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SPECIFICATION

References

European Normative References (EN):

BS EN 1634-1: 2008 Fire resistant tests for door and shutter assemblies.

BS EN 1363-1: 1999 Fire resistant test method. Part 1 General requirements.

BS EN 1363-2: 1999 Fire resistant test method. Part 2 Alternative and additional procedures.

BS EN 14600: 2005 Doorsets and openable windows with fire resisting and/or smoke control characteristics. Requirements and classification.

BS EN 13501-2: 2003 Classification using data from fire resistance tests, excluding ventilation services.

International Standards Organization (ISO):

BS EN ISO 9001: 2008 Quality management systems.

Quality assurance

Manufacturers:

Manufacturers manufacturing products for performing Works of this Section shall be, during the bidding period as well as during installation, BS EN ISO 9001: 2008 certified or equivalent.

Installers:

If requested by the Engineer, submit names of projects with locations names of the Owner(s) and Engineer(s) where the products to be used has been used previously and performed satisfactorily, date it was installed, and size of installation.

Installer shall employ only qualified installers with proven 5 years experience in this type of work.

If the Works of this Section is not installed by the manufacturer, the Works of this Section shall be performed by an installer acceptable to the Engineer and acceptable to the manufacturer of the products to be used.

Pre-installation meeting:

Prior to commencing Works of this Section, arrange for the manufacturer's technical representative to review with the Contractor and the Engineer procedures to be adopted, conditions under which the work of this Section shall be done.

Inspection and testing:

Inspect and test minimum of two (2) of each type of fire barrier.

After inspection is complete, repair all defective fire barriers and test again. Continue this procedure until all defective fire barriers pass inspection and testing.

Submit inspection and testing report clearly indicating types of fire barriers and locations, compliance with EN requirements, and confirmation that the defective fire barriers have been repaired and/or replaced and passes subsequent inspection and testing.

Submittals

Shop drawings:

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Submit shop drawings in accordance with the Conditions of the Contract.

Shop drawings for Works of this Section shall consist of schedules, plans, elevations, sections, elevation details, section details, and all other special details as deemed necessary by the Engineer. Include the weights of each unit.

No Works of this Section shall be fabricated until shop drawings have been reviewed and accepted by the Engineer.

Samples:

Submit samples in accordance with Conditions of the Contract.

Submit full representative samples of all required fire barrier products.

Product data sheets:

Submit product data sheets in accordance with the Conditions of the Contract.

Product data sheets shall indicate but shall not be limited to the following:

EN test assembly number(s), required temperature and flame rating(s), and manufacturer's printed installation instructions.

Safety data sheets:

Submit safety data sheets in accordance with Conditions of the Contract.

Submit safety data sheets for inclusion with project record documents. Keep one (1) copy of safety data sheets on Site for reference by workers.

Quality assurance certificates:

Submit quality assurance certificates in accordance with the Conditions of the Contract.

Provide certified copies of quality assurance certificates that the manufacturer is and shall be for the duration of the Works of this Section, BS EN ISO 9001: 2008 certified or equivalent specifically for the products described.

Inspection and testing reports:

Submit inspection and testing reports in accordance with the Conditions of the Contract.

Submit inspection and testing reports that fire barrier assemblies have been inspected and tested by an independent testing authority and meet or exceed the specified design criteria for the location(s) of installation(s).


Certification documentation:

Submit certification documentation that the;

Complete automatic fire barrier assembly, complete with side containment channels, has full testing and certification to BS EN 1634-1 and is classified to BS EN 13501-2.

Complete fire barrier assembly must show tested ability to adjust and control speeds on site to suit specific site requirements and prove Gravity Fail-Safe in accordance with BS EN 12101-1, ensuring the system is "safe" and "fit for purpose" as defined in ISO/IEC Guide 21 1996, with self-closing and smoke control to BS EN 14600

Environmental conditions

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Comply with the manufacturer(s) written requirements for temperature, relative humidity and substrate moisture content for minimum 24 hours prior to installation, during installation and curing of products.

