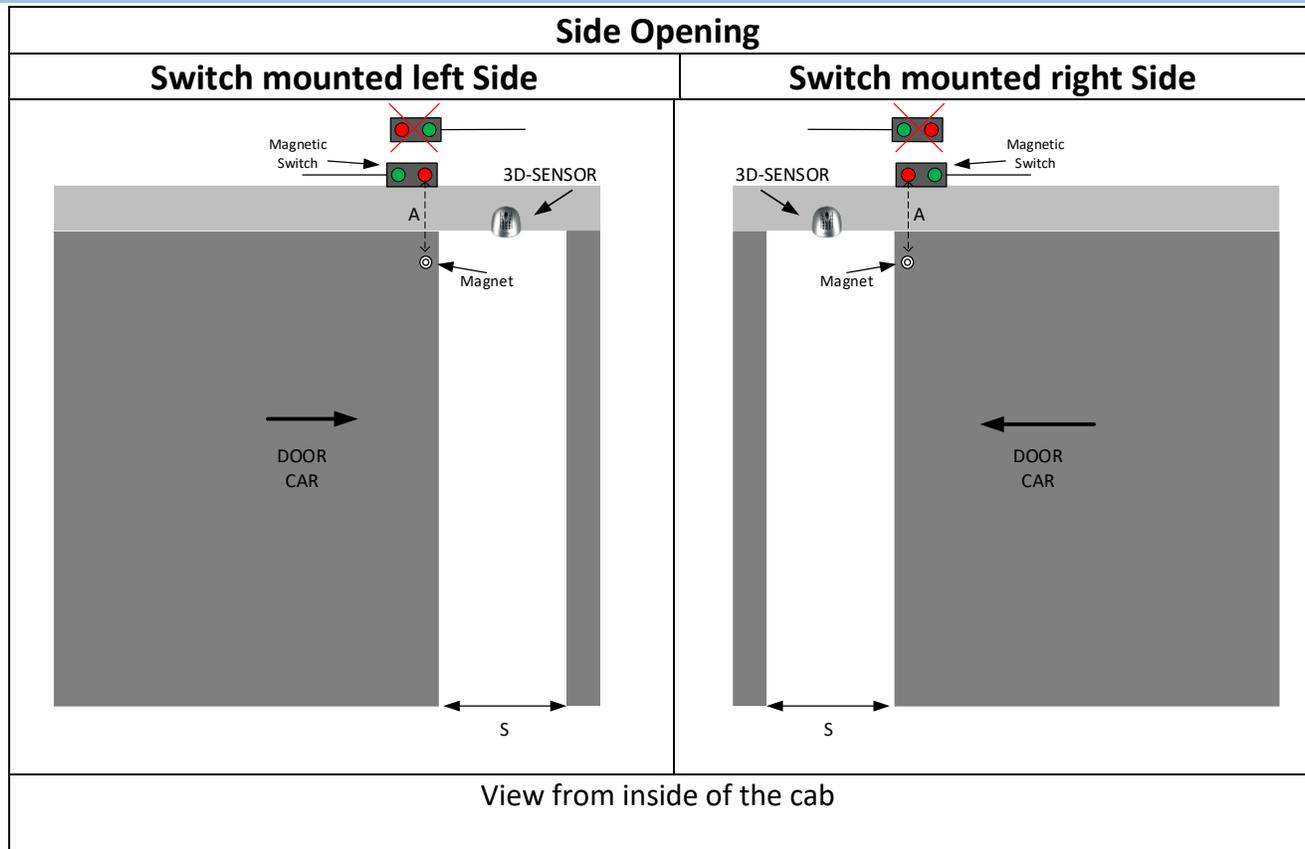
Switch mounted left side



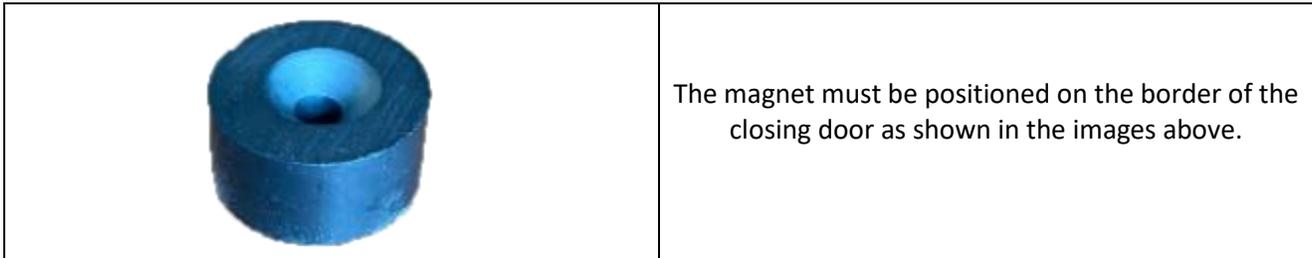
Switch mounted right side



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MAGNET:



