



SYSTEM OVERVIEW

VERTICAL DEFENDER FIRE CURTAIN



Fire Curtains allow building designers to develop wide open architectural spaces whilst maintaining compliance as an Alternate Solution to the DtS requirements of the NCC [1]

They are a reliable means of protecting openings and creating fire compartments using latest technology vertically descending barriers. Fire Curtains provide a more compact and light-weight solution compared to a Metal Fire Shutter and are capable of multiple deployment function for incorporation into Fire Engineering analysis for escape routes and occupant safety.

The Defender Vertical Fire Curtain achieves this based on excellent radiation attenuation data that allows consistent Fire Engineering analysis to produce an alternate solution for DtS -/120/30 performance up to -/240/30.

The Vertical Defender Fire Curtain is an uninsulated fire barrier that vertically protects openings in fire rated walls or can be used to completely replace non-load bearing fire rated walls. The curtain fabric is made of stainless steel reinforced glass fiber, which provides excellent resistance to the spread of smoke & fire in accordance with AS1530.4:2014 & AS1530.7:2007.

MAXIMUM WIDTH: 36 Metres

MAXIMUM HEIGHT: 12 Metres

FIRE RATING: Up to -/240/-

KEY SYSTEM PERFORMANCES:

- Fire performance Tested/Assessed to AS1530.4:2014 for up to 240-minutes [FRL-/240/-] Smoke leakage performance in accordance with AS1530.7- 2007
- EW60 performance to EN 1634-1 from distance 1.0m.
- Insulating Zone Data: Air temperature shall not exceed 180°C [average] at a distance of 120mm from curtain non-fire face for a period up to 60-minutes.
- Radiant Heat Flux measurement of 8.8kW/m² from a distance of 250mm from curtain non-fire face for a period up to 39-minutes.
- Calculable Occupant Escape Speed 1.0m/sec from distance 1.25m for 46-minutes.
- Calculable Occupant Escape Speed 1.4m/sec from distance 365mm for 39-minutes.
- Curtain closing speed between 10.2m to 12.0m per minute.
- Battery back up as a standard feature.

Insulating Zone Data

Time	Distance	T/C	Time	Distance	T/C
Mins	From Specimen	Number	Mins	From Specimen	Number
	mm	Deg. C		mm	Deg. C
0	50	9	140	125	210
10	50	125	150	125	205
20	50	185	160	125	228
30	95	169	170	125	221
40	155	178	180	125	226
50	80	176	190	125	225
60	120	174	200	125	226
70	120	185	210	125	232
80	90	186	220	125	238
90	90	191	230	125	241
100	90	189	240	125	242
110	90	195	250	125	237
120	90	199	252	125	249
130	90	205			

Reference Standards:

- BS EN 1634-1:2014 [assessed to AS1530.4:2014] Fire (Single Barrel Arrangement) resistance & smoke control tests for door, shutter and operable window assemblies and elements of building hardware. Fire resistance tests for doors, shutters and operable windows.
- BS EN 1634-1:2014 [assessed to AS1530.4:2014] Fire (Multiple Barrel Arrangement) resistance & smoke control tests for door, shutter and operable window assemblies and elements of building hardware. Fire resistance tests for doors, shutters and operable windows.
- BS EN 1634-3:2004 [assessed to AS1530.4:2014] Fire resistance & smoke control tests for door and shutter assemblies, operable windows and elements of building hardware. Smoke control test for door and shutter assemblies.
- BS 5234-2:1992 (Method of Test as set out within BS 8524-1:2013) Double Severe Duty Impact Test
- BSEN 1363-1:2012 Fire resistance tests. Part 1: General requirements [assessed to AS1530.4:2014]
- BSEN 1363-2:1999 Fire resistance tests. Part 2: Alternative & additional procedures. [assessed to AS1530.4:2014]
- BS476-6:1989+A1:2009 Fire tests on building materials and structures. Method of test for fire propagation for products. [assessed to AS1530.4:2014]
- BS476-7:1997 Fire tests on building materials and structures. Method of test to determine the classification of the surface spread of flame of products. [assessed to AS1530.4:2014]
- BSEN 14600:2005 Door sets & operable windows with fire resisting and / or smoke control characteristics. Requirements & classification. Cold formed welded structural sections of non-al-loy and fine grain steels.
- BSEN ISO 9001:2015 Quality management system
- UL 10D Fire protective curtains classification (For single and multiple roller arrangements).
- UL 10D S Fire protective curtains classification, smoke designation (For single and multiple roller arrangements).
- UL1784:2009 Air leakage tests of door assemblies.
- GB14102 Integrity Test of a Fire Curtain Assembly
- AS1530.4 – Methods for fire tests on building materials, components and structures, Part 4 Fire- resistance test of elements of construction.
- AS1905.2 – Fire Shutters
- AS3837– Method of test for heat and smoke release rates for materials and products using an oxygen consumption calorimeter AS6905.1 – Smoke Doors
- AS1530.7 – Methods for fire tests on building materials, components and structures. Part 7 – Smoke control assemblies –ambient and medium temperature leakage test procedure.
- UL10D – Fire tests of fire protective curtain assemblies
- BS476.22 – Fire tests on building materials and structures. Method for determination of the fire resistance of non-loadbearing elements of construction
- UL1784 – Standard for Air Leakage Tests of Door Assemblies
- EN13501.2 – Fire classification of construction products and building elements, Part 2 Classification using data from fire resistance tests, excluding ventilation services AS1670 automatic detection and alarm systems.

