

# U.S. SMOKE & FIRE PROTECTING THE PEOPLE®

SD60GS Elevator Smoke Containment Curtain Installation Manual

Intertek Compliance Research Report CCRR-0418 In compliance with ICC-AC77



Code Compliance Research Report CCRR-0418

## SD60GS ELEVATOR SMOKE CONTAINMENT SYSTEM

## Included:

Step by step instructions to install a U.S. Smoke & Fire SD60GS Elevator smoke containment system.
List of essential tools (not provided by US Smoke & Fire).
Identification of standard equipment needed from installer (not provided by US Smoke & Fire).
Best techniques and practices on how to install smoke curtains.
Reminder to use proper safety equipment

## Caution:

Though this hardware is fabricated to be strong and durable and to deploy in emergency situations, it can be damaged, particularly the smoke curtain fabric.

Please take great care not to accidentally cut or damage the fabric.

Damage to any of the hardware could cause the smoke curtain to malfunction.

Please handle equipment with care during transport and installation.

<u>Note:</u> Each smoke curtain differs depending on job/ model/ function. Slight differences in installation hardware and procedure do exist. For any questions, please call the US Smoke & Fire office at (888)917-8777.





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## Contents of Smoke Curtain Kit

When the equipment is received it is good practice to go thru the contents of the crate and verify all parts are intact and accounted for. The sooner it is realized something is damaged or missing the sooner it can be replaced. Beware not to hold up the project. Keep materials stored inside a building in a **clean and dry location**. \*Smoke Curtains and associated electronics are **NEVER** to be stored outdoors.





(2X)Flat Plates



(1)Tray Bracket



## (2X)Side Guide Shoes



## Sheet Metal Screws

(1X)Headbox

(2X)Side guides



(1)Bottom Bar w/ screws



Roller w/ Motor



Contents of Smoke Curtain Kit



(1)Built-in IMC(Independent Motor Controller)



## Contents of Smoke Curtain Kit



Built-in IMC(Independent Motor Controller) Connections

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- The layout is the most important part of an installation. Using a laser and attaining a benchmark from the project supervisor will assure you don't make the mistake of installing the headbox in the wrong location or at the wrong height. Even if the measurement is off by 1/4 inch it could lead to costly time losses and avoidable complications.
- One challenge may be finding the elevator threshold has not been poured with concrete. This is typical in new construction where the elevator installation has not been completed. This obviously will complicate installing the side guides which are to be anchored at floor level using provided u-shaped brackets. Collecting preliminary photos before sending an installation team is extremely beneficial. Work with the general contractor to see what could be done in order to have the finished floor ready at side guide locations.
- Be aware that the framers and drywall crews don't block you out, they want to rush and finish but this is part of the buildings life safety plan and is an essential part of the building structure.
- Strategize with the gc to avoid issues and be sure to meet and collect contact information with the supervisor of the electricians and framers for a seamless install.



## TERMS TO KNOW

**Drop Height-** The drop height is measured from the bottom of the head box to the finished floor level.

**Opening width-** This is measured from face of side guide to face of side guide, typically headbox length minus eight inches(four inches per side guide).

Headbox length- Total length of the headbox.

**Centerline-** An imaginary line measured from the top center of the headbox down the floor at the center of the elevator opening.

**Drop Line-** An imaginary line directly under the headbox opening where the curtain bottom bar will land once deployed. It is directly centered between the center face of the two side guides.





## **STEP ONE-**

Establish the ceiling height using a provided benchmark in order to plan the following steps of the installation. Plan for the wiring connection over top or on the side of the headbox depending on project site features. Depending on the mounting surface you will need to use the appropriate hardware.

Once the height is confirmed mark a center line on the wall at the drop height level based off of the elevator framing. Also make a mark on the center bottom of the headbox.

Drill out six holes depending on what hardware is being used 2" in from every corner and center of the headbox. Attach onto the wall using the appropriate hardware and check finished headbox installation level with a bubble level. Adjust as needed.

Depending on what structure you are attaching to you may need to use tapcon screws, 3/8'' sleeve anchors or  $2\frac{1}{2}''$  framing screws. Be sure the hardware can support the weight of the headbox and fabric roller. Six attachment points are required.



