White Paper
A Guide to the fire safety regulations relating to fenestration products.

Building Regulations **Document B**

Fire Safety
August 2006

Smart Systems Ltd

smart
SYSTEMS

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INTRODUCTION

Building Regulations Document B covers the Fire Regulations, and BS EN 1125 covers the standards for panic hardware. This document summarises the areas in these documents of relevance to the fenestration industry.

The provision for escape for residential properties is introduced with the requirements for egress (escape) windows dimensions and locations. Escape provision for commercial buildings is a very broad topic largely covering internal layouts escape route and signage, which is beyond the scope of this paper.

The Smart Systems egress friction stay is shown and the relevant deductions to achieve the statuary legal requirements for fire escape.

The categorisation systems for performance characteristics in BS EN 1125 is explained and examples are given for Smarts Systems panic hardware.

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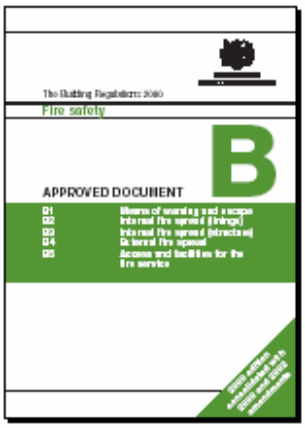
Building Regulations

Approved document B Fire Safety



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Means of escape from fire

All habitable rooms in dwellings, except for kitchens, must have at least one means of escape.

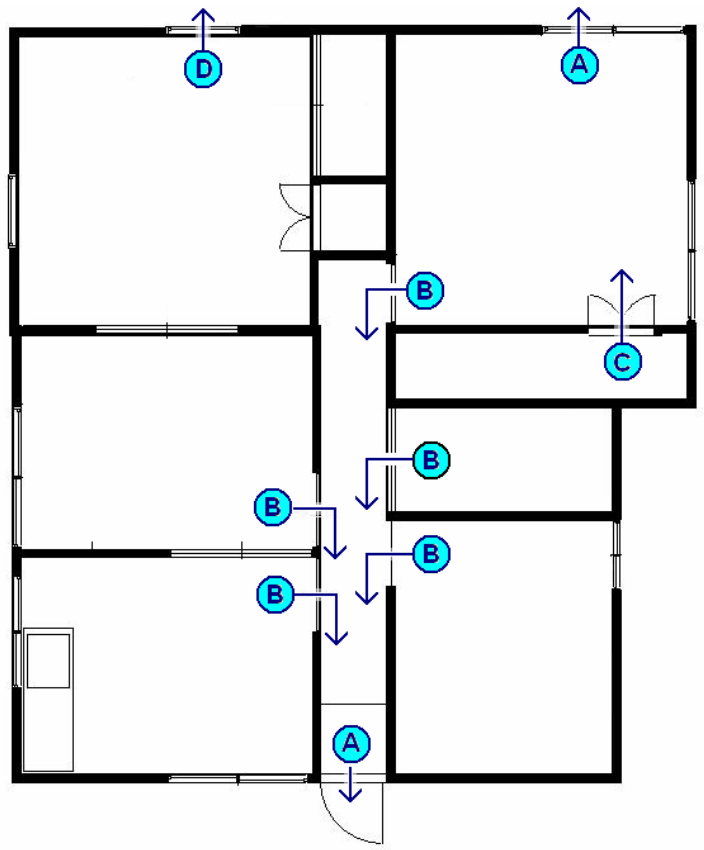


Diagram 1: Escape routes

Methods of escape:

A) External Doors
The room contains a doorway which leads directly to a open area outside provides a main escape route.

B) Internal Door, opening into the hallway.
If the room is on the ground floor and an internal door from the room opens directly into a hallway leading to the entrance, this would also be a valid means of escape.

C) Internal Door, leading through a connecting room.
A room where the only means of escape is through another room is termed an inner room is only an acceptable means of escape when the room is:
a. a kitchen
b. a laundry or utility room;
c. a dressing room;
d. a bathroom, wc, or shower room;

D) Egress Escape Window
If a rooms doesn't satisfy any of the criteria above the provision of a window of sufficient size can offer a valid means of escape.
Refer to page 3

Special note for tall buildings
When buildings have floor levels more than 7.5 meters above ground level, emergency escape through upper windows becomes increasingly hazardous. It is therefore necessary for an assessment of alternative and/or protected route(s) for exit. (Refer to Document B Section 2.14 for more details)

Provision of an escape window (Egress Window)

Certain criteria must be met in order to classify a window as an egress window. The window must be of sufficient size to allow easy escape and must be in a correct location.
The window or door should enable the person escaping to reach a place free from danger of fire. This is a matter for judgment in each case, but in general a courtyard or back garden from which there is no exit other than through other buildings would have to be at least as deep as the dwelling is high to be acceptable. (Refer to the document B Section 2.11 for more details)

Miniumum Dimensions
The width and height of the openable area must be at least 450mm, further to this requirement the total openable area should also be greater than 0.33m². In order to satisfy both requirements a window 450mm width must therefore have a minimum openable height of 734mm. (Refer to Table 1 for the minimum heights)

Window Location
The height of the window on the wall must also be considered, the bottom of the openable area must be no more than 1100mm from floor level.