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System Overview

VERTICAL DEFENDER FIRE CURTAIN [-/120/-]

Document Number: E120FC-2020/01

SYSTEM OVERVIEW

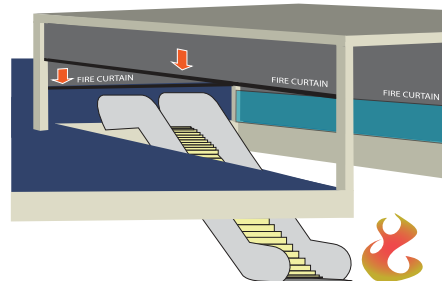
VERTICAL DEFENDER FIRE CURTAIN



APPLICATIONS

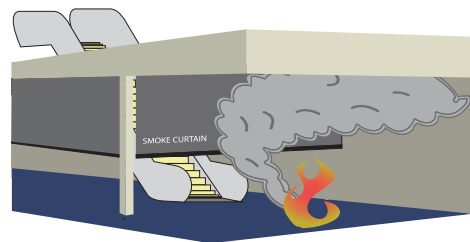
1. VOID EDGE SEPARATION

Escalators and stairs create gaps between floors. These gaps are critical points that need to be sealed off in the event of a fire to stop the spread of fire and smoke from lower to upper levels. By deploying on the upper level, fire curtains create a physical barrier against fire.



2. SMOKE RESERVOIRS

Escalators and stairs create gaps between floor compartments that need to be sealed off in the event of a fire to stop the spread of fire from lower to upper levels.



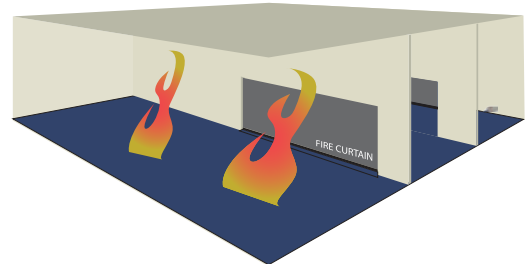
3. LIFT LOBBY & ELEVATOR SEPARATION

Elevator shafts are easy conduits for the spread of fire and smoke which can engulf an entire building in minutes. Elevator doors might be fire rated but cannot create a seal against the passage of smoke. Fire curtains with a smoke seal replace smoke stop lobbies in front of the elevator doors. While virtually invisible when retracted above the elevator frame, they create a seal that greatly reduces smoke leakage through elevator shafts and elevator doors.



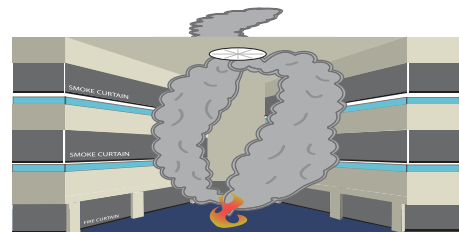
4. FIRE COMPARTMENTALIZATION

To prevent spread of fire from one zone to another, fire curtains are a vital element of a fire compartmentalization strategy. On deployment, they create a physical barrier against the spread of fire and control the spread of fire through a building.



