



A CSW Industrials Company

Model 600 | Operations & Maintenance Manual

Smoke Curtain



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1.0 – Introduction

This is the official operation, maintenance, and testing manual for the Model 600 Smoke Curtain from Smoke Guard, Inc.

The Smoke Guard Model 600 Smoke Curtain (M600) is a motorized smoke protection system housed above an elevator. The M600 system is rated to UL 1784 according to the requirements of smoke and draft control assemblies defined in NFPA 105.

The system uses a DC motor to lower a specialized curtain in a strategic location. When not in use, the M600 is retracted into a housing unit, thereby maintaining the aesthetic of the facility in which it is installed.

The smoke detector or other initiating device is part of the building smoke and fire alarm system and not a component of the Smoke Guard system. However—it is an essential component—vital to the proper operation of the M600 system and all other connected equipment. 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 authority having jurisdiction (AHJ). Emergency power to the smoke detector should be maintained in accordance with NFPA 105.

The M600 features a smoke protective curtain rolled onto a steel threshold within a steel housing. Under alarm conditions, the curtain deploys to the floor with the curtain magnets adhering to either the elevator frame or auxiliary rails, sealing the opening.

The M600 controller interfaces with a smoke detector or fire alarm circuit already installed in a building to form a fully integrated fire control safety system. The controller also controls the DC motor which deploys and retracts the curtain. Additionally, the M600 controller is equipped with a battery for backup power to ensure the curtain deploys in the event of AC power loss with an active fire alarm. The battery also prevents fault deployments in the event of AC power loss. However, the battery is for emergencies only.

Initial installation of Smoke Guard systems must be completed by Smoke Guard factory recognized installers. Installations completed by non-factory recognized installers risk improper installation and function in an alarm event, thus voiding the unit’s regulatory listing and factory warranty.

As with other fire protection systems, periodic inspections for preventative maintenance are required for the M600 to ensure proper functionality. NFPA 105 requires annual inspection and testing; the manufacturer recommends the building owner inspect and test each M600 at least once every six months. Only factory recognized individuals trained in servicing the M600 are qualified to perform periodic inspections and maintenance.

Failure to properly test and maintain your M600 could result in death or serious injury in the event of a fire. Contact Smoke Guard for information on the entity qualified to perform inspections and maintenance in your area.

Reference NFPA 105, Standard for Smoke Door Assemblies and Other Opening Protectives, 2016 Edition, Chapter 8, for operational safety checks.

2.0 – The Responsibilities of the Building Owner

The Smoke Guard Model 600 Smoke Curtain is considered “connected equipment” as defined in NFPA 105. As such, the owner or designated representative shall be responsible for ensuring that inspection, functional testing, and preventative maintenance are performed at least once every six months. The owner or designated representative is also responsible for maintaining records of period inspection and maintenance, as well as records of initial acceptance testing.

Only Smoke Guard factory recognized individuals are qualified to perform period inspections, testing, and maintenance. For information on factory recognized individuals in your area, please contact Smoke Guard for support.

Delegation of responsibility shall be in writing with a copy made available to the AHJ under the provisions of the building code and local ordinances.

Record Keeping

A permanent record of all inspections, testing, and maintenance must be kept up to date and include the name of the tester and date(s) of testing, modification, inspections, etc. More information on record keeping is available in Section 4.

Testing Frequency

Visual inspection, functional testing, and maintenance described in this manual must be performed and recorded at intervals in accordance with NFPA 105. The manufacturer recommends the building owner conduct tests at least every six months. Testing must be performed more frequently where required by the AHJ.

Caution should be taken to avoid over-cycling the M600 system. While Smoke Guard systems are designed and tested for a long service life, excessive cycling can accelerate wear and necessitate more frequent replacement of critical components.

Alterations and Additions

Alterations and additions include any changes to the M600 unit or the area surrounding the installation.

Visual inspection shall ensure that there are no changes that would affect equipment performance. These changes include but are not limited to:

- Building modifications
- Occupancy hazards
- Environmental effects

Any alterations or additions must be performed by Smoke Guard recognized personnel. Changes made by non-Smoke Guard recognized personnel voids the warranty and may prevent the unit from functioning properly in the event of an alarm.