4 POWER, RELAYS AND EXTERNAL DOOR SIGNALS

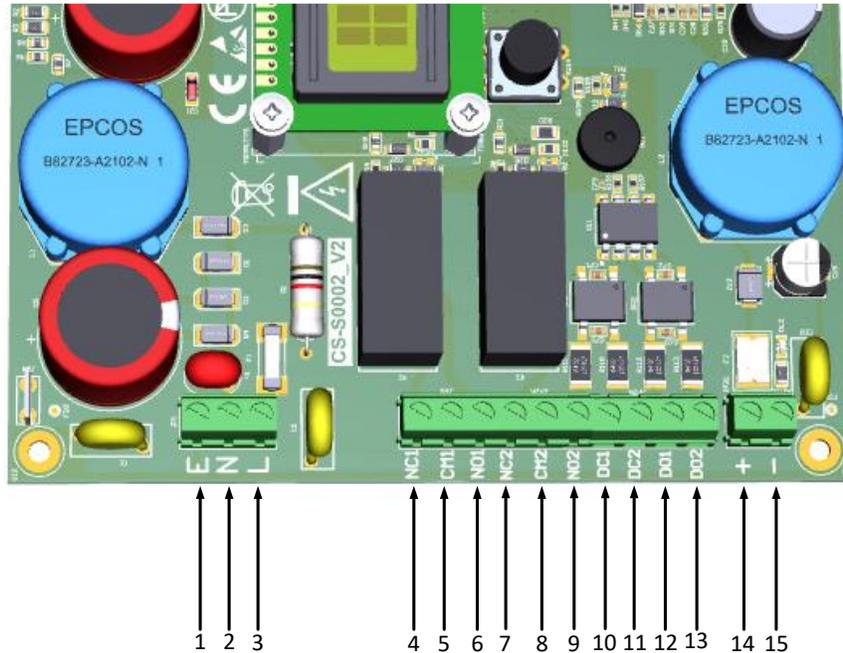
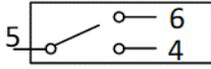
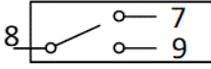


Fig 4: 3D Controller Left-Side connections

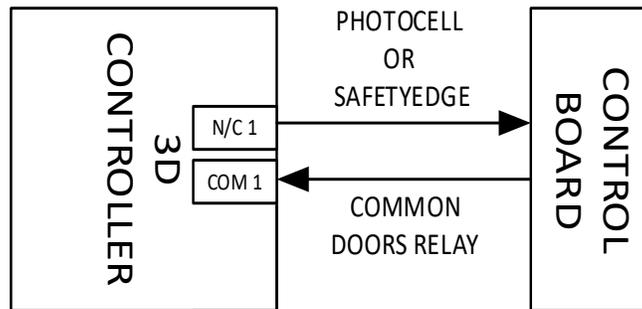
Terminal No.	Function	Comments
1	Earth	85 to 260VAC if powered via AC (for DC use 14 & 15)
2	Neutral	
3	Line	
4	N/O 1	Relay 1  Relay 2 
5	COM 1	
6	N/C 1	
7	N/C 2	
8	COM 2	
9	N/O 2	
10	DC1	Door closing input (12 to 230 AC/DC)
11	DC2	Note: not polarised
12	DO1	Door opening input (12 to 230 AC/DC)
13	DO2	Note: not polarised
14	+	+12 to 48VDC if powered via DC
15	-	0V

Consult the following wiring examples to connect the 3D controller with the different connections.