5. FIRE & SMOKE STRATEGY

Automatic Fire and Smoke Curtains are indispensable to a successful building fire strategy. Atria create large open spaces that can be quickly engulfed in fire and smoke as it spreads from lower to upper levels. Spread of fire can be limited by fire curtains and smoke curtains can channel smoke to chimneys or extraction fans.



SYSTEM OVERVIEW

VERTICAL DEFENDER FIRE CURTAIN



SINGLE ROLLER ASSEMBLY

1. HEADBOX

The steel headbox houses the roller, fabric and motor within the casing creating a small compact package that remains virtually invisible above the ceiling.

2. ROLLER AND TUBULAR MOTOR

A tubular motor drives a steel roller tube to retract and deploy the fabric from normal position in the headbox to its operational position.

3. GUIDE RAIL

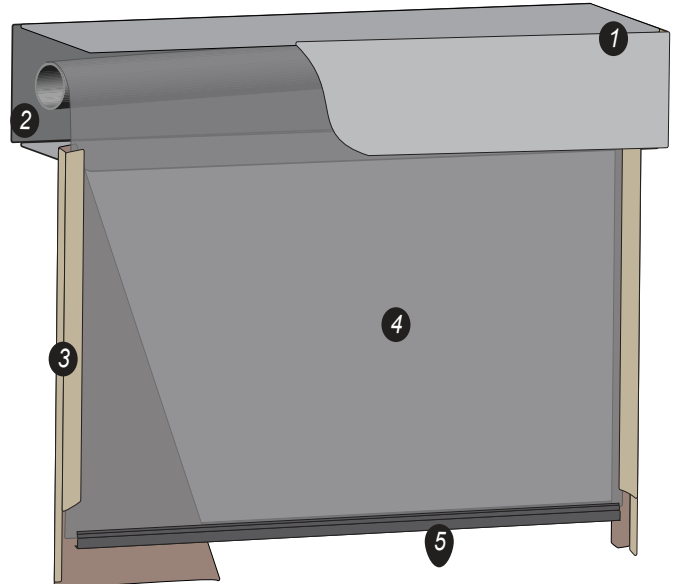
During deployment, slim steel side guides prevent derailment of the fabric during operation ensuring integrity of the system when faced by positive or negative pressures of a real fire.

4. FABRIC CURTAIN

Woven fiberglass wire reinforced fabric with individual panels stitched and hemmed using stainless steel thread.

5. STEEL BOTTOM BAR

The profile bottom bar provides weight and stability to the system ensuring a gravity fail safe deployment.



SINGLE ROLLER ASSEMBLY

Smaller widths can be spanned by a single roller assembly.

MULTIPLE ROLLER ASSEMBLY

6. OVER-UNDER ROLLER ARRANGEMENT

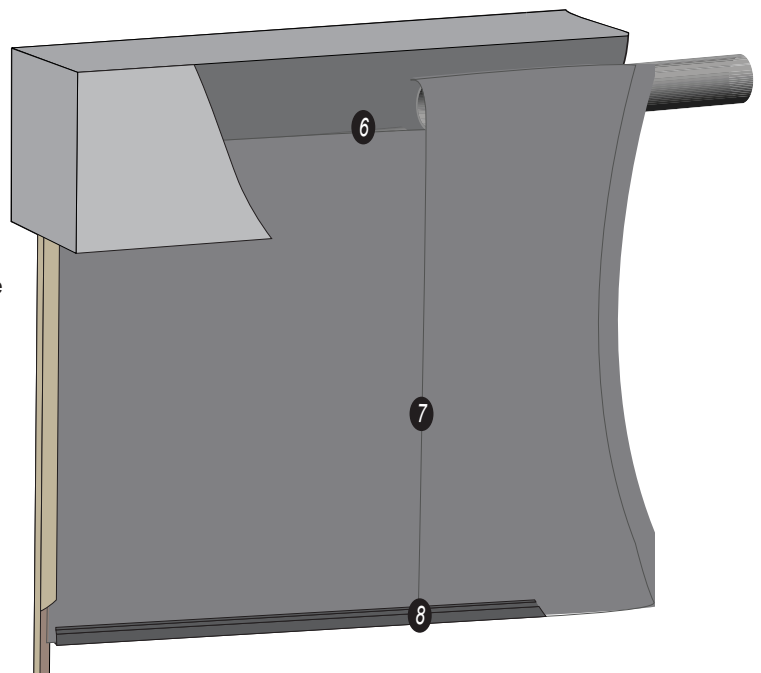
An over-under or side by side arrangement of the barrels (to suit the project requirements) allows multiple rollers to be enclosed in a single compact headbox.