System Acceptance Testing

Acceptance tests shall be performed after system components are added or removed following any modifications, repairs or adjustments to the system hardware or wiring.

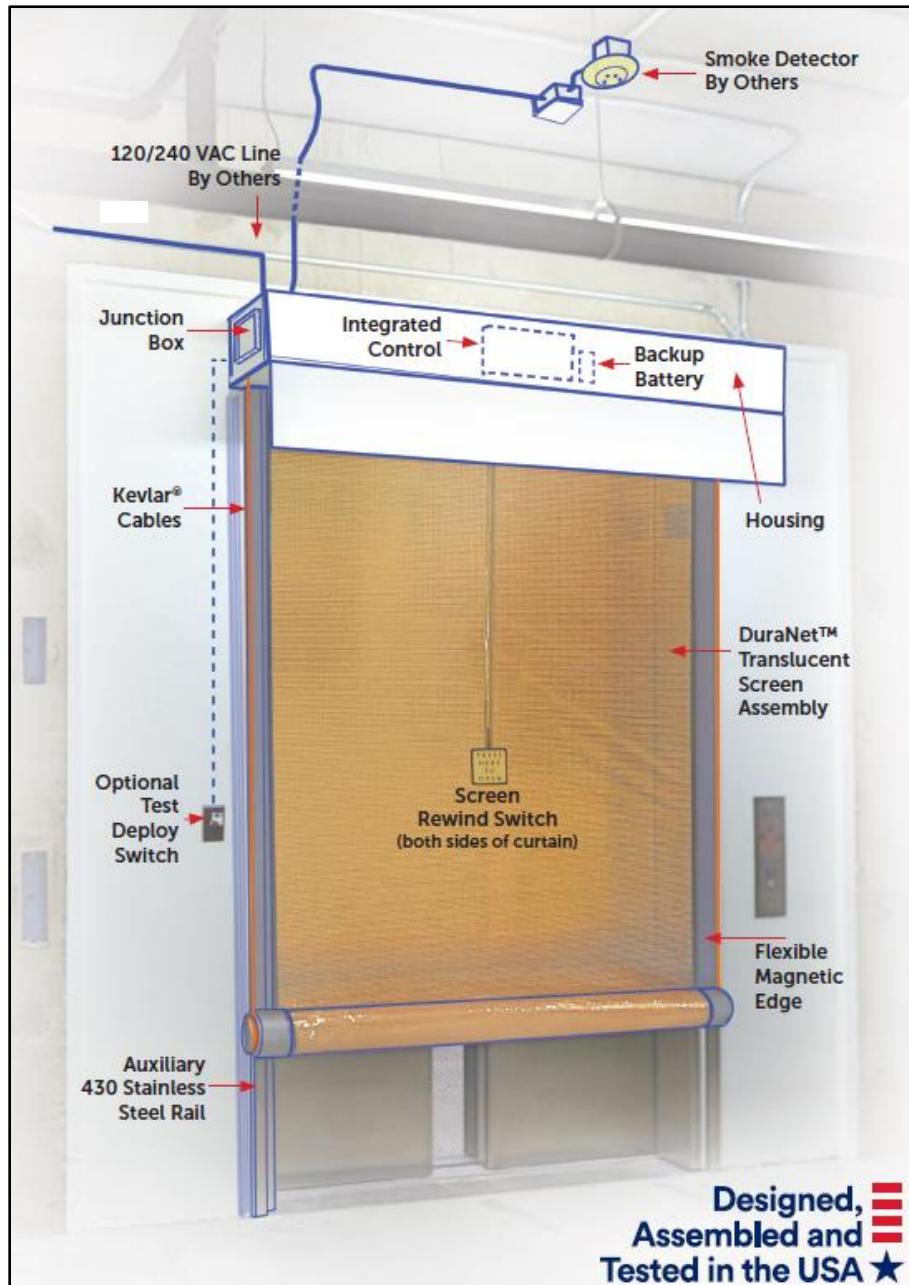
Painting

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

- Take care to avoid painting the housing door shut.
- Before painting auxiliary rails, you must strip any existing paint to bare metal. Use a paint that is resistant to 300 degrees Fahrenheit and coat to a maximum thickness of 0.005 inches.
- After painting any components your system must be completely retested to ensure no functional issues have been created.

