



CM

PS2 Electric Ventura DCU

Commissioning Manual

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Revision history

Revision	Date	By	Description
1.0	2019-05-27	M.Sandtmann	Initial release



Preface

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1 Introduction

1.1 Purpose

This commissioning manual describes commissioning procedures for the Ventura plug slide 2 door system electric with DCU. Together with the installation manual and system drawings makes a complete set of installation documentation. It is important to follow all instructions. All instructions must be conducted without air/electric power unless mentioned otherwise. When the instructions involve a door leaf, those instructions should be executed for the left and right door leaf when the system contains two door leaves. A well-adjusted door system is less vulnerable to failure. The right maintenance is crucial for the durability of the door system.

1.2 Scope

The purpose of this document is to guide trained mechanics through the commissioning steps of the plug slide door system.

1.3 Definitions

1.4 Acronyms and Abbreviations

Abbreviation	Description
ISO	International Standardization Organization
PSI	Pound-force per Square Inch
DCU	Door Control Unit
HQ	Headquarters

Table 1: Acronyms and abbreviations

1.5 References

1.5.1 External documents

Reference	Description	Date
IATF 16949:2016	Automotive quality management system standard	2016-10-01
ISO 9001:2015	ISO Standard for Quality Management Systems – Requirements.	2015-10-01
REG 107 Rev 6	Regulation No 107 — Uniform provisions concerning the approval of category M2 or M3 vehicles with regard to their general construction	2014-06-10
REG 107 Rev 6 Amend 1	Regulation No 107 — Uniform provisions concerning the approval of category M2 or M3 vehicles with regard to their general construction	2015-06-22
REG 107 Rev 6 Amend 2	Regulation No 107 — Uniform provisions concerning the approval of category M2 or M3 vehicles with regard to their general construction	2015-11-09
REG 107 Rev 6 Amend 3	Regulation No 107 — Uniform provisions concerning the approval of category M2 or M3 vehicles with regard to their general construction	2016-06-11
REG 107 Rev 6 Amend 4	Regulation No 107 — Uniform provisions concerning the approval of category M2 or M3 vehicles with regard to their general construction	2016-10-28
REG 107 Rev 6 Amend 5	Regulation No 107 — Uniform provisions concerning the approval of category M2 or M3 vehicles with regard to their general construction	2016-10-28
REG 107 Rev 6 Amend 6	Regulation No 107 — Uniform provisions concerning the approval of category M2 or M3 vehicles with regard to their general construction	2017-07-28
REG 107 Rev 6 Amend 7	Regulation No 107 — Uniform provisions concerning the approval of category M2 or M3 vehicles with regard to their general construction	2018-11-02
REG 107 Rev 6 Corr 1	Regulation No 107 — Uniform provisions concerning the approval of category M2 or M3 vehicles with regard to their general construction	2014-12-08
REG 107 Rev 6 Corr 2	Regulation No 107 — Uniform provisions concerning the approval of category M2 or M3 vehicles with regard to their general construction	2017-06-02
TS 155	Bus door safety systems	2017-11-23

Table 2: External documents

1.5.2 Ventura Systems documents

Reference	Type	Description	Revision	Date
PS2200001	MM	Plug Sliding Door System 2 : Maintenance Manual	0.6	2018-12-20
PS2200002	IM	Plug Sliding Door System 2 : Installation Manual	1.0	2019-05-20



Table 3: Ventura Systems documents

1.6 Overview

Section 1 gives an introduction, definitions and overview of this document.

Section 2 contains the general door system safety instructions, safety symbols and disclaimer.

Section 3 contains information about the general lay-out of the door mechanism.

Section 4 contains general checks before commissioning the mechanism.

Section 5 contains instructions for commissioning the mechanism.

2 Door installation safety

2.1 General

Safety of the operator and bystanders is one of the main concerns in designing and developing a new piece of equipment. Ventura's door systems have the proper safety features for common use of the system. An accident can often be avoided by recognizing potentially hazardous situations before an accident occurs. As you install, operate, or maintain the door system, you must be alert to potential hazards. Make sure you have the necessary training, skills and tools to perform any assembly, or maintenance procedures. Improper operation and maintenance of this door system may result in a dangerous situation that may cause injury or death.

Ventura Systems cannot anticipate every possible circumstance that may involve a potential hazard. The warnings in this manual and on the product are not all-inclusive. If a method of installation or operation is used, which is not specifically recommended by Ventura Systems, you must satisfy yourself that it is safe for you and for others. You should also ensure that the door system will not be damaged or be made unsafe by the installation and/or operational methods you choose. The information, specifications and illustrations in this manual are based on the information that was available at the time this manual was written and can change at any time without notice.

2.2 Disclaimer

The information contained in this document is based upon reliable technical data at the time the document was published. These instructions are intended for use by persons having the technical knowledge to install, maintain or repair this door system. The instructions are to be used at the mechanic's own discretion and risk. Ventura Systems assumes no responsibility for results obtained or damage incurred from the use of this material either in whole or in part by the installer. This document provides basic instructions for handlings of the door system in a step-by-step sequence that will work in most situations. While effort has been made to ensure the information in this document is correct and complete, we would appreciate it if you would contact us in case of errors.

2.3 Safety alert symbols

This manual contains safety messages which alert you to potential personal injury hazards. Obey all safety messages in this manual to avoid possible injury or death. The following key words and layouts calls for your attention: DANGER, WARNING, CAUTION and NOTICE. Below are examples of every safety message. The NOTE message is used for additional information but these are not threatening for the mechanic, bystanders, nor the door system.



Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. This signal word is limited to the most extreme situations.



Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



Indicates a potentially hazardous situation which if not avoided, may result in minor or moderate injury.



Indicates that equipment or property damage can result if instructions are not followed.



Additional information important but not threatening for people or to the system.

2.4 Safety instructions



WARNING!

This door system is designed for a specific application;
DO NOT modify or use this unit for any application other than for which it was designed.

Door systems operated improperly or by untrained personnel is dangerous. Lack of operation knowledge may cause high risk.

Do not install this door system if it is damaged. If you are in doubt if the door system has a defect, immediately stop the installation and contact Ventura Systems.

Do not connect the door system to air or electric supply during the maintenance process. If the manual states otherwise, follow the manual.

Do not attempt to install the door system under influence of drugs or alcohol.

NOTICE

Do not modify the door system or safety devices. Unauthorized modifications may impair its function and safety.

If equipment has been altered in any way from the original design, Ventura Systems does not accept any liability for injury or warranty.

If replacement of parts is necessary, genuine factory replacement parts must be used to restore the door system to its original specifications.

*always disconnect the air and/or electric power while replacing parts. Safety features may not be active while replacing parts.

Ventura Systems will not accept responsibility for damages as a result of the use of unapproved parts.

While working on the Ventura door systems wear appropriate personal protective equipment.

This list may include but is not limited to:

- Protective shoes with slip resistant soles
- Protective goggles, glasses or face shield
- A hard hat

Follow the regional and country laws and safety precautions.

3 Door mechanism description

3.1 Standard mechanism lay-out

Mechanism layout as standard for an electric mechanism with a Ventura DCU. This is not a representation of a specific mechanism but a general, indicative image.

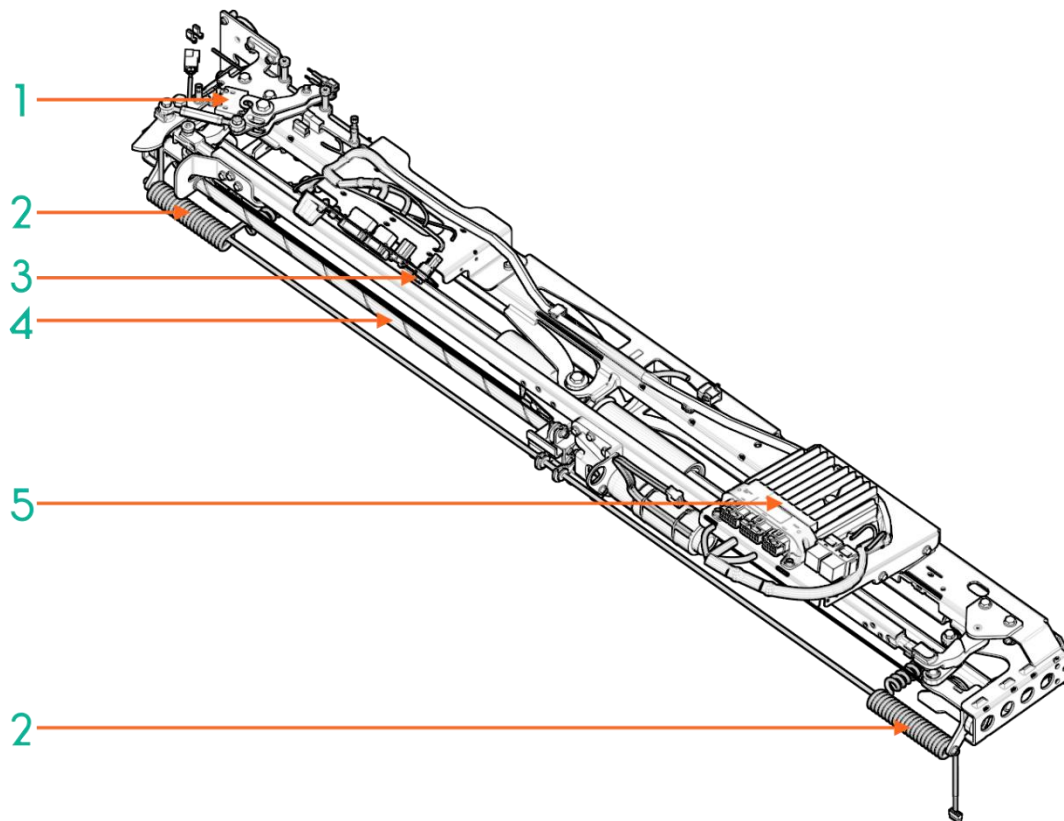


Figure 1: indication of parts

1. Cams & Switches
2. Spiral cable
3. Workshop button
4. Actuator
5. Ventura DCU

NOTICE

The mechanism is one of Ventura's most comprehensive models. It is possible one or more options are not on the mechanism you use.

Left and right are defined looking from the inside of the vehicle.

Illustrations or images in the manual may differ from reality.

4 Commissioning checks

Before the final adjustments are made for commissioning the door system there are some safety checks which need to be done.

4.1 Check torque settings

Check if all door system torque settings are torqued to specification as described in the "installation manual". This can be done by checking the torque marks applied with a torque marker.

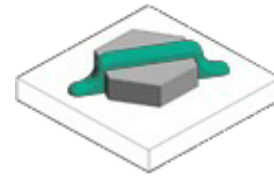


Figure 2: mark the fasteners with a torque marker.

4.2 Tie Wraps

Check if there are tie wraps on the moving parts of the door system. If there are, remove the white tie wraps, they are mostly used to secure components during transportation. White tie wraps can prevent the door mechanism from functioning properly. Black tie wraps are used to secure parts onto the mechanism and are meant for permanent application.