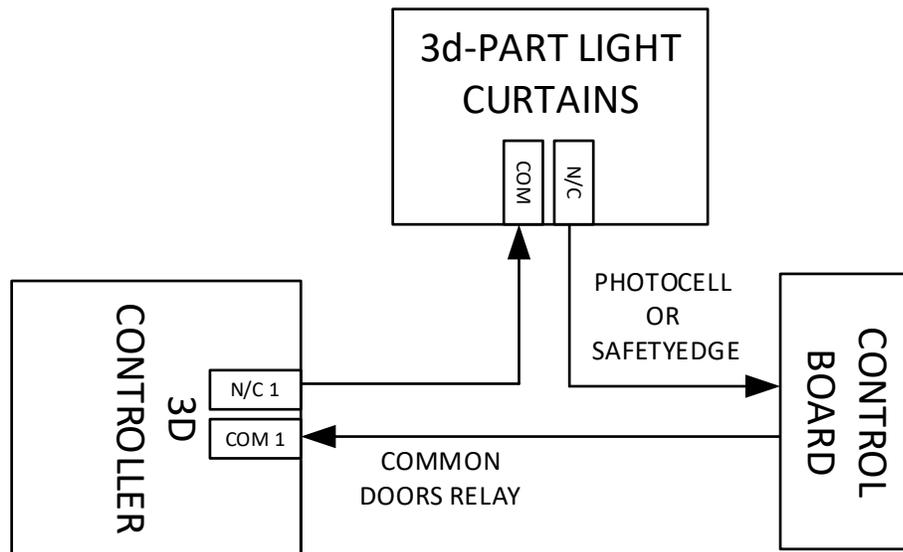
4.1 Relay Connection

The relay is used to stop the door closing of the elevator.

If Vega light curtains are used and connected to the 3D-Controller the relay connection should be done as follow:

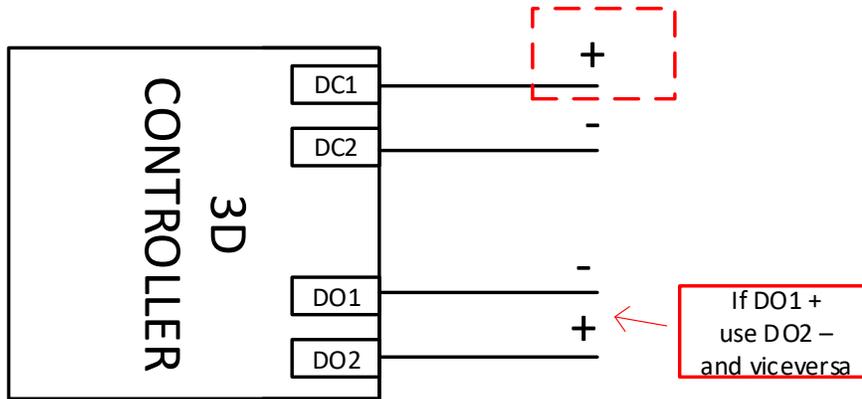


If third part light curtains are used 3D-Controller Relay need to be connected in series with the Light curtains Relay. 2D must be disabled on the 3D Controller Menü: *2D-Settings-> 2D-Enable->Off*.

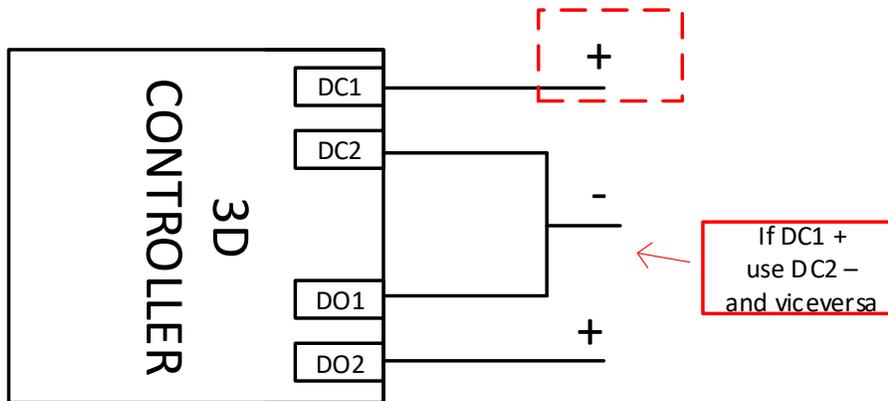


5 EXTERNAL SIGNALS WIRING EXAMPLES

CONNECTION TYPE A: DOOR OPENING/ CLOSING



CONNECTION TYPE B: DOOR OPENING/ CLOSING



ATTENTION:

If DC1 is *positive* set DC2 to *negative*
Same connection required for both types of current.