3.0 – System Overview

The M600 Smoke Curtain is a motorized smoke protection system housed in the ceiling of a building. The system uses a DC motor to deploy a specialized curtain into a strategic location. When not in use, the M600 is retracted into a housing unit which maintains the aesthetic of the facility in which it is installed.



3.1 – Major Components

Smoke Detector: The local smoke detector is the recommended initiating device for the M600.

AC Line In: The M600 connects to the building 120 or 240 VAC for primary power.

Housing: The M600 housing contains the control, drivetrain, and screen assembly (when retracted).

Battery: The M600 is equipped with a 12V, 7 ampere hour battery that, when connected to power, is charged, and periodically load tested by the unit's controller.

DuraNet™ Screen Assembly: The transparent screen assembly forms the main smoke protection barrier from the elevator shaft and allows visibility from the car onto the landing

Kevlar® Cables: The cables connect the screen threshold pulleys to the drivetrain in the housing to allow the screen to retract and deploy.

Flexible Magnetic Edge: The magnets on either side of the screen assembly secure the screen to the auxiliary rails or elevator frame. These magnets also allow for push through manual egress if necessary.

Screen Rewind Switch: The Screen Rewind Switch (SRS) allows egress from either side of the screen. When pressed the screen will temporarily retract into the housing before redeploying.

Auxiliary Rail: Auxiliary rails provide a surface for the screen magnets to adhere to if the elevator frame is not used. They can also be used as stub rails to bridge the gap from the housing to the elevator frame.

Auxiliary Rail Backer: If auxiliary rails are used, the backer is attached to the mounting surface during install.

3.2 – Optional Components

The M600 may be shipped with the following optional components:

- Wall Activation Switch
- Obstruction sensor
- FSCS Compatibility

3.3 – How the M600 Works

Armed:

During normal operation, the M600 is retracted and concealed in the ceiling. The unit is connected to an auxiliary relay in the smoke detector located on or near the ceiling of the installation site.

Deployment:

In the event of a smoke alarm, the M600 deploys. The curtain is lowered from the ceiling until the assembly contacts the floor.

While deployed, the curtain can be temporarily retracted by pressing the Screen Rewind Switch. The curtain will stay retracted for a few seconds and then redeploy. When the alarm clears, the curtain will retract automatically.

Input / Output Signal Monitoring:

The Main Controller monitors the integrity of the various subsystems. If the Main Controller detects any anomalies during operation, the curtain deploys approximately six inches from the housing (partially opening the door), and LEDs on the outside of the Main Controller will display different error codes. The LEDs can indicate a range of problems, as well as normal operating status for the M600.

The various error codes and possible solutions can be found in *Section 7*. If you are unable to resolve the issue, contact Smoke Guard Inc. at: *1-800-574-0330*

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, enough battery remains to deploy and retract the curtain a approximately ten times.

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.

4.0 – Record Keeping

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

- Test date
- Name of person performing inspection, maintenance and/or tests
- Functional test of smoke detectors signaling the system per NFPA 105
- Location of the M600 unit
- Any modifications or alterations made to the M600 unit
- Name and signature of tester

Why keep records?

According to NFPA 105 (2016 edition), the building owner is responsible for retaining the maintenance and testing records for the life safety devices in their building. Records of periodic inspections and testing must be retained for a period of at least three years and be made available for examination upon request by the AHJ.

Failure to keep records is a violation of NFPA regulations and can result in litigation from AHJ.

Service Record chart

An official record keeping document will aid in staying up to date with systems maintenance and tracking Mandatory Semi-Annual Cycle Testing. A blank service record is available in the appendix.

