

Automatic Opening Vent (AOV) Window Compliance Requirements



SE Controls

SE Controls is a leading international specialist in the design and delivery of intelligent smoke and environmental ventilation systems.

We design, specify, install and commission full turn key smoke ventilation projects, predominantly, but not solely, in the realm of high-rise residential schemes. Our contracting team have many years' experience within the selling and delivery phase, with support from our accredited and qualified in-house fire engineering specialists.

Having in-house fire engineering expertise means we can be called upon to ensure the most seamless of system integrations from sheltered living schemes to super high-rise towers, and code-compliant natural shaft solutions to mechanical extract systems. This includes innovative hot corridor mitigating solutions across our range of proprietary controls and

actuation devices, delivered in accompaniment to a full range of AOV smoke dampers, roof vents and mechanical extract fans.

Our team of expert engineers can be on site to install and commission projects nationwide, however, our 'remote service' solution also allows the proactive management of site-based systems, whereby our engineers can communicate with our systems without the need to be on site. In addition, our unique proposition is the incorporation of tested EN12101-2 window actuators across a substantial number of system company profiles which means our UK smoke ventilation contracting entity can directly deliver a comprehensive and fully compliant system offering without recourse to third parties.

Made in Britain

SE Controls is a member of the national 'Made in Britain' initiative that recognises and promotes British manufacturing and has had a production base in the UK for more than 15 years.

Global Presence

Whilst our roots are firmly in the UK, we are a truly international business.

- Supply, Installation and Commissioning
- Maintenance
- Over 150 Employees
- Online Technical Teams
- UK Manufacturer

Regional Offices in:

SE Controls Asia Pacific (SECAP)

Hong Kong
(Established 2007)

SE Controls Africa (SECAF)

Durban
(Established 2009)

SE Controls India (SECIN)

Chennai
(Established 2011)

SE Controls Middle East (SECME)

United Arab Emirates
(Established 2012)



Introduction to EN 12101

EN 12101 family of standards detail the mandatory requirements for life safety products and systems.

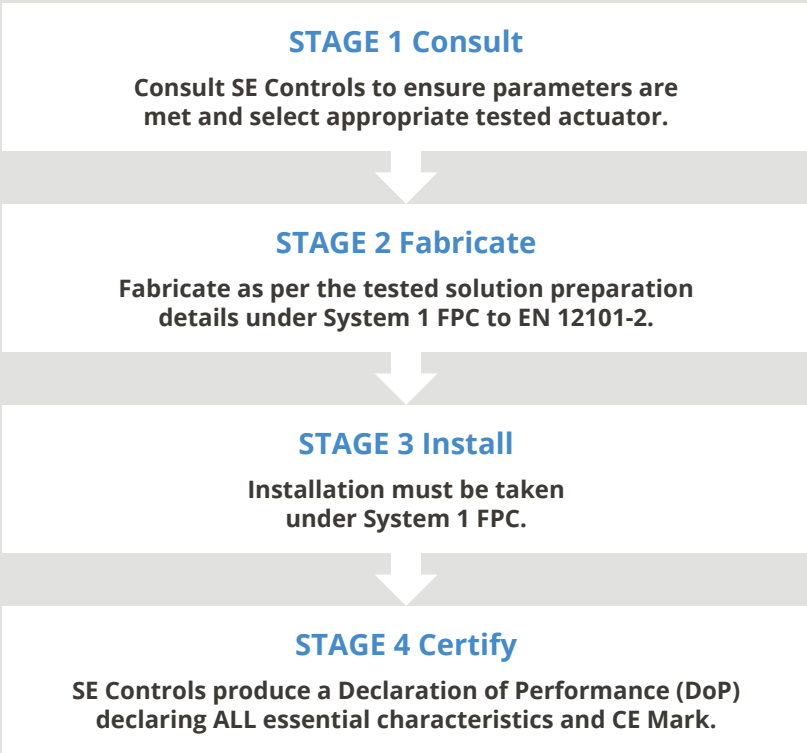
The three standards pertinent to this document are parts 2, 9 and 10, which encompass smoke ventilators (SHEV's) and their controls.

