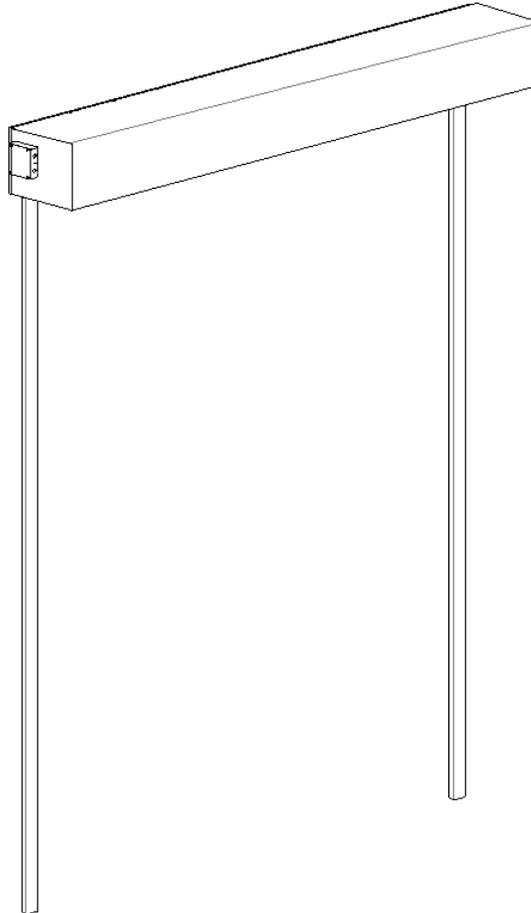




Model 600 Operation & Maintenance Manual



**Including Semi-Annual Testing
for your Smoke Guard® System**

*287 N. Maple Grove - Boise, ID 83704
Phone: (800) 574-0330 (208) 639-7851
E-Mail: info@smokeguard.com
Website: <http://www.smokeguard.com>*

*Call your local Smoke Guard System Distributor
for answers to questions about your system*

IMPORTANT

The purpose of your Smoke Guard System is to reduce the risk of death or serious injury due to vertical smoke migration in the elevator shaft during a fire. The Smoke Guard System is designed to meet the requirements of the International Building Code. Our manufacturing quality control programs and network of factory-trained installers help ensure that your system functions as designed at the time of installation.

As with other components of your fire protection system, periodic maintenance is required. The building owner must inspect and test each Smoke Guard system unit at least once every six months. Damage to the housing, improper painting of the elevator door frame, or other factors could hinder the proper operation of your unit. Failure to properly test and maintain your Smoke Guard System could result in death or serious injury in the event of a fire.

Table of Contents

Introduction.....	4
Why the Smoke Guard System?.....	4
The responsibilities of the building owner.....	5
Testing frequency.....	5
Alterations and additions.....	5
System acceptance testing.....	5
Painting.....	5
Operation.....	6
How the Model 600 works.....	6
What makes up the Model 600.....	7
What to do if the curtain won't stay in the housing.....	8
What to do if someone walks through a deployed curtain.....	8
What to do if the curtain deploys during a fire.....	8
Maintenance/Testing.....	9
Before you test.....	9
Functional test and visual inspection.....	10
Battery inspection.....	11
Record Keeping.....	12
Why keep records?.....	12
What records should be kept?.....	12
Appendix: Trouble-Shooting Status LEDs.....	14

Introduction

This is the official operation, maintenance, and testing manual for the Model 600 smoke containment system from Smoke Guard.

This section includes the following topics:

- Why the Smoke Guard System?
- Responsibilities of the building owner

NOTE: Read this entire manual before operating, maintaining or testing your Smoke Guard System.

Why the Smoke Guard System?