The following is an example of a properly completed service record sheet:

Date	Location	Smoke Detector	Curtain	Modifications / Tasks	Inspector's Name	Inspector's Signature
3/7/2023	Main lobby	14	M600	6-Month Inspection	John Doe	<i>John Doe</i>

5.0 – What to do if the M600 Deploys

Normal Operation / Armed

The M600 should only deploy if the smoke detector or other initiating device signals an alarm.

If the unit is deployed, the SRS can be used to temporarily retract the screen. If the smoke detector or other initiating device is still signaling an alarm, the curtain will re-deploy automatically.

After the smoke detector or other initiating device clears, the curtain will retract automatically.

If a unit deploys during a fire, notify Smoke Guard at 1-800-574-0330 for a free service visit.

Possible Errors

If the unit fully deploys on its own, this may indicate that the system has completely lost power and the optional backup battery has fallen below a critical threshold, or the system has encountered a fault.

See troubleshooting in *Section 7* for more information on fault deployments.

6.0 – Testing

You should test the M600 periodically to ensure it is functioning properly. These instructions assume the installation of your M600 is complete and your installer has conducted initial system testing as well as calibration of your unit.

For guidance on testing frequency, see *Section 2.0* of this document.

Before testing, notify building occupants or anyone who may receive a fire alarm.

WARNING: Check for free movement of the housing door prior to attempting a test deploy. Finish work or other trades can potentially cause the door to get stuck closed, if the unit deploys with a stuck door there is the potential for system damage or injury to personnel.

Step 1 – Simulate an alarm by closing the alarm circuit.

NOTE: If the system is not connected to the building fire alarm system, apply a jumper across the end-of-line diode.

Step 2 – Verify the Curtain deploys and seals the full length of the floor.

6.1 – Test Keyed Switch

For installations that don't utilize the Keyed Test Switch, skip to the next section.

Step 1 – With the system fully retracted, test the Keyed Switch by setting the key to the Open Position.

- The Curtain should deploy normally.

Step 2 – Turn the key to the Closed Position.

- The Curtain should retract normally. Check for a green LED on the Controller to verify successful deployment.

6.2 – Test Screen Rewind Switches

Step 1 – Fully deploy the Curtain.

Step 2 – Press the Screen Rewind Switch.

- The Curtain should temporarily retract into the housing before lowering back to the floor.

Step 3 – Repeat step 2 until all attached switches have been evaluated.

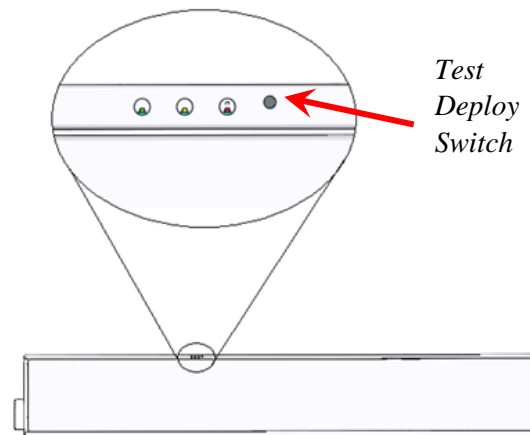
Step 4 – Retract the Curtain.

6.3 – Calibration

If the unit is functioning properly there is no need to recalibrate, however you may need to perform a calibration if there is an error present.

WARNING: Do not attempt to calibrate unless the curtain is fully deployed to the floor. Calibrating from another location may damage the system.

To recalibrate disconnect the batteries and power off the unit. Wait at least 5 seconds and then power on the unit. Within 4 seconds, press/hold the Test Deploy Switch until the curtain begins to move. The curtain will go up and hit the up-limit switch and then down to the ground to hit the down limit. A new calibration will be set, and the error will be cleared.



