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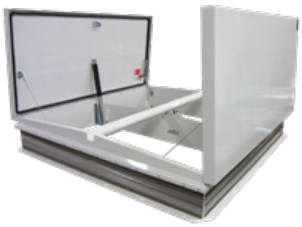
Installation, Operation + Maintenance Manual

Smoke Vents

Model(s): BSVS/BSVL

GENERAL DESCRIPTION



Smoke vents are designed to open automatically to provide emergency smoke and heat ventilation. Prompt venting in case of fire is essential for the safe evacuation of occupants and for effective fire-fighting conditions within a building. The smoke vent is not intended for use as general-purpose building ventilation devices. International Building Code requires smoke venting in a variety of applications including Factory and Storage Facilities, Stages and Platforms. The following is a general instruction for installing, operating and maintaining smoke vent products. These are recommended general guidelines only. Locally accepted roofing and sealing practices and procedures should be followed to ensure the ultimate weather-ability of vents installed into various types of roofing systems

GENERAL SAFETY PRECAUTIONS Improper selection, installation, or use can cause personal injury or property damage. It is solely the responsibility of the user, through its own analysis to select products suitable for their specific application requirements, ensure they are properly maintained, and limit their use to its intended purpose. Follow proper local, state and federal regulations for proper installation and operation requirements.

Introduction + Safety

Please read the complete instructions carefully before beginning any work. To ensure proper installation and performance of the Smoke Vent the following actions must be completed by the installing contractor. Failure to do so will affect product warranty.

Transportation + Storage

- Inspect all shipments and materials for missing or damaged components and hardware.
- Material must be stored in a clean, dry location.

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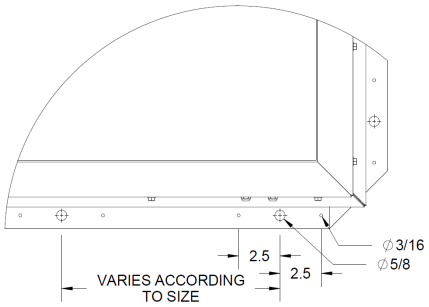
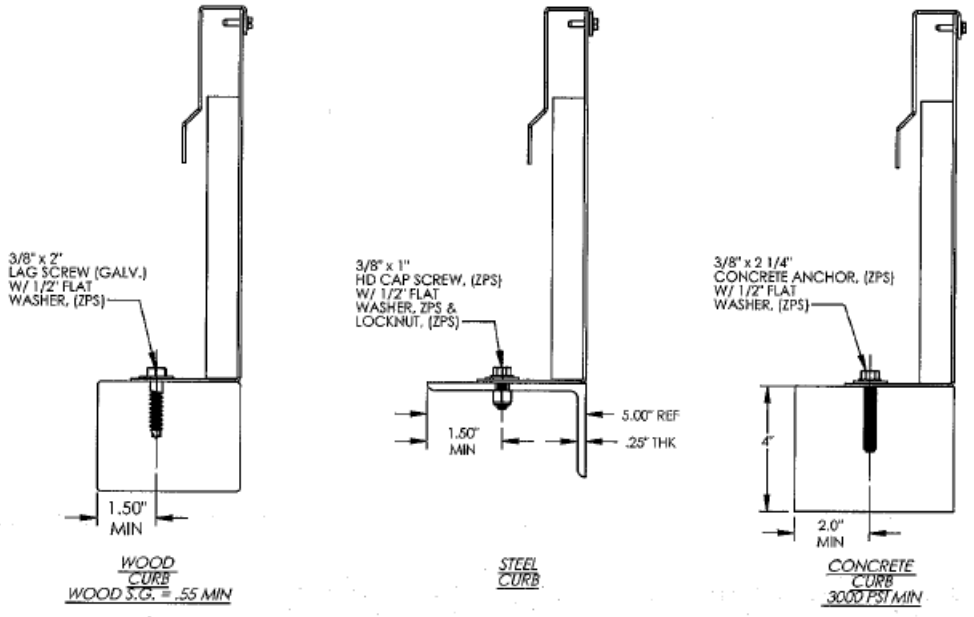
INSTALLATION

Ensure that the roof mounting surface is level to avoid twisting of the smoke vent base. It is essential that the vents are installed level and square for the door to make a proper seal. Place the smoke vent over the existing opening in the roof that has been prepared with appropriate roofing membrane, if applicable.