6 MENU NAVIGATION

Settings configuration can be changed using the 4 buttons on the keypad Controller.



Key	Function
←	Cancel
✓	Confirm
▲	Menu and value up
▼	Menu and value down

Programming Menu

Language	English		Language selection
	Italian		
3D Settings	3D Enable		
		Smart	Smart detection with filtering of transversal movement. [Default]
		Standard	Standard detection
		Off	Turn Off 3D Detection
	3D Position		
		Center	Sets the configuration according to the position of the sensor in the car header. [Default: Center]
		Right	
		Left	
	3D Mode		
		On closing	3D activates when the doors are closing
	ON (5s)	3D activates with 5s timeout	
	ON (10s)	3D activates with 10s timeout	
	ON (20s)	3D activates with 20s timeout	
	Always ON	3D activates with no timeout [Default]	
	Count	Counts the 3d triggers and disable 3D once this count is reached. Count reset when the target crosses the doors or door fully closed. (0 is count disabled). [Default: 3]	
	Range	Sets detection range up 2 mt [Default: 140cm]	

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	Size-Opening		Sets size-opening to fit the beam
		Small	<1 mt [Default]
		Medium	>1 mt, <1.5mt
		Large	>1.5 mt, <2mt
	Shut-Off 3D		
		Timer	3D deactivates with timeout after door closing signal [Default]
		External Signal	3D deactivates with external signal
		Disabled	3D deactivates on the falling edge of door closing signal
	Timer Off		Sets timeout for Shut-Off 3D->Timer [Default: 3s]
	Offset		Sets the doors thickness to adjust the beam [Default: 22cm]
	Sensitivity		Sets sensor sensitivity to avoid door reflection [from 0 to 4, Default: 2]
	Doors Detection		To avoid Doors in Standard Mode [from 0 to 2, Default: 0]
2D Settings	2D Enable		
		On	Enable 2D Detection
		Off	Disable 2D Detection [Default]
	Nudging Mode		
		American	If Relay 2 set to Nudging, after Nudging Timeout Relay 2 is energized and Relay 1 remains activated until door path is cleared [Default]
		Canadian	If Relay 2 set to Nudging, after Nudging Timeout Relay 2 is energized and Relay 1 is deactivated
		Off	Nudging deactivated
	Nudging Timeout		Sets timeout for Nudging (5-70s) [Default: 20s]
Second Realy	Copy Main		Sets Relay 2 as Main Realy [Default]
			Relay 2 activates when a fault is detected
			Relay 2 activates after nudging timeout
			Relay 2 disabled
Audio	Obstruction beep		
		On	Beep activated on trigger

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		Off	Beep off [<i>Default</i>]
	Nudging beep		
		On	Beep activated after nudging timeout
		Off	Nudging Beep off [<i>Default</i>]
	Volume		Sets beep volume [from 0 to 8, <i>Default: 8</i>]
	Key Sounds		
		On	Keypad Sound On [<i>Default</i>]
		Off	Keypad Sound Off
Display			
	Info		
		Status	Devices Status on Display [<i>Default</i>]
		Config	Coded display of configuration
	Standby		Screen turns off after 3 minutes of inactivity
		On	Enables standby screen [<i>Default</i>]
		Off	Disable standby screen
Software			
	Controller Vers.		Controller firmware version
	Sensor Vers.		Sensor firmware version
	Controll Upgrade		Starts to update Controller firmware version from Sd-Card
	Sensor Upgrade		Starts to update Sensor firmware version from Sd-Card
Configuration			
	Restore Default		Resets to factory settings

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Status & Config

The display home screen shows real-time status of connected devices (3D Sensor and 2D light curtains). Digit meanings for each device is explained below:

- 'r' = running;
- 'x' = off;
- '+' = linked, but not working;
- '-' = not linked

Input Status:

- During the closing of the doors you will see on the display the letter "C" on the top right meaning that the controller is receiving a signal on the D/C pin.
- During the opening of the doors you will see on the display the letter "O" on the top right meaning that the controller is receiving a signal on the D/O pin.

