



HATCHES/FANS

SMART HATCH

Installation instructions

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SPHEROS

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SMART HATCH

1. Introduction**1.1. Scope and Purpose**

1.1.1. This operation and service manual is intended to support trained personnel in the use, operation and care of the Smart ventilation and emergency exit hatch.

1.2. Applicability of Manual

1.2.1. This manual is applicable only for products identified on the title page.

1.3. Meaning of Warnings, Cautions and Notes

1.3.1. WARNINGS, CAUTIONS and NOTES in this manual have the following meaning:

 **WARNING**
This heading is used to highlight that non-compliance with instructions or procedures

 **CAUTION**
This heading is used to highlight that non-compliance with instructions or procedures may cause damage to equipment.

NOTES
This heading is used to highlight and draw specific attention to information.

1.4. Additional Documentation

1.4.1. This manual contains all the information and procedures necessary to install, operate and service the Smart roof hatch, no additional documentation is necessary.

1.5. Safety Information and Regulations

1.5.1. The general safety regulations for 32 the prevention of accidents and relevant operating safety instructions have to be observed at all times.

1.5.1. "General Safety Regulations" be 32 beyond the scope of these regulations are detailed in the following.

1.5.1. The Specific safety regulations ap 32 plicable to this manual are highlighted in the individual chapters by WARNINGS, CAUTIONS and NOTES.

1.6. Legal Provisions for Installations

1.6.1. Company shall comply with all permits and licenses required by Federal, State, or local authorities in connection with the delivery and installation of the Equipment.

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1.6.2. In principle, the general accident prevention regulations and current works safety instructions are applicable, in the United States of America and Canada.

1.7. Corrections and Improvements

1.7.1. Deficiencies, improvements or proposed corrections to this manual should be mailed to:

Valeo Thermal Commercial Vehicles North America, Inc.

22150 Challenger Drive

Elkhart, IN 46514 USA

Telephone: (574) 264-2190

Website: https://www.valeo-thermalbus.com/us_en/Home

2. Product Description

2.1. General

2.1.1. The SMART ventilation and emergency exit hatch is designed to ventilate the interior of school, city buses or long distance motor coaches and to act as an emergency exit in the event of an accident. The SMART hatch is fully compatible with existing 24 inch x 24 inch nominal roof openings, no adjustments are necessary in the bus roof when installing.

2.1.2. The ventilation function is operated manually. The following positions of the hatch cover are defined:

- Open at the rear
- Open at the front
- Open at the rear and front
- Closed

2.1.3. In the event of an emergency, the dome assembly can be opened manually and removed from the inside using the emergency release handle.



(Photo 1: SMART Hatch Assembly)

2.2. Cover Assembly

2.2.1. In addition to the dome, the cover assembly includes the following:

- The emergency release mechanisms
- Dome handles (to operate the emergency release feature)

2.3. Emergency Release Mechanism

2.3.1. The emergency release mechanism consists of the interior and exterior release handle, which is connected to the mechanism by a support tube. It includes a standard hatch emergency release indicator switch.

2.4. Frame

2.4.1. In addition to the outer frame and release mechanism the frame assembly includes the following:

- Hinge mechanisms (x2)

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2.5. Cover Seal

2.5.1. The dome seal provides a leak free design that prevents the ingress of air and water when the ventilation hatch is closed. A special elastomer profile is used as the sealing element. The seal is installed on the edge of the frame.

NOTES

The lip or edge of the seal must face up and outwards from the frame opening or the hatch will not seal properly.

2.5.2. When the hatch is closed, the hollow profile deforms as a result of the closing force and comes into contact with the underside of the frame. This positive and forced contact creates the required sealing effect.