Other considerations to the positioning of the window also need to be considered, such as sufficient height to offer guarding protection and location of handles to allow ease of operation.

Refer to Document K Protection from falling, collision and impact; this requires that bottom of windows to be greater than 800mm to offer protection from falling from the window. Refer to BS8213; this recommends that to be easily reachable a handle must be less than 2m above floor and is that the height reduced if the controls are obstructed.

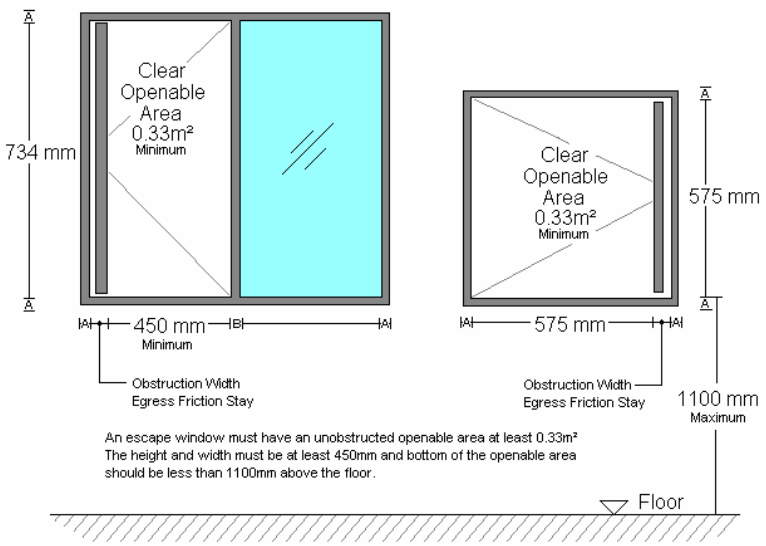


Diagram 2: Egress Statutory Requirements

Width	Minimum Height
450mm or less	Inadequate width for an escape window
450 to 475	734 mm
475 to 500	695 mm
500 to 525	660 mm
525 to 550	629 mm
550 to 575	600 mm
575 to 600	575 mm
600 to 625	550 mm
625 to 650	528 mm
650 to 675	508 mm
675 to 700	489 mm
700 to 734	472 mm
734mm or more	450 mm

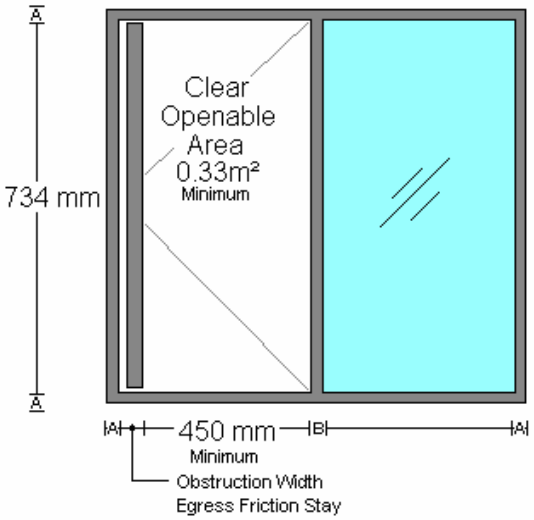
Table 1 Minimum height to achieve area 0.33²

Egress Mode of operation

Smart Systems Easy Clean Egress Friction Stay default mode of operation is in egress mode. When the window is opened normally the window opens to almost 90 degrees which reduces the obstruction to only 65mm. The window can also open in an easy clean mode (refer to Page 6)

The external dimensions are dependent on the sections used for the outer frame and vent frame.

Example Alitherm 47
ETC010 Outer Frame
ETC030 Mullion
The sight lines are 39mm for the outer frame and 24mm to the centre of the mullion; this gives a 575mm dimension from outer frame to centre line of mullion.