Depending on what surface you are mounting to mount the headbox 2" in from every corner and center using the appropriate mounting hardware; for instance, a 3/8" sleeve anchor or tap cons are used for concrete, Teks #14 x 2-1/2-in Socket Hex-Drive Sheet Metal Screws if attaching to framing, etc.

Use a laser lever or a bubble level to assure there is no tilting in any direction. Because this fail-safe system deploys with gravity, it is important the system be completely level.



Side guides generally align directly in front of the elevator frame, refer to your project plan. Use a laser to mark the side guide 2"x4" footprint location. Side guide openings at the bottom of the headbox should align with the elevator frame below if centered properly.

The bottom of the headbox will generally align to the ceiling, this will allow for easy access into the bottom of the headbox where the BMC (built-in motor controller) is housed.

Drop Height

Headbox Length

**Opening Width** 



#### **STEP TWO-**

Once the head box has been installed the electricians need to bring 120v and FAS wires into the top or side of the headbox thru separate connections. A three foot whip of each cable is to be left for installation.

Once power has been brought into the headbox the roller needs to be installed and locked into place making sure the fabric falls towards the wall and not towards the installer.

The motor and wire typically will be on the left-hand side of the headbox when installing. Be careful not to damage the wire during roller installation. Each end of the roller tube will have a hole thru its axle which will plug into a stud on the inside of the roller support brackets. Be sure the roller does not slide side to side once in position.

Small metal flat plates are provided that are screwed onto the support brackets using (2)10-32 half inch long stainless-steel screws each locking the roller into place.

Use ¼" wire straps to secure the wire within the headbox. This will avoid possible wire damage from the curtain tabs during deployment and retraction as well as prevent the wire from preventing proper deployment if snagged.



#### **Optional location**

**Optional location** 

Once the headbox is in place the 120v power and the FAS wires will need to be connected separately to the top center of the headbox by the others with **\*3 feet of** additional wiring left inside the headbox.

Depending on the site design, the wires may be brought in thru the sides of the headbox if needed. The final curtain installers will terminate all wiring into the independent motor controller(IMC) after confirmation that the electrician and fire alarm contractors' scope of work is complete, and power is verified off.



FAS

120V

Slide the roller into position between the roller brackets and align the axle holes on each end onto the roller bracket studs. Secure the provided flat plates into position using a #2 philips tip. Be sure motor wire is not damaged during install. Secure the motor wire to the inside of the headbox using a ¼ wire strap.



#### **STEP THREE-**

Small u-shaped components called shoes are to be attached to the floor using drop-in anchors or tap-con screws. Using a laser position the brackets directly under the side guide notch-outs under the headbox. Offset the holes on the bracket so they are not directly in the drop line which may prevent the bottom bar from contacting the floor and locking into place. If not properly set the side guides may not be level which may cause deployment issues.





**Elevator Landing Diagram** 

Clear Opening Landing/Threshold

Reveal- The outer most face of the elevator frame.

Call button

Elevator frame >

The smoke curtain side guides will be placed directly in front of the elevator frame up against the reveal. The side guides are 4" wide therefore will typically over-hang any elevator frame less than 4" wide. Trim kit sections will fill in the gap. Return- The measurement from reveal(outer face) to surrounding wall. The depth of the return will determine the size(depth) of the trim kit.





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As seen in this diagram the bottom bar will fall directly in the dropline going thru the center of the snug fit bracket. It is important any fastening hardware not be in the pathway of the bottom bar or it will not rest on the floor correctly.



#### **STEP FOUR-**

Trim kits are required for projects where the smoke curtain side guides sit in front of elevator frames which extrude out from a wall.

The purpose of the trim kit is to close the gap between the side guides and the wall above and around the elevator frame. Trim kits are only attached to the side guides and not to the wall.

Trim kits are specifically measured to the depth of the elevator return which is face of the elevator frame to the face of the wall.

The trim kit sections are attached to the side guides using the provided rivets. The trim kit includes l-shaped and optional j-shaped five-foot primed steel sections.

The I-shaped pieces will be used on the outsides of the side guides and fill the gap between the guides and the wall for the full drop height.

When the side guides are set back behind the elevator frame j-shaped pieces will fill in the gap above the elevator frame up to the bottom of the headbox.

