SE CONTROLS
secontrols.com

Façade Automation Guide

Creating a healthier and safer environment

CONTENTS

Global interests

Offices in the UK, Hong Kong, China, India, Middle East, South Africa and Brazil

Who we are & what we offer

SE Controls are a leading specialist in the design and delivery of smoke ventilation and natural ventilation systems using façade automation as an integral part of the building envelope.

Since 1981 SE Controls has been developing innovative control systems that harness sustainable natural elements to create a safer and healthier indoor environment. This family owned business has grown from a humble start into an international business delivering products and projects across several continents.

Our customers benefit from qualified advice and technical support that is at the leading edge of international regulations and product development. Our products are designed and tested to international standards keeping our customers at the forefront of technology.

Free area calculations

There are generally three methods to measure free area through a window which are all applied relative to the building type and the application (smoke or natural ventilation).

In all applications be aware of obstructions such as framework, recesses, side walls etc., and of course neighbouring vents.

GEOMETRIC FREE AREA

The physical area produced by opening the window A + B. This area cannot exceed the maximum geometric area of the vent a x b.

AERODYNAMIC FREE AREA (AvCv)

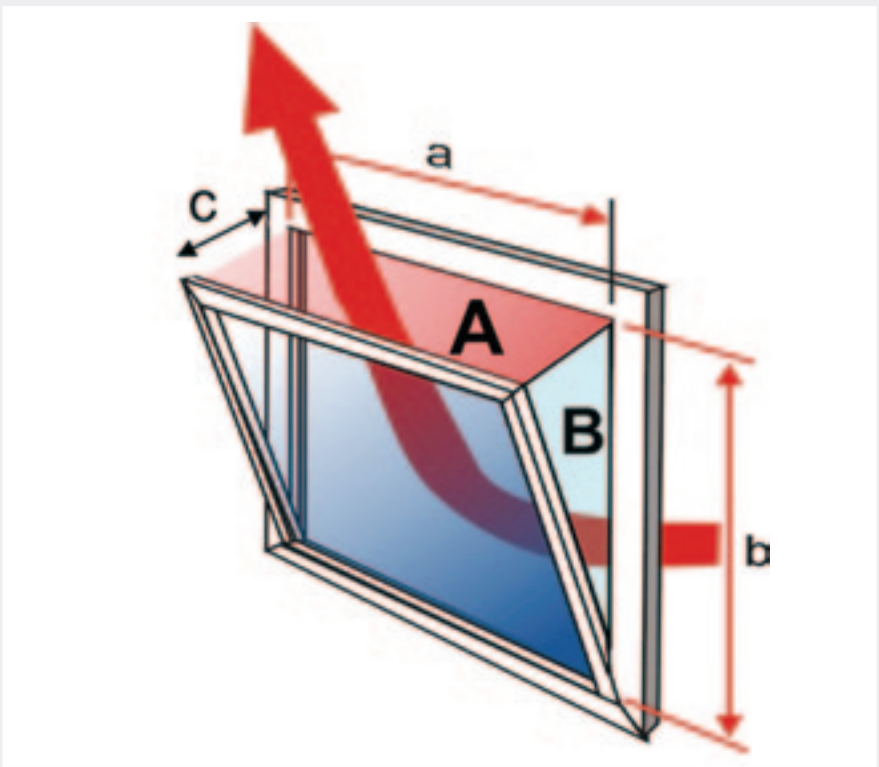
Mainly used for smoke ventilation the internal throat area a x b (Av) multiplied by the efficiency factor or coefficient of discharge (Cv) of the vent which is determined by the opening angle.

This information is only available if an aerodynamic test is carried out.

Generally 30-60% efficiency factors are achieved dependent upon the opening angle.

EFFECTIVE AREA

Similar to aerodynamic area, this is the effectiveness of the vent rather than physical geometric area but this method is more often used for natural ventilation applications.



PLEASE CONSULT SE CONTROLS' TECHNICAL SUPPORT TEAM WHO WILL ASSIST YOU IN PREPARING FREE AREA CALCULATIONS RELATIVE TO YOUR APPLICATION.

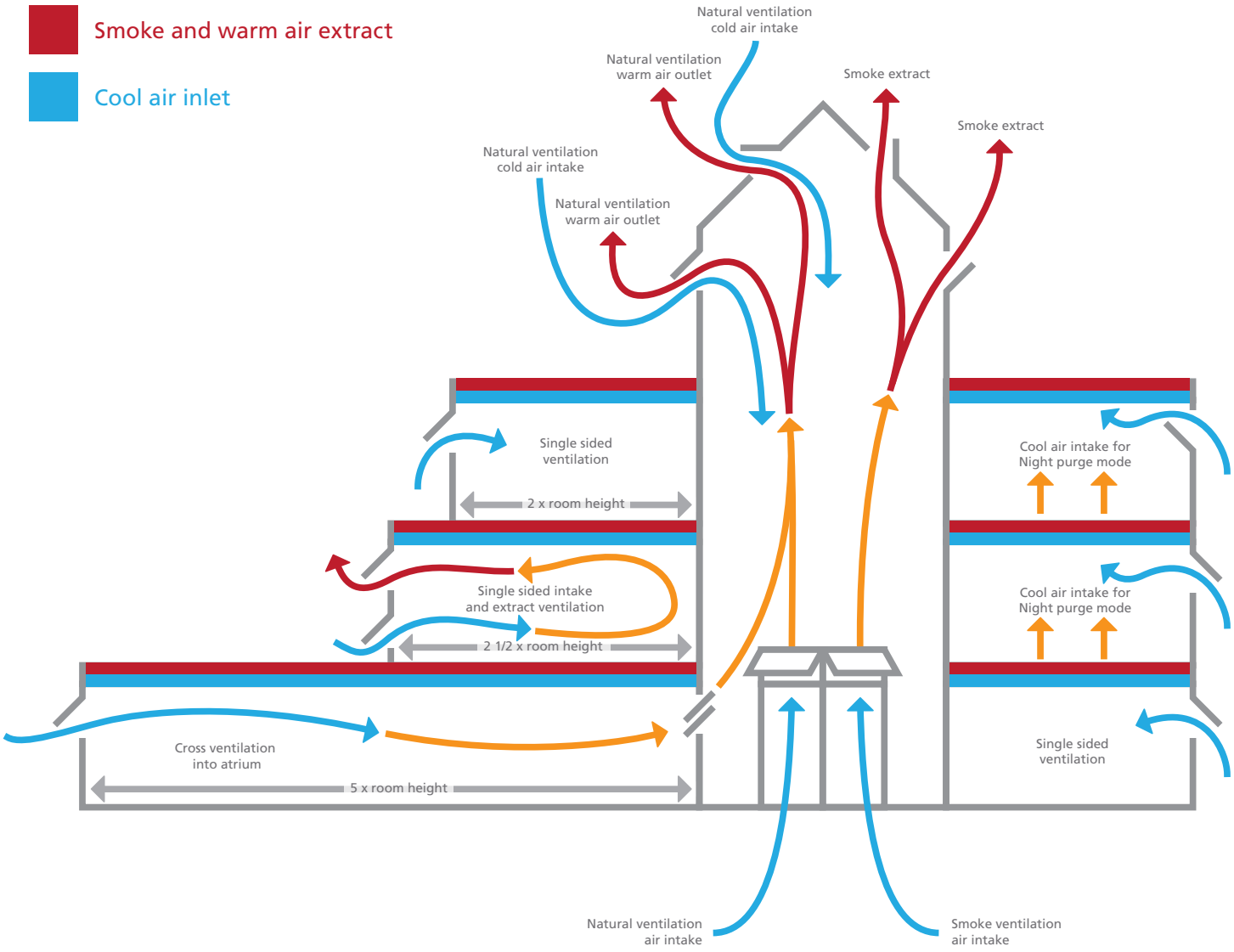
General principles of airflow

The direction of airflow or smoke flow is an important factor when selecting a suitable vent type.