PART 1 Specification for smoke barriers.	PART 6 Specification for pressure differential systems.
PART 2 Natural Smoke And Heat Exhaust Ventilators (SHEVs).	PART 7 Smoke control sections.
PART 3 Specification for powered SHEVs.	PART 8 Smoke control dampers.
PART 4 Installed SHEVs systems for smoke and heat ventilation.	PART 9 Control panels (pr EN).
PART 5 Guidelines on functional recommendations and calculation methods for SHEVs.	PART 10 Power supplies.

EN 12101 Part 2

EN 12101-2 dictates that an opening smoke vent is in itself a unique product which can only be CE marked if it meets certain criteria. The vent profile and actuator need to be tested together to comply to EN 12101-2 at an accredited testing facility.

The installation onsite must be identical to the test. Therefore an audited certified Factory Production Control (FPC) process must be followed, with accompanying documentation. As this is a life safety product, the CPR does not allow alternative products to be utilised, other than the prescriptive products used in the test.



Note:

The CE Mark does not solely satisfy the requirements of the CPR, it is only a part of it. The ultimate document to prove compliance is the DoP which is signed by a director of the company placing the product onto the market. The DoP must contain references to the tests, notified body and declare performance against all essential characteristics required by the standard.

EN 12101-2:2017 has been blocked from citation in the OJEU by the European Commission. This means that it is not yet possible to CE mark products according to this standard. CE marking is only possible after the 'Date of applicability of the standard as a harmonised standard', which is part of the citation in the OJEU. Until the new standard is cited, CE marking of products in scope must follow EN 12101-2:2003.

See link to the current harmonised standard listed in OJEU;

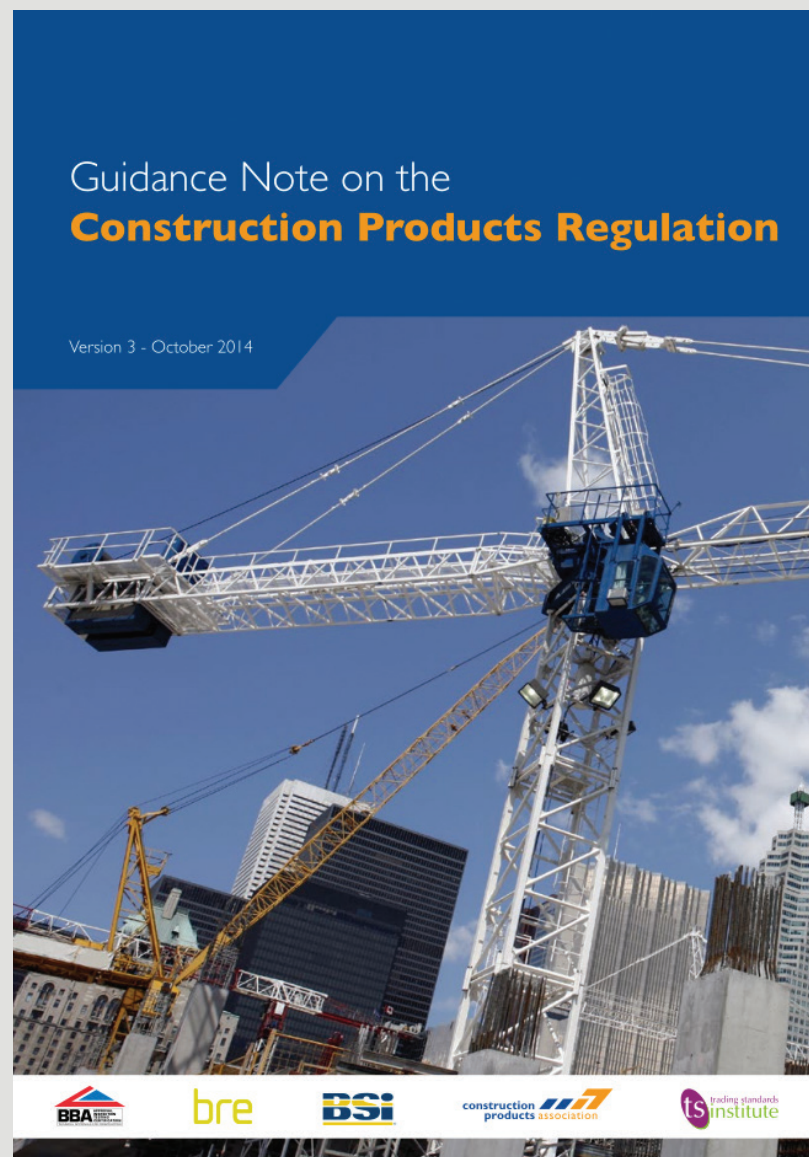
<http://ec.europa.eu/growth/tools-databases/nando/index.cfm?fuseaction=cp.hs&cpr=Y>