- **Why are elevators a problem?** A natural ventilation cycle called “stack effect” occurs in every building over one story in height. Air typically infiltrates the lower portions of the building and is exhausted out the top. The taller the building and the greater the temperature difference between the inside and outside temperatures, the greater the air flow. The elevator shaft acts like the chimney in a fireplace, drawing smoke from a building fire through the gap between the elevator door and frame, and exhausting the smoke into the upper exit ways.
- **How does the Model 600 fit into the codes?** The Model 600 Smoke Guard system is recognized by the ICC Evaluation Service reports ESR-1136 and ES AC77. This system, when used in conjunction with a rated elevator door, is recognized as a “tight-fitting smoke and draft-control assembly” under section 715.3.3 of the 2003 edition of the International Building Code, section 715.4.3.1 of the 2006 edition, and section 715.4.3.1 of the 2009 edition. Use of the M600 permits the deletion of an enclosed elevator lobby. In addition, ETL recognizes the Model 600 as an approved life safety releasing device.

The responsibilities of the building owner

The Model 600 is considered “connected equipment” as defined in NFPA 72. As such, the owner or designated representative shall be responsible for inspecting, functional testing, recording of tests, and maintaining the system. Delegation of responsibility shall be in writing, with a copy made available to the authority having jurisdiction under the provisions of the building code and local ordinances.

The building owner should be aware of the following:

- **Testing frequency**
- **Alterations and additions**
- **System acceptance testing**
- **Painting**

Testing frequency

Visual inspection, functional testing, and maintenance described in this manual must be performed and recorded at intervals not longer than 6 months, more frequently where required by the authority having jurisdiction.

Alterations and additions

Visual inspection shall ensure that there are no changes that would affect equipment performance, such as building modifications, occupancy hazards, and environmental effect. Smoke Guard factory trained personnel must perform any alterations or additions to your Model 600.

System acceptance testing

Acceptance tests shall be performed after system components are added or deleted, after any modification, repair, or adjustment to the system hardware or wiring.

Painting

Do not field paint auxiliary rails, housing, or housing door without first contacting Smoke Guard or your installing distributor.

- Do not paint housing door shut.
- Painting auxiliary rails requires that you strip them of existing paint to base metal and repaint with a spray paint, which is resistant to 300 degrees Fahrenheit, to a maximum thickness of 0.005 inch.
- After painting any of the above said components, your Model 600 must be tested thoroughly.

Operation

How the Model 600 works

Ready—The Model 600 is connected to an auxiliary relay in the smoke detector located near the elevator. The smoke containment curtain is rolled into a housing located above the elevator door.

Alarm—The system deploys in response to an alarm from the smoke detector near the elevator, not on general fire alarm. When the smoke detector goes into alarm, a motor inside the housing deploys the curtain to the floor. Magnets along the sides of the curtain adhere to auxiliary rails, or to the elevator frame in some installations.

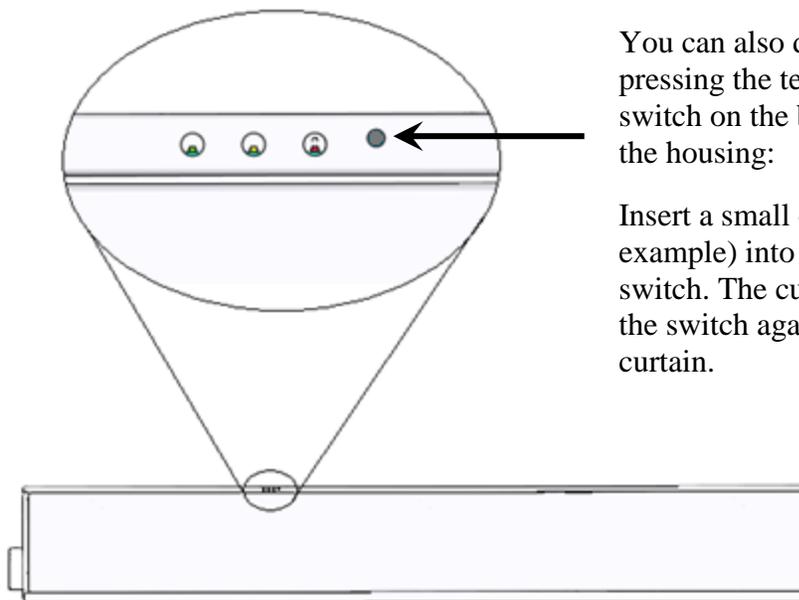
If there is an obstacle in the path of the curtain, it stops, retracts fully, and redeploys. If the obstacle is still present, the curtain stops at that point and enters a fault state. Remove the obstacle to clear the fault state.