The roof rough opening dimensions are equal to the vent dimensions as measure from the inside curb to inside curb. For example, a 48 inch by 96 inch smoke vent will have a roof rough opening of 48 inches by 96 inches.



1. The smoke vent curb flange includes 5/8-inch diameter pre-drilled mounting holes for anchoring to the curb. Mark and drill the curb as required and secure the curb flange using appropriate fasteners (provided by others) in accordance with project requirements and applicable building codes.



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Metal Decking Installation

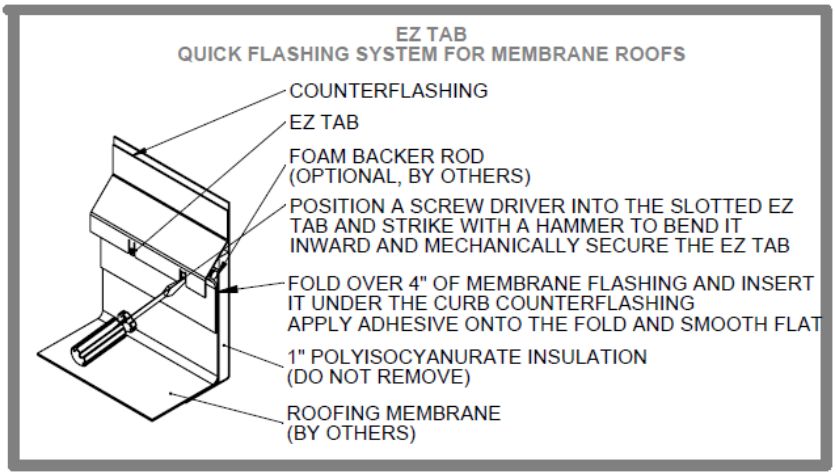
Mechanical fasteners (screws, powder or pneumatically driven fasteners, etc.) are recognized as viable anchoring methods, provided the type and spacing of the fastener satisfies the design criteria, with fasteners providing a minimum 5/16 inch (8mm) diameter bearing surface (fastener head size). Strength of mechanically fastened connections are dependent upon both deck and support thickness.

In accordance with the ANSI RD-2010 Standard for Steel Roof Deck, section 3.4 Accessory Attachment,

- Structural accessories shall be attached to supporting structure or deck as required for transfer of forces, but not to exceed 12 inches (300 mm) on center. Nonstructural accessories shall be attached to supporting structure or deck as required for serviceability, but not to exceed 24 inches (600 mm) on center.
- Mechanical fasteners or welds shall be permitted for accessory attachment.

For Curb Mount Installation

Prepare the curb using standard acceptable weatherproofing methods (i.e. butyl tape, sealant, etc.). Place the smoke vent on the curb. Fasten the smoke vent to the curb using pan-head fasteners that will penetrate the curb a minimum of 3/4 inch. Install fasteners every 16 inches along the sides and ends of the smoke vent.



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Install roofing material up to and around the roof curb, up under the counterflashing, using appropriate roofing material and locally accepted processes. Do not remove curb insulation. Lay membrane flashing up onto curb insulation. Press up under counterflashing using foam backer rod (by others). Apply adhesive to fully secure membrane in position. Ensure all joints are fully sealed to provide a weather tight seal. Bend EZ tabs to mechanically secure, using a screwdriver or similar tool.

Conduct an acceptance performance test and inspection of all smoke vents immediately following installation to establish that all operating mechanism function properly.