You can check current configuration on 3D-Controller by option Display -> Info -> Config. The left-hand side of the display shows configuration, the format is as follows:

Digit	Setting	Meaning
1	2D Enable	'2'= 2D enabled, ' '= 2D disabled
2	3D Enable	'3'= 3D Standard Mode, 's'= 3D Smart Mode, ' '= 3D disabled
3	3D Mode	'a'= Always ON, 'c'= On Closing, '5'= ON 5s, 1= ON 10s, '2'= ON 20s
4	3D Position	'C'= center, 'R'= right, 'L'= left
5	Opening-Size	'S'= small, 'M'= medium, 'L'= large
6	Shut-Off 3D	' '= disabled, 'e'= external sign., 't'= timer
7	Doors Detection	From 0 to 2
8	Sensitivity	From 0 to 4
9	Rel2 function	'm'= copy main, 'f'=fault, 'n'= nudging, ' '= disabled

The right-hand side shows devices status (according to the order: 2D Receiver, 2D Transmitter, 3D Sensor).

7 3D MODES

3D Sensor Work Mode:

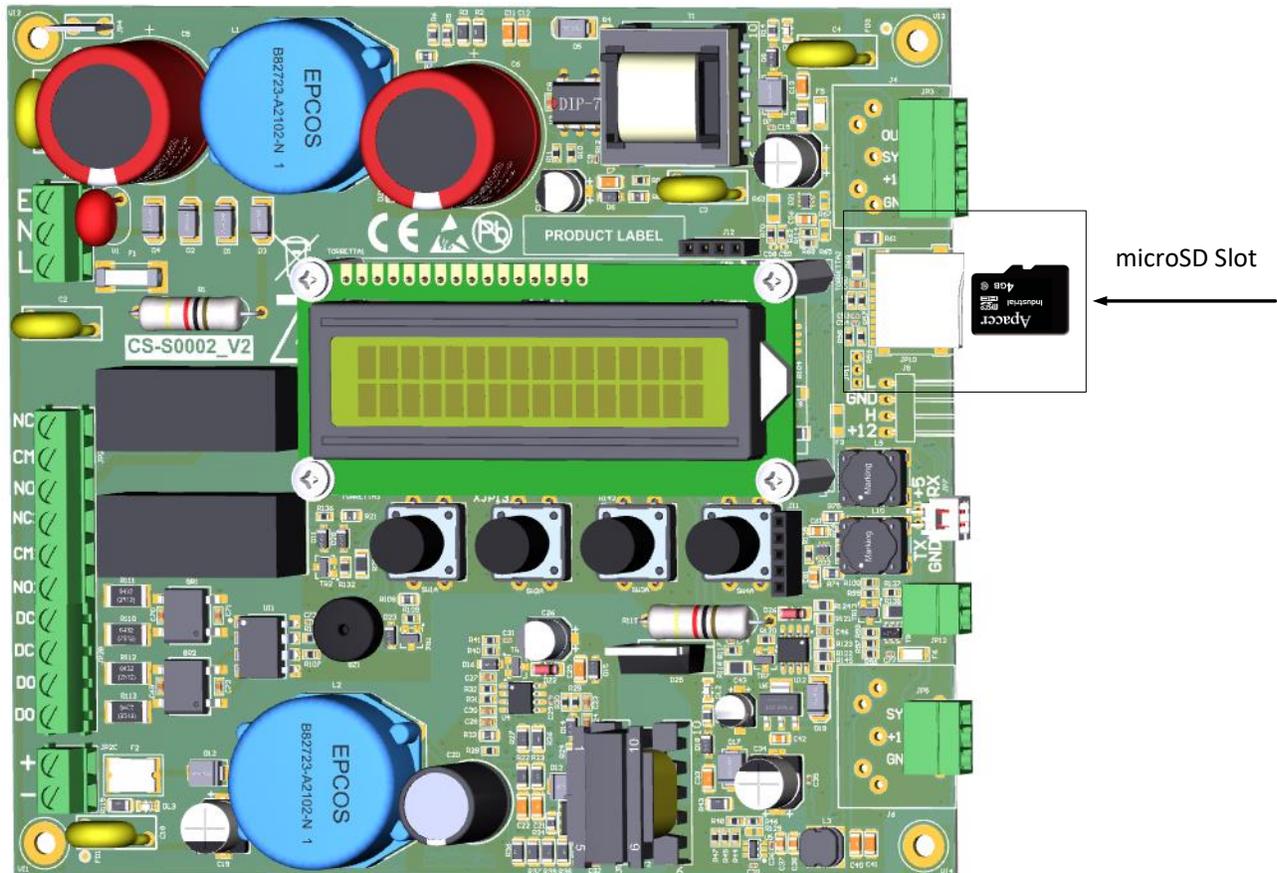
Standard	any movement in any direction within the defined area is detected by 3D Sensor which commands a reopening of the door.
Smart	only approaching movement is recognized by 3D sensor, cross-traffic is ignored.