Basic principles of airflow relative to external and internal temperatures and pressures will determine the optimum solution. The direction of airflow or smoke flow is an important factor when selecting a suitable vent type as certain hinge arrangements are more suited to air intake and smoke extract.

Smoke and warm air extract

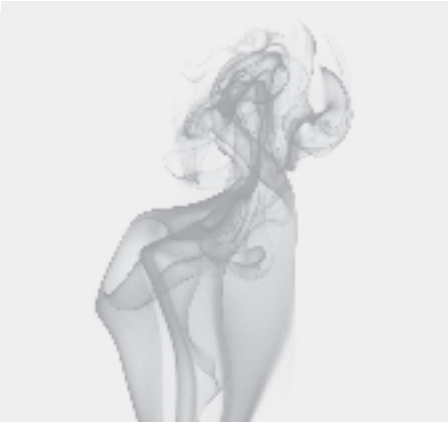
Cool air inlet



Consult SE Controls' Technical Support Team who will assist you to select the most appropriate vent orientation.

Actuator selection criteria

The following criteria are an indication of the types of information you may need to consider when choosing the correct actuator for your application.



SMOKE OR NATURAL VENTILATION?

This will govern the regulations and certification that will apply to the selection.

CHAIN OR LINEAR ACTUATOR?

In general, chain drives tend to be used for vertical vents as they do not protrude within the room space, and can easily be powder coated to match the frames or concealed within the profile.

Linear drives tend to be used for inclined vent applications or extremely large vertical windows due to their higher force capabilities.

ACTUATOR SIZE/AESTHETICS

There is a huge variation in actuator sizes available but generally the size tends to increase proportionally with the stroke and opening force.

Concealed actuators are possible but careful consideration must be made to maintain weathering and strength if profiles require routing to accommodate the actuator.

FLEX LENGTH AND SPECIFICATION

Actuator flexes tend to be between one and three metres, however extended flex lengths are available up to a recommended maximum of ten metres for DC actuators.

If cables are run within aluminium profiles of glazing systems, care must be taken to ensure sufficient electrical safety and 24 DC actuators are recommended. Actuators for smoke ventilators will be supplied with a low smoke and flame silicone flex for connection locally to fire rated field wiring.

FORCE (N)

Actuator force is measured in Newtons (N).

Actuators need to be selected with sufficient force to safely and reliably open and close windows. Whilst basic force calculations are relatively straightforward, modern window technology, high performance glass and hardware selection can have a dramatic effect on the forces required to operate a window. Incorrectly selected actuators can lead to rapid product failure and potentially dangerous mechanical faults.

LOCKING POINTS

High performance façade technology demands stringent air and water permeability performance. Any automated windows being installed into a façade must be able to match the performance specification of the façade. Frequently windows will use multipoint locking hardware to ensure this performance and any automation must be able to operate this hardware. This will involve sequencing electronics and safety systems to ensure the various drives operate seamlessly.

FINISH

Most actuators have a standard grey or white powder coating or silver anodized finish.

Alternative finishes are available but can cost a premium and increase delivery time.

VOLTAGE

Most actuators are available in both 24v DC and 230v AC versions.

Smoke ventilation predominantly utilises 24v DC as the system can operate via a battery back up secondary power supply.

Natural ventilation uses both voltages although 24v actuators tend to be more cost effective and offer increased functionality (tandem drive, multi point locking, programmable speed and force etc).

It is important for a façade specialist to ensure electrical safety of the system especially if extended flexes or cabling within the profiles is requested. A 24v solution is recommended in this instance as it is electrically safe. A 230v may require additional safety measures.

WARRANTY

Most actuators have a 10,000 cycle warranty. It is important that this is independently monitored by the control system so the fabricator can back up the warranty.

The SE Controls range of controllers offers this facility.

HINGE TYPE

The importance of hinge technology on actuator selection is crucial. Poorly specified interactions between hinges, restrictors and actuators can lead to premature failure or even more serious mechanical failures. It is important that the designer ensures all hardware is compatible and should ensure actuator brackets are selected which ensure correct operation and free movement of mechanical components.

VENT POSITION

Any automated windows create a danger of injury through entrapment unless safety measures are put in place. Where automated windows are at a high level with little risk of access internally and externally then the risk of injury is relatively low. However where automated windows are more accessible then preventative measures should be employed. These may range from the installation of simple physical barriers to sophisticated controls which sense movement and proximity. SE Controls can help assess these risks.

SPEED

Generally smoke ventilators are expected to achieve their fire ready position in under 60 seconds. Correct actuator selection must therefore ensure that the actuator is firstly tested to recognised high temperature performance and also that it must be able to open the vent sufficiently in under 60 seconds.

When actuators are not used for smoke ventilation, the speed of opening is of less importance and in some instances it is more advantageous if the actuators operate at very low speeds. This can reduce the danger of entrapment and assist with reducing electrical consumption and operating noise.

PRODUCT SECTION

Chain Actuators

Chain actuators provide the most cost effective solution for window automation. They are usually surface mounted, but concealed solutions can also be offered.

Actuators are available in a range of stroke lengths from 100mm-1000mm and with multi point locking abilities in order to meet weather and security performance requirements.

Whilst chain actuators are predominantly used on vertical applications, stronger products with robust chains are also capable of operating sloping vents.

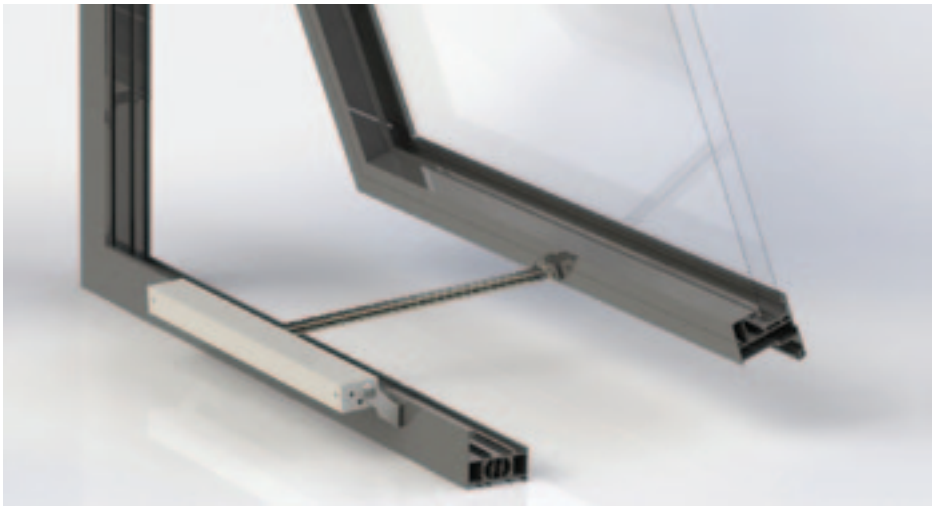
CHAIN ACTUATOR

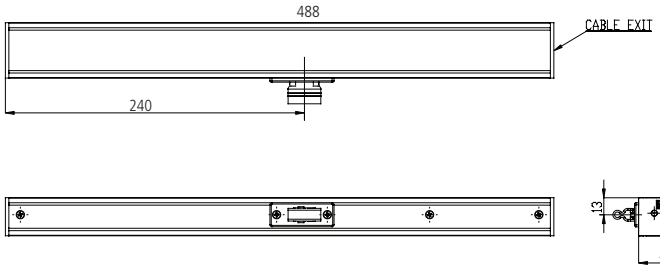
SECO N 24 25

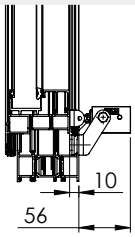
The SECO 24 25 chain actuator is a high quality, cost effective chain drive designed and manufactured by SE Controls and tested to EN 61000-6-1 & 2.