OPERATION

Vents are designed and built for many years of dependable service. The assembly includes a curb and cover with a continuous extruded EPDM gasket that creates a weather resistant seal. *Warning: If interior of smoke vents are field painted, all component parts must be masked. Critical component parts include spring/dampers, latches, fusible links and any labels. Painted component parts may damage the smoke vents and will void the warranty.*

Field Testing

If required, test for proper operation after installation by one or more of the following:

1. Melt fusible link located inside the smoke vent using a hand-held propane tank torch. Replace fusible link from automatic latching mechanism, as shown below.
2. Pull internal or external manual pull handle with red vinyl grip, then close smoke vents.
3. If applicable, open vents using an electrical signal from the fire alarm, push button controller or other applicable electrical means.

OPENING SMOKE VENTS

Manual Operation

Smoke vents are designed to open manually via pull handles located on the exterior and interior of the smoke vent. The internal pull cable comes with 10 feet of 1/16 inch diameter aircraft cable. If required, additional cable can be ordered to extend and rig down to floor level.

Emergency Operation

Smoke vents are designed to open thermally when a UL 33 listed and labeled fusible link melts at its temperature rating (165˚F, 212˚F, 280˚F, 350˚F, 360˚F, 370˚F, 386˚F, 450˚F) in the event of an emergency fire. Fusible links are easily accessed from the roof for replacement.

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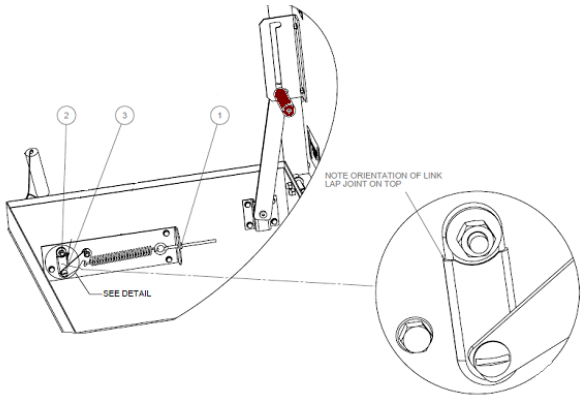
TO REPLACE THE FUSIBLE LINK:

1. Back off the nut (1) all the way to remove tension from the spring.
2. Remove nut (2) and washer
3. Remove screw (3), nut and washer
4. Replace link, ensuring the proper lap joint orientation at the top
5. Install screws (3), nut and washer
6. Replace nut (2) and washer leaving a 1/16 inch gap so the link is free to pivot
7. Tighten down nut (1).



Electrical Opening

An optional belimo actuator allows smoke vents to open electrically when a low voltage (24VDC/AC) or High Voltage (110VAC/220VAC) signal is sent to a UL listed rotary actuator to open vents in coordination with a fire alarm or sprinkler system.

CLOSING SMOKE VENTS

Smoke vent covers close manually from the exterior roof top level. Pull the red vinyl grip handle forward to *disengage* hold open arm from the slotted lock bracket. Safely close the cover and ensure latch engagement. It may require two people to close the door, due the spring force. Smoke vent covers closed manually from the exterior roof top level. The closing procedure may require a couple people to close and securely latch the smoke vent doors.

Caution: Follow all OSHA fall protection safety requirements regarding fall protection (ie. OSHA 1926.500 regarding safety harnesses, tie offs points, etc.) It may be necessary to stand on top of the smoke vent door where the latch is centrally located and use one's body weight to force the doors into the fully latched position.

MAINTENANCE

Plan and schedule

Smoke Vents have a manual release device to allow direct activation to facilitate inspection, maintenance and replacement of components, such as fusible links.

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Vents should be manually operated in accordance with local fire safety precautions. At a minimum, the vents should be operated annually to check proper component performance.

Fusible link inspection

- Inspect fusible links at least annually for evidence of any corrosion, stress/strain or build-up of particulate matter.
- Fusible links that have been painted must be replaced as soon as the condition is observed.
- Fusible links coated with paper dust, fiberglass hairs or similar particulate matter should be cleaned. If cleaning with air pressure does not remove such matter, replace the links or contact either the Authority Having Jurisdiction or the fusible link manufacturer for guidance.