Deployed— An aluminum tube creates a seal at the floor when the curtain is fully deployed. (Once the curtain reaches the floor, it may bow in or out from the opening due to the direction of airflow.) The curtain remains deployed until the smoke detector clears.

Retract—The curtain retracts automatically when the smoke detector clears.

PRESS HERE TO OPEN switch—Press the yellow switch on the curtain to retract the curtain temporarily while the curtain is deployed. The curtain rewinds then redeploys after a few seconds if alarm conditions still exist; otherwise, it remains in ready mode.

Test-deploy/calibration switch:



You can also deploy the curtain by pressing the test-deploy/calibration switch on the bottom front edge of the housing:

Insert a small object (a paper clip for example) into the hole to depress the switch. The curtain deploys. Press the switch again to rewind the curtain.

System monitoring—The control monitors the system for problems that might compromise system performance. Upon detection of a fault, LEDs on the bottom of the housing warn that the unit requires corrective action.

- **Fault deployment**—To indicate that a critical fault exists, the curtain deploys a approximately six inches from the housing, partially opening the door. Examine the status LEDs to determine the specific fault (see immediately below).
- **Status LEDs**—LED flash patterns visible on the bottom of the housing identify the system fault. Refer to the appendix in this document Appendix: “Troubleshooting Status LEDs” on page 14 to determine the fault and appropriate corrective action.

Battery operation—The Model 600 includes a battery for backup power. If 120 VAC is lost, the system remains in ready mode on battery power for at least 24 hours. After 24 hours there will still be enough battery capacity to deploy and retract the curtain a minimum of ten times.

What makes up the Model 600

NOTE: The smoke detector itself is part of the building smoke and fire alarm system and NOT a component of the Model 600. However, it is vital to the proper operation of the Model 600. The smoke detecting system must therefore be inspected, tested, and properly maintained in accordance with the equipment manufacturer’s guidelines as well as the requirements of the authorities having jurisdiction. Emergency power to the smoke detector should be maintained in accordance with NFPA 70.

Housing—The housing is a sheet metal box mounted above the elevator door. The housing holds the curtain, down-limit switch, up-limit switch, and motor. To open the housing door, hook the housing door key (furnished with this manual) around the lip of the housing door to gently pull it open (door opens away from the elevator).

- **Control**—The control circuit board is where the smoke detector, curtain drive motor, rewind switch, and limit switches are terminated. The board reads all inputs, makes decisions regarding motor control, and provides power to the motor as needed. Additionally, it monitors the battery and wiring.
- **Battery**—The housing holds a 12V 7 ampere hour battery. When connected to 120VAC, the control keeps the battery charged and periodically performs a load test (weekly when in ready mode). The status LEDs on the bottom of the housing blink in succession to indicate the beginning and the end of this test.

Curtain—The curtain consists of a reinforced transparent polyimide film. The film is attached to a flexible magnet along each vertical edge by means of an elastomeric sealant that allows the film to expand under differential air pressures in an elevator shaft. Air leakage meets all requirements as described in AC77.

Auxiliary rails (required for most installations)—The auxiliary rails attach to the wall next to the elevator door frame and extend from the floor to the housing. The magnets on the curtain adhere to the rails and form a seal. In some installations, the elevator frame is of a ferrous metal and the auxiliary rails are not necessary, except to extend the seal from the elevator head to the housing.

What to do if the curtain won't stay in the housing

If the curtain deploys only a few inches and remains there in the absence of a smoke alarm, there is a system fault. Refer to “Trouble-Shooting Status LEDs”, the appendix to this document. If you are unable to resolve the issue, contact Smoke Guard Inc. at: 1-800-574-0330

What to do if someone walks through a deployed curtain

If someone walks through a deployed curtain, do NOT rewind the curtain into the housing until you inspect the curtain.