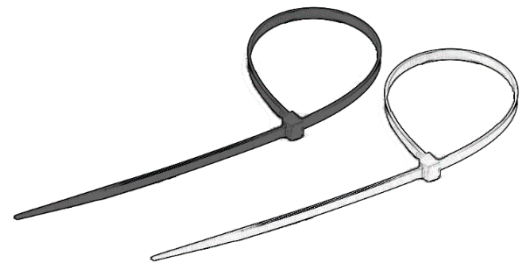


Figure 3: black and white tie wraps.

4.3 Remove red plugs

When the system has pneumatics, all pneumatic components need to be connected following the pneumatic scheme. Check the pneumatic components and air tubes for red plugs. When there are red plugs in the tubes, remove them and connect the loose end to the right component. When there are red plugs in components, connect the right tube to the component.

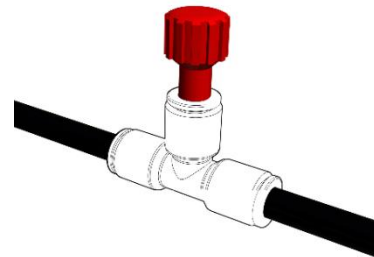


Figure 4: black and white tie wraps.

4.4 Door moving freely

Check manually if the door leaves are able to move freely from closed to fully open position (without pressure). The door should not collide into or slide over other surfaces while moving.

4.5 Connect buttons

- Make a cut-out in the side of the bus.
- Emergency buttons can be electric (1), pneumatic (2) or both. In case of pneumatics there is an air inlet (3) and outlet (4). Connect the pneumatics according to the pneumatic scheme.
- Screw the button in place.

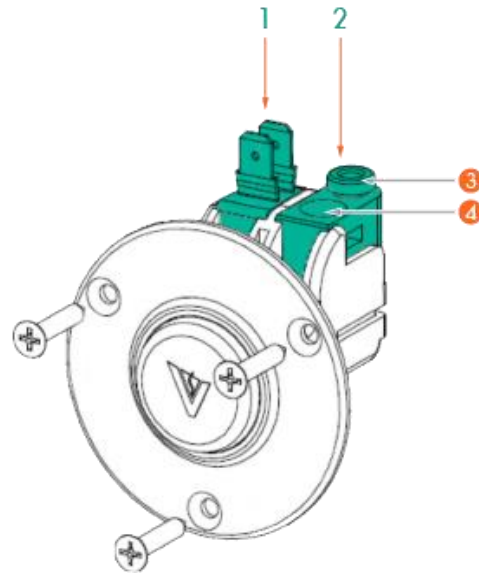


Figure 5: Connect the buttons

4.6 Connect pneumatics



WARNING!

Be sure all safety checks have been executed before applying power.

Connect the pneumatic tube from the vehicle's pneumatic system to the filter regulator to apply air pressure to the system. Be aware to connect the air to the correct side of the filter regulator.

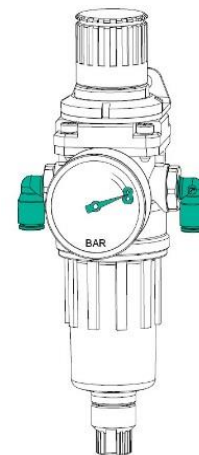


Figure 6: Filter regulator

4.7 Connect power



WARNING!

Be sure all safety checks have been executed before applying power.

Connect the cable loom of the door mechanism to the designated power source on the vehicle side. If necessary, look at the electrical scheme.

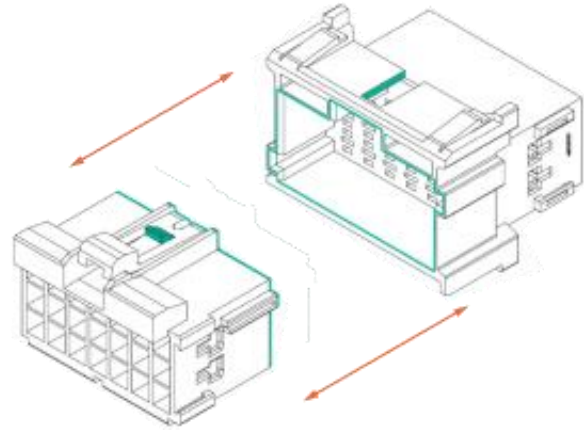


Figure 7: Connect power supply

5 Commissioning

5.1 Calibrating the door system (Ventura DCU)

The calibration process is essential for the DCU to be able to control the door system. The calibration process is to define the positions of the door leaves in open and closed position.

These steps must be performed when:

- The door system is newly installed.
- After configuration of the door control movement (Reed switches, potentiometer or cams + sensors, whichever is applicable).
- Re-adjustment of door systems parts (door leaves, door shafts, guiding brackets or bottom supports).



CAUTION!

Be aware the system could move when applying power and/or pressure to the system.

1. Push and hold the workshop button (1) regardless of the position of the door leaves. The Ventura DCU will now move the door to closed position.
2. When the door is already in closed position or has moved into closed position, a green light will flash only once on the Ventura DCU. Hold the workshop button.
3. The Ventura DCU will continue open the door slowly into open position. When the open position is reached, a green light will flash twice on the Ventura DCU.
4. Release the workshop button (1). The open and closed positions are now set.