Cleaning recommendations

- Fusible links coated with paper dust, fiberglass hairs or similar particulate matter should be cleaned. If cleaning with air pressure does not remove such matter, replace the links or contact either the Authority Having Jurisdiction or Babcock-Davis for assistance.
- Non-moving parts can be cleaned with a mild soap or dishwashing detergent and water solution.
- Gaskets can be cleaned with a clean, damp, lint-free cloth. *Do not apply mineral oils, vinyl dressings, or other lubricants to the gasket as they can cause the gasket to break down over time.*

SPARE PARTS AND SUPPLY LIST

- **Latch:** Positive hold release mechanism designed to hold the covers closed. Manually released by interior and exterior pull cables or thermally released by fusible melt out link.
    - (SV-KIT-ROTARYLATCH-S for single, SV-KIT-ROTARYLATCH-D for double and quads)
- **Fusible Link:** Replaceable, melt out links. Select model # based on link temperature.
    - (SV-KIT-LINK-165, SV-KIT-LINK-280, SV-KIT-LINK-350, etc)
- **Gas Spring/Damper:** Provides the force to automatically open covers against a 10psf snow load at a controlled speed.
- **Hold Open Arm:** Locking hold open arm automatically engages and locks when the door fully opens. Pull the red vinyl grip handle forward to disengage and safely close the door.

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- (SV-KIT-HOA)

- **Gasket:** Adhesive backed continuous EPDM rubber gasket on cover. (SV-KIT-GASKET)

Fusible link ambient temperature rating –

The fusible link should be specified with a temperature rating greater than the maximum ambient exposure temperature that will be seen at the installation. For example, an "ordinary" fusible link rated at 165 degrees F has a maximum ambient exposure temperature rating of 100 degrees F. If this fusible link is routinely exposed to ambient temperatures over 100 degrees F, it is liable to separate. Select a fusible link rated at 212 degrees F (or greater) for this type of application. See table below to find a fusible link temperature range compatible with an expected or measured ambient temperature. This is in accordance with UL guidelines.

Temperature classification	Temperature ratings		Maximum ambient temperature	
	Degrees F	(Degrees C)	Degrees F	(Degrees C)
Low	125 – 130	(51 – 54)	90	(32)
Ordinary	135 – 170	(57 – 77)	100	(38)
Intermediate	175 – 225	(79 – 107)	150	(66)
High	250 – 300	(121 – 149)	225	(107)
Extra high	325 – 375	(163 – 191)	300	(149)
Very extra high	400 – 475	(204 – 246)	375	(191)
Ultra high	500 – 575	(260 – 302)	475	(246)

Fusible link inspection – The following guidelines are recommended for facility managers or other end-users of smoke vent products.

- Inspect fusible links at least annually for evidence of corrosion, stress/strain or build-up of particulate matter.
- Fusible links that have been painted must be replaced as soon as the condition is observed.
- Fusible links coated with paper dust, fiberglass hairs or similar particulate matter should be cleaned. If cleaning with air pressure does not remove such matter, replace the links or contact either the Authority Having Jurisdiction or the fusible link manufacturer for guidance.

If any questions arise during the operation or maintenance of the products, please feel free to call technical support for assistance, 1-888-412-3726.

OVERVIEW - MANUAL WINCH OPTION

Smoke vents with manual winch remote operation provide are designed with the additional convenience of opening and closing the smoke vents from a remote location, such as the catwalk or floor level.

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Manual Winch Operation

Open Smoke Vent with Manual Winch

1. Pull manual release cable to release the rotary latch in the smoke vent
2. Unwind manual winch to fully open smoke vent doors

Close Smoke Vent with Manual Winch

1. Move lever to the downward position to disengage the locking hold open arm
2. Wind the manual winch till the vent rotary latches engage to secure covers closed
3. Return the lever to the upward position

Reset at Roof Level

1. Feed out a minimum of 14ft of cable at lower winch to create slack.
2. At upper winch remove spent fusible link from the system by removing the retaining lock nuts. Reseat the spring attached to the lever arm to the winch housing. Pull the lever arm up, bring the two screws close enough to set the new fusible link in place and secure with the retaining lock nuts. (only if thermally released).
3. Flip the ratchet at upper winch up to the engaged position.
4. Wind upper winch until the cable in taught.
5. The thermal release is now reset, and the vent can be winched closed by lower winch.