CPR and CE Marking

Whilst the use of CE marking has been commonly applied to a wide variety of products for a number of years, the need to CE mark products sold into the UK Construction market became mandatory in July 2013 when the Construction Product Directive became the Construction Products Regulation (CPR).

The CPR mandates that where a European harmonised standard exists for a product, a manufacturer must draw up a declaration of performance and apply CE marking to this product. Any product that has a harmonised European standard that is placed upon the construction market must be CE marked against that standard.

The risks of non compliance are refusal of payment, LAD's due to delays in handover and criminal prosecution for failing to meet mandatory life safety standards.



CE Marking Process Under CPR

STAGE 1 Product

Identify if it has an applicable Harmonised European Norm (hEN) EU directive.

STAGE 2 Assess

Review the essential characteristics and establish the route to conformity.

STAGE 3 Test

Test the product against the standard at an independent accredited facility - Certify (CCP).

STAGE 4 Process

Ensure that you have sufficient Factory Production Control (FPC) processes and qualifications to manufacture the product. For life safety systems, a System 1 FPC process is required (audited by an external notified body).

STAGE 5 Certify

Submit a Declaration of Performance (DoP) and affix the CE marking to the product or document.

NO DoP - NO COMPLIANCE

Why Choose SE Controls?

SE Controls provide the Declaration of Performance and take responsibility for your smoke vent compliance.

We are full members of the Smoke Control Association (SCA) and SDI 19 Certified, which is the SCA audited competency scheme ensuring compliance.