3. Installation Guide

3.1. Internal Mount Version

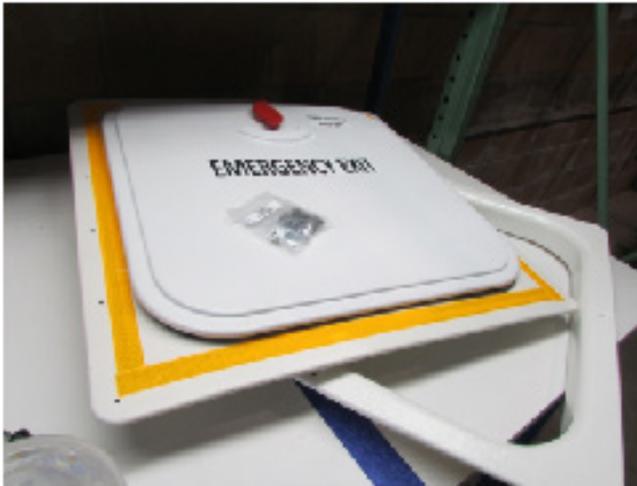
3.1.1. Remove the hatch from the packaging. Open the hatch to the ventilation position, both the front and rear hinges should be fully open.



(Photo 2: SMART Hatch Assembly)

SMART HATCH

3.1.2. Make note of all the parts that should be included for the installation.



(Photo 3: SMART Hatch Assembly)

3.1.3. Interior installation - Remove backing tape from both butyl seals. Insert the hatch through the roof opening diagonally and place the bottom of the frame on the roof surface.

NOTES

Surfaces must be clean and dry to ensure proper sealing of butyl tape on bus roof. Application temperature range for butyl is +50°F to +125°F (+10°C to +52°C).



(Photo 4: SMART Hatch Assembly)

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▲ CAUTION

The roof hatch must be installed onto a smooth surface to allow proper sealing of butyl tape between frame and outer roof material. Any variations or deviations can result in water intrusion, proper roof preparation is the responsibility of the installer.

3.1.4. Position the hatch so that the red handle is at the back of the opening (towards the rear of the vehicle). Center the hatch inside the roof opening so that the gap is equal on all four sides of the cut-out. Make certain that the butyl seal adheres completely.



(Photo 5: SMART Hatch Assembly)

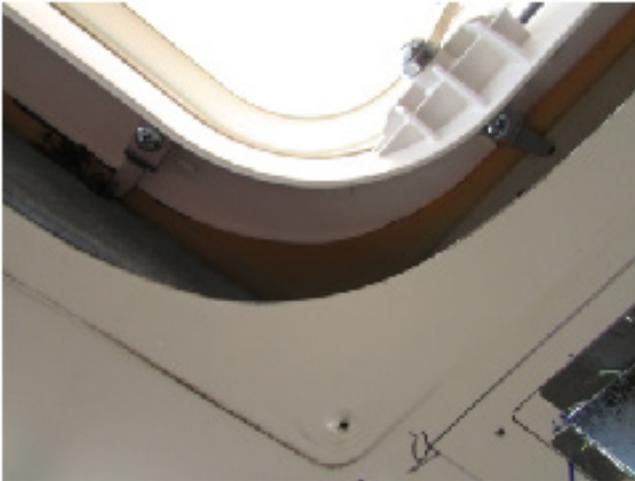
3.1.5. Once the hatch is in position, pull down on the outer flanges to set the butyl seal and adhesive all four sides.



(Photo 6: SMART Hatch Assembly)

SMART HATCH

3.1.6. Using a screw driver loosen the 12 clamp screws, rotate the (12) clamps off of their seat so that they point outwards from the hatch frame.



(Photo 7: SMART Hatch Assembly)

3.1.7. Once the hatch is in position, pull down on the outer flanges to set the butyl seal and adhesive all four sides.



(Photo 8: SMART Hatch Assembly)

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3.1.8. Using a #2 Phillips driver, tighten all (12) clamp screws. Make certain that the clamps remain in position, pointing out from the frame. Tighten the clamp screws to a maximum torque of 3.5 N-m (31 in. - lbs.)



(Photo 9: SMART Hatch Assembly)

 CAUTION

Overtightening of the fasteners will result in damage to the product. Use torque control device or tool to ensure proper securement force is applied.

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3.1.9. Connect the switch wire to the vehicle wiring harness.



(Photo 10: SMART Hatch Assembly)

3.1.10. Insert trim ring into hatch opening with arrow sticker facing towards the front of the bus. Make sure that the switch wire is not trapped between the trim ring and the roof.