7.0 – Troubleshooting

7.1 – Spotting an error

If the M600 system encounters a problem, the system will enter an Error State which attempts to warn operators of a potential problem. This may occur if one of the system-monitored input/output signals sends an abnormal signal (such as over-current, obstructions, or circuit failure). In an Error State, the curtain deploys approximately six inches from the housing (partially opening the door), and LEDs on the outside of the Main Controller will display blink codes. See *Section 7.3*

NOTE: A jogger will be needed to move the curtain if the curtain is stuck and/or not responding to the Test Deploy Switch.

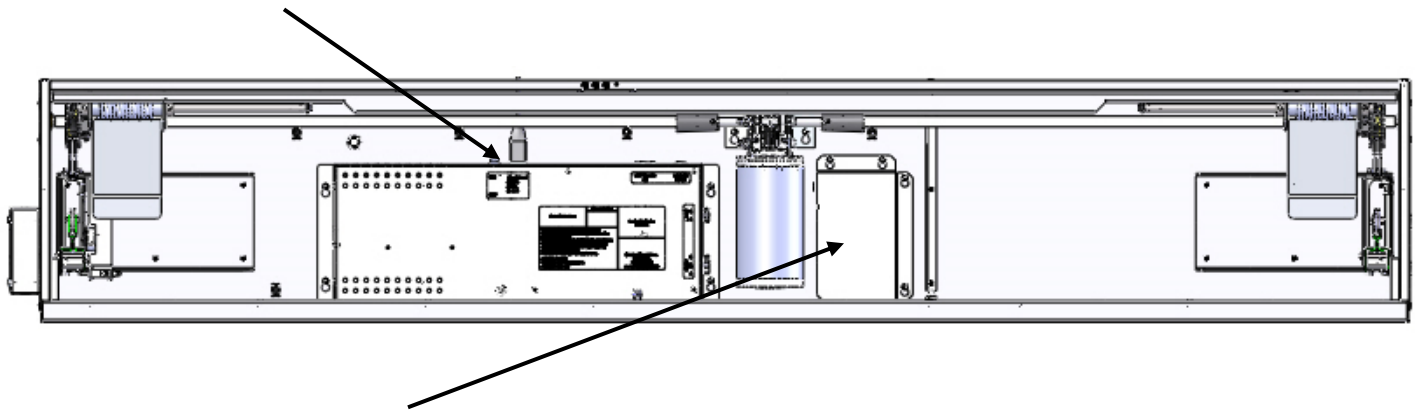
7.2 – Battery Inspection

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.

Inspecting the Battery:

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.

7.3 – Blink Codes

The table below explains the different indications and the error they correspond to. Once you identify the error, use the Solutions Guide to troubleshoot the problem.

State	Description	Green	Yellow (Fault code)	Red (Trouble)	Notes
Normal 1	System OK	ON	OFF	OFF	System fully functional.
Normal 2	Power on/ Self-test active	Blinking	Blinking	Blinking	Approximately 12 seconds to complete.
Normal 3	System in calibration	1-blink every 5 s.	1-blink every 5 s.	OFF	System in calibration
Normal 4	LAS active	ON	1-Blink every 5 s.	OFF	Normal operation with full deploy
Normal 5	FSCS close or open active	ON	2-Blink every 5 s.	OFF	Normal operation with deploy in accordance with FSCS request.
Normal 6	No AC, battery active	1-blink every 5 s.	off	1-blink every 5 s.	Low voltage power supply or main power off, running on battery
Error 1	Battery health low	OFF	1-Blink every 5 s.	ON	Battery or controller problem
Error 2	Obstruction or out of calibration	OFF	2-Blink every 5 s.	ON	If obstruction, then fault deploy
Error 3	LAS open circuit	OFF	3-Blink every 5 s.	ON	No EOL detected
Error 4	Moving up or down timeout	OFF	4-Blink every 5 s.	ON	Motor, controller, or limit switch problem
Error 5	Up-limit Switch short circuit	OFF	5-Blink every 5 s.	ON	Up limit switch stuck closed
Error 6	Up-limit Switch open circuit	OFF	6-Blink every 5 s.	ON	Up limit switch stuck open
Error 7	Motor over-current	OFF	7-Blink every 5 s.	ON	Motor stopped due to over-current