1. Inspect the cables for lost wraps around the pulleys.
2. Holding the outside edges of the magnets, pull the magnets away from the rails.
3. Gently pull both magnets apart to work the excess film out of the center.
4. Allow the magnets to reattach to the rails.
Both magnets should be plumb and cover the rails evenly.
5. Press the curtain rewind switch.
The curtain rewinds temporarily and then redeploys.
6. If there is any telescoping, repeat steps 1 through 4.

What to do if the curtain deploys during a fire

If a Model 600 deploys during a fire, notify Smoke Guard (1-800-574-0330) for a free service visit.

Maintenance/Testing

The following topics cover the requirements for testing, inspecting, and maintaining your Model 600 system:

- **Before you test**
- **Functional test and visual inspection**
- **Battery inspection**

Before you test

NOTE: These instructions assume that installation is complete and the installer has conducted the tests specified in the installation manual to verify proper installation.

Prior to testing, complete the following tasks:

- Review the information regarding the system included in this manual.
- Notify anyone who might receive an alarm.
- Notify building occupants.
- Setting off the smoke detectors will, in most instances, send the elevator into fire service. Before conducting the test, contact the elevator representative for procedures for restoring normal service.

Functional test and visual inspection

A functional test involves triggering the smoke detector near the elevator landing, observing the deployment of the Model 600, rewinding the curtain using the rewind switch on the curtain, and making minor adjustments if necessary. Fill out the service record on page 13. You are responsible for reporting any required adjustments to your authorized Smoke Guard service representative or Smoke Guard Inc. (800-574-0330).

1. Activate the elevator landing smoke detector per manufacturer's recommendations.
2. Observe the deployment of the Model 600 curtain.

The curtain should unwind smoothly from the housing and stop when it meets the floor. Some slack in one of the cables is normal.
3. Visually inspect the curtain assembly to locate any damage to the curtain, flexible magnets, curtain rewind switch, or the seal at the floor.
4. Inspect the flexible magnets for a straight alignment relative to the auxiliary rails, (or the elevator frame in some installations)

Both magnets should be plumb and cover the rails or frame evenly. If necessary, adjust the curtain so it fits tightly, as described in the topic "What to do if someone walks through a deployed curtain" on page 8.
5. Inspect the auxiliary rails (if installed).
6. Press the rewind switch on the curtain (PRESS HERE TO OPEN).

The curtain re-winds and then re-deploys, as long as the smoke detector remains in alarm.
7. Inspect the rewind operation of the curtain for a straight and uniform roll of the film around the threshold pulleys.
8. Clear the smoke detector.

The curtain should rewind back into the housing.
9. Verify that the LEDs on the bottom of the housing reflect the following pattern:
 - green LED: ON
 - yellow and red LEDs: OFF
10. Fill in the service record on page 13.

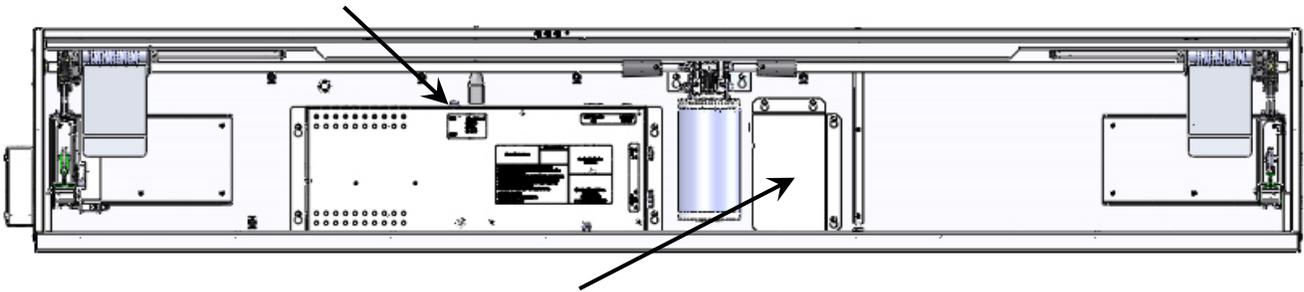
Battery inspection

Battery maintenance normally consists of periodic inspections and tests. Many battery problems can be detected by visual inspections. Tests aid in evaluating performance and permit comparisons with standards and with historical test results. Battery manufacturers are good sources of information for maintenance programs (NFPA 70B, Section 6-8.4.2).