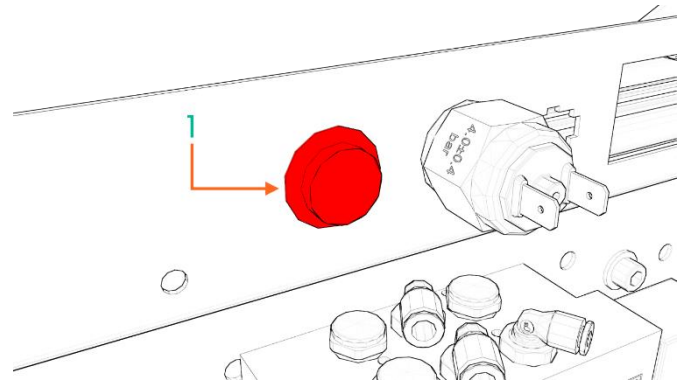


Figure 8: Workshop button

5.2 Configuring door leaf positions: Cams + Switches (if needed)

The micro switches are optional. When the door system has one or more micro switches do the following checks. When the door system has no micro switches, skip this step.

Door mechanism that go overcenter need to be adjusted using the adjustment tool 6 mm – 8 mm P/N VB8538.

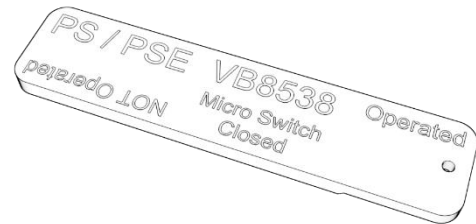


Figure 9: Adjustment tool VB8538

Door systems that go overcenter either have a type 1 or a type 2 soft stopper (1) (see image).

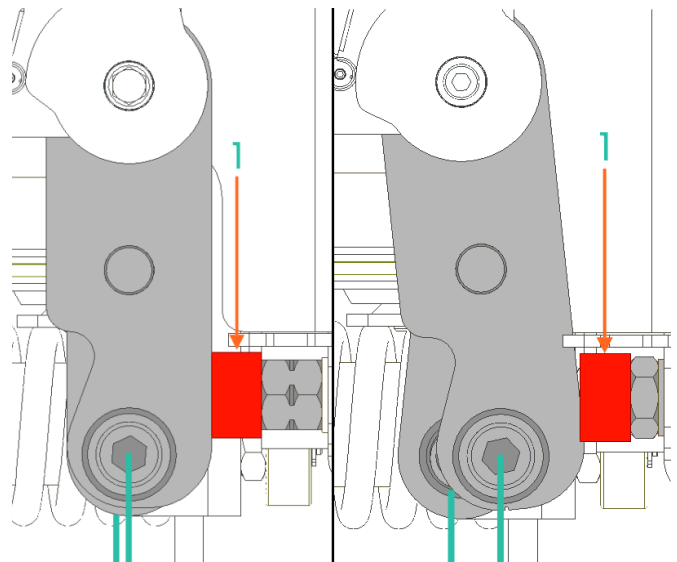


Figure 10: Overcenter position



WARNING!

Pinch-point hazard!

The following steps have to be performed when parts of the door system are moving.

When the doors are in open position, the micro switch open (1) has to be activated. This micro switch is not adjustable.

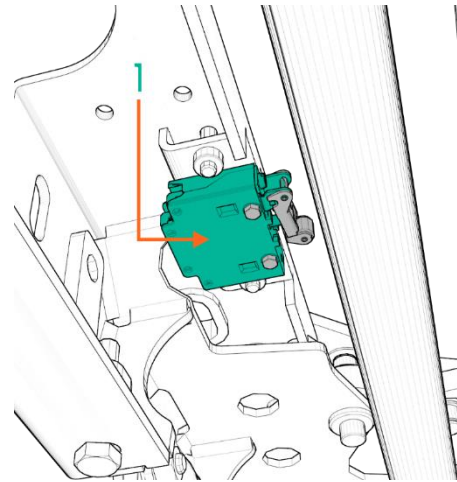


Figure 11: Micro switch open position

When the doors are in closed position, the micro switch closed (2) has to be activated. If the micro switch closed is not activated follow the next steps to adjust the micro switch closed position (2).

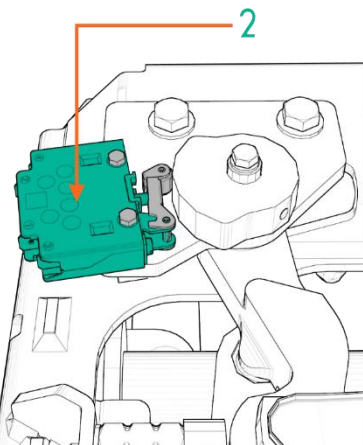


Figure 12: Micro switch closed position

- Place the door in an open position
- Place the 6mm side of the adjustment tool between the door mechanism and the end stopper (See image)
- Close the door and move on to the next steps. Be aware of pinch point hazard.

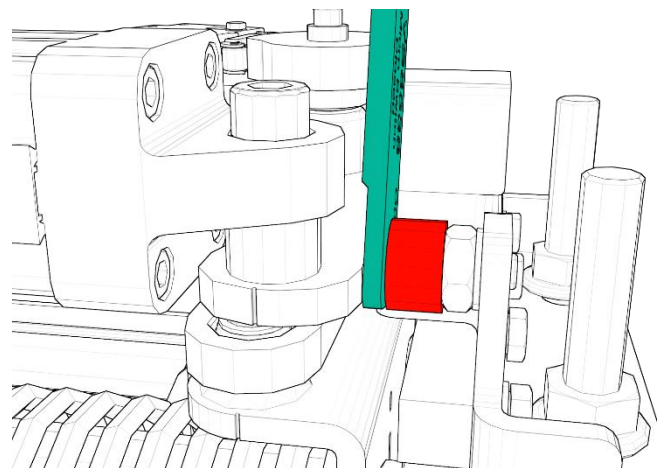


Figure 13: Position 6mm adjustment tool



- Unscrew the cam with an Allen key
- Turn the cam to a position where the micro switch activates (See image)
- Fasten the cam with an Allen key
- Place the door in an open position and move on to the next steps