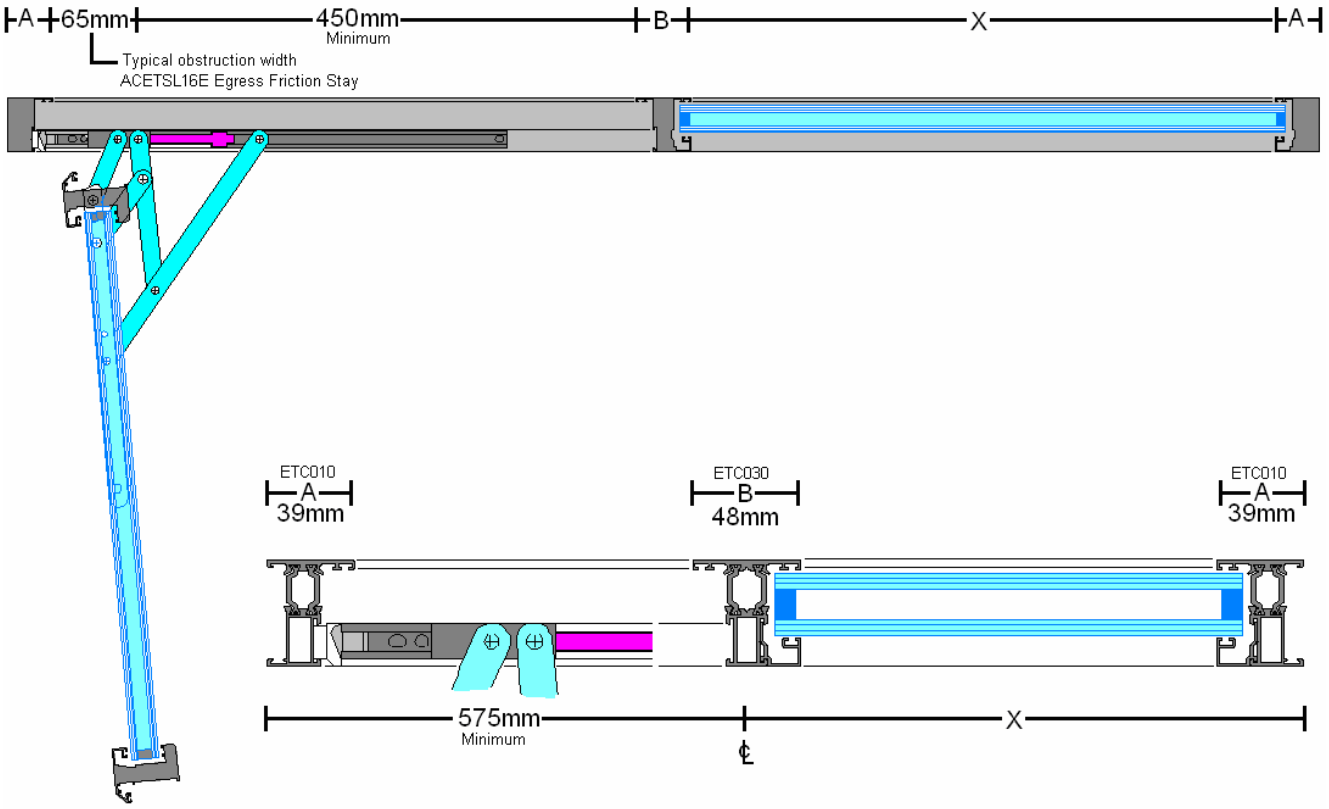


Diagram 3: Smart Systems ACETSL16E (Egress Mode)

Easy Clean Mode of operation

Smart Systems Easy Clean Egress Friction Stay allows the window to open in an easy clean mode. Allowing easy access from inside to the outside sheets of glass.
It is recommended to allow for easy clean operation in multistory buildings and in certain circumstances there is a legal requirement to offer an easy clean solution.