Smoke Vent covers also open when activated by the following methods:

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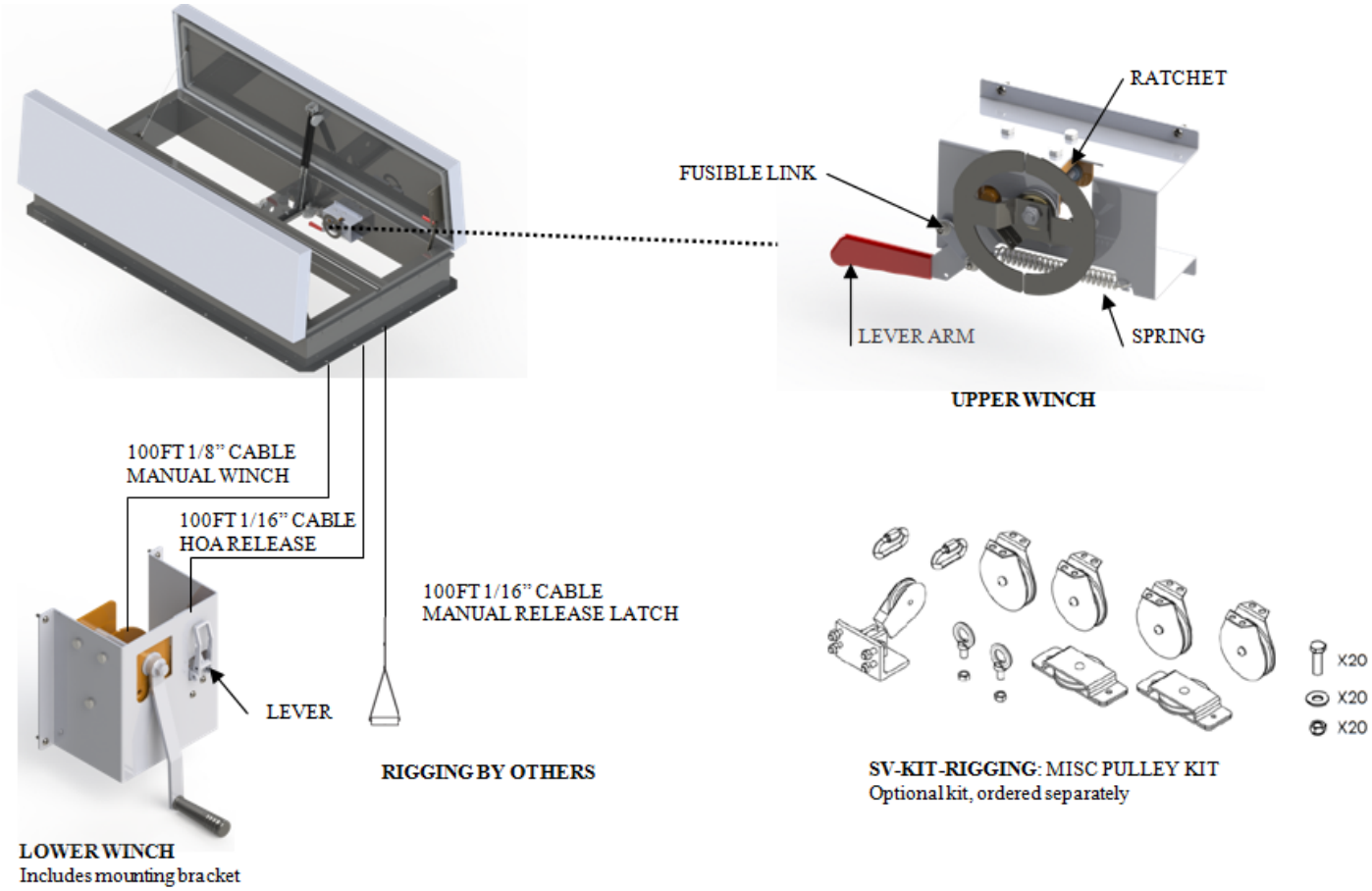
- Reset at roof level is required.
- Thermal: Release by heat with fusible link.
- Manual at Roof: Pull external manual release cable.
- Optional Electrical: Released by 2.5W Belimo Actuator when energized to 24V or 110V.