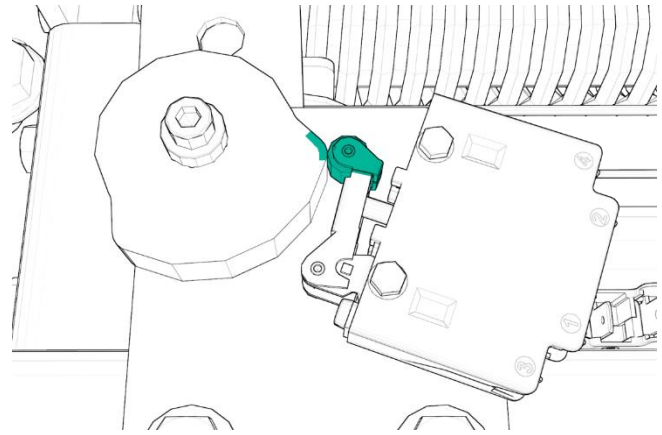


Figure 14: Adjusting micro switch closed position

- Place the 8mm side of the adjustment tool between the door mechanism and the end stopper. (see image) Be aware of pinch point hazard.
- Close the door
- Check if the micro switch closed position activates. The micro switch should NOT be activated.
- If the micro switch activates redo the previous steps.

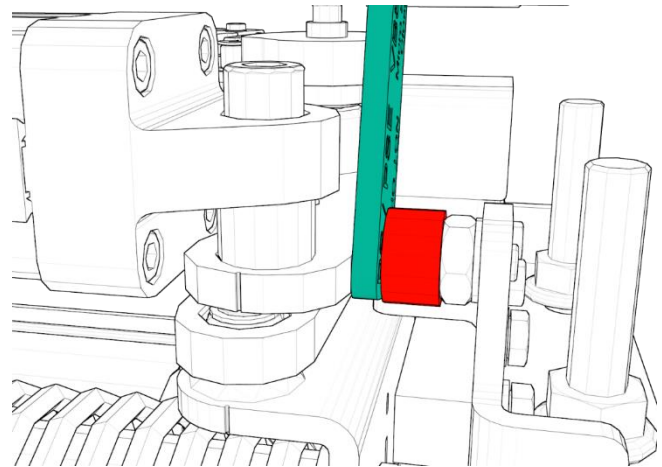


Figure 15: Position 8mm adjustment tool



WARNING!

Remove the power and/or pressure from the system after executing these steps and before you continue.

5.3 Sensitive edge

Sensitive edges are installed inside the seal of the leading edge of the door leaves. It provides line of touch sensing along surfaces when the door is in operation. The activation of the sensitive edge results in a signal being send to the control system. This signal stops and reverses the door movement. In case one of the sensitive edges fails, the other is still active.



CAUTION!

Dysfunctional sensitive edges have to be replaced immediately.

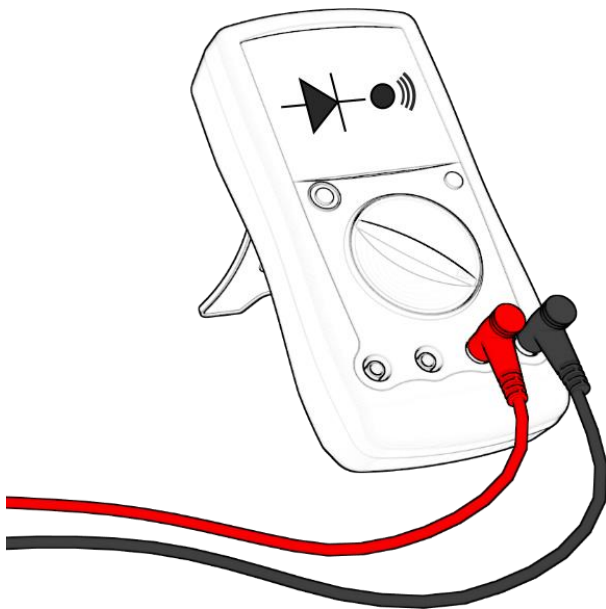


Figure 16: Multimeter on continuity mode

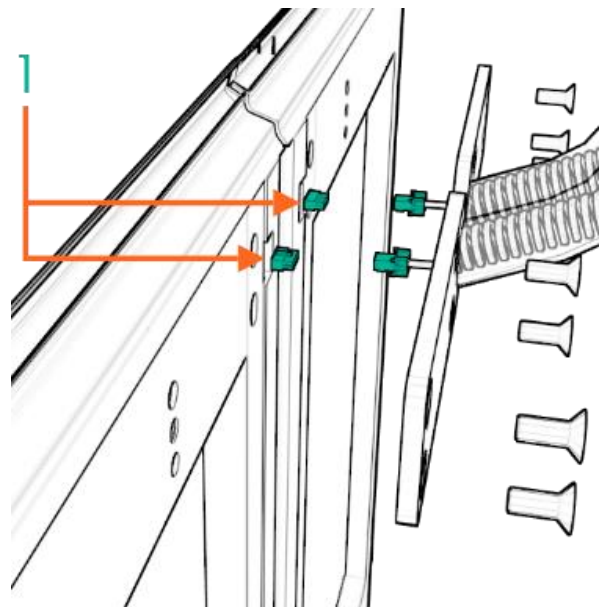


Figure 17: Sensitive edge connector

- Consult the electrical drawing to see which type of sensitive edge is used (with or without resistor).
- Remove the door leaf from the door arm and disconnect the sensitive edge from the spiral cable.
- Connect a multimeter on continuity mode to the connector of the sensitive edge (1)
 - Sensitive edge without resistor:
 - Sensitive edge not pressed = resistance infinite ($\infty \Omega$)
 - Sensitive edge pressed = $\sim 0 \Omega$
 - Sensitive edge with resistor:
 - Sensitive edge not pressed = 1200 or 8200 Ω
 - Sensitive edge pressed = $\sim 0 \Omega$
 - Sensitive edge malfunctioning = resistance infinite ($\infty \Omega$)