7. FABRIC OVERLAP

Multiple rollers utilize the use of a 500mm overlap arrangement which removes the need for intermediate side guides and minimizes the potential for roller bounce.

8. CONJOINED BOTTOM BAR

A conjoined bottom bar runs the entire width of the curtain.



MULTIPLE ROLLER ASSEMBLY

To achieve a virtually unlimited width without the need for intermediate guide rails, multiple rollers are arranged in an 'over-under' (as illustrated) or side by side arrangement and neatly encased within the headbox.

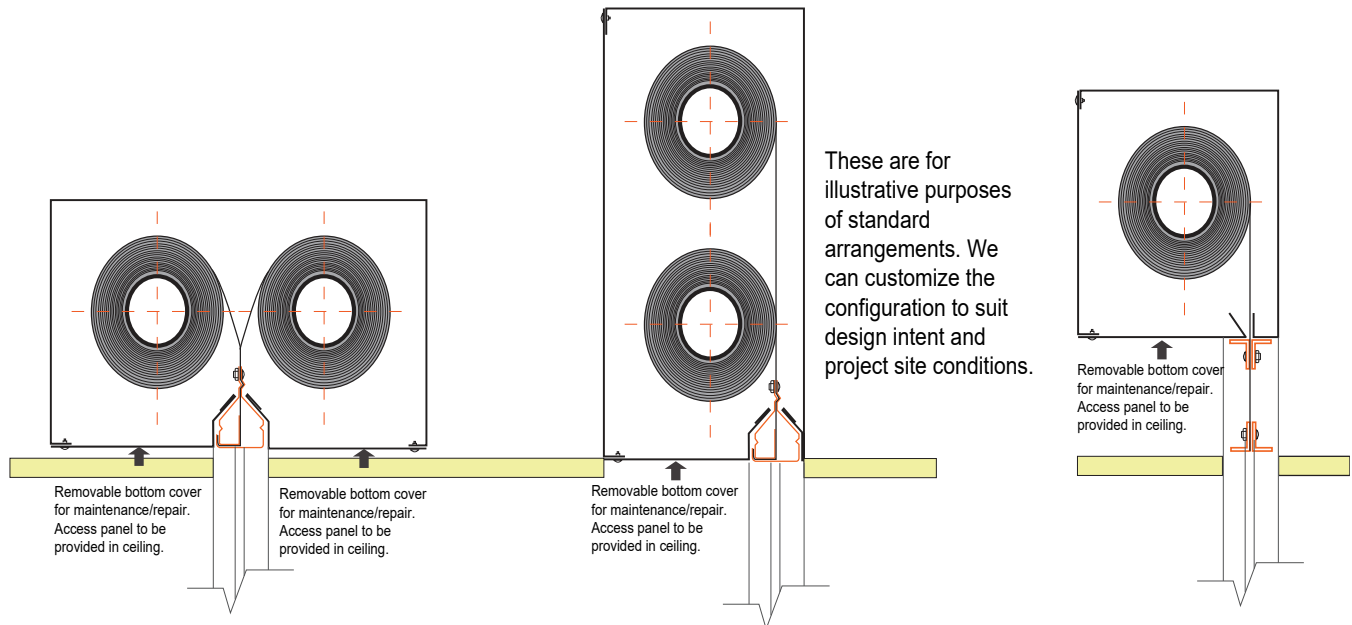
SYSTEM OVERVIEW

VERTICAL DEFENDER FIRE CURTAIN



HEADBOX

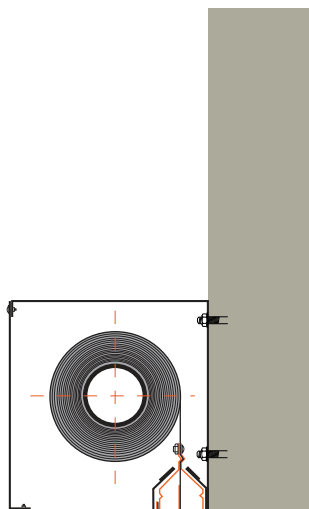
Headbox Arrangement and Ceiling Interface