Delivery, storage, handling and protection

Co-ordinate deliveries of Works of this Section to comply with construction schedule and arrange ahead for strategic off-the-ground, under cover storage locations. Do not load any area beyond the design limits.

Deliver products to the Site undamaged and with labels intact. Inspect containers to verify that they have not been opened.

Store and protect products as required by manufacturer(s).

Warranty

Refer to Conditions of the Contract.

Submit a written warranty for the Works of this Section for one (1) year in accordance with the Conditions of the Contract.

If any part of the Works of this Section, including design, fabrication or installation are sublet to any party, such party shall provide a collateral warranty equivalent to the warranty.

PRODUCTS

General

Products specified are to establish performance and quality required, and are not intended to restrict submission for substitutions.

Acceptance of products from other manufacturers will be subject to review by the Engineer, for conformity with the specifications and meeting the physical characteristics of the specified products. During this review of alternate products the Engineer will require submission of technical data verifying that all specified standards and products are met, submission of alternative samples similar to that specified, and a list of references of successfully completed projects of similar size in the last five (5) years. Include compliance with referenced standards. Submittals which do not include adequate data for the product evaluation will not be considered.

The compliant Tender shall not include any alternatives and shall conform to the requirements of the specification Section.

General

Fire barrier systems shall conform to requirements of BS EN 1634-1, BS EN 1363-1, BS EN 1363-2, and BS EN 14600.

Products and manufacturers specified establish performance and quality required, and is not intended to restrict submission by other manufacturers.

Acceptance of products from other manufacturers will be subject to review by the Engineer, for conformity with the specifications and meeting the physical characteristics of the specified products. Include compliance with referenced standards. Submittals which do not include adequate data for the product evaluation will not be considered.

If unapproved substitute products are included in the bid, the specified products shall be provided without additional compensation.

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Acceptable manufacturer

Coopers Fire Ltd., Edward House, Penner Road, Havant, Hampshire, PO9 1QZ, England, Tel: +44 (023) 9245 4405; Fax: +44 (023) 9249 2732; web site: www.coopers-uk.com

Or other manufacturer approved by the Engineer.

Automatic fire barriers

All automatic fire barrier assemblies, complete with side containment channels shall be tested to BS EN 1634-1 and classified to BS EN 13501-2, and shall be tested for controlled adjustable gravity fail-safe on total power failure (must not be reliant on secondary power supplies to provide the braking effect) as per BS EN 12101-1, with self-closing and smoke control to BS EN 14600.

Any combination of the alarm/control signal provided by the Electrical Subcontractor, and/or the specified fail-safe functions, shall activate the automatic fire barrier assembly.

Automatic fire barriers shall consist of fire resistant fabric, stainless steel reinforced for impact resistance, with an intumescent coating which is wound on a steel roller with 1:600 deflection performance to BS 6323-5 and be powered by an internal, electric, tubular geared motor.

The complete product assembly is tested to BS EN 1363-1 for (E) Integrity for 120 minutes and tested to BS EN 1363-2 for (W) Radiation for 120 minutes. It is classified to BS EN 13501-2 for E120, EW60. EW60 is the maximum classification when testing to BS EN 1634-1.

The fabric shall be wound onto a steel roller which will incorporate a 24Vdc motor and gearbox. Motor shall contain the necessary internal brake system and drive mechanism complete with regenerative braking system and mechanical epicyclic gearbox retarder. All working parts shall be totally enclosed and protected within the steel roller and shall form part of the BS EN 1634-1 test.

The roller assembly, incorporating the fabric, shall be housed in a 1.2mm galvanized mild-steel head box which shall be fixed to the building structure as per the tested orientation of BS EN 1634-1.


The head box size shall be 240x290mm. Provide larger head boxes where the barrier drop is in excess of 3000mm, or widths in excess of 4000mm.