5.4 Overcenter functionality

The overcenter functionality is a locking mechanism that prevents the door leaves from opening at low or medium force.

An easy way to see if the system has an overcenter position is to check if the door mechanism has an unlock cylinder (1), otherwise known as a press-out device. This device is used in emergency situations to open the door system by pressing the door mechanism out of the overcenter position.

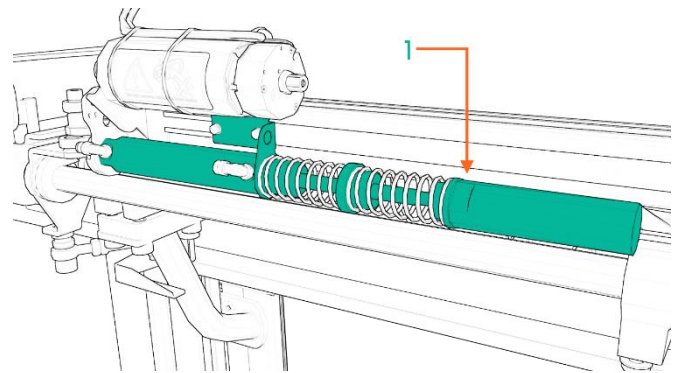


Figure 18: Emergency press-out device

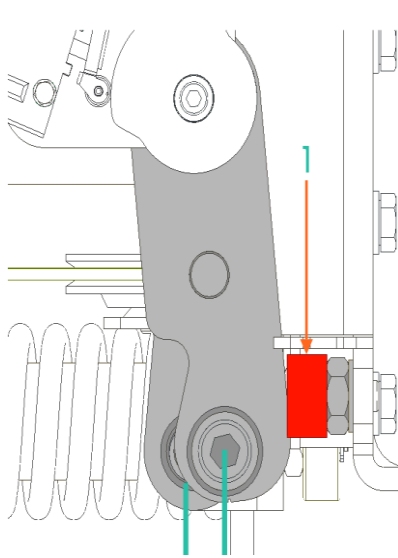


Figure 19: Overcenter electric PS with unlock cylinder

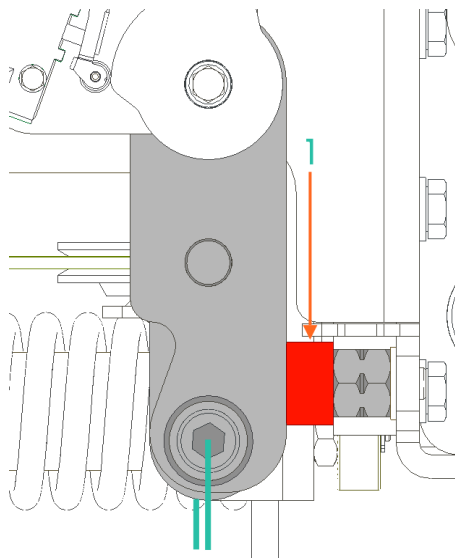


Figure 20: Overcenter pneumatic with unlock cylinder

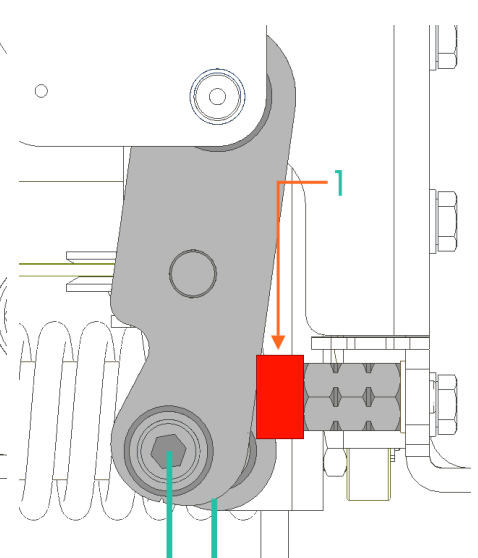


Figure 21: No overcenter function

- Check if the length of the soft stopper (1) is one or two units thick. If the soft stopper is three units thick it means there is no overcenter functionality.
- Pneumatic door mechanism:
 1. Put the door in fully closed position.
 2. Check if the lever touches the end stop.
 3. If the lever does not touch the end stop or the markings are incorrect, check adjustments. If adjustments are incorrect, contact Ventura Systems.
- Electric door mechanism:
 1. Put the door in fully closed position.
 2. Check if the lever touches the end stop.
 3. If the lever does not touch the end stop or the markings are incorrect, check adjustments. If adjustments are incorrect, contact Ventura Systems.

5.5 Emergency inhibit/reset valve

The emergency inhibit/reset valve prevents operation of the emergency triggers while the bus is at a traveling speed faster than determined in the "Req107" or the "TS155", depending of the requirements of the local government.

This safety feature must be tested before delivery of the bus and during maintenance intervals. The emergency inhibit/reset valve is not adjustable.