Electronically defined closing force ensures a tight close on each operation and the SECO N 24 25 is available in standard or bespoke body lengths in addition to stroke finish and flex length/type variations.

- Voltage – 24v DC and 230v AC
- Force – 250N
- Stroke range – 100-350mm (bespoke strokes available)
- Standard Finish – RAL 9006 (silver grey)
- Slim & distinctive grooved enclosure with branded end cap
- Flexible bracket range to suit all vent applications (0, 5, 10mm)
- Soft close available via adjustable zero point setting
- Virtually silent operation with selectable speed control
- Warranty – 2 years/15,000 cycles
- BMS simulation tested to 500,000 cycles
- Intelligent variants to follow
- Optional volt free signal output
- CE certified







10mm OFFSET BRACKET

SUITABLE FOR:

Natural Ventilation ✓

Smoke Ventilation ✗

Download data sheets and CAD files from our product catalogue at www.secontrols.com

CHAIN ACTUATOR

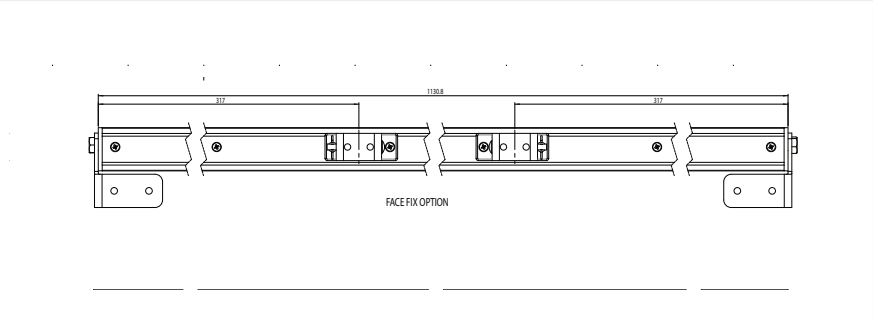
TWIN SECO N 24 25

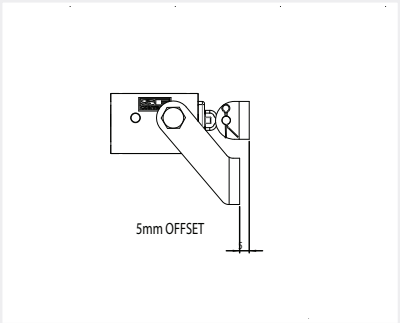
The TWIN SECO 24 25 is a unique twin chain actuator designed to offer improved window performance.

Designed and manufactured by SE Controls, this actuator has selectable compression point location and seal relief to optimise weather performance.

The TWIN SECO N 24 25 is available in standard or bespoke body lengths in addition to stroke finish and flex length/type variations.

- Voltage – 24v DC and 230v AC
- Force – 2x250N)
- Stroke range – up to 350mm (bespoke strokes available)
- Standard Finish – RAL 9006 (silver grey)
- Slim and distinctive grooved enclosure with branded end cap
- Flexible bracket range to suit all vent applications (0, 5, 10mm)
- Virtually silent operation with selectable speed control
- Soft close available via adjustable zero point setting
- Warranty – 2 years/15,000 cycles
- BMS simulation tested to 500,000 cycles
- Intelligent variants to follow
- Optional volt free signal output
- CE certified





SUITABLE FOR:

Natural Ventilation ✓

Smoke Ventilation ✗

Download data sheets and CAD files from our product catalogue at www.secontrols.com

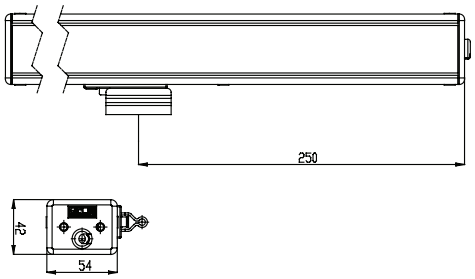
CHAIN ACTUATOR

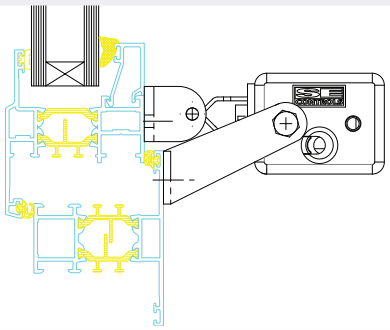
SECO N 24 40 RANGE

The SECO N 24 40 chain actuator range is a high quality but cost effective chain drive designed and manufactured by SE Controls and tested to EN 61000-6-1 & 2 and EN12101-2 smoke regulations.

Both single and twin versions are available in standard or bespoke body lengths in addition to stroke finish and flex length/type variations.

- Voltage – 24v DC and 230v AC
- Force – 400N (up to 600mm stroke)
- Stroke range – 100-900mm
- Standard Finish - RAL 9006
- Distinctive grooved enclosure and branded end cap
- Flexible bracket range to suit all vent applications
- Single and twin applications
- Warranty – 2 years/15,000 cycles
- BMS simulation tested to 500,000 cycles
- Intelligent variants to follow
- Optional volt free signal output
- CE certified





SUITABLE FOR:

Natural Ventilation ✓

Smoke Ventilation ✓

Download data sheets and CAD files from our product catalogue at www.secontrols.com

CHAIN ACTUATOR

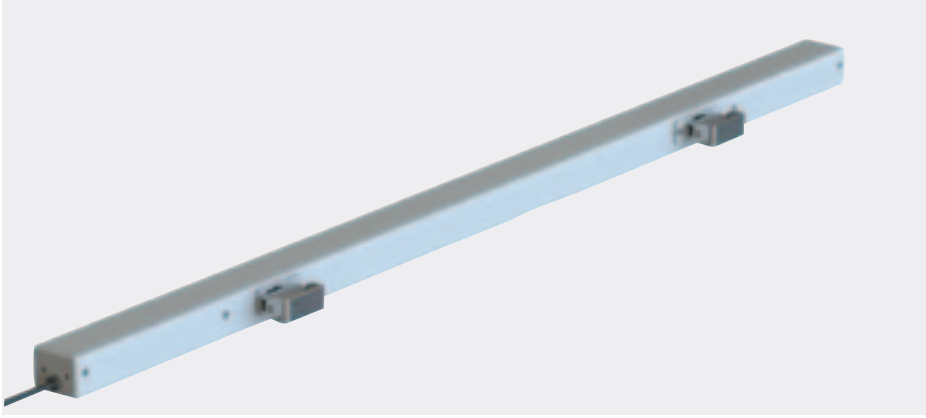
TWIN SECO N 24 40

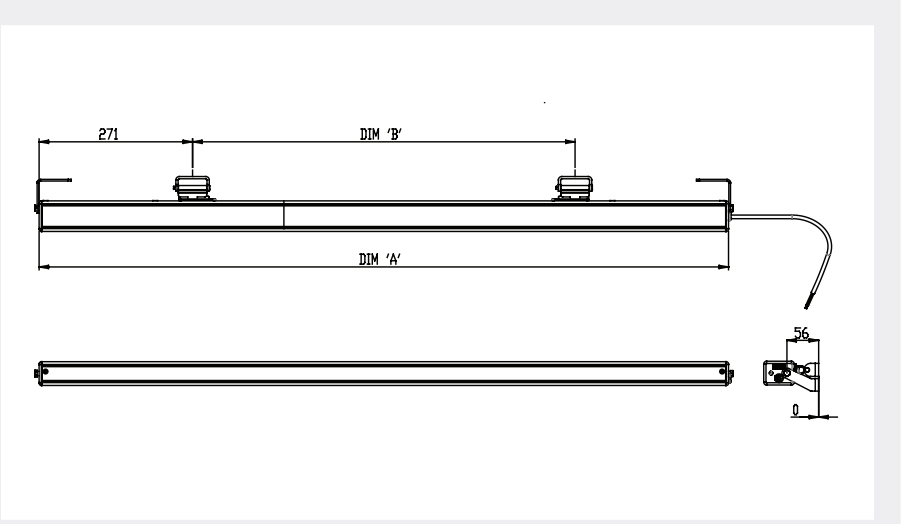
The Twin SECO N 24 40 window actuator is a European certified and compliant developed chain actuator, designed to provide precise and reliable operations for natural ventilation applications, with two synchronised drive mechanisms integrated into one extrusion.