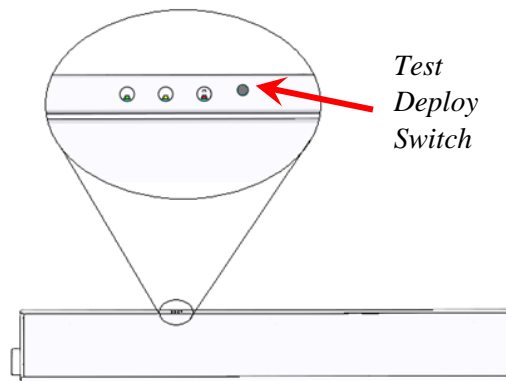
7.4 – Solution Guide

Normal 1 – 6:

System functioning normally If the LED lights indicate Normal 1 through Normal 6 then the system has not logged an error. A unique condition (e.g., active alarm or AC power off) may be present.

WARNING: If the unit continuously deploys, the preload on the door closer paddles may be too tight. Refer to Error 2's Figure.

NOTE: Press the Test Deploy Switch to clear any errors, the unit will deploy after the button is pressed.



Error 1 – Battery Health Low

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

Visually inspect the battery for corrosion or leakage and verify that all connections are secure. If necessary, clean the battery terminal and connections as described in NFPA 70B. The battery may need replaced.

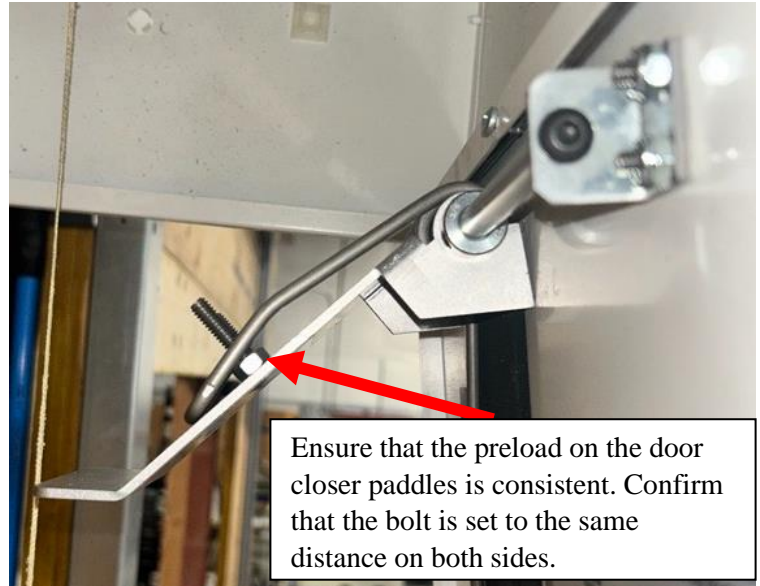
If Error 1 persists, contact Smoke Guard Technical Support.

Error 2 – Obstruction or out of calibration

This error can occur to various situations.

Check for any obstructions around the curtain that caused the error, press the Test Deploy Switch to clear the error. If there are no obstructions to the system, check the preload on the door closer paddles.

If the error persists, the unit may be out of calibration. To recalibrate disconnect the batteries and power off the unit. Wait at least 5 seconds and then power on the unit. Within 4 seconds, press/hold the Test Deploy Switch until the curtain begins to move. The curtain will go up and hit the up-limit switch and then down to the ground to hit the down limit. A new calibration will be set, and the error will be cleared.



If Error 2 persists, contact Smoke Guard Technical Support.

Error 3 – LAS Open Circuit

This error indicates that the LAS (Local Alarm System) circuit is compromised.

Ensure the alarm circuit is complete and the diode is correctly wired. Reference the wiring diagram in Appendix B. If you have verified that the circuit is correct and Error 3 persists, contact Smoke Guard Technical Support.

Error 4 – Moving Up or Down Timeout

This error occurs when the curtain moves further than expected.

Verify the unit has been calibrated. If not perform a calibration Using the instruction located in Error 2. Otherwise, the unit may not be triggering the up-limit switch. Check that the cables of the curtain are even. If Error 4 persists, contact Smoke Guard Technical Support.