If the safety feature is not working:

- Test power and operating signal (1).
- Test incoming pneumatic pressure (See pneumatic scheme).
- Test outgoing pneumatic pressure when the valve receives an operating signal (1) and check the incoming pneumatic pressure. If the valve is not switching, replace the emergency inhibit/reset valve. See pneumatic scheme for the correct pressure.

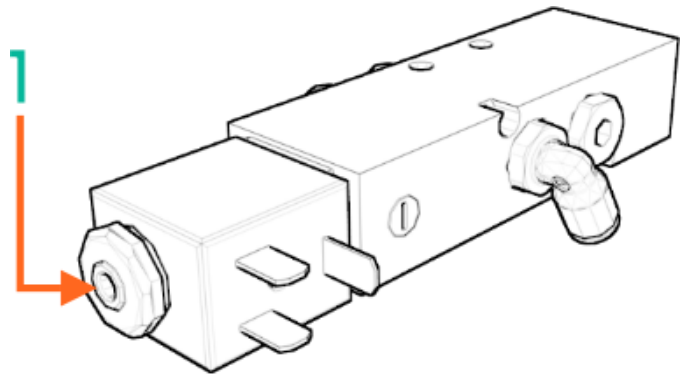


Figure 22: Emergency inhibit/reset valve

5.6 Detection beam

This paragraph explains how to test the detection beams.

All types of detection beams have a LED indication light or emit light that should be visible when closely inspected.

NOTE

Infrared light is not visible with the naked eye. Use a camera or a smartphone camera to see if the light is emitting.