The Twin SECO N 24 40 provides actuation of particularly wide windows for a robust and efficient installation. The closing of the actuator is electronically switched to ensure a tight and secure closing compression on every operation.

Tailored body lengths, finishes and bespoke flex lengths are available to optimise the locking point positions for improved weather tightness.

- Voltage – 24v DC
- Force – 2 x 400N (up to 600mm stroke)
- Stroke range – 250 – 900mm
- Standard Finish - RAL 9006
- Distinctive grooved enclosure and branded end cap
- Flexible bracket range to suit all vent applications
- Warranty – 2 years/15,000 cycles
- BMS simulation tested to 500,000 cycles





Description	Dim 'A'	Dim 'B'
1450 VENT (UP TO 400mm STROKE)	1267.5	725
1350 VENT (UP TO 400mm STROKE)	1217.5	675
MINIMUM LENGTH 250mm STROKE	927.5	385
MINIMUM LENGTH 400mm STROKE	1077.5	535
MINIMUM LENGTH 600mm STROKE	1277.5	735
2100 VENT (UP TO 900MM STROKE)	1592.5	1050

SUITABLE FOR:

Natural Ventilation ✓

Smoke Ventilation ✓

Download data sheets and CAD files from our product catalogue at www.secontrols.com

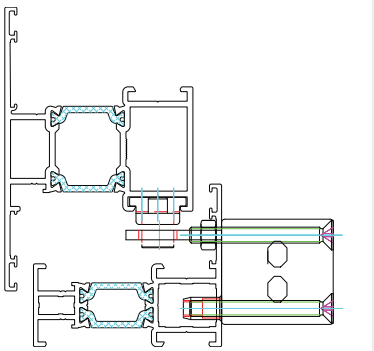
CHAIN ACTUATOR

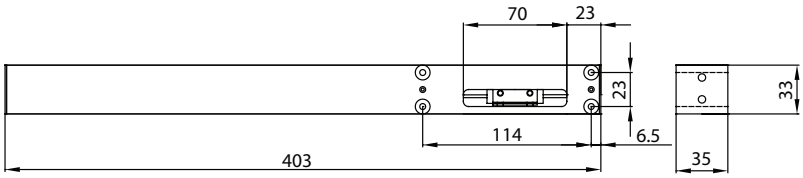
SECA LOCKING MOTOR

Our range of chain actuators and linear actuators are available with automated multi point locking motors with integrated sequential controls that will activate the locking mechanism and then the window actuator in the appropriate sequence.

Consult our Technical Sales Team who will be happy to advise on appropriate selection and use.

- Voltage – 24v DC
- Standard finish - Aluminium
- Force – 1200N / 600N





SUITABLE FOR:

Natural Ventilation

Smoke Ventilation

Download data sheets and CAD files from our product catalogue at www.secontrols.com

PRODUCT SECTION

Linear Actuators

Linear Actuators are predominantly used for sloping applications, where greater opening forces are required.

They can also be used on vertical vents where the vents are required to open to a distance greater than can be achieved by a chain actuator. They can be utilised to provide 90° opening if required.

LINEAR ACTUATOR

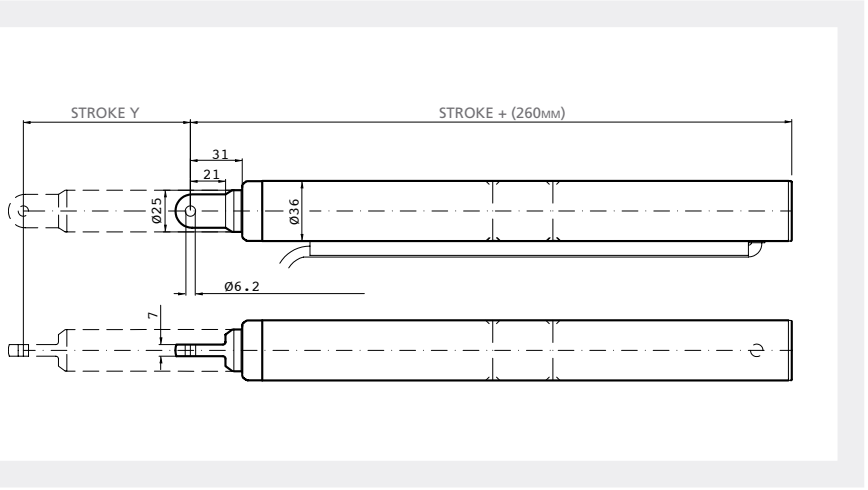
TGLA 24 50 - 2000 RANGE

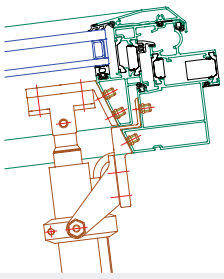
An expansive range of cylindrical linear drives predominantly used to automate sloping vents where increased forces and opening distances are required.

Large vertical vents can also be automated where larger strokes and forces are required where a chain drive is unsuitable.

Single, tandem and multiple combinations are available plus integration with multi point locking motors for larger vertical vents.

- Voltage – 24v DC
- Force – 500N,1000N,1500N & 2000N
- Stroke Range – 100-1000mm
- Standard Finish – Silver Anodized (RAL available)
- Warranty – 2 years/10,000 cycles
- CE certified





SUITABLE FOR:

Natural Ventilation ✓

Smoke Ventilation ✓

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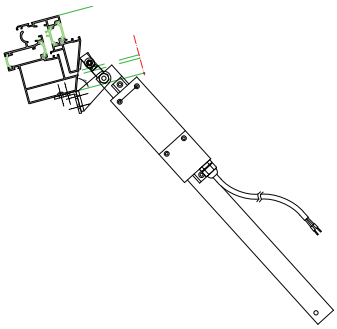
LINEAR ACTUATOR

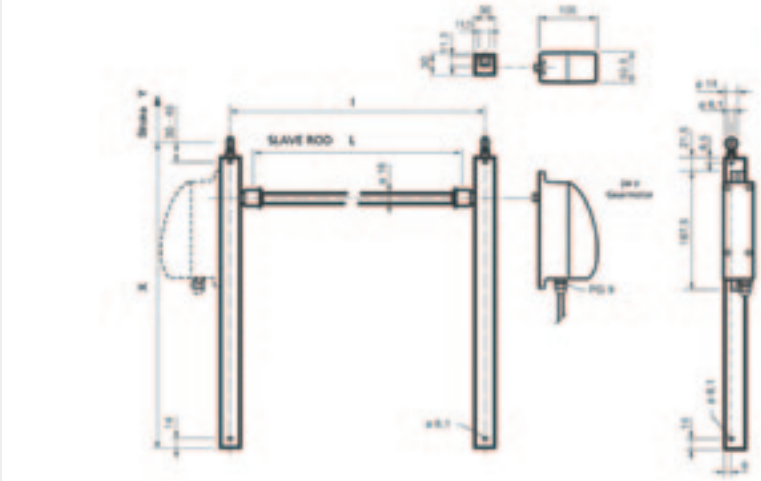
SELA S & 24 S

A cost effective linear rack type actuator predominantly used for sloping vents where strong forces are required.

Single and tandem operation is possible with a secondary rack and connecting rod.