Work Mode Configuration Settings:

On at Closing	3D detection will be activated when doors begin to close. 3D system will allow up to three consecutive 3D triggers (this parameter can be changed by 3D Settings -> Count), then it will be deactivated. The target crossing of the doors resets the count. Anyway, 3D detection turns off with falling edge of Closing signal or according to option: 3D Settings -> Shut-Off 3D if it is enabled.
ON (5s) [Available only with 2D Enabled]	3D detection will be activated when doors have reached their fully-opened position. When 3D target is detected, a timer of 5 seconds starts and doors remain open until 2D trigger. If timer expires without 2D target is detected, 3D Sensor is switched off and the doors are allowed to close with an intermittent beep sounding as a warning. This beep will occur regardless of the beeper setting. If there is a 2D trigger at any time, the timer will be cleared. Count option is enabled.
ON (10s)	This is the same as ON (5s) but the timer is set to 10 seconds.
ON (20s)	This is the same as ON (5s) but the timer is set to 20 seconds.
Always ON	3D detection will be activated when doors have reached their fully-opened position and remains operative until the falling edge of Closing Signal or according to option: 3D Settings -> Shut-Off 3D if it is enabled. There is no timer in this mode, count option is enabled.

8 FIRMWARE UPDATE

To update the software version for both the sensor and the controller you will need a microSD inserted in the microSD slot on the 3D Controller: Consult the programming menu and the image under.



You can verify the software version of the controller at the startup. Otherwise you can check the version of the display from the menu “Software”.

During the boot of the device you can press “UP” and “DW” buttons to enter the Firmware Update menu, this is a useful command to use in case of a problematic during the data memorization of the device.

IMPORTANT:

The display will show if there is a microSD present in the reserved Slot by showing a “S” in the top right corner of the display.

9 KNOWN ERROR LIST

Error Code	Description
11	RX light curtain not detected
12	RX light curtain not working
21	TX light curtain not detected
22	TX light curtain not working
30	3D sensor not responding
31	3D sensor not found
32	Comunication error with 3D Sensor
40	Relay bonding
41	Opening and Closing Signals active simultaneously
50	5V Undervoltage
51	5V Overvoltage

10 TECHNICAL DATA

Name	
Model	3D-SENSOR
Variante	3D-SENSOR-VG
Mechanical	
Size	8x8.3x5 cm
Weight	100g
Material	ABS
Surface treatment	Chrome plating
Environmental	
Enclosure rating	IP20
Operating temperature	-20°C/+50°C
Storage Temperature	-40°C/+85°C
Electrical	
Input Voltage	+5 VDC
Power consumption	3.5W
Radio	
Transmitter Frequency	60-64 GHz
EIRP	-10.2dBm [0.09mW]
Angle	110°
Range Resolution	3.75cm
Operation characteristics	
Adjustable Detection Range	Up To 200 cm
Mounting Height	180 – 249 cm
Detection Width	152.4 cm Side Opening 200 cm Central Opening
Detection Mode	Motion
Operating Distance	With door separations > 30 cm

For satisfying RF exposure compliance requirements, the transmitter must be used with a separation distance of at least 20 cm from all persons.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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Attribute	Value
EMC emission	EN 12015:2020
EMC immunity	EN 12016:2013
Radio	EN 305 550
RoHS, REACH	2011/65/EU
Certificate	
CE	2014/30/EU, 2014/33/EU
FCC	Class B (*)