(Photo 11: SMART Hatch Assembly)

NOTES

The interior trim ring was designed to work with roof thicknesses between 1.4 inch to 2.7 inches. Heights above or below this range will result in gapping or interference with the frame. Modifications for fitment are the responsibility of the installer.

SMART HATCH

3.1.11. Attach bottom cover to roof of bus with (9) #8 x 1" long pan head sheet metal screws.



(Photo 12: SMART Hatch Assembly)

3.1.12. Remove TO FRONT OF VEHICLE sticker.



(Photo 13: SMART Hatch Assembly)

SMART HATCH

3.1.13. Close front and rear hinges on roof hatch.



(Photo 14: SMART Hatch Assembly)

3.2. External Mount Version

3.2.1. Remove the hatch from the packaging. Open the hatch to the ventilation position, both the front and rear hinges should be open.



(Photo 15: SMART Hatch Assembly)

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3.2.2. Make note of all the parts that should be included for the installation.



(Photo 16: SMART Hatch Assembly)

3.2.3. Exterior installation - Remove backing tape from butyl seal. Insert the hatch through the roof opening diagonally and place the bottom of the frame on the roof surface.

NOTES

Surfaces must be clean and dry to ensure proper sealing of butyl tape on bus roof. Application temperature range for butyl is +50°F to +125°F (+10°C to +52°C).



(Photo 17: SMART Hatch Assembly)

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⚠ CAUTION

The roof hatch must be installed onto a smooth surface to allow proper sealing of butyl tape between frame and outer roof material. Any variations or deviations can result in water intrusion, proper roof preparation is the responsibility of the installer.

3.2.4. Position the hatch so that the red handle is at the back of the opening (towards the rear of the vehicle). Center the hatch inside the roof opening so that the gap is equal on all four sides of the cut-out, being careful that the butyl seal doesn't seat on the roof until item is secured.



(Photo 18: SMART Hatch Assembly)

3.2.5. Once the hatch is in position, pull down on the outer flanges to set the butyl adhesive all four sides.



(Photo 19: SMART Hatch Assembly)

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3.2.6. From the exterior of the vehicle, screw in (20) #10 x 1 hex head self-drilling screws into frame of the hatch. The frame has dimples molded into the surface to use as a target for the screw location. Make sure the screws are secured tightly to properly seal the butyl tape.



(Photo 20: SMART Hatch Assembly)

CAUTION
The roof hatch must be installed onto a smooth surface to allow proper sealing of butyl tape between frame and outer roof material. Any variations or deviations can result in water intrusion, proper roof preparation is the responsibility of the installer.

3.2.7. Push up on hatch to make sure it is firmly attached to bus roof.



(Photo 21: SMART Hatch Assembly)

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3.2.8. Connect the switch wire to the vehicle wiring harness.



(Photo 22: SMART Hatch Assembly)

3.2.9. Insert trim ring into hatch opening with arrow sticker facing towards the front of the bus.



(Photo 23: SMART Hatch Assembly)

SMART HATCH

NOTES

The interior trim ring was designed to work with roof thicknesses between 1.4 inch to 2.7 inches. Heights above or below this range will result in gapping or interference with the frame Modifications for fitment are the responsibility of the installer.

3.2.10. Attach bottom cover to roof of bus with (8) #8 x 1 long self-drilling pan head sheet metal screws.



(Photo 24: SMART Hatch Assembly)

3.2.11. Remove TO FRONT OF VEHICLE sticker.



(Photo 25: SMART Hatch Assembly)

SMART HATCH

3.2.12. Close front and rear hinges on roof hatch.



(Photo 26: SMART Hatch Assembly)

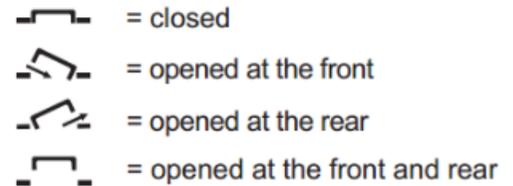
4. Operation

4.1. Ventilation Function

4.1.1. General

4.1.1.1. The passenger cabin can be ventilated by opening the roof hatch.

- The ventilation function is defined by the following positions:



4.1.2. Ventilatin Operation

4.1.2.1. The ventilation function is performed manually by pushing on the hinged end of the hatch to lift the dome to the open position. Both ends can be lifted independently of the other to allow front, rear or both ends to be extended in the open position.