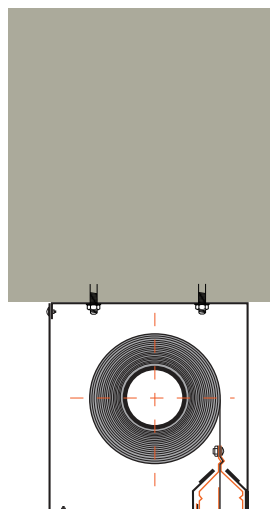
MULTIPLE ROLLER ASSEMBLIES SHOWING OVER-UNDER AND SIDE BY SIDE ARRANGEMENT WITH BOTTOM BAR FLUSH WITH UNDERSIDE OF HEADBOX

SINGLE ROLLER ASSEMBLY WITH ALTERNATE BOTTOM BAR DROPPED TO CEILING

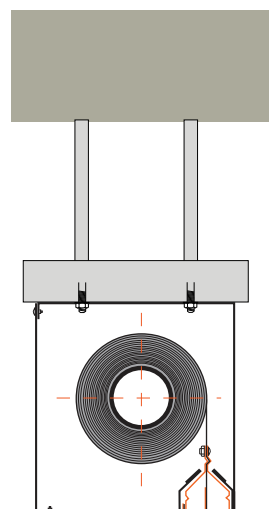
Headbox Fixing



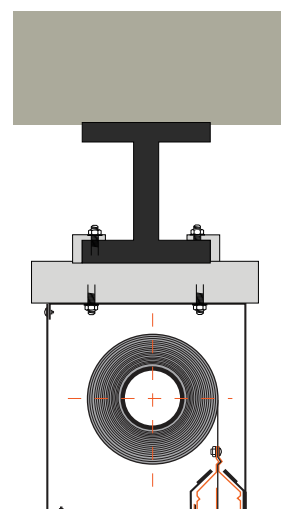
FACE FIXED
Fixed directly to the lintel above an opening.



SOFFIT FIXED
Fixed directly to the underside of the soffit slab.



SOFFIT SUSPENDED
Suspended from soffit via unistruts and drop rods



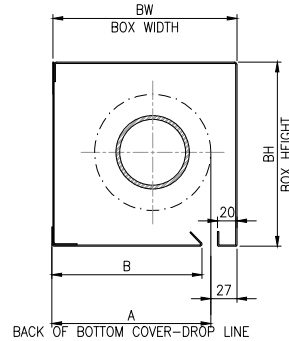
I-BEAM Clamped to a steel beam

SYSTEM OVERVIEW

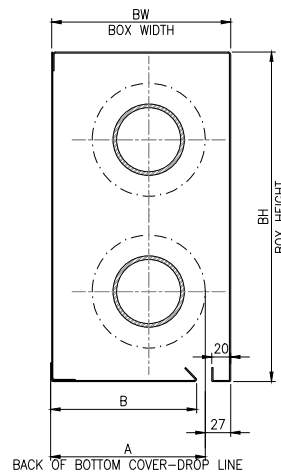
VERTICAL DEFENDER FIRE CURTAIN



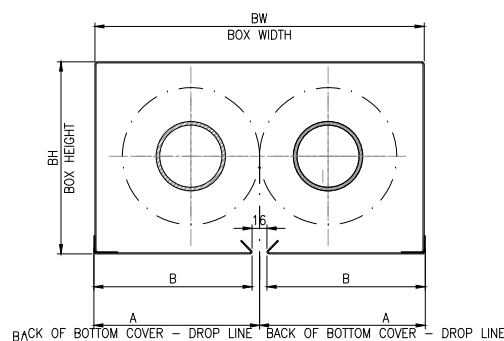
HEADBOX SIZING



CURTAIN DROP	SINGLE ROLLER BOX - TYPE 1			
	WIDTH(BW)	HEIGHT(BH)	A	B
UPTO 3m	190mm	190mm	163mm	155mm
3m TO 7m	210mm	210mm	183mm	175mm
7m TO 12m	280mm	280mm	253mm	245mm