(*) NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

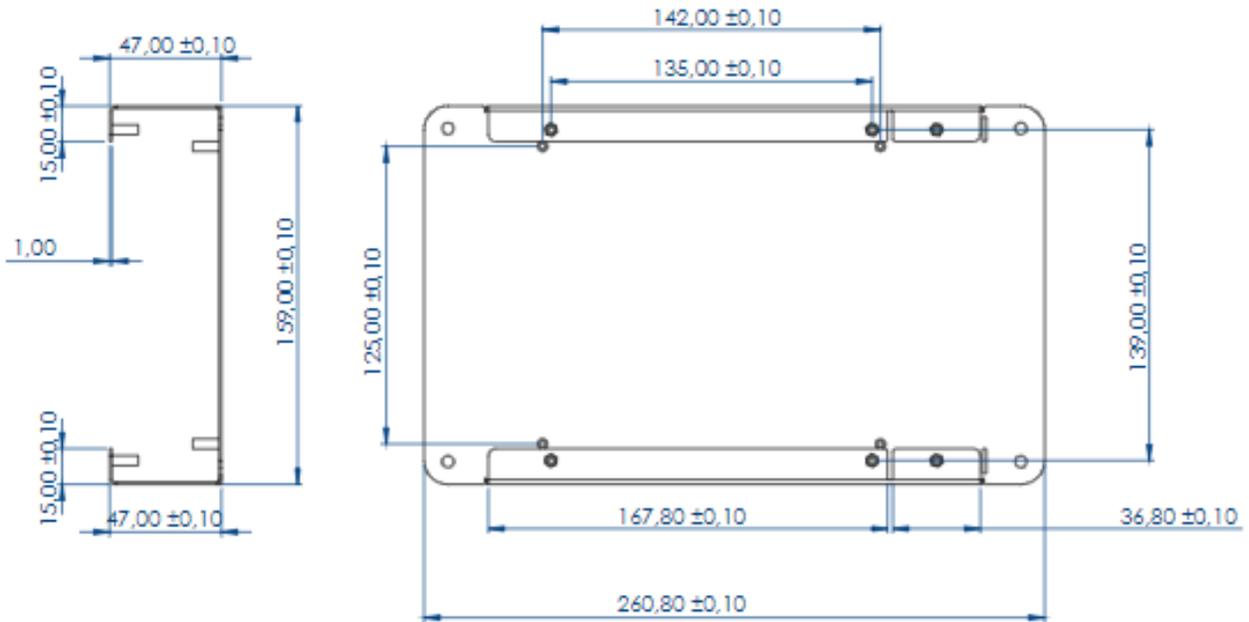
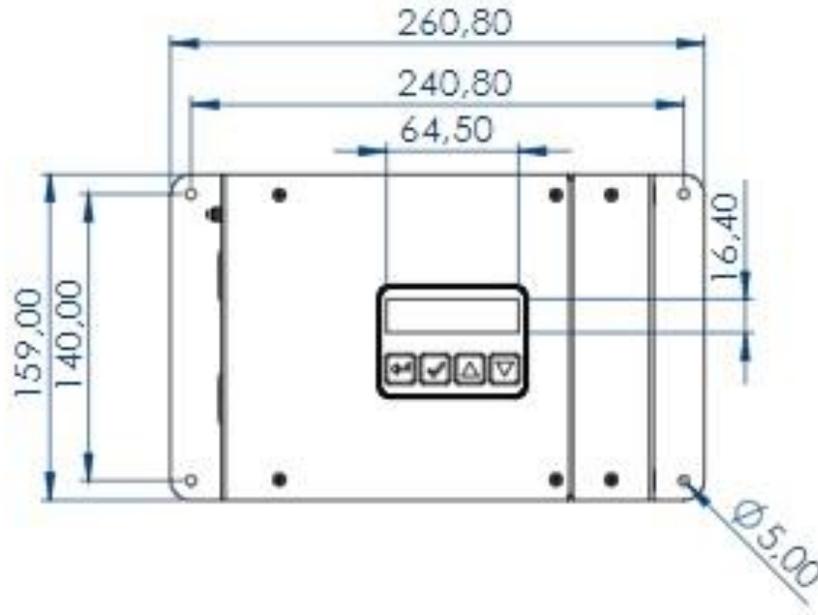
- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Company	Vega s.r.l.
Model	3D-SENSOR
FCC ID	2BC5H-3DSENS