Operation of the fire barriers shall be via either a Power Supply Unit (BBU-CAM) or Emergency Power Supply Unit (ERU-CAM) which can either be mounted adjacent to the fire barrier head boxes within the ceiling void allowing access for maintenance, or mounted in a remote position from the fire barriers. The panel requires a local 240V ac supply rated at 13 Amperes via an un-switched fused spur on a maintained supply installed by the Electrical Subcontractor.

For operational purposes connect the Power Supply Unit (BBU-CAM) or Emergency Power Supply Unit (ERU-CAM) to a normally closed volt-free contact within the fire alarm control panel configured to open on fire and fail safe.

The BBU-CAM is capable of operating up to 20 number rollers and shall include battery back-up which will maintain the fire barriers in their retracted position for a pre-determined period (usually 30 minutes) during a mains failure. The ERU-CAM is capable of operating up to 8 number rollers and shall include battery back-up which will maintain the fire barriers in their retracted position for a pre-determined period (usually 30 minutes) during a mains failure.

Additionally the ERU-CAM will operate the fire barrier system for a limited number of cycles without mains power available; as required by PAS 121:2007. This is activated through its Emergency Retract Facility via an Emergency Retract Button (ERB). This is dependent upon the number and size of the active fire barriers connected to it and the distance between them.

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PAS 121:2007 requires fire barriers to automatically descend under fail safe by gravity upon receipt of a signal from the fire alarm panel and automatically retract when the signal is returned. During descent the motors shall be controlled via a synchronized speed circuit to ensure all barriers descend at synchronized speeds. Fire barriers shall descend and ascend under mains power, emergency power and then under gravity in the event of total mains and battery back-up failure. Speeds shall have proven synchronisation at all times.

The lower edge of the fire barriers shall incorporate a heavy bottom bar with a minimum standard weight of 4 k/m with the facility to increase this weight to 10 k/m to ensure positive operation when the barrier is subjected to air pressure.

PAS 121:2007 requires the fire barrier to be subjected to an impact test. The complete fire barrier assembly including the fabric and retaining system to have been impact tested to double the severe duty rating of BS 5234-2:1992. The retaining system (side guides) provide a seal between the fire barrier fabric and the adjacent building construction.

In addition a monitoring system should be used to prove that barriers are not just instructed to descend but have physically unrolled to a specific position.

A fire barrier replaces what would otherwise be a solid static barrier therefore this is essential.

Operation

System shall drive down and drive up with mains power available, and in the event of mains power failure, the system shall remain retracted using its own dedicated battery back-up power supply for a predetermined period (usually 30 minutes). During mains power failure an Emergency Power Supply Unit (ERU-CAM) is capable of operating the fire barrier system for an unspecified number of operating cycles under its own dedicated emergency power supply. If signalled to descend during this period the barrier will drive down. At the end of the predetermined time delay the barrier must descend under gravity with a controlled and adjustable rate of descent. This safety feature is essential to avoid dangerous guillotine/free-fall descent.

The fire barrier system is ASB1 & 3 "Life Safety" compliant in accordance with EN 12101:2006. The fire barrier system must move to the fire operational position in a controlled manner when all consumable primary and auxiliary power sources are removed, in the event the wiring or system corruption, or any combination thereof as required by PAS 121:2007.

PAS 121:2007 requires the fire barrier system to commence movement upon initiation or any initiation, power or system failure and move to the fire operational position, in all operating modes, at site specific adjustable and synchronized velocities within the range of 0,06 m/s to 0,30 m/s. Barriers which are located in critical areas of the project, e.g. escape routes, entrances/exits to escalators, stairways, etc., shall have site specific adjustable and synchronized velocities within the range of 0,06 m/s to 0,15 m/s. Speeds shall be dictated by the authorities for safety in use, according to the location and nature/function of each unit. All speeds controls must show appropriate testing by a notified body and must be sight adjustable without altering bottom bar mass.