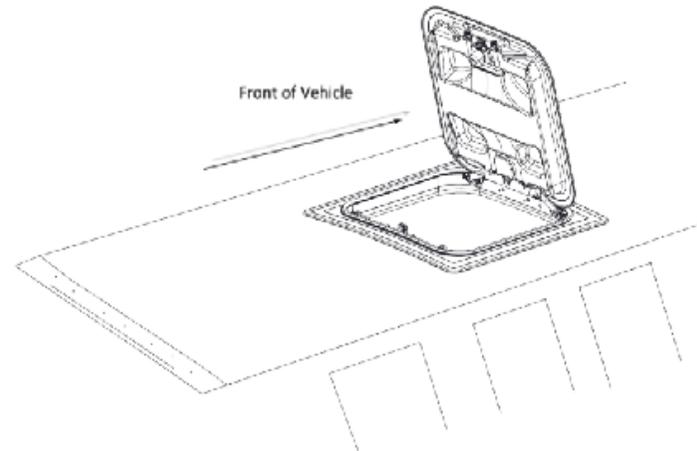
4.2. Emergency Exit Function/ Emergency Release

4.2.1. General

4.2.1.1. The emergency exit function can be initiated by turning the emergency release handle. This action will release the dome assembly from the hinge mechanism so that it can be swung away.

4.2.2. Operation

4.2.2.1. The emergency release function is performed manually by turning the red emergency release handle to disengage the lock wedge, then pushing on released end of the hatch dome. The dome panel will swing out of the way to allow passenger to escape through the opening in case of an emergency.



(Figure 2: SMART Hatch Installation)

▲ WARNING

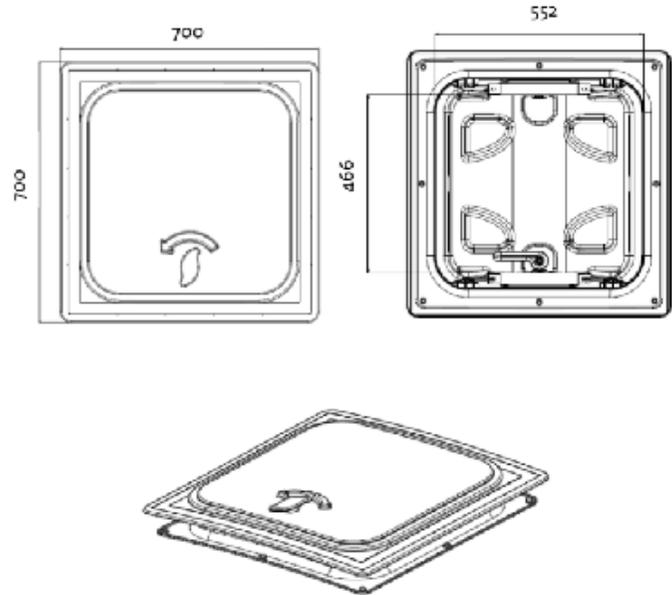
The Emergency Release function is for emergency situations on a stopped vehicle. Operating the emergency release when the vehicle is in motion may result in injuries to the operator or damage to the product.