CURTAIN DROP	MULTIPLE ROLLER BOX - TYPE 2			
	WIDTH(BW)	HEIGHT(BH)	A	B
UPTO 3m	190mm	350mm	163mm	155mm
3m TO 7m	210mm	390mm	183mm	175mm
5m TO 10m	280mm	500mm	253mm	245mm



CURTAIN DROP	MULTIPLE ROLLER BOX - TYPE3			
	WIDTH(BW)	HEIGHT(BH)	A	B
UPTO 3m	320mm	190mm	160mm	153mm
3m TO 7m	370mm	210mm	185mm	178mm
7m TO 12m	480mm	280mm	240mm	233mm

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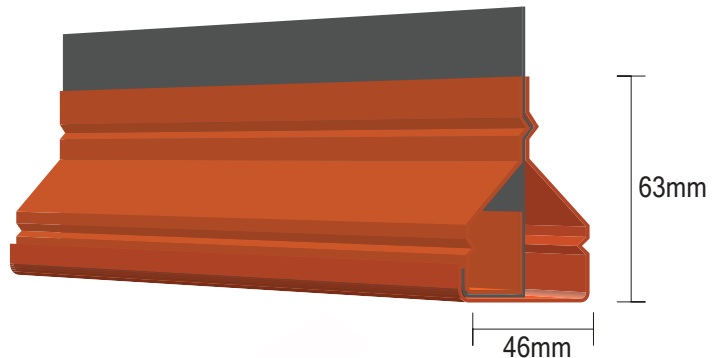
VERTICAL DEFENDER FIRE CURTAIN



BOTTOM BAR

The bottom bar profile is designed to provide the necessary weight to draw the curtain down during a **gravity safe deployment** and to stabilize the curtain during descent.

Rolled from galvanized steel, with a powdercoated finish.

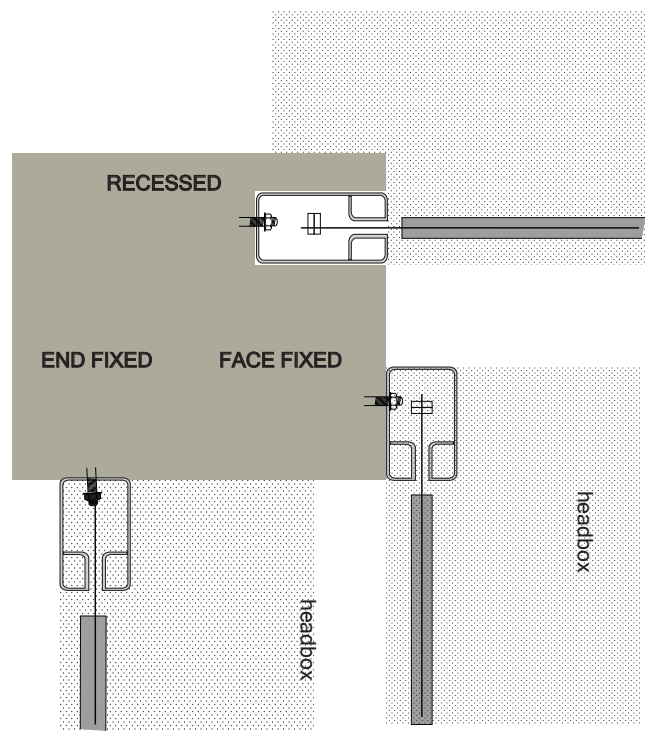
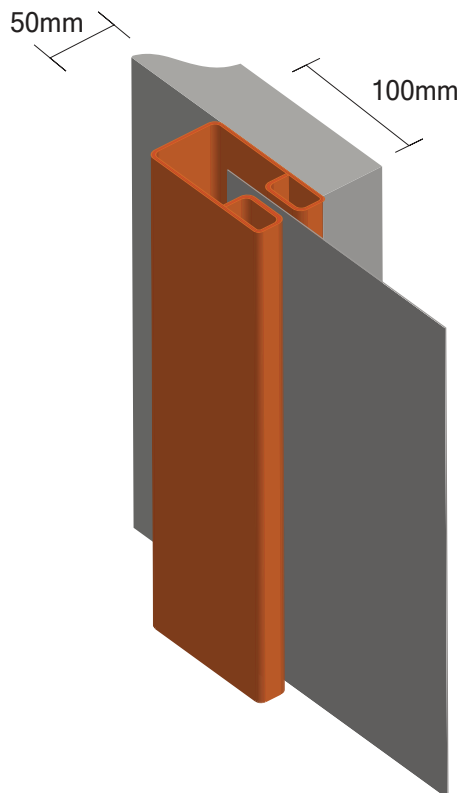


SIDE GUIDES

The steel side guides can be powdercoated to blend in with the surround wall.