Personnel should be aware of the hazards associated with stationary batteries. A battery can produce and emit a mixture of hydrogen and oxygen gas that is very explosive. Exposing skin and eyes to electrolyte can cause severe burns and blindness. Voltages present can cause injury and death (NFPA 70B, Section 6-8.4.3).

Consult NFPA 70B (National Fire Protection Association, 1999 edition) for battery maintenance.

1. Turn off 120VAC using the switch on the control inside the housing:



2. Visually inspect the battery for corrosion or leakage.
3. Verify that all connections are secure.
4. If necessary, clean the battery terminal and connections as described in NFPA 70B.

Replace batteries in accordance with the recommendations of the battery equipment manufacturer or every three years. The following types of rechargeable batteries are approved for use by Smoke Guard:

Power Patrol SLA1075	12V	7.5 amp hour
Power Sonic PS 1270	12V	7.0 amp hour
Yuasa NP7-12	12V	7.0 amp hour

WARNING! Be sure to observe correct polarity. The red wire connects to the red or positive (+) terminal. The black wire connects to the negative (-) terminal.

Record Keeping

The following topics explain how to maintain a record of the tests that you perform on your Model 600:

- **Why keep records?**
- **What records should be kept?**

Why keep records?

According to NFPA 72 (1999 edition), the building owner is responsible for keeping the maintenance and testing record for the life safety devices in their building. Records should be kept available for examination by any authority having jurisdiction upon request.

What records should be kept?

A permanent record of all inspections, testing, and maintenance shall be retained by the building owner, including all the information below:

- Test date
- Unit # (if there are multiple units installed)
- Name of person performing inspection, maintenance, and/or tests
- Functional test of smoke detectors signaling the Model 600 per NFPA 72
- Functional test of curtain
- Battery inspection
- Any modifications or alterations made to the system
- Signature of the tester

Appendix: Trouble-Shooting Status LEDs

State	Description	GREEN Status	YELLOW Fault Code	RED Trouble	Fault Deploy	Notes
Normal 1	System OK	on	off	off	N/A	System fully functional.
Normal 2	Power on/ Self test active	Sequential flash	Sequential flash	Sequential flash	N/A	Approximately 12 seconds to complete.
Normal 3	System in calibration	1-blink on .5 S off 5 S	1-blink on .5 S off 5 S	off	N/A	
Normal 4	LAS active	on	1-Blink on .5 S off 5 S	off	N/A	Normal operation with full deploy
Normal 5	FSCS close or open active	on	2-Blink on .5 S Off 5 S	off	N/A	Normal operation with deploy in accordance with FSCS request.
Normal 6	No AC, battery active	1-blink on .5 S off 5 S	off	1-blink on .5 S off 5 S	N/A	Low voltage power supply or main power off, running on battery
Error 1	Battery health low	off	1-Blink on .5 S off 5 S	on	Yes	Battery or controller problem
Error 2	Obstruction or out of calibration	off	2-Blink on .5 S off 5 S	on	Yes	If obstruction then fault deploy
Error 3	LAS open circuit	off	3-Blink on .5 S off 5 S	on	Yes	No EOL detected
Error 4	Moving up or down timeout	off	4-Blink on .5 S off 5 S	on	No	Motor, controller, or limit switch problem
Error 5	Uplimit Switch short circuit	off	5-Blink on .5 S off 5 S	on	No	Up limit switch stuck closed
Error 6	Uplimit Switch open circuit	off	6-Blink on .5 S off 5 S	on	No	Up limit switch stuck open
Error 7	Motor over- current	off	7-Blink on .5 S off 5 S	on	No	Motor stopped due to over-current



Copyright 2011, Smoke Guard Inc. All rights reserved