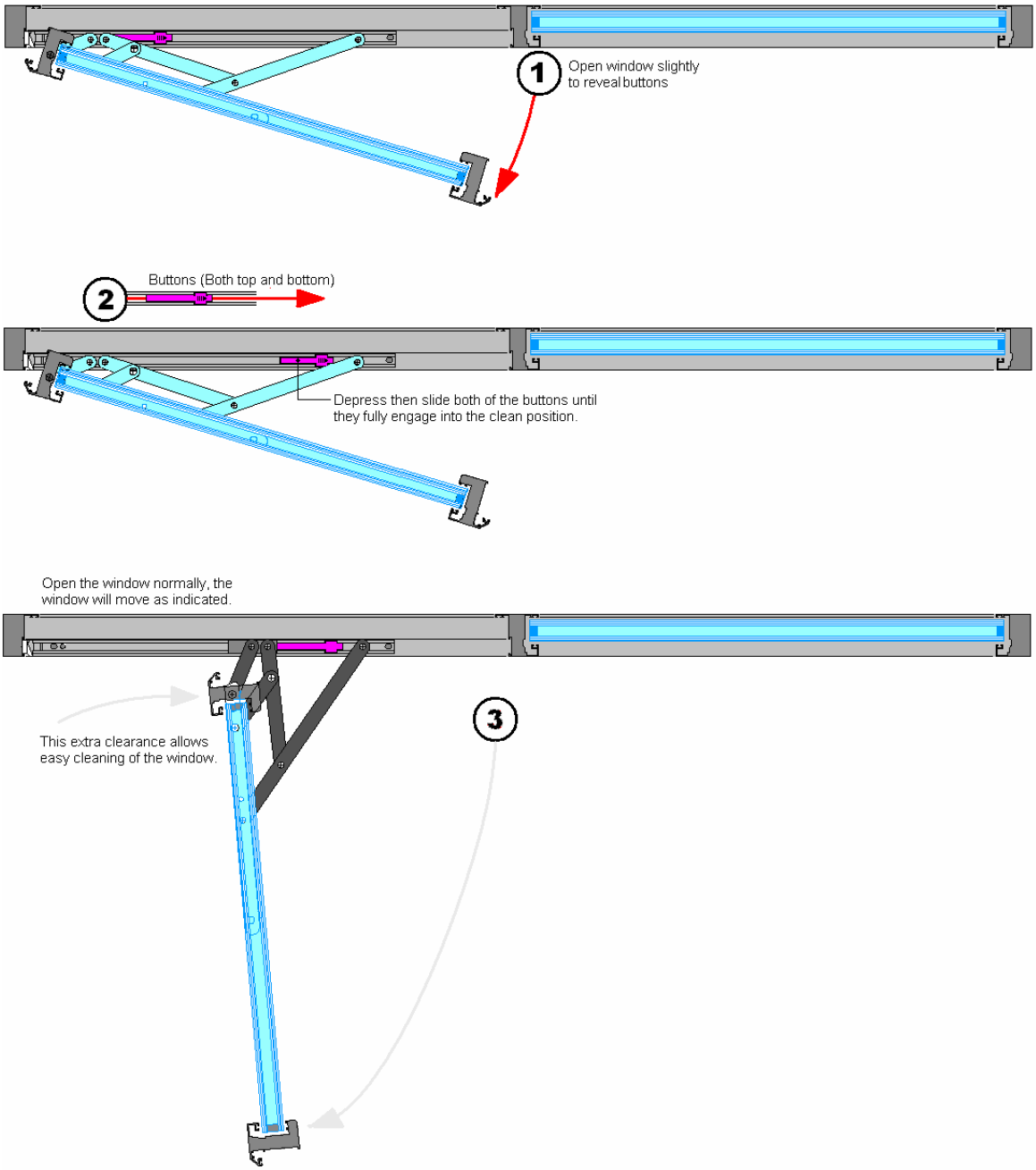
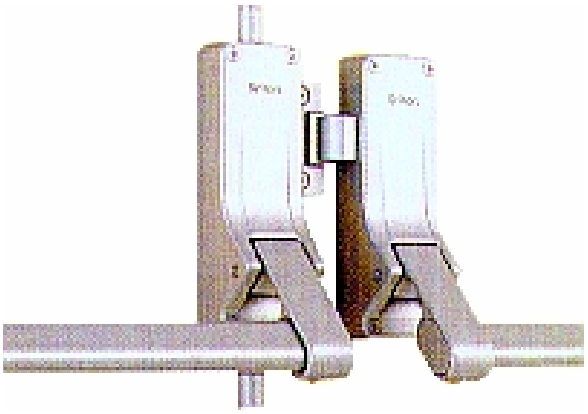


Diagram 4: Smart Systems ACETSL16E (Easy Clean Mode)

Commercial doors on escape routes

The time taken to negotiate a closed door can be critical in escaping. Doors on escape routes (both within and from the building) should therefore be readily openable, if undue delay is to be avoided.



Direction of opening

The door of any doorway or exit should, if reasonably practicable, be hung to open in the direction of escape, and should always do so if the number of persons that might be expected to use the door at the time of a fire is more than 60.

Door fastenings

In general for fire safety reasons, doors on escape routes (whether or not the doors are fire doors), should not be fitted with lock, latch or bolt fastenings. They should only be fitted with simple fastenings that can be readily operated from the side approached by people making an escape. The operation of these fastenings should be readily apparent and without the use of a key and without having to manipulate more than one mechanism.

This is not intended to prevent doors being fitted with hardware to allow them to be locked when the rooms are empty. There may also be situations such as hotel bedrooms where locks may be fitted that are operated from the outside by a key and from the inside by a knob or lever etc.

In buildings where security on final exit doors is an important consideration, such as in some Assembly and Recreation or Shop and Commercial uses, panic bolts may be used. In non-residential buildings it may also be appropriate to accept on some final exit doors, locks for security that are used only when the building is empty. In these cases the emphasis for the safe use of these locks must be placed on management procedures.