The guides help the curtain withstand positive and negative pressures. The stitched fabric inserted into the guide rail is provided with retainer tabs for added strength.

Designed to be slim and as unobtrusive, the side guides can be fixed to the building structure in 3 ways as shown on previous page. Our side guides are provided with capped holes that allow for bolting the guides to the wall without the need for visible fixing angles, further reducing the guide footprint.



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CONTROL SYSTEMS

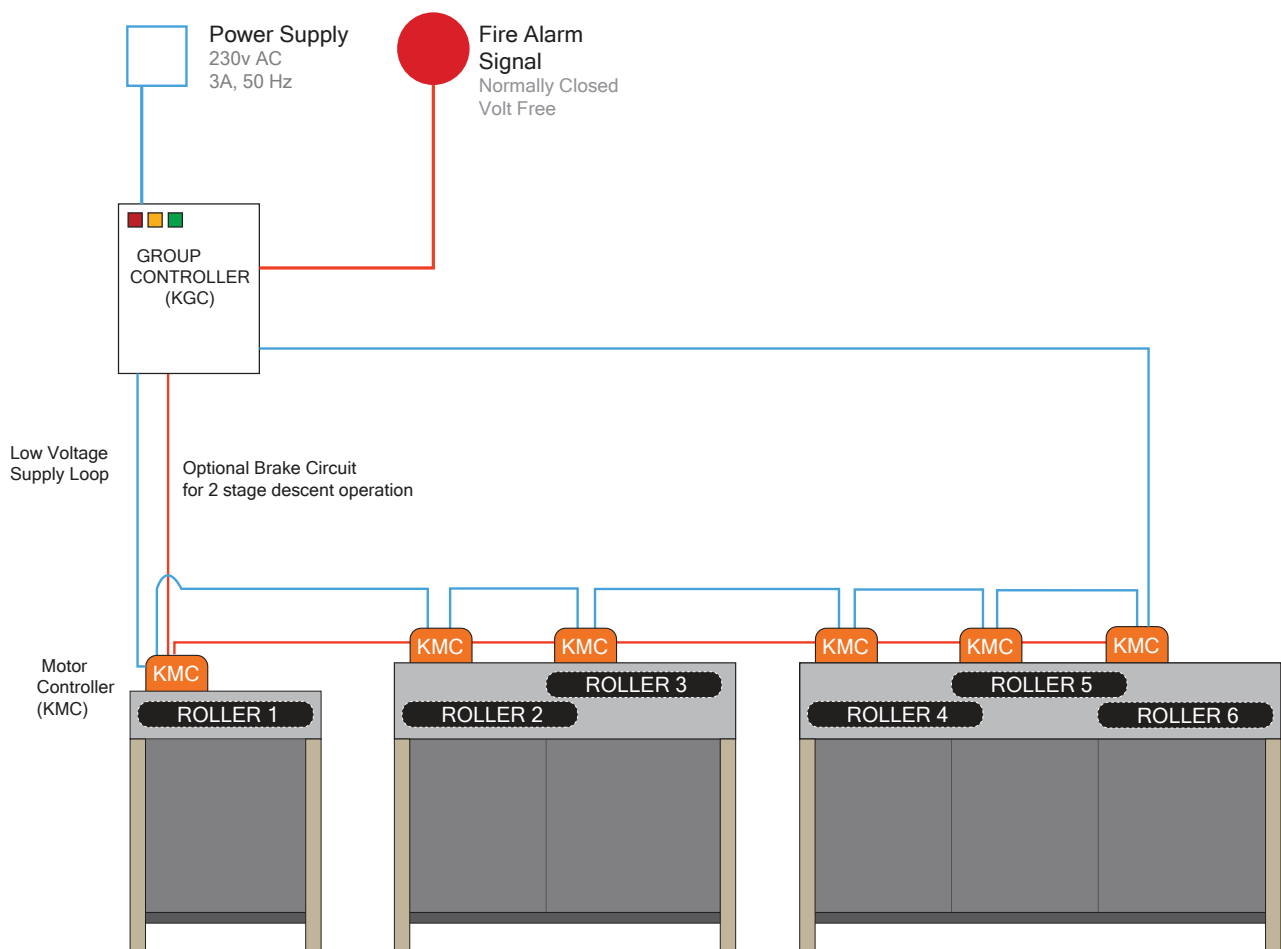
OPERATION IN A FIRE SCENARIO (FIRE ALARM SIGNAL RECEIVED)