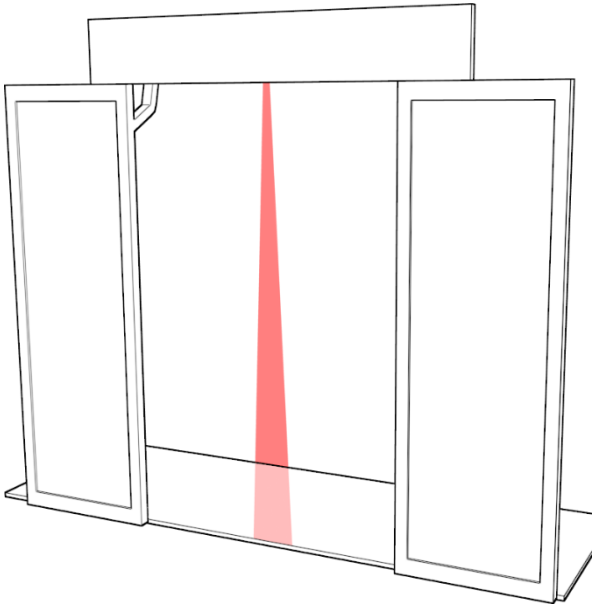


Figure 23: Cone beam top sensor

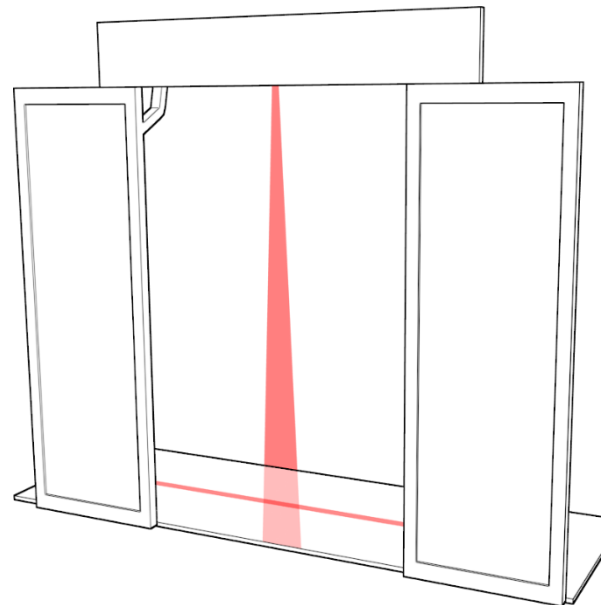


Figure 24: Cone beam top sensor and horizontal beam

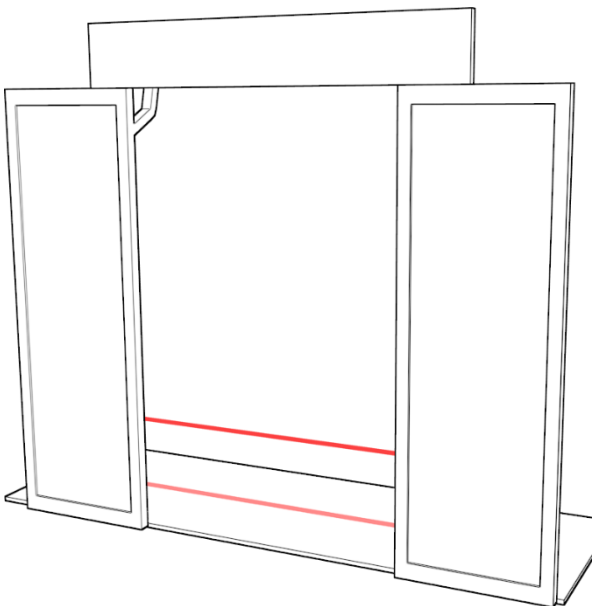


Figure 25: Double horizontal beam

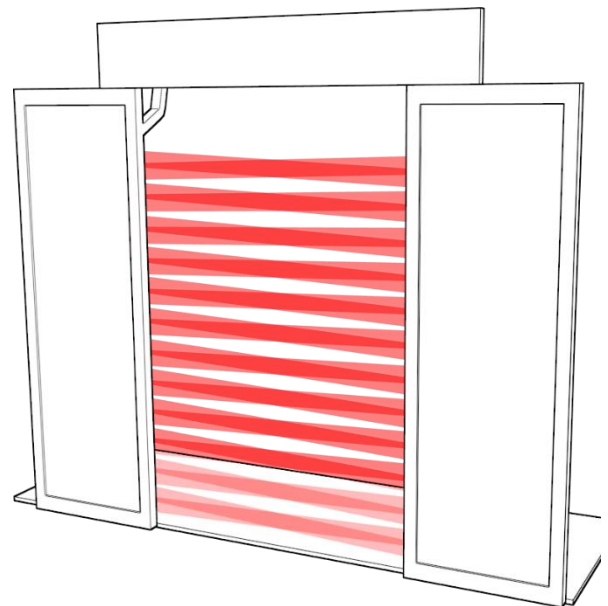


Figure 26: Light curtain



WARNING!

Do not place a person between the door leaves to test the detection beams while operating the door system!

- Check if the sensor is working by checking if the LED light is active or by trying to operate the door while blocking the beam with an object.
- If the sensor is not working but the LED light is active, then check the DCU settings with the DCU diagnostics software.
- If the sensor is not working and the LED light is not active, then check the wiring (see paragraph Electrical Scheme to see how the detection beam is connected to the cable loom).

6 Contact

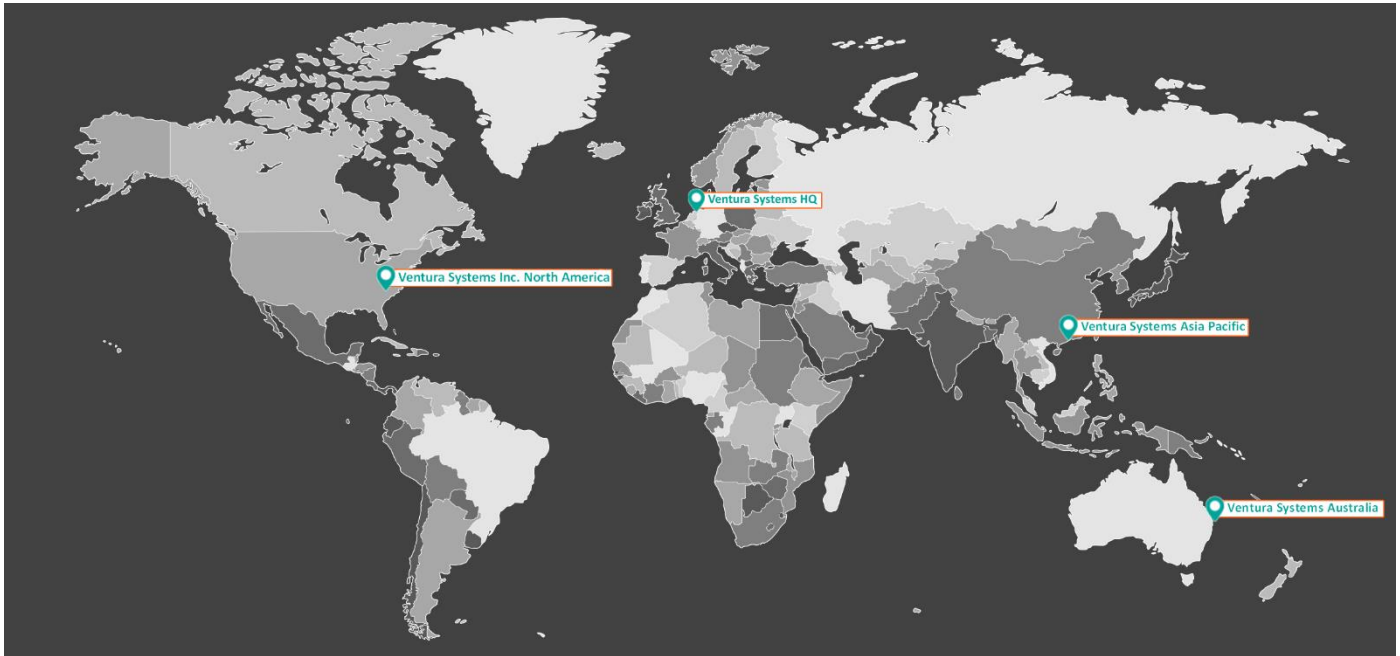


Figure 27: Worldmap Ventura locations






Ventura Systems HQ	Ventura Systems Asia Pacific	Ventura Systems Australia	Ventura Systems Inc North America
 De Marne 216 8701MH Bolsward The Netherlands	Unit 02 on the 11/F Fotan Industrial Centre 26-28 Au Pui Wan Street Hong Kong	PO Box 284 Sanctuary Cove QLD 4212 Australia	160 Gibson Ct NC 28034 Dallas
 +31 (0) 51 557 7750	+852 2712 6001		+1 704-691-0311
 +31 (0) 51 557 3410	+852 2512 2325		+1 704-691-0313
 service@venturasystems.nl	info@venturasystems.hk	info@venturasystems.com.au	info@venturasystems.com
 www.venturasystems.nl			

Table 4: General contact information



Ventura Systems HQ	Ventura Systems Asia Pacific	Ventura Systems Australia	Ventura Systems Inc North America
 parts@venturasystems.nl	info@venturasystems.hk	info@venturasystems.com.au	info@venturasystems.com
 +31 (0) 515 577485			

Table 5: Parts contact information

Contact your local Agent for parts.