Error 5 – Up-limit Switch Short Circuit

This error indicates an issue with the up-limit switch or the wiring between the switch and the control.

Check the following items:

- Ensure the tang of the switch is not jammed and is able to move freely.
- Verify that the wires are connected to the switch.

If Error 5 persists, contact Smoke Guard Technical Support.

Error 6 – Up-limit Switch Open Circuit

This error indicates an issue with the up-limit switch or the wiring between the switch and the control.

Check the following items:

- Ensure the tang of the switch is not jammed and is able to move freely.
- Verify that the wires are connected to the switch.

If Error 6 persists, contact Smoke Guard Technical Support.

Error 7 – Motor Over-Current

This error indicates that motor drew a higher-than-expected amount of current during a deploy or retract.

Check the following items:

- Tangled items on the axles or in the gearbox.
- Jammed door closer hardware.
- Look for snags on the full length of the cables and magnets.
- Ensure the curtain cables are even

If you have verified that there is no jam or blockage to the system and Error 7 persists, contact Smoke Guard Technical Support.

8.0 – Contact Smoke Guard

Smoke Guard can be reached for customer service, troubleshooting and general questions on any of your Smoke Guard products by phone, email, or standard mail. You can also contact Smoke Guard to learn more about upgrades to your Smoke Guard products as well as additional Smoke Guard products and services.

Physical address:

287 N. Maple Grove
Boise, ID 83704

Business hours are from 7:30am – 5:30pm, Monday – Thursday and 7:30am-2:00pm, Friday (Mountain Time).

Phone:

Customer service: 1-800-574-0330
Technical support: 1-800-215-6138

Fax:

1-208-639-7851

Email:

info@smokeguard.com

Website:

www.smokeguard.com

Revision History			
Revision	Date	Author	Notes
22	2/27/2024	J.Stevenson	Added troubleshooting notes and preload information

9.0 – Glossary

AC – Alternating Current, this refers to the primary power source of the M600.

AHJ – Authority Having Jurisdiction.

Battery – The M600 comes standard with a battery which provides emergency backup power in the event primary power is lost.

BOM – Bill of Materials, a detailed list of parts shipped with the unit.

Brake – Some versions of the M600 use an electromagnetic brake in the motors to stop the curtain.

Calibration – The process which captures the total travel distance of the curtain. The Controller uses this value to keep track of the curtain position.

Curtain – The sealing component of the M600 that adheres to the elevator frame or auxiliary rail to contain smoke. Used interchangeably with Screen.

EOL – End-of-Line diode, a component located at the smoke detector which maintains a circuit between the M600 and the smoke detector.

Housing – Refers to the metal components which house the M600.

Key Switch – The Key Switch is an option on the M600 that will allow the unit to deploy for testing purposes. The key is given to the building manager following installation of the unit.

LAS – Local Alarm System, refers to the building's alarm circuit which commands the M600 to deploy.

Layout Sheet – The Layout Sheets are a series of documents shipped with the M600 that show how the system is to be organized prior to installation.

LED – Light Emitting Diode, refers to the lights on the Controller which indicate the status and any errors in the unit. For more information on LED status and error codes, see Section 7.

Main Controller – The primary controller for the M600. The Main Controller houses status LEDs, the ON/OFF switch and backup battery.

NC – Normally Closed contacts of an electrical switch. Used as the initiating device for an M600.

NO – Normally Open contacts of an electrical switch. Used as the initiating device for an M600.

Screen – The sealing component of the M600 that adheres to the elevator frame or auxiliary rail to contain smoke. Used interchangeably with Curtain.

Smoke Guard – Idaho-based company which produces the M600 and other smoke & fire protection systems. Contact information is available in the appendix.

SRS – Screen Rewind Switch. Used to temporarily retract the screen during an alarm.

TDS – Test Deploy Switch, located on the Controller. Used to calibrate the system, deploy the curtain, and clear system faults.

Terminate – Point at which a wire begins or ends.