The Group Controller (KGC) is powered by a 230v AC, 3 Amp 50 Hz power supply. A pair of normally-closed, volt-free fire alarm contacts supplies the fire alarm signal when commanded by the Building Management System. In its stored position within the headbox, the curtains remains retracted and held in place by a low voltage supply (24v DC) to the curtain motors. Upon receipt of a fire alarm signal, the supply to the motor controller is removed, which releases the curtains. Using Kent's Guaranteed Gravity Fail Safe System, the curtains deploy to the operational position at a controlled rate under the force of gravity. No power source is required for curtain deployment.

OPERATION IN CASE OF LOSS OF POWER (NON-FIRE SCENARIO)

In the event of a mains power failure, each KGC is supplied with a battery back-up system providing up to a minimum of 60 minutes of power to the curtain motors. This prevents unintentional deployment of the curtain in a non-emergency situation. Upon exhausting the battery back-up, the curtain will descend safely under gravity.

CURTAIN TESTING



One KGC has the ability to control a maximum of 6 no.x 20 Watt motor. If the number of motore exceeds 6, KGC's can be linked together. This avoids the need for each KGC to be supplied with its own fire alarm signal. This set up also ensures synchronous descent of multiple curtains. Should a 2 stage descent is required, a brake is added to the motor which is energised by an additional brake cable shown in the schematic.

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Fire Curtain [fabric] Vs Fire Shutter [metal]



ABOVE: FIRE CURTAIN



ABOVE: FIRE SHUTTER

	Fire Curtain	Fire Shutter
Overall Appearance	Clean, neat lines and architecturally pleasing.	Industrial in appearance and function.
Head Box	Slim line head box 190mm x 190mm and easily hidden from sight.	Motor & gear box overlaid with large & unsightly 800mm x 600mm metal box [required for fire rating but often not installed]
Side Guides.	Architecturally designed, compact detail with hidden fixings.	Industrially designed, chunky detail with visible fixings.
Bottom bar	Architecturally designed, compact detail. Flat bar option for seamless closing onto ceiling.	Industrially designed, chunky detail.
Weight	70% lighter than metal shutters, requiring no structural engineering and allowing light weight opening structure. Require no heavy lifting equipment and easily moved around site.	Extremely heavy units weighing anything from 800kg to 2000kg. Require a structural engineer to design the opening. Require heavy lifting equipment and a serious SWMS for moving around site and during installation.
Descent	Smooth motorised descent supported by battery backup. Light weight curtain represents minimal safety hazard if closing onto occupants below.	Free fall gravity descent aided by speed control governors. The sheer weight of the shutter will often not allow a controlled & safe descent. Represents significant safety hazard if closing onto occupants below.
Fire Engineering	Test data allows consistent fire engineering as an Alternate Solution to DtS compliance with NCC [1] insulation requirements without the use of sprinklers.	Require drenching sprinklers to achieve insulation performance. Without sprinklers the metal curtain is just a large heater in a fire event.
Actuation and Operation Systems	Technologically superior allowing programming of multiple deployment & retraction settings that are critical in the design of complex egress pathways.	Simple motor & gear box assembly allows no programming for complex performance.
Power Requirements	Simple plug & play into 240v gpo.	Usually require 3-phase 415v direct wiring.
Smoke Containment	Fire curtains are [air] leakage tested and comply with AS1530.7: 2006 for smoke containment.	Metal fire shutters do not provide smoke leakage data due to their general construction.

Fire curtains: Safe, lightweight, attractive with high performance