- Voltage – 24v DC & 230v AC
- Force – 600N at 230v - 800N at 24v
- Stroke Range – 180 / 230 / 350 / 550 / 750 / 1000mm
- Standard Finish – Silver Anodized (RAL available)
- Warranty – 2 years/10,000 cycles
- CE certified





SUITABLE FOR:

Natural Ventilation

Smoke Ventilation

Download data sheets and CAD files from our product catalogue at www.secontrols.com

LINEAR ACTUATOR

SELA 24 G & SELA 24 P

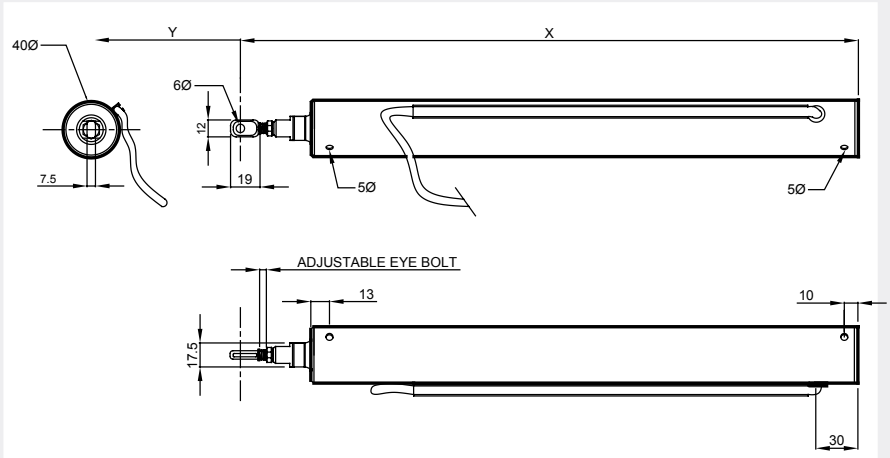
The SELA range of linear drives are strong cylindrical actuators predominantly used for sloping vent applications and windows requiring large angles of opening where a chain drive is insufficient.

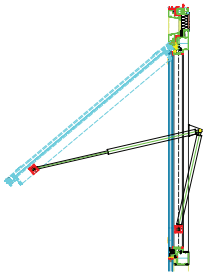
The SELA 24 P is identical to a SELA 24 G but has a rear eye for fixing from the rear.

The SELA 24 G linear actuator hangs perpendicular to the vent, whereas the SELA 24 P is a double pivoting solution, avoiding large opening angles.

Single and tandem versions are available.

- Voltage – 24v DC
- Force – 400N,650N,1000N
- Stroke Range – 100-1000mm
- Standard Finish – Silver Anodized (RAL available)
- Warranty – 2 years/10,000 cycles
- CE certified





SUITABLE FOR:

Natural Ventilation

Smoke Ventilation

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PRODUCT SECTION

Control Systems

SE Controls offer the most comprehensive range of control systems to suit every application for both smoke and natural ventilation bespoke to the façade/ envelope automation industry.

Every product is rigorously tested in the UK to the required standards.

It is imperative the controls are compatible with the actuators they operate.

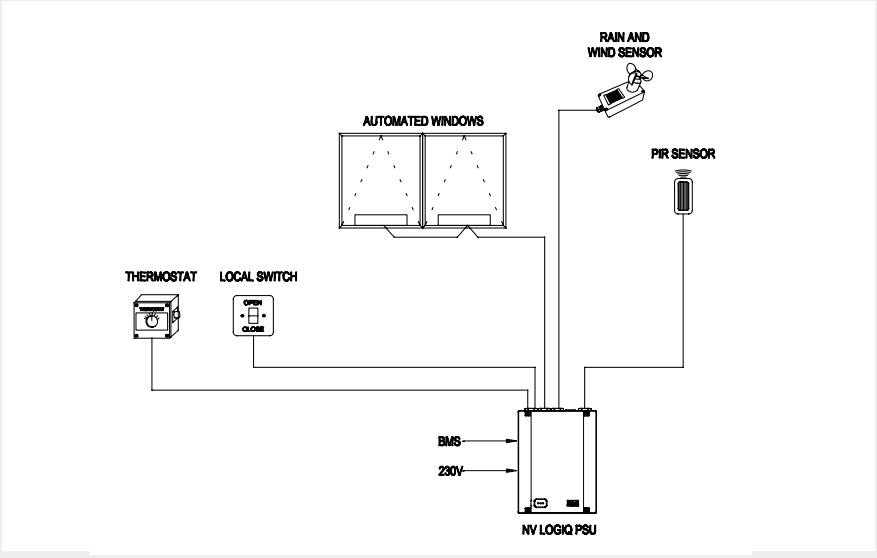
CONTROL SYSTEMS

NVlogiQ PSU

The NV LogiQ PSU is an intelligent power supply unit that can operate actuators via a simple switch,external sensors, as a stand alone system or as a slave to a Building Management System (BMS).

Features :

- Compact aesthetic design
- 230Vac-24vDC transformer/rectifier
- 6A output
- Switch and BMS volt free inputs
- BMS 0-10v inputs to deliver graduated opening in 10% increments (5% with NV LogiQ Controller)
- BMS lock out period (programmable) to prevent conflict with local switch
- Associated sensor inputs (stat,rain,wind etc)
- Actuator cycle monitoring to protect operational frequency warranty.
- External LED status indicators
- CE certified



SUITABLE FOR:

Natural Ventilation ✓

Smoke Ventilation ✗

Download data sheets and CAD files from our product catalogue at www.secontrols.com

CONTROL SYSTEMS

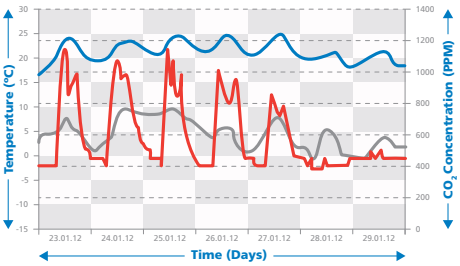
NV LogiQ ROOM CONTROLLER

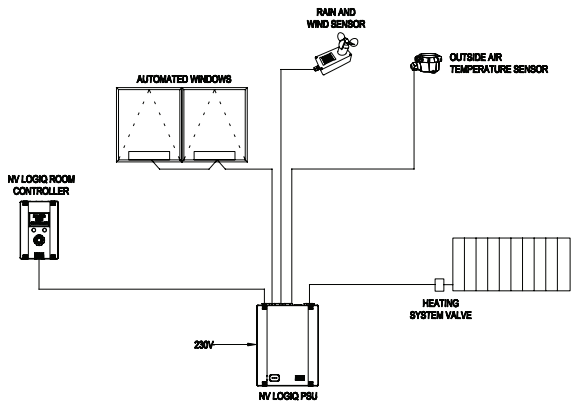
In conjunction with the NV LogiQ PSU the NV LogiQ room controller provides the ultimate solution for an automated natural ventilation system within a classroom or office space in addition to providing energy efficiency and night purging features.

An inbuilt control strategy which takes into account internal temperature CO_2 and humidity relative to the outside conditions and time day month and year ensures optimum working and energy efficient conditions.

Features :

- Data logging for system design for existing buildings and post installation monitoring
- Red amber and green indication of CO_2 to educate and inform occupants
- Inbuilt pre-programmed strategy (reprogrammable after monitoring period)
- Occupants override switches with auto lock out (adjustable time period)
- LCD graphic display of room conditions
- Neat compact design
- Individual room system with global control options (rain close global evening close etc)
- Heating / cooling control in conjunction with ventilation products (window actuators louvres stacks etc)
- CE certified





SUITABLE FOR:

Natural Ventilation

Smoke Ventilation

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CONTROL SYSTEMS

OS2 TYPE 23 & 24

The OS2 controller range is a compact stand alone or BMS interface networked controller for both smoke and natural ventilation solutions vastly reducing expensive cable runs by locating the power supplies close to the vents.