Commercial Fire Doors Categories

Spec	Description	Comments
FD30	A Fire Door with 20 minutes Integrity & 30 minutes Insulation properties (also shown as FD30/30) and complete with Intumescent Seals.	Smarts Systems aluminum does not have a fire rating.
FD60	A Fire Door with 20 minutes Integrity & 60 minutes Insulation properties (also shown as FD60/60) and complete with Intumescent Seals.	Smarts Systems aluminum does not have a fire rating.
SC	Self Closing	Shopline / Imperial Swing doors With none Hold Open Closer
(S)	Smoke Seals use brushes as better wearing than rubber strips.	Recommend the use of brushes to seal around the doors, and also rebated doors will perform better then none rebated doors.
VP	Vision Panel	See Note 1
FRG 30/60	Fire Resistant Glazing (30/60 minutes Resistance)	See Note 2
PB	Push Bar Emergency opening device complying with BS EN 1125:1997	Refer to Page 8

Table 2 Typical Commercial Fire Door Specifications

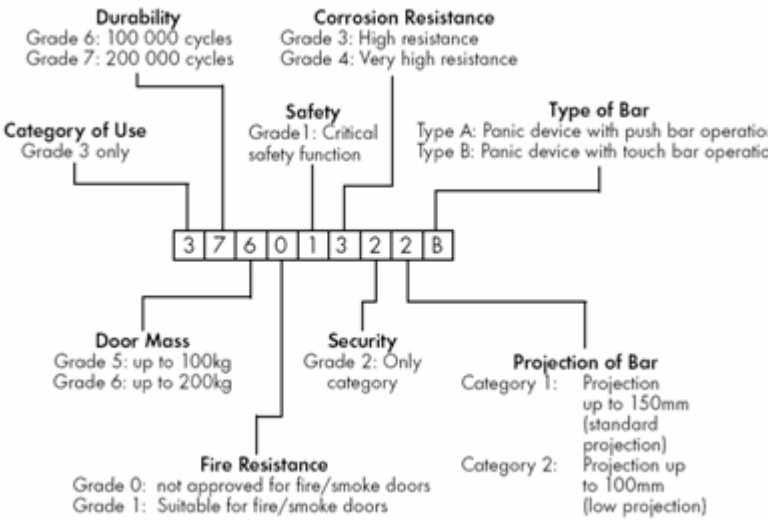
Note 1 – Vision Panels
Where doors are specified as VP, a suitably sited vision panel not less than 0.1m² should be located in the door or walls of the inner room, to enable occupants of the inner room to see if a fire has started in the outer room. Refer to Document M, for additional requirements for vision panels.

Note 2 – Fire Resistant Glazing
If glass is specified as FRG, then Pyro FR glazing must be clearly marked and visible in the corner with the tradename and BS476 Part 22. The FR mark is not to be confused with the BS 6206: 1981 / BS6262 Series which is for safety glazing and does not imply any resistance to fire.

Panic Hardware Standard

BS EN ISO 1125

The main purpose of the performance requirements of this standard is to give safe and effective escape through a doorway with minimum effort and without prior knowledge of the device, i.e. for locked doors on escape routes where panic situations can be foreseen.
BS EN 1125 defines a nine digit classification system for performance, where each digit represents a certain characteristic of the hardware such as durability.



The Classification System of BS EN 1125

Specifying and selecting Panic Hardware.

The characteristics of the panic hardware must be considered and suitable for the particular application. The following points are key recommendations taken from annex A of BS EN 1125.

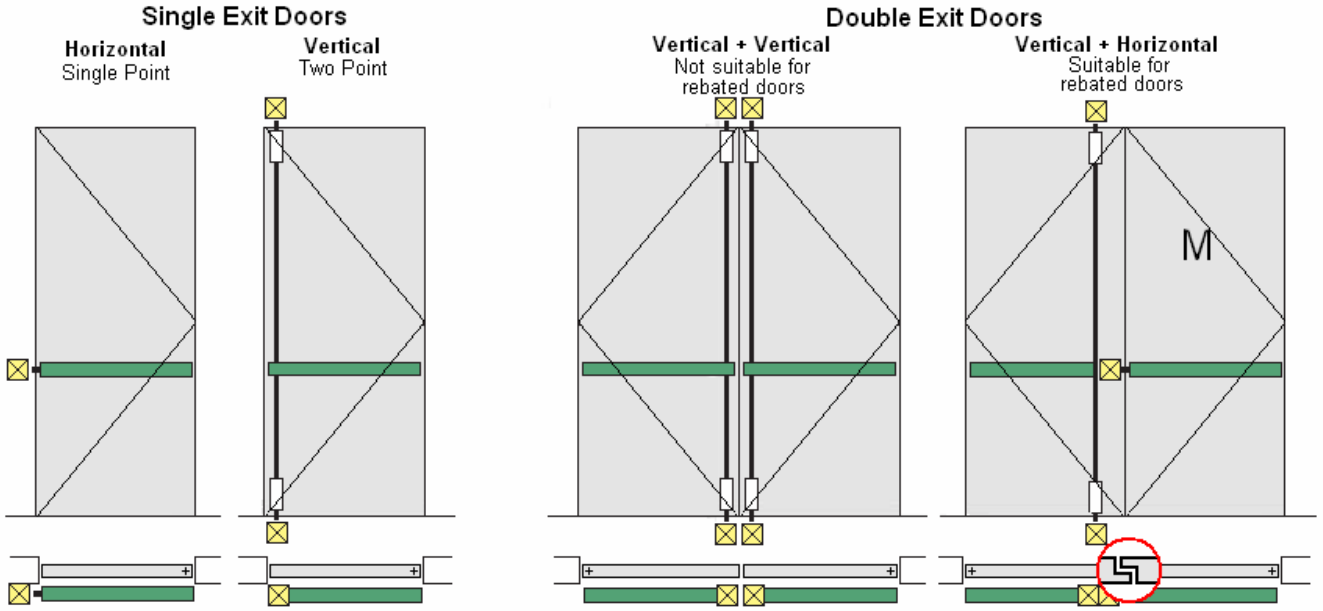
Types of device
Category 2 (low projection) panic devices should be used in situations where there is restricted width for escape, or where the doors are fitted with panic devices that are not able to open beyond 90°