PAS 121:2007 requires the fire barrier system to have the facility to move to a partial drop position prior to moving to the fire operational position, under both mains and emergency power.

When in a retracted or stalled position all power shall be removed from the motor drive to prolong motor life.

PAS 121:2007 requires multiple overlapping fire barriers to have a bottom bar system that is one piece and each unit conjoined with mutual operation, i.e. one down – all down (handshaking).

Any combination of the alarm/control signal provided by the Electrical Subcontractor, and/or the specified fail-safe functions shall activate the system.

Provide system with a "soft ascent facility" to ensure no damage to ceiling interface.

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Provide system with built in protection in the event that the barrier is prevented from ascending to the up/retracted position or descending to the fire operational position. This ensures the system is always in its required position and avoids damage to the fire barrier mechanism and the surrounding finishes.

Controls

System shall have a full monitoring system with both local and remote monitoring facilities with the following;

Colour Touch Screen Monitoring Unit (CTSMU) shall be connected to the system via a screened data cable. This data cable connects all Power Supply Units (BBU-CAM) or Emergency Power Supply Units (ERU-CAM) and Motor Control Units (MCU) on a continuous run.

Each part of the system shall have individual programmable addresses and be fully addressable.

A CTSMU shall continually poll all parts of the system for faults. Operation of any system faults shall be displayed and stored in a log.

During normal operation the system shall display date/time. During a fault the display shall show a fault log number, fire barrier address number, nature of the fault and date/time of occurrence.

CTSMU requires a 230V ac 13A 50Hz dedicated and maintained un-switched fused spur provided by the Electrical Subcontractor. The CTSMU shall have its own dedicated Battery back-Up system.

To gain entry to the system there shall be (2) two levels of password protection.

CTSMU shall have built in RS232 port for connection to printer, and (2) two USB ports for connection to USB device.

CTSMU shall be able to connect to a modem for local service diagnostics and remote service support.

Power Supply Unit(s) (BBU-CAM):

BBU-CAM shall be mains operated unit with 24V dc Battery Back-Up. Period of Back-Up shall be determined by the size of the battery ampere, to be nominally 30 minutes.

BBU-CAM will be provided with a 230V ac 13A 50Hz dedicated and maintained un-switched fused spur by the Electrical Subcontractor.

The 230V ac input shall be transformed internally to provide the fire barrier a DC signal.

Set time delay function, which maintains units in the raised position in the event of a temporary interruption of mains power to the system for a period of 30 minutes. Fire barriers shall operate if the alarm is activated within this period. If power is not returned, the fire barriers shall descend to their fire operational position after the time delay.


BBU-CAM shall provide volt free contact outputs that can be connected to a Building Management System to display Mains Failure, Battery Failure and Alarm Status.

BBU-CAM shall provide an audible warning in the event of a mains power failure.

BBU-CAM shall have an incorporated test and re-set facility to lower and raise the fire barriers connected to it. Shall also have the capability to connect the same test and re-set facility to it in the event that the BBU-CAM is not easily accessible.

BBU-CAM shall have visual indicators to display mains power and alarm status.

Emergency Power Supply Unit(s) (ERU-CAM):

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ERU-CAM shall be mains operated unit with 24V dc Battery Back-Up and for Emergency power operation in the event of a mains power failure. Period of Back-Up shall be determined by the size of the battery ampere, to be nominally 30 minutes. Emergency operating cycles is dependent upon the number and size of the active fire barriers connected to it and the distance between them.

ERU-CAM will be provided with a 230V ac 13A 50Hz dedicated and maintained un-switched fused spur by the Electrical Subcontractor.

The 230V ac input shall be transformed internally to provide the fire barrier a DC signal.