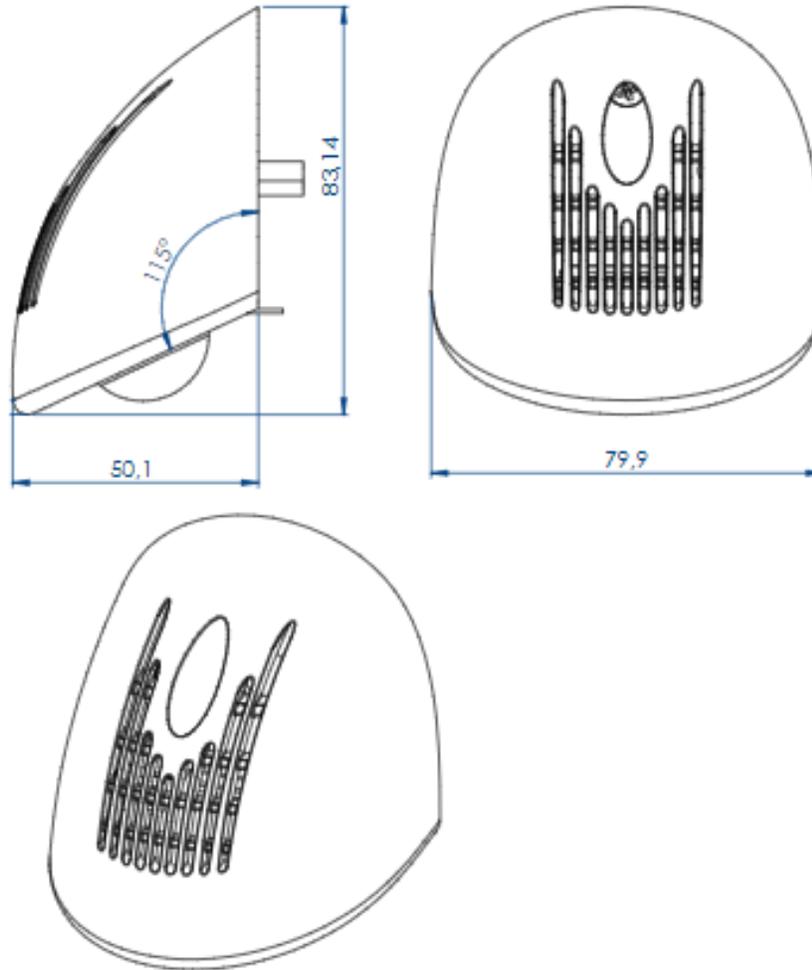
This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

11 DIMENSIONS

3D CONTROLLER



3D SENSOR



12 CLEANING INSTRUCTIONS



**ATTENTION:
THE 3D SENSOR IS NOT WATERPROOF**

The sensor can deteriorate or not work correctly if scratched or damaged. Avoid using inappropriate cleaning materials such as corrosive or abrasive cloths to avoid this. The sensor may be wiped using a lightly dampened cloth.

13 DISPOSAL

The 3D-System or components of the 3D-System should only be replaced if a similar protection device is installed. Disposal should be done 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.

Waste Electrical and Electronic Equipment (WEEE):

At the end of life, this equipment should be collected separately from any unsorted municipal waste.

14 FAQ

During Doors closing a target is detected even if there is no one around the car.

In this case door movement is detected as a target because of its high reflectivity (it depends on doors material). You can decrease the 3D-Sensor Sensitivity with option 3D-Settings->Sensitivity.

If the issue has not been solved, you can set the parameter 3D-Settings->Doors Detection as the number of doors.

During Doors closing a target is detected by people inside the car.

You need to set the option 3D-Settings->Shut-off 3D->Timer, and adjust the timer based on the time it takes for the doors to close. If a timer is already set, probably you need to decrease this timer to turn off Sensor before the door passes in front of it. Alternatively use the external signal option and connect the magnetic switch to set the exact position where 3D-Sensor must be turned off.

People movement on the landing prevent lift to close the doors.

You can set the option 3D Settings->3D Mode->Count to a maximum number of attempts to close the doors. (Default is 3). When triggers exceed this value, Sensor is turned off and doors will close.

Only Door Closing signal is available. Can I still use 3D-Sensor?

You can use 3D Settings->3D Mode->On Closing. With this setting Doors Opening signal is not necessary.

Door Closing signal/Opening Signal are a pulse. Which is the configuration to use?

You must use 3D Settings->3D Mode->On Closing on and you need to set the option 3D-Settings->Shut-off 3D->Timer, and set a timer based on the time it takes for the doors to close. Alternatively use the external signal option and connect the magnetic switch to set the exact position where 3D-Sensor must be turned off.

Closing signal remains active during the run. Which is the configuration to use?

You can use 3D Settings->3D Mode->Always on and you need to set the option 3D-Settings->Shut-off 3D->Timer, and set a timer based on the time it takes for the doors to close. Alternatively use the external signal option and connect the magnetic switch to set the exact position where 3D-Sensor must be turned off.



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