Bar Location
The bar should be installed to give maximum effective length. The bar should normally be installed at a height of between 900mm and 1100mm from the finished floor level. Where it is known that the majority of occupants of the premises are young children, consideration should be given to lowering the height of the bar.

Signage
A sign which reads ‘push bar to open’ or a pictogram should be provided on the inside face of the door immediately above the bar, or on the bar itself if it presents sufficient flat face to take the size of lettering.

Hardware Types and Configurations

Horizontal and Vertical configurations are possible, horizontal types latch the door at one point and vertical uses link rods to lock the door at the top and bottom.



Typical Panic Hardware Configurations

Vertical panic hardware can either be concealed where the link rods and mechanism are within the aluminium extrusion or mounted on the face of the extrusion. Vertical generally offers greater security; however, on rebated double doors, to ensure that both doors can act independently when either bar is pressed the master leaf must be a horizontal bar.

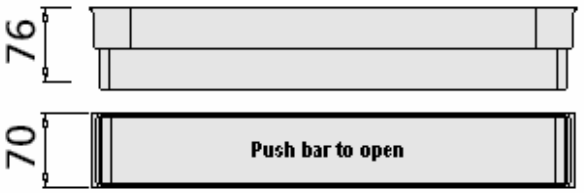
Appendix A

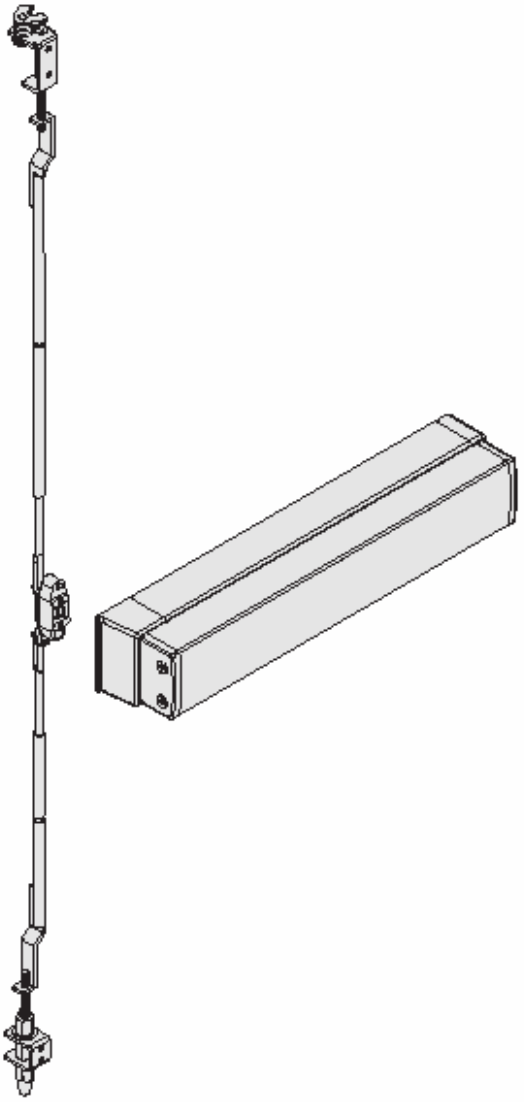
Smart Systems – Panic Hardware Devices

System	Type	Code	Orientation
Shopline	**Concealed Rods**	**ACSH451**	**Vertical W = 914 mm**
		ACSH452	**Vertical W =1,067 mm**
Visoline or Imperial	**Face Mounted Bernini**	**ACMX05050**	**Horizontal**
		ACMX05052	**Vertical**
	Face Mounted Cellini	**ACMX05060**	**Horizontal**
		ACMX05062	**Vertical**
	Face Mounted Classic	**ACMX05090**	**Horizontal**
		ACMX05092	**Vertical**