These trim kit sections should be affixed onto the side guides starting from the floor level up until they reach the bottom of the headbox. The trim kit sections are not to go into the headbox. The side guides will be slightly longer as to lock into the headbox.



Trim kit sections are attached to the side guides using provided rivets which provide a sleek and clean look.

The drywall or mounting surface around and above the elevator frame needs to be level and consistent. Bump-outs or wall obstructions will push the side guides away from the wall and out of position from lining up to the headbox.

Once the side guides are installed, the project site and not the installer will be responsible to caulk and paint the smoke curtain equipment. It is good practice to warn the GC that thick paint inside the side guide channel can build up during function and ultimately prevent the bottom bar from deploying correctly.







The side guides each have a solenoid grab-strap system which will help position and retain the bottom bar onto the floor after each deployment.

- Each solenoid system is held into place with (2)10-32 half inch long screws thru the bottom back of each side guide.
- Each solenoid will have two 18AWG wires that will need to be extended by the installer and run up thru the empty channel within the side guide and into the headbox.
- The wires will be connected to the built-in motor control circuit board. Wires need to be strapped out of the way of the roller.
- Both sets of solenoid wires will be paired together and plugged into the MC-NEG and AUX-POS connections on the built-in motor controller.

\*Polarity is not important; the solenoid will function wired either way. It is important the wire is routed away from the guide shoe which can damage the wire if overlooked.



The bottom bar will come in two sections. The section closest to the elevator cab will hold two spring loaded swing arms at each end which are designed to extend under the solenoid grab-strap system inside the side guides. The other bottom bar section will hold the curtain in place using countersunk screws installed from the corridor side of the smoke curtain.

The swing arms will also have a 1/16" stainless steel cable connecting the arms together which will connect thru the release grab strap on the cab side of the smoke curtain.

Be sure to pull fabric tight when installing the bottom bar at finished floor level. Additional fabric can be cut off using a blade run underneath the bottom bar. \*Screw tips may need to be grinded down on the cab side of curtain.





Support bracket

Attach tray using machine screws from the **INSIDE** of the Headbox

The Built-in motor controller tray will be installed using two included machine screws holding the tray to the side of the headbox. The tray will have little support until the front cover and support bracket are installed. Once attached, the tray will bend hanging downwards but it will hold in place temporarily.

Side tab

Once the tray is in this position, run the motor cable, FAS and 120V wires in thru the oval opening on the left side of the tray. Wire strap the motor cable so it cannot snag on the curtain side tabs. Once the wires are pulled install the front cover on the headbox and affix with included machine screws. Be sure to also install the tray support bracket which holds the tray level by attaching to the headbox front cover as well. Attaching the pull strap to the steel cable is done once the installation is complete. The bottom bar needs to be installed at finished floor level and all electrical wires need to be terminated and powered on. The system can be tested and deploy the curtain by disconnecting the FAS signal from the motor controller. Once deployed, install the provided buckle to secure the pull strap to the stainless-steel release cable. Be sure to leave some slack on the pull strap to assure the bottom bar swing arms release into position.



## US Smoke and Fire Emergency Up Button(EUB) options:

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Side Guide Mounted Buttons 36" A.F.F.



Curtain Mounted Membrane Switch

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The "Push to Exit" membrane switch is affixed to the smoke curtain directly under the viewing panel and will be connected to the EUB terminal on the motor control board. The wires for the switch will run in thru the roller and out the non-motor side of the roller. The wires need to be affixed to the inside of the headbox and out of the way of the curtain side tabs or it can become an obstruction.

Stickers placed on both sides of the smoke curtain will indicate where the button is. The membrane switch will raise the curtain for a set period and re-deploy the system once that time has passed. This time is controlled by the builtin motor controller and can be adjusted by the installer.



Viewing panel

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A 20AWG wire will transmit the membrane switch signal to the motor controller when the button is pressed. The default time will be set for 15 sec. though it can be adjusted if needed. The curtain needs to remain rolled up and not wrinkled during the installation process or the connection to the membrane switch may be damaged.



Push buttons require 16mm holes drilled 36" above finished floor level on the left side guide on both sides of the side guide channel. These may be factory pre-installed with a wire whip extruding from the top of the guide.