Installation Instructions for Manual Winch

1. Once the smoke vent has been roofed in and is fully installed the Manual Winch option can be set up to operate the doors to open and close.

2. Determine the desired location for the floor level winch (shipped loose) and mount it to a suitable structure.

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3. Rig the 1/8 inch manual winch cable, 1/16 inch HOA cable, and 1/16 inch manual release cable down to the floor level winch. *(all three cables should be coiled on the interior side of the unit)*

4. Attach and wind the 1/8 inch cable taught onto the floor level winch.

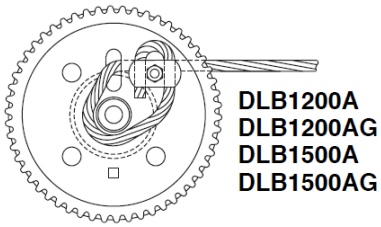

Figure A – Cable Termination for Floor Winch

5. Open the smoke vent by pulling the interior manual release (now rigged to a location near the floor winch) and unwind the manual winch to the fully open position.

6. Place the lever on the floor winch in the downward position and tie the 1/16" HOA cable to the HOA tie off point of the lever. Ensure the cable is taught. (IMPORTANT: this cable is required to disengage the hold open arms, if it is not installed prior to closing the smoke vent with the manual winch the unit will be damaged during the operation, UL 793 requires the inclusion of the hold open arms as the doors are required to lock into the open position)

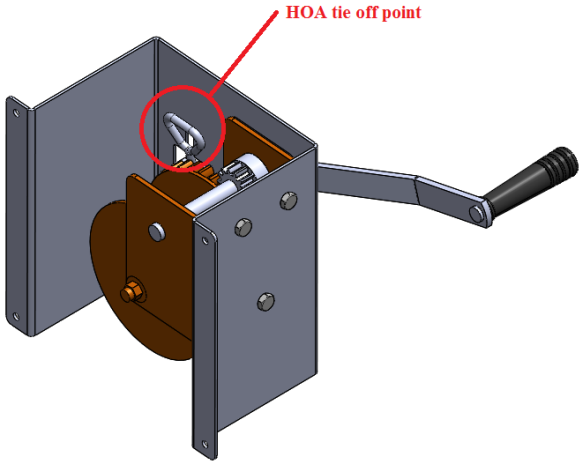

Figure B – HOA Tie-off Point

7. To ensure the HOA cable was correctly fastened, with the lever in the downward position, wind the winch slowly to begin closing the doors. If the doors close the HOA cable has been properly secured. If the doors only close slightly and the force required to wind the winch increase greatly the HOA cable has not been secured tight enough and the operator should cease winding as continued operation could result in damage to the unit. If the HOA cable has not been secured tight enough, detach and reattach it tighter than it was previously.

8. Once the HOA cable has been confirmed to be securely fashioned the smoke vent can be winched close and the installation of the Manual Winch option is complete.