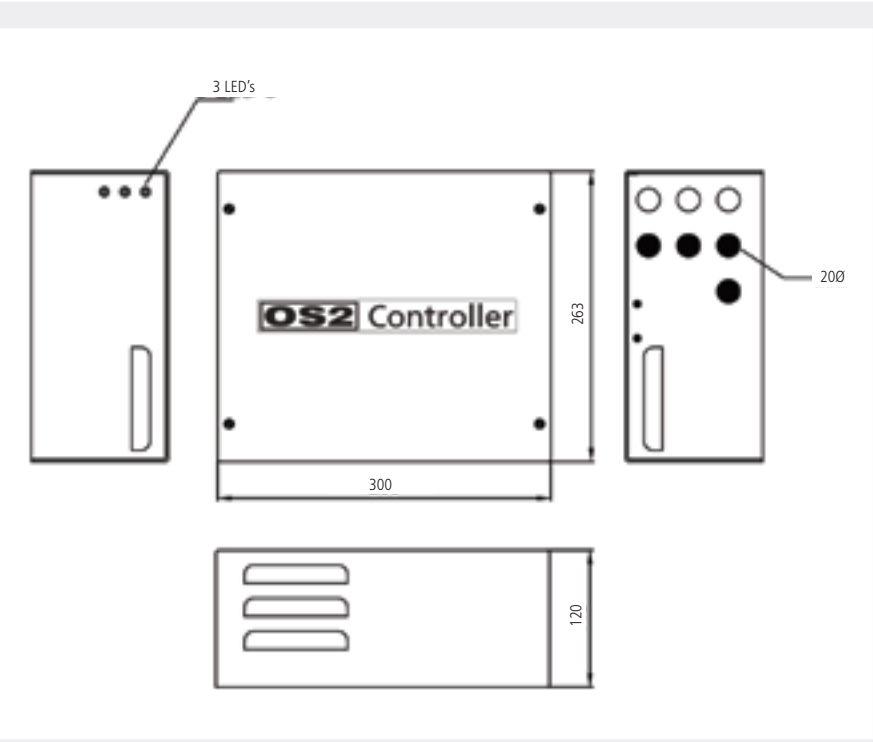
The intelligent inbuilt power and control board provides interfaces with all common fire alarm and BMS systems plus communication boards can be added to suit bespoke building automation protocols.

The addition of sensors switches and smoke detectors can create a stand alone system if required.

Standard and programmable façade automation parameters are inbuilt to suit all project requirements.

Features include :

- 230v AC – 24vDC transformer rectifier 5A type 22 8A type 24
- Monitored battery back up for smoke ventilation 5A type 21 8 Amp type 23
- Small compact controller
- Networked or stand alone operation
- CE certified
- Standard BMS & fire alarm interfaces plus plug in protocol boards
- Actuator cycle monitoring to protect warranties
- Large switch and sensor range for both smoke and natural ventilation applications
- Local switch with BMS lock out period (programmable)
- External status LED's
- Multi zone modular panels available
- Internal communications protocol - SE Controls OSLINK
- External communications protocol - LON, BACNET or universal gateway



SUITABLE FOR:

Natural Ventilation

Smoke Ventilation

Download data sheets and CAD files from our product catalogue at www.secontrols.com

CONTROL SYSTEMS

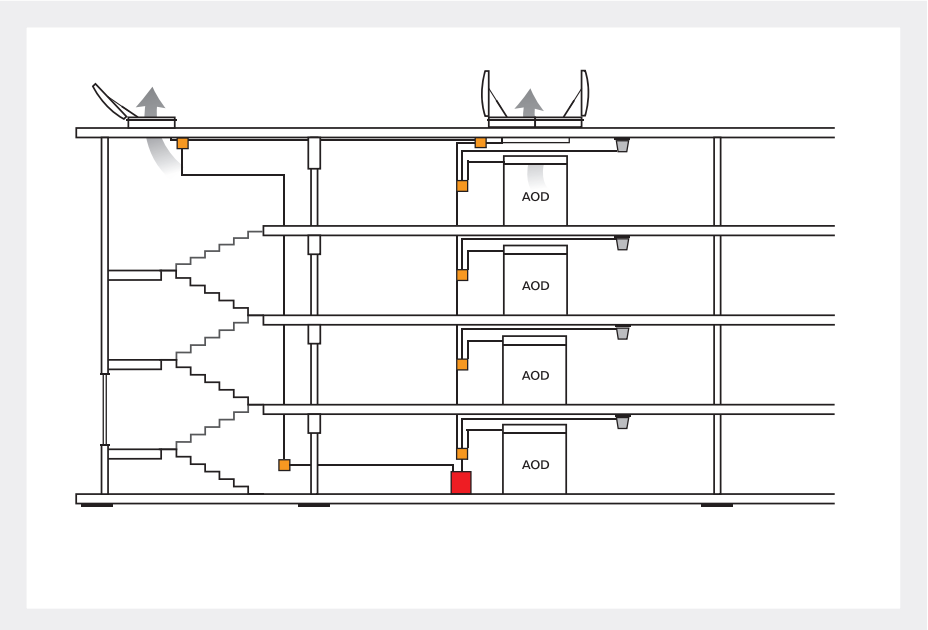
OSLOOP

OSLOOP is a looped smoke ventilation control system designed for use in high rise residential applications such as apartments hotels and student accommodation.

Considerable savings in cabling can be made as both power and data is looped between Manual Control Points which receive fire alarm or smoke detector signals and actuator cable directly.

The OSLOOP system can be used for AOV end of corridor windows or vertical smoke vents.

- PR EN 12101 – 9 compliant
- EN 12101 – 10 compliant
- ISO 21927 – 9 compliant
- ISO 21927 – 10 compliant
- CE certified



SUITABLE FOR:

Natural Ventilation

Smoke Ventilation

Download data sheets and CAD files using the search bar at www.secontrols.com

CONTROL SYSTEMS

SWITCHES & SENSORS

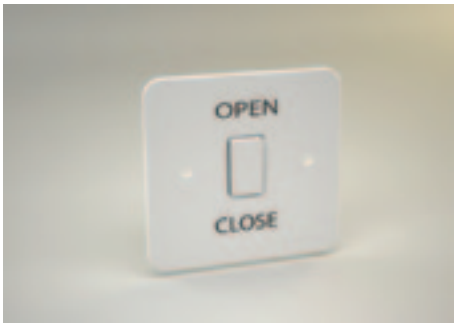
A complete range of sensors and switches both standard and bespoke is available from SE Controls for all applications.

All products are compatible with the SE Controls extensive range of control systems.

External temperature sensor

Wind speed and direction sensor

PIR sensor

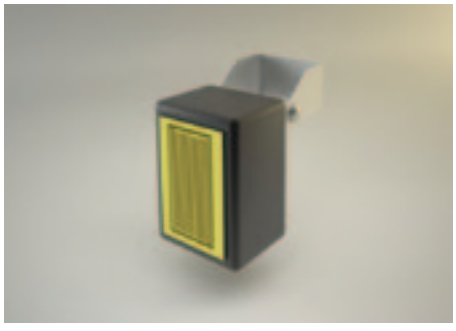


Open / close switch

Manual override switch / key switch

Smoke detector

Manual Control Point



Rain sensor

Download data sheets and CAD files from our product catalogue at www.secontrols.com

Manual winding gear

For high level or out of reach windows, we have a range of manual winding gear solutions that can be applied to single or multiple vents to provide smoke or natural ventilation.

Vertical windows predominantly utilise single or double chain drives which have an opening stroke of 250mm or 380mm.

Sloping vents will require a linear screwjack with an opening stroke of 380mm.

White is the most common finish, but grey, brown and black are also available.