The push button (18-20 AWG) wires will travel up thru the empty channels within the side guide into the headbox. Once in the headbox the push button wires will be connected and plugged into the EUB connection on the motor controller. Strap the wires inside the headbox to prevent any obstruction.



## **PUSH BUTTONS**



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In parallel wiring each of the two sets of wires will be connected together near the tray using wire nuts. Connect the wires to the EUB connector on the motor controller.

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#### **STEP FIVE-SETTING SIDE GUIDES**

Depending on whether you have push buttons installed in the side guide or a membrane switch on the curtain fabric you will need to be sure when running the wires inside the box that you strap them out of the way of the curtain and the curtain side tabs.

Retract the curtain using building power or use battery power(12-24v).

Set your side guides first gently on the shoes and be sure not to damage any wires at the bottom of the guide. Once both guides are in place slide the bottom bar into place before setting the side guides into the headbox notches. Do not go any more than 3/4 inch into the headbox or it may cause an obstruction.





## AC Mains

The AC power cable should enter the headbox and be secured with a UL recognized cable clamp. The wires need to be strapped safely to the inside walls of the headbox away from the curtain side tabs. The wires will come down thru the left side of the builtin motor control tray beside the terminal block. NOTE: AC mains wiring is CLASS 1 and must not share conduit or clamps with lowpower signal wiring.

A qualified electrician should land AC power to the fused terminal block (see photo at right). Connect the hot/line wire (black) to the left screw terminal (nearest the fuse). Connect the neutral wire (white) to the right screw terminal nearest the chassis. Safety ground (green or bare wire) must be connected to a ground lug or affixed to the headbox. Wire pass thru



Fuse



## Alarm Interface

The IMC must be connected to an alarm source such as a building's fire alarm system or a local smoke detector with normally-closed dry-contact relay output.

The alarm must be connected using 18AWG wire to the ALM terminal block. The terminals are not polarized and should be connected to a dry-contact normally-closed relay.





## EUB Option

The IMC may also be connected to a normally-open SPST momentary switch (Emergency Up Button or EUB) to provide an option for emergency egress after the curtain has been lowered. The EUB should be UL recognized and anti-vandal type. The EUB is only enabled when the curtain is deployed. When the EUB is pressed, the IMC will raise the curtain and keep it raised for a configurable period after the button has been released. This allows emergency egress during a fire condition without the need to lift the curtain manually.





Red and Black wires pre-wired power wiring coming from power source.

## Solenoid grab-strap system wiring

The two sets of solenoid wires coming from each side guide should be wired in parallel and connected to the AUX\_POS and MC\_NEG screw terminals using 14AWG wire. The wires are not polarized





\*Batteries for Control Panel and Independent Motor Controller are optional.

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		Engineer:	Rob Cole ****
Company:	U.S. Smoke and Fire	Engineer:	Yuriy Kharakh <sup>YK</sup>
		Engineer:	Rushikesh Yeole RY
Project #:	G103849570	Reviewer:	Sergey Koltovskiy S.X
Product Name:	Curtain Releasing Controller System	Sample Condition	Prototype
Model:	CP, MC, IMC	Sample ID:	NYM1912191131-001 - NYM1912191131-011, NYM1912191423-001 - NYM1912191423-005
Standard:	Control Units And Accessories For Fire Alarm Systems [UL 864:2014 Ed.10 +R:29Mar2018]; Control Units For Fire Alarm Systems [ULC S527:2011 Ed.3 + Amendment 1].		

**Releasing Device – Power Supplies** 

UL 864 Section 52

**Test Results: Pass** 

#### Test Parameters / Observations and Conclusions:

52.1 A visual 'power on" indication (visible after the product is installed) is to be present on products employing an operator interface. A unique character presentation on a display device meets the intent of this requirement.

52.2 A product intended only as a releasing device is not required to provide a secondary power source, when the product actuates the intended releasing operation for each of the following conditions:

a) Total instantaneous loss of primary power;

b) Degradation of primary power to 85% of rated voltage.



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#### COMMISIONING

Commissioning is done with permanent power and a fully programmed fire alarm system. Test the curtain before commissioning by pulling the FAS connector from the IMC at inside the headbox. This will simulate a FAS signal and deploy the curtain. Once this has been tested reinstall the FAS connector and attach the bottom cover onto the headbox.