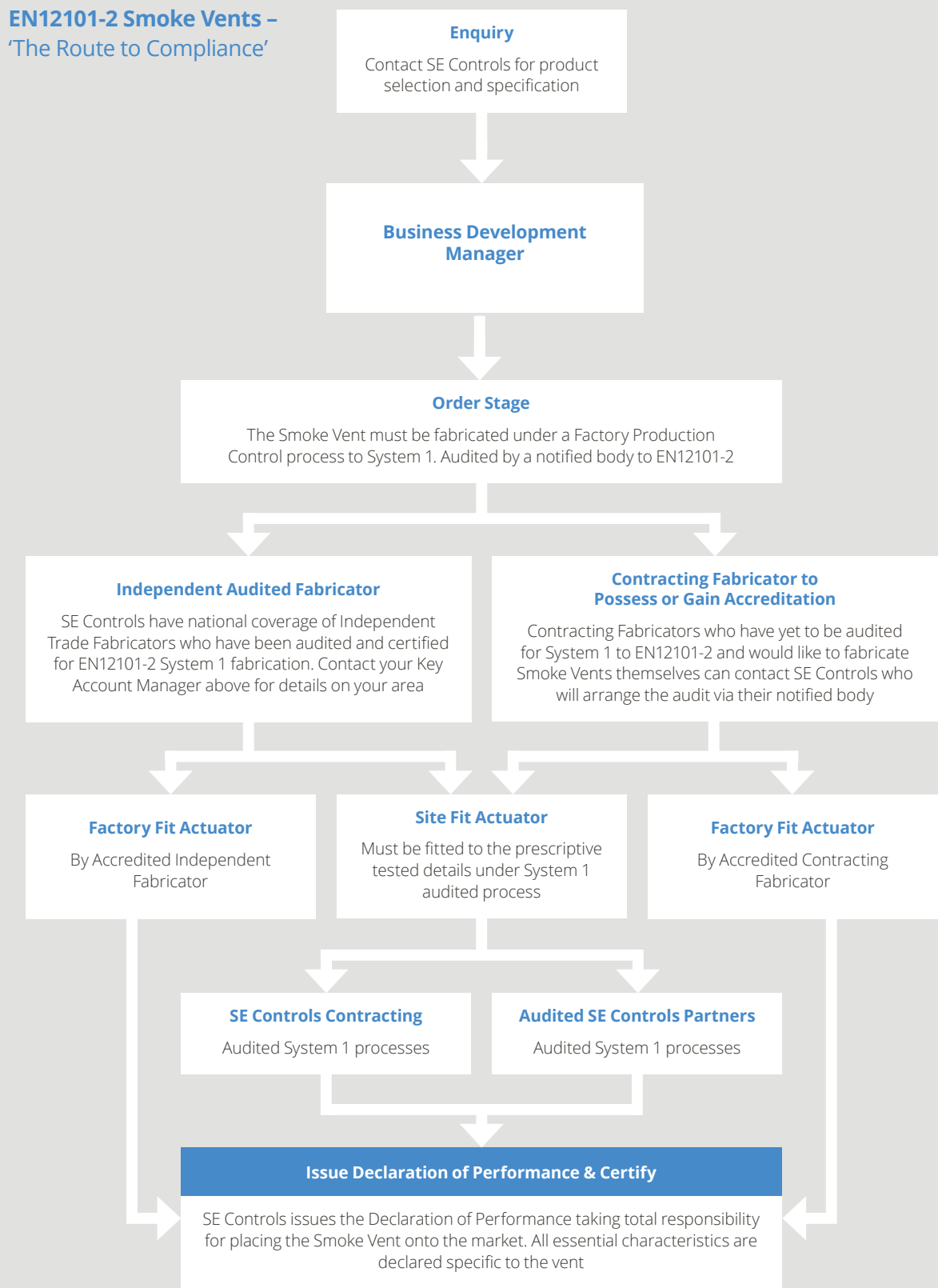
Free guidance for Smoke Ventilation Design and Compliance is available in our Tested Solutions portal.

We have a wide range of EN12101-2 smoke vent tests:

To view the full list of Tested Solutions please register at: www.secontrols.com/register

Route to Compliance



Geometric Free Area Calculation for High Rise Residential

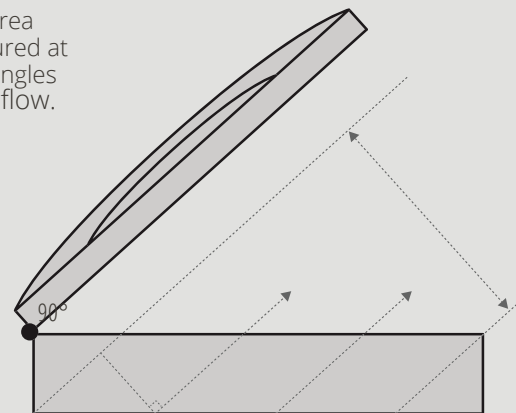


The measurement of the free area of a vent is defined in Approved Document B (ADB) 2019.

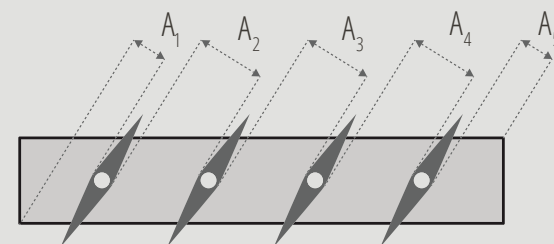
The total unobstructed cross sectional area, measured in plane where the area is at a minimum and at right angles to the direction of air flow (as shown in the diagram on the right).

Generally 1.0m² geometric free area is required for head of stair and 1.5m² for end of corridor vents however each project will have its own design. Aerodynamic free area calculation is also allowed under Approved Document B.

Free area measured at right angles to air flow.