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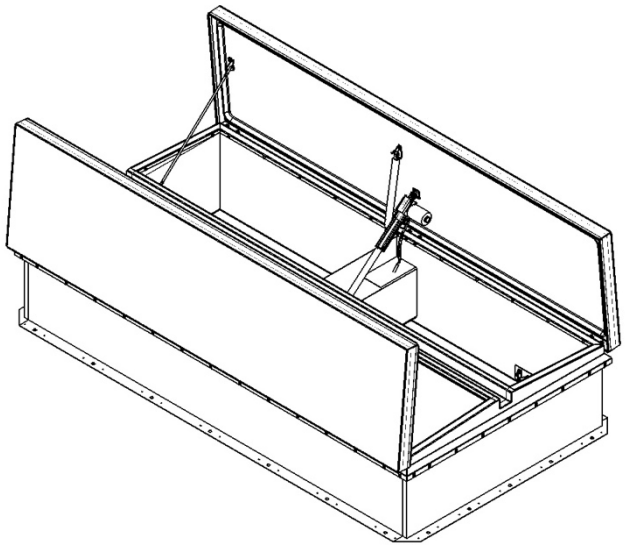
Option: Actuator Overview

Smoke vents with linear actuators are designed to conveniently open and close smoke vents remotely with a push button controller. The system is comprised of linear actuators (one per cover), a control box mounted to the inside of the smoke vent curb, a 2 position (open, close) push button station and door position sensors.



These smoke vents are also designed to open automatically without power in the event of a fire emergency. Smoke vents open thermally when heat parts a fusible link and they also open manually with both internal and external manual pull handles.

LINEAR ACTUATOR SMOKE VENT MODES OF OPERATION

Open Smoke Vents

1. Manual*: Pull manual release cable (exterior or interior) to release the actuator latch and open vents
2. Thermal*: Fusible link melts to release the actuator latch and open vents. A new link is required.

**If smoke vent is opened manually or thermally, the linear actuator must be reset and securely re-latched to curb. This is accomplished by electrically opening to fully extend the linear actuator so that the rotary latch engages.*

3. Electrical Open with Controller:
    a. Push OPEN button on controller, continuously hold until both doors stop moving
4. Electrical Open with signal (by others)
    a. Wire a 24VDC signal from a fire alarm, smoke detector, etc. into the control box at the smoke vent level.

Close Smoke Vent

1. Electrical Close:
    a. Push CLOSE button on controller and continuously hold until both doors stop moving

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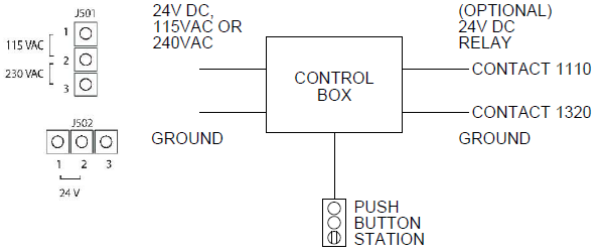

Push Button Station

Linear Actuator

User Operation	**Execution**	**Reset?**
Open using push button station	User depresses the open button until both doors fully open	no
Close using push button station	User depresses the close button until both doors fully close	no
Open using interior manual pull *	User pulls the interior manual pull handle	yes
Open using exterior manual pull *	User pulls the exterior manual pull handle	yes
Thermally *	Fusible link melts at listed temperature (160-520F)	yes

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Open with 24V Signal (fire alarm)	Optional signal sent from fire alarm, smoke detector, etc by others	no
Reset	Push and hold the Open button on the control button station until the actuators back into the rotary latches.	n/a

* EMERGENCY OPERATION, releasing the actuator from the rotary latched pivot point

Input	**Operation**
User presses and holds the open button.	Controller checks to ensure the open position internal limit switch for actuator is not closed, if not the controller will drive the actuator to extend until the user releases the open button or the open position internal limit switch for actuator closes. Works individually for each actuator.
User resses and holds the close button.	Controller checks to ensure the close position internal limit switch for actuator is not closed, if not the controller will drive the actuator to collapse until the user releases the close button or the close position internal limit switch actuator closes. Works individually for each actuator.
Fire alarm tie-in sends a constant signal to the 24V relay in control box when the fire alarm is tripped	The controller will drive each actuator until the open position internal limit switch for each actuator closes or until the timer finishes. Drives both actuators simultaneously.

Questions? For more information on installation, repair or replacement, please visit www.BabcockDavis.com or call 888.412.3726.

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