Set time delay function, which maintains units in the raised position in the event of a temporary interruption of mains power to the system for a period of 30 minutes. Fire barriers shall operate if the alarm is activated within this period. If power is not returned, the fire barriers shall descend to their fire operational position after the time delay.

ERU-CAM shall provide volt free contact outputs that can be connected to a Building Management System to display Mains Failure, Battery Failure and Alarm Status.

ERU-CAM shall provide an audible warning in the event of a mains power failure.

ERU-CAM shall have an incorporated test and re-set facility to lower and raise the fire barriers connected to it. Shall also have the capability to connect the same test and re-set facility to it in the event that the ERU-CAM is not easily accessible.

ERU-CAM shall have visual indicators to display mains power and alarm status.

Motor Control Unit (MCU):

MCU shall control the fire barrier motors with drive voltage.

Each MCU shall have a final soft ascent closing facility that ensures no damage to ceiling interface, and shall have built in protection in the event that the barrier is prevented from ascending to the up/retracted position thereby avoiding damage to the fire barrier mechanisms, fabric or the surrounding finishes. Each MCU incorporates a 'stall' facility to protect the motor from 'burn' out.

MCU must provide full handshaking of those fire barriers joined on a continuous bottom bar. Should any part of the continuous run of fire barriers fail they shall descend to their fire operational position, i.e. down. MCU must have fully adjustable speed controls for normal descent and fail-safe by gravity

System shall have the facility to move to a partial drop position prior to moving to the fire operational position, under both mains and emergency power.

MCU shall provide volt free contact outputs that can be connected to a Building Management System to display Fire Barrier position Up/Down and Fault.

Operational monitoring and addressability:

System shall have the following facilities;

Local monitoring:

To dedicated event and fault log recorder.

Remote monitoring (via modem):

24 hr monitoring station.

Dedicated event and fault log recorder.



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Visual indication of fire barrier position, and control status.

Monitored functions:

Individual barrier.

Barrier in retracted position, i.e. Up.

Barrier in fire operational position, i.e. down.

Signal/alarm status (with event log).

Primary power and signal supply status.

Open circuit wiring and communications condition.

Mains supply status.

DC power and signal supply status.

Battery high/low status.

Provide system with additional safety and operational features as follows;

Voice warning:

Audio or spoken multi message facility when mains or emergency power is available.

Beam protection and obstruction warning:

A beam detector, with delay timer which will sound in the event of any obstruction being placed in the barrier drop line when mains or emergency power is available.

Visual alert system:

Light warning system when mains or emergency power is available.

Split drops delay:

Partial descent to predetermined level to permit preliminary escape and initial smoke containment. After delay barrier descends to full fire operational position when mains or emergency power is available.

Emergency retract:

Touch button retract facility for multi escape and emergency service access when mains or emergency power is available.

Fabric

Fabric must be tested as part of the complete assembly complete in the orientation and standard use of the application and installation and must comply with the requirements of the FR test for BS 476-22.8:1987 for a period of 120 minutes and/or BS EN 1634-1:2000 for a period of 120 minutes.

Fabric must be tested as part of the complete assembly to comply with the requirements of smoke leakage at Ambient temperature to BS 476-31.1:1983 or BS EN 1634-3:2004.

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EXECUTION

Examination

Examine substrate surfaces to receive the Works of this Section and ensure that The Works done as part of the Works of other Sections is complete and that there are no conditions with will adversely affect the performance of the Works of this Section. Notify the Engineer of any unsatisfactory conditions. Do not proceed with Works of this Section until unsatisfactory conditions have been corrected. Commencement of the Works of this Section implies acceptance of surfaces and conditions.

Installation

Install automatic fire barriers in strict accordance with manufacturer's written installation instructions and as specified herein.

Cleaning

On a daily basis as the Works of this Section proceeds, remove and dispose of all debris and waste resulting from the Works of this Section.

Leave work areas of the Works of this Section broom clean at the end of each work day.

Clean up

Remove debris and excess products from the Site.