Shopline
Concealed panic Hardware

ACSH451 width 914mm
ACSH452 width 1067mm





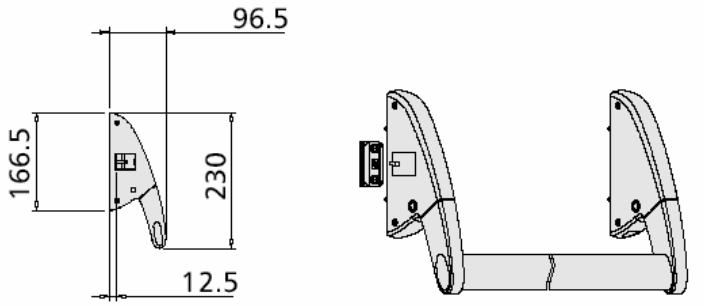
BS EN1125:199+A1: 2004
Tested to Category 3601322B

Application:	Smarts Shopline System
Type:	Concealed Hardware
Category of use:	High frequency of use
Durability:	200,000 cycles
Door Mass:	up to 200kg
Fire Resistance:	N/A
Corrosion:	High resistance
Security:	Grade 2
Bar projection :	76 mm
Bar type:	Touch-bar operation

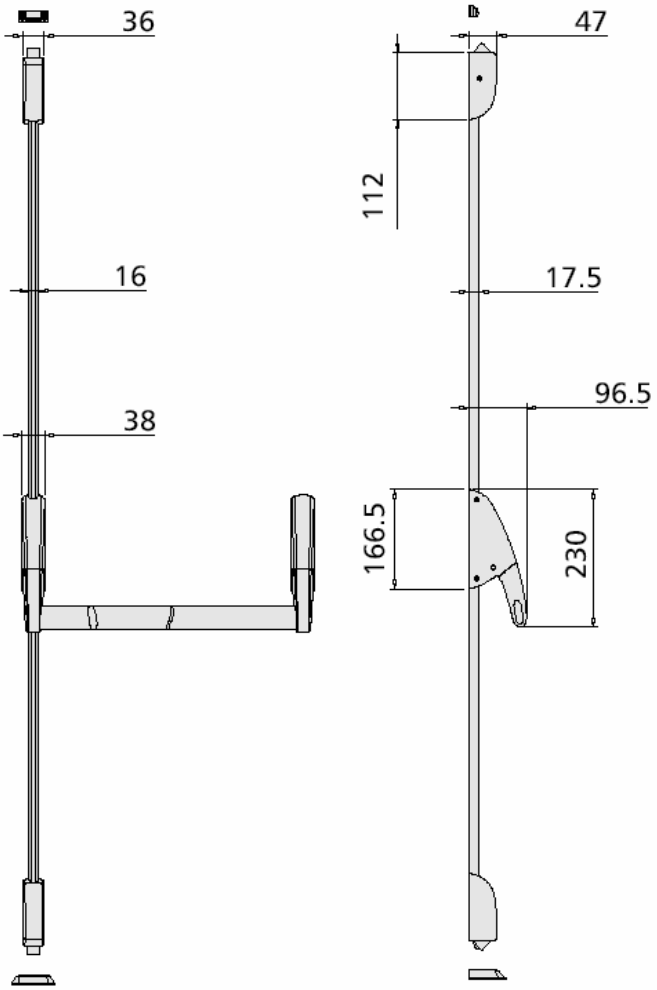
Panic device using Concealed Vertical Rods for Smarts Shopline door. This provides panic device and security by use of a rotating top bolt and a post type header strike. This bolt deadlatches around its strike post, and simultaneously deadlocks the bottom bolt. Non-handed to fit either LHR or RHR doors, the standard device will fit all Smarts Shopline Styles (SH020 SH039 and SH025). Will accommodate any bar height (from threshold bolt to centreline of bar) from 900mm to 1100mm and any door height up to 1676mm above the bar

Bernini
surface mounted panic hardware

ACMX05050
Bernini Horizontal Panic Latch



ACMX05052
Bernini Vertical Panic Latch



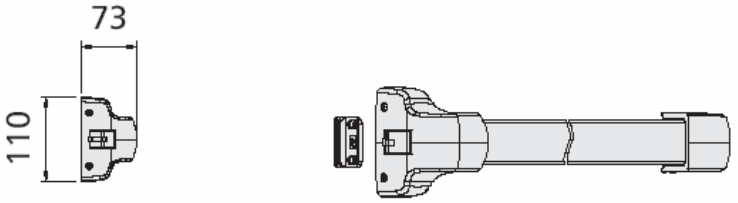
Bernini
BS EN1125:199+A1: 2004
Tested to Category 3601422A

Application:	Visoline and Imperial
Type:	Surface Mounted
Category of use:	High frequency of use
Durability:	200,000 cycles
Door Mass:	up to 200kg
Fire Resistance:	N/A
Corrosion:	Very high
Security:	Grade 2
Bar projection :	96.5 mm
Bar type:	Push-bar operation