RIGHT **Midi Control Handles**
APPLICATION SHOT SHOWS MIDI CONTROL HANDLE AND CHAIN OPENER INSTALLED TO TOP HUNG VENTS

MIDDLE **Chain Opener**
APPLICATION SHOT SHOWS MIDI CONTROL HANDLE AND CHAIN OPENER INSTALLED TO TOP HUNG VENTS

FAR RIGHT **Screwjack**
APPLICATION SHOT SHOWS OPERATIONAL SCREWJACK IN PLACE

Glossary of terms

SMOKE VENTILATION

AOV (Automatic Opening Vent)
Typically a casement or louvre operated automatically to its required position via a 24v DC electric actuator.

Approved Document B (2006) – Building Regulations
Prescriptive requirement for smoke ventilation. Details free area requirements methods of measurement and product standards for AOVs.

Approving Authority
The person or body responsible for the verification of design and installation of a smoke ventilation system. This could be Local Authority Building Control, NHBC (National House Building Council) or Approved Inspectors in conjunction with local Fire and Rescue services.

AvCv or Aerodynamic Free Area
Measured performance of a smoke vent calculated in square metres. Size hinge arrangement and opening angle will affect the AvCv which results in an efficiency percentage applied to the area. Many Consultants will assume a 0.6 Cv (60%) coefficient but you must apply the Cv of your particular vent. (see coefficient of discharge). The Cv can range from 0.3 to 0.65 dependent upon the vent criteria and opening angle and vastly affects the quantity of AOVs required.

BRE - British Research Establishment
Have produced many performance and design documents used in smoke ventilation design.

Breakglass/reset switch
Old terminology for the Fireman's control switch (see MCP). These are historically yellow but new MCP's are now orange.

BS 5588 series
Previous design standards prior to the publication of BS 9991 & 9 series.

BS 9991 (2011)
Code of practice for fire safety in the design,management and use of residential buildings. Includes design guidance for residential smoke ventilation systems including product standards,performance and functional requirements.

BS 9999 (2008)
Code of practice for fire safety in the design, management and use of buildings. Includes design guidance for non-residential smoke ventilation systems.

BS 7346 Part 1 (1991)
Natural smoke vent certification standard prior to EN12101-2. Vents tested to this old standard do not comply as the standard was superseded by EN12101-2 and withdrawn by the BSI. Other parts of the BS 7346 are still current especially reference to maintenance (part 8).

BS 8519 (2010)
Design standard for smoke ventilation system cable installation.

CFD - Computational Fluid Dynamics
Computer simulation analysis of air and smoke behaviour in a building. Used in fire engineered solutions and natural ventilation designs to provide confidence of the potential performance when designing outside of the prescriptive standards and regulations.

Chain Actuator
Should be tested to EN12101-2 Annex G when used for smoke ventilation plus CE marked to demonstrate conformity with EMC 89/336/EEC and LVD 2006/95/EC.

Coefficient of Discharge (Cv)
Percentage efficiency factor of a smoke vent relative to the opening angle and vent arrangement. Proven via test under EN12101-2 but in the absence of test data the maximum Cv that can be applied is 0.4 (see previous free area section).

Direction of smoke flow
The path that smoke takes to exit a vent representing the area of the vent that can be used to calculate the geometric free area (see page 10).

EN 12101 part 2 (2003)
Current natural-smoke vent certification standard. The standard contains several annexes including test criteria to establish aerodynamic coefficients of discharge ability to operate against imposed, operational reliability loads and performance at high temperature (annexe G).

EN 12101 part 9
Imminent European standard against which all control systems used to operate smoke control systems will be tested and CE marked to. ISO 21927-9 is a published standard against which manufacturers can demonstrate compliance for their control products.

EN 12101 part 10
Current European standard against which all power supplies used to control smoke control systems must be tested and CE marked.

FIRAS
A third party certification scheme for smoke vent system installers. Operated by Warrington Certification in conjunction with the Smoke Control Association.

Fire Engineered Solution
A smoke ventilation system designed outside the prescriptive regulations and usually in line with the guidance of BS7974. These designs often require CFD analysis to back them with the Designer offering substantial pedigree and PI (professional indemnity) insurance. The design will need to be approved by the Authorising Authority prior to commencement of the works.

FP or MIC Cable
Fire rated cable used between the control system and the smoke vent to ensure power gets to the vent when exposed to fire and high temperature. (refer BS 8519).

GFA - Geometric free area
The physical free area of a vent produced when open. It does not indicate the 'effectiveness' of a smoke vent but can be used for specific applications.

Internal Throat Area
The rectangular clear internal dimension of a vent (width and height) used for free area calculations.

LABC – Local Authority Building Control
Regional body mostly responsible for the verification of the design and installation of smoke ventilation systems.

Linear Actuator
Should be tested to EN12101-2 Annex G when used for smoke ventilation.

LSF Cable
Low smoke and fume silicone actuator cable rated for high temperature operation (but not fire rated). This cable is commonly used to connect the actuator locally to FP or MICC field wiring due to it's flexibility but should not be used as fire rated cable installation.

Manual Control Point (MCP)
The official terminology for an Fireman's switch. This is now an orange switch as required in EN12101-10 and provides fire personnel operation of the smoke vents. Standard and tamper proof MCP's are available in the SE Controls smoke vent control systems ranges.

NSHEVS
European terminology for certified smoke vents compliant to the EN12101-2.

OV – Opening Vent
Manually openable vent used for smoke ventilation this could be electrically operated via an MCP in areas where the vent is inaccessible such as fire fighting and escape stairs or manual handle operated.

Regulatory Reform (Fire Safety) Order (RRO)
Under this legislation, a building owners employers and managers are solely responsible for the provision of effective and compliant fire safety solutions within their premises. Failure to comply with any requirement under the RRO or specific corrective measures issued within an RRO compliance notice issued by the enforcing authority is an offence and is likely to result in prosecution together with a fine or custodial sentence.

SCA – Smoke Control Association (SE Controls are members)
Trade organisation responsible for driving standards and approved methods for smoke ventilation in the UK.

SHEVS - Smoke and Heat Exhaust Ventilation Systems
European terminology for certified smoke ventilation systems compliant to the EN12101 series.

Snow Load
Imposed load that needs to be factored into sloping smoke vent calculations but often overlooked. Measured in newtons or pascals the snow load often exceeds the dead weight of the vent resulting in the need for actuators twice the strength normally selected.

Wind Load
Imposed load that also needs to be factored into smoke ventilator calculations. Actuators must be calculated to open against designed wind loads.

Wind Directions
Wind direction needs to be considered when designing the location of smoke vents. Incorrect positioning can result in positive pressures being imposed resulting in smoke blowing back into the building.

Wind Baffles
Now often used for sloping smoke vents and rooflight applications to negate the effect of side winds upon the exhaust performance.

NATURAL VENTILATION

Approved Document F – Building Regs
Purpose provided ventilation of fresh air for breathing, displacement of pollutants, odour & humidity for dwellings and non-dwellings. Background ventilation energy efficiency and indoor air quality are all factors with the regulation stating flow rates free area requirements and acceptable levels. Requires the use of effective free area performance of vents (as opposed to geometric).

BMS or BEMS –
Building (Energy) Management System
A centralised system monitoring and controlling HVAC systems and products to provide an overall building control strategy. Stand alone systems such as OS2 and NV LogiQ from SE Controls can also deliver this for individual room or total dynamic building control.

BREEAM
A BRE method to assess the environmental performance of a building. Includes all aspects of building's impact on environment (even transport). Score points (credits) for every aspect of building's impact, above and beyond normal regs / standards. PASS, GOOD, VERY GOOD, EXCELLENT. Different assessments for Schools, Offices & Health Buildings. Good BREEAM ratings result in lower running costs via reduced energy usage therefore higher rental yields and saleability of buildings. The use of natural ventilation such as façade automation systems gains a credit.

Building Bulletin 87 (BB87)
Guide for environmental design for schools ADL2, Heating & Thermal Performance, Ventilation & indoor Air Quality, Lighting, Hot & Cold Water Supplies. School Premises Regulations.