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5. Technical Data

5.1. The technical data for the Smart roof hatch are listed in Table 1.

Panel Size	700 x 700 mm (27.6 x 27.6 in.)
Egress Opening Size	552 x 466 mm (21.7 x 18.1 in.)
Opened Height	134 mm (5.3 in.)
Closed Height	38 mm (1.5 in.)
Weight	5 kg (11 lbs.)
Materials	Plastic, Steel and Aluminum
Roof Radius Range	3,000 to 23,000 mm (118.1 to 905.5 in.)
Roof Thickness Range	35 to 70 mm (1.4 to 2.7 in.)
Roof Cut-Out, min. / max.	597 mm (23.5 in.) / 616 mm (24.25 in.)
Temperature Range	-40° to 85°C (-40° to 185°F)



(Figure 3: SMART Hatch Dimensions)

6. Service and Repair General

6.1. General Operation

6.1.1. This section describes how to identify and remedy problems on the SMART ventilation and emergency exit hatch.

**CAUTION**

Servicing the hatch requires special knowledge of the structure and operation of the ventilation hatch. Service must only be performed by trained personnel or an authorized service center.

6.1.1. The following potential causes of malfunctions have not been included and should always be checked to eliminate as the source of failures:

- Corrosion of the parts
- Loose fasteners
- Damaged or frayed cables

6.2. Inspection

6.2.1. The roof hatches should be inspected once per year in an authorized service center. The service center will perform the appropriate inspections and tests using the service manual.

6.2.2. At the start of winter the dome seal should be inspected and treated with a rubber care product.

6.2.3. Regular visual inspections include checking for the following:

- Inspect the cover (dome) for damage, cracks, etc.
- Inspect the sealing surfaces for debris, dirt and moisture.
- Inspect the dome seal to ensure that it is correctly positioned and in good shape, particularly around the hinges.
- Inspect the release mechanism and cable to ensure that it is not damaged and properly secured to the handle and hinge pins.
- Inspect the emergency release handle to ensure that it is in its cradle.

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6.3. Spare/ Replacement Parts

Part Number	Discription	Quantity
11135687A	Dome Assembly	1
11135688A	Screw (for Mechanism Tube)	2
11135944A	Weather Seal	1
11135945A	Mechanism Assembly	1
11135938A	Spring Plunger	1
11135949A	Bolt (for Frame)	1
11135946A	Microswitch and Cable	1
11136389A	Inner Handle	1
11135947A	Mechanism Tube	1
11136388A	Outer Handle	1
11136301A	Outer Handle Gasket	1
11136308A	Inner Trim Ring	1
11135948A	Knob Assembly	1

(Table 2: Smart Hatch Spare Parts)

6.4. Seal Replacement

6.4.1. The hatch seal can be replaced with the dome assembly open, without having to remove the dome assembly from the hatch frame. If it is possible to access the dome assembly completely, steps 1 and 4 may be unnecessary.

6.4.1.1. Actuate the emergency release, then swing the dome assembly forwards and place it on the roof of the bus.

6.4.1.1. Remove the dome seal from the edge of the frame by pulling on the rubber seal upwards or perpendicular to the bus roof surface.

6.4.1.1. Position the new seal evenly around the frame and press on the edges to secure the seal in place.

6.4.1.1. Reattach the dome assembly.

6.5. Emergency Release Reassembly

6.5.1. The dome panel can be reattached to the hinge mechanism after emergency release.

6.5.2. The following steps should be used to reattach the dome to the mechanism:

6.5.2.1. Rotate the handle to the full open position.

6.5.2.1. Position and insert the plastic alignment feature on the mechanism tube into the support bracket opening.

CAUTION

Make certain the handle has been rotated to the full open position. Do not force or attempt to insert the alignment feature if the handle is not in the full open position.

NOTES

The mechanism tube and support bracket do not need to be held together in order to re-latch the hatch. A gap between these two parts of 1" is acceptable to allow proper re-latching of the dome assembly.

6.6. Seal Replacement

6.6.1. The hatch seal can be replaced with the dome assembly open, without having to remove the dome assembly from the hatch frame. If it is possible to access the dome assembly completely, steps 1 and 4 may be unnecessary.

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6.7.2.1. Position and insert the plastic alignment feature on the mechanism tube into the support bracket opening.

CAUTION

Make certain the handle has been rotated to the full open position. Do not force or attempt to insert the alignment feature if the handle is not in the full open position.

NOTES

The mechanism tube and support bracket do not need to be held together in order to re-latch the hatch. A gap between these two parts of 1" is acceptable to allow proper re-latching of the dome assembly.



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