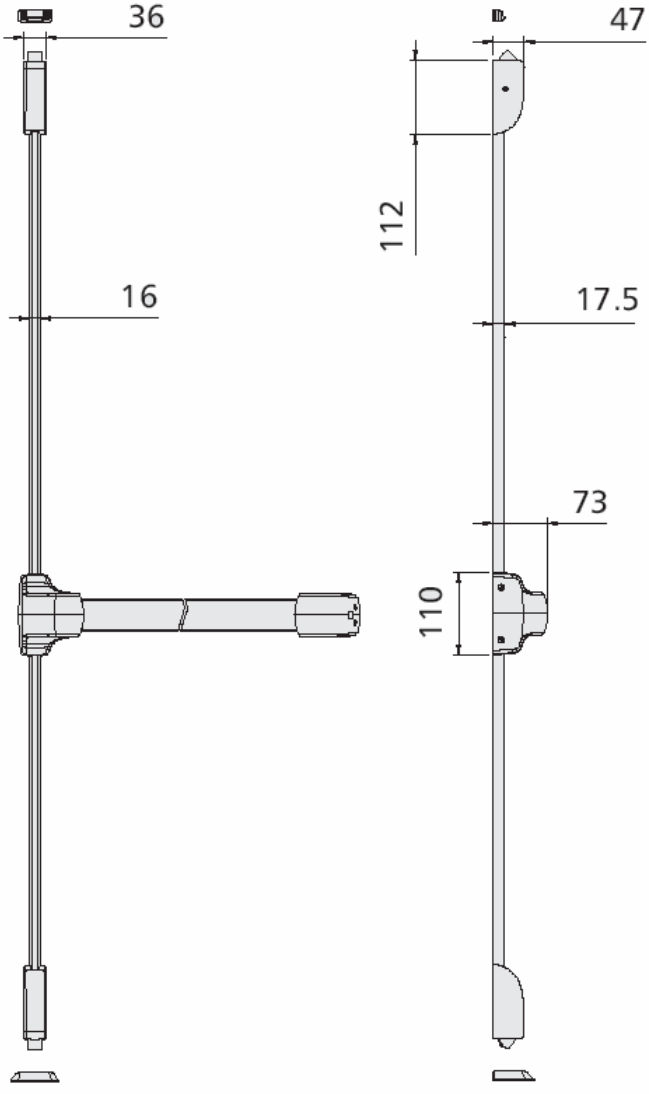
ACMX05054
Door handle panic exit device Cylinder

Cellini
Surface mounted panic hardware

ACMX05060
Cellini Horizontal Panic Latch



ACMX05062
Cellini Vertical Panic Latch



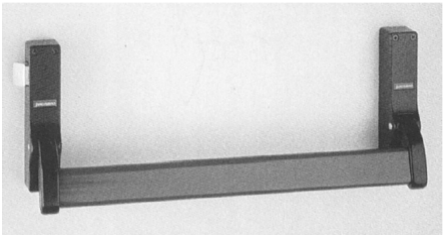
BS EN1125:199+A1: 2004
Tested to Category 3601422A

Application:	Visoline and Imperial
Type:	Surface Mounted
Category of use:	High frequency of use
Durability:	200,000 cycles
Door Mass:	up to 200kg
Fire Resistance:	N/A
Corrosion:	Very high
Security:	Grade 2
Bar projection :	73 mm
Bar type:	Push-bar operation

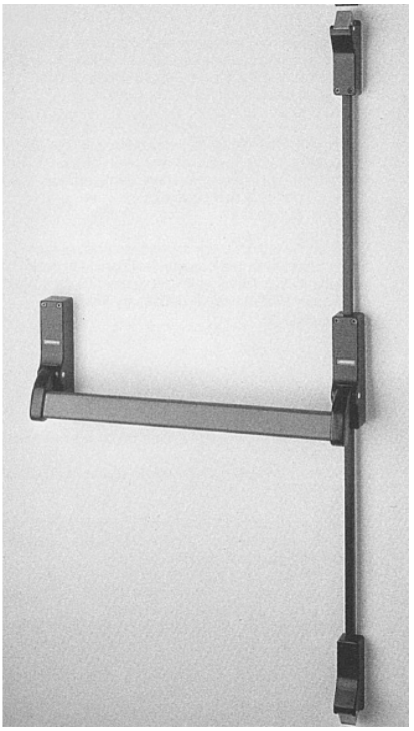
ACMX05054
Door handle panic exit device Cylinder

Classic
Surface mounted panic hardware

ACMX05090
Horizontal Panic Bar



ACMX05092
Vertical Panic Bar



ACMX05093
Third Closing point for ACMX05092

ACMX05094
Door handle with cylinder for panic latch
(For use with ACMX05090 or ACMX05092)

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