Building Bulletin 93 (BB93)
Acoustic performance of naturally ventilated school buildings. Details noise entry from outside and noise generated internally.

Building Bulletin 101 (BB101)
Regulatory framework and design Guide for ventilation of school buildings. This lays out the target parameters for optimum performance in relation to temperature and CO_2 and required air changes (measured in litres per second per person) when recommended set points are exceeded. Approved Documents F and L are detailed within BB101. Studies have proven that poor IAQ results in a 10-15% reduction in output performance and learning ability. SE Controls are qualified to calculate the required flow rates and free areas via the façade in relation to the requirements of the standard.

CIBSE – Chartered Institute of Building Services Engineers

CIBSE Nat Vent Group
(SE Controls are members)
The CIBSE Nat Vent Group is responsible for publishing design guides for natural ventilation. SE Controls are members of this group.

CIBSE Guide A 'Environmental Design'
CIBSE Guide B 'Heating Ventilation Air conditioning and Refrigeration'
Design guides for best practice of system design and performance.

CIBSE Guide AM10 'Application Manual "Natural ventilation in non-domestic buildings"
A comprehensive handbook on how to design natural ventilation into a building. Includes prescriptive calculation methods.

CWCT Technical Note TN 74 "VENTILATION" (November 2011)
Concentrates on ventilation through the façade. Refers to Approved Document F, CIBSE AM10, CIBSE Guide A, BS5925:1991, BS 6375: Part 1 2009, BB101, School Premises Regulations.

Effective Free Area (also Equivalent Free Area)
The effective free area of a vent taking into account the inefficiency of airflow through apertures giving a true performance.(see previous free area section)

Energy Performance Of Buildings Directive (EPBD)
EU directive to reduce energy used in buildings to cut carbon emissions. All buildings to have energy performance certificate at time of sale or rent (except heritage & some factories). Large & public buildings to display this. In UK based on ADL 2006 & must demonstrate compliance with ADL 2006. Implemented into UK law Jan 2006.

HVAC – Heating Ventilation and Air Conditioning
The technology of indoor and automotive environmental comfort control which includes window/façade automation.

Indoor Air Quality - IAQ
Measured in parts per million of CO_2 indoor air quality is maintained by introducing fresh air changes when the CO_2 exceeds acceptable levels.

Morning (fresh air) Purge.
Introduction of fresh air in the morning prior to building occupancy via the automation of façade products (vents louvres etc).

Night Purge (Free Night Cooling)
The process of introducing cool air into a building at night during warmer periods of the year. When the internal to external temperature differential is advantageous automated vents allow cool nightime air to enter the building to cool down the thermal mass of the building. This 'coolth' is stored and emitted during the day either totally negating or vastly reducing the requirement for mechanical ventilation (air con) which produces CO_2 into the environment. Thermal comfort is enhanced resulting in improved production and learning ability.

TC – Thermal Comfort
Measured in degrees C the temperature within a room space which should be kept within acceptable parameters of comfort for the occupants. Any control system should be adaptive and recognise the interaction between TC, IAQ and Energy Efficiency. SE Controls NV LogiQ range contains intelligent and proven control strategies to achieve this developed in conjunction with leading academic partners and associations.

0-10v Signal
A common signal received from a BMS to increment automated vent actuators. Control systems such as the SE Controls range will receive the 0-10v signal and position the vent accordingly in 10% increments. This is more accurate than a volt free signal which is mentioned in the general section.

GENERAL

CE Marking
Mandatory conformity mark for products placed on the market in the European Economic Area.

Construction Products Regulation (2013) (CPR)
Replaces the Construction Products Directive. It will be mandatory for products within the scope of harmonised European Standards (hENs), to carry CE marking if they are to be placed on the UK market.

EN60335-2-103 2003
This is a European standard that requires automated products such as windows to be assessed for entrapment risk if they are located below 2.5m from FFL. After the risk assessment preventative measures such as reduced speed and force products are available plus motion sensor solutions are available. Control strategy methods however can also be utilised to negate the risk.

Volt Free Contact
A digital signal supplied by both fire alarm and BMS signals to either signal smoke vents to open/close or to increment vent opening positions.

This signal is received by the control system powering the vent actuators such as the SE Controls control panel range (see controls section).

Projects

TOP LEFT **Olympic Velodrome**
LOCATION: LONDON
ARCHITECTS: HOPKINS
MAIN CONTRACTORS: ISG
200 AUTOMATED WINDOWS CONTROLLED BY OS2 CONTROLLERS

TOP RIGHT **Evelyn Grace Academy**
LOCATION: BRIXTON
ARCHITECTS: ZAHA HADID
MAIN CONTRACTORS: MACE
250 AUTOMATED WINDOWS OPERATED BY OS2 CONTROLLERS

MIDDLE LEFT **Featherstone Prison**
LOCATION: WOLVERHAMPTON
ARCHITECTS: PICK EVERARD
MAIN CONTRACTORS: KIER
400 AUTOMATED EN12101-2 VERTICAL AND SLOPING SMOKE VENTS, 15 POWERED EXTRACT FANS AND DAMPERS OPERATED BY MODULAR PSU CONTROLS (FIRE ALARM AND BMS INTERFACE) AND 415 FAN PANELS

CENTRE **Woodcock Street**
LOCATION: BIRMINGHAM
ARCHITECTS: ASSOCIATED ARCHITECTS
MAIN CONTRACTORS: THOMAS VALE
300+ AUTOMATED FAÇADE AND ATRIA VENTS OPERATED BY OS2 CONTROLLERS

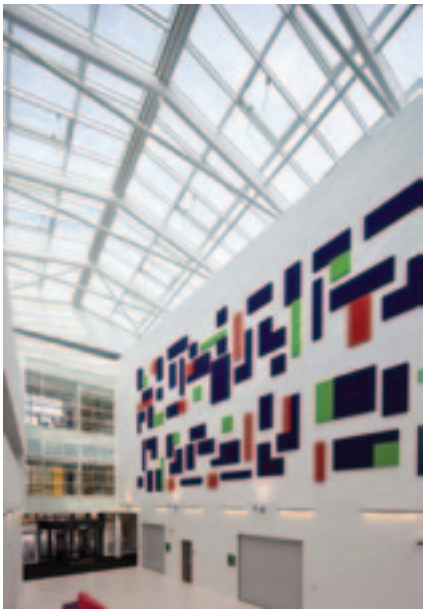
BOTTOM LEFT **The Chips Building**
LOCATION: MANCHESTER
ARCHITECTS: ALSOP ARCHITECTS
MAIN CONTRACTORS: URBAN SPLASH
AUTOMATED SMOKE VENT AOVs OPERATED BY OS2 CONTROLLERS

BOTTOM 2ND FROM LEFT **Parkview Green**
LOCATION: BEIJING
ARCHITECTS: IDA HONG KONG
MAIN CONTRACTORS: CHINA JIANGSU INTERNATIONAL CONSTRUCTION
4500+ CHAIN ACTUATORS TO FAÇADE OPERATED BY 330+ CONTROLLERS

BOTTOM 3RD FROM LEFT **Cruise Terminal**
LOCATION: HONG KONG
ARCHITECTS: FOSTER + PARTNERS
MAIN CONTRACTORS: DRAGAGES HONG KONG
2000+ LINEAR ACTUATORS TO SLOPING AND VERTICAL VENTS, 3000+ LOCKING MOTORS AND CONTROLS

BOTTOM RIGHT **Salford Royal Hospital**
LOCATION: MANCHESTER
ARCHITECTS: HKS
MAIN CONTRACTORS: BALFOUR BEATTY
AUTOMATED SMOKE VENT AOVs, SHEVTEC LOUVRES AND EN12101-2 ROOF VENTS OPERATED BY MODULAR PSU CONTROLS

THE DEPARTMENT FOR CULTURE, MEDIA & SPORT



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Creating a Healthier and Safer Environment

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