Free area for louvered vent = $A_1 + A_2 + A_3 + A_4 + A_5$

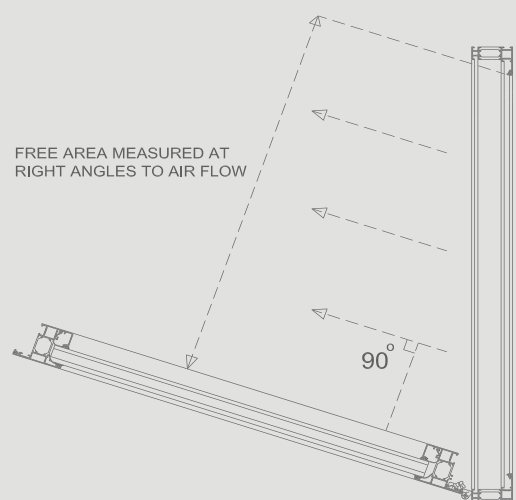


The two top images show how Approved Document B describes how you measure free area, but they do not illustrate how this is interpreted for a window.

The image at the bottom shows a window interpretation of Approved Document B as a bottom hung or side hung smoke vent.

There are documents in existence produced by the Smoke Control Association that seek to give clarity on how this is measured which typically results in a double stacked bottom hung open out or side hung solution, however the ultimate regulation is ADB.

Free area calculations should be submitted for approval to an approved Inspector to be assessed for ADB compliance.

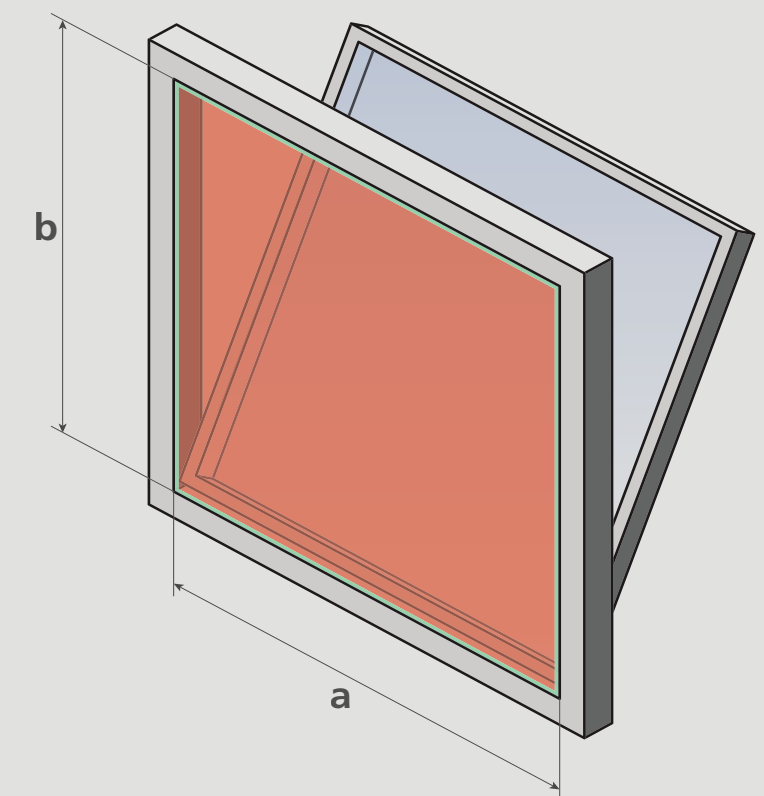


Aerodynamic Free Area Calculation



The internal throat area $a \times b$ (A_v) is multiplied by the efficiency factor or co-efficient of discharge (C_v) of the vent which is determined by the opening angle.

The opening angle of the vent dictates the efficiency factors achieved, generally 0.3-0.6.



Internal Throat Area:

$a \times b$ = maximum geometric area (A_v) x co-efficient value of vent (C_v).

The internal throat is the inner most clear dimensions of the vent.

FAQS

Q. What is EN12101-2:2003 and is that the latest standard?

A. The EN12101 series of harmonised standards apply to smoke ventilation products. These standards often have specific requirements relating to installation or testing practice.

For example, EN 12101: Part 2 dictates that unless the actuator and vent profile are tested together as a system, in a smoke environment and at an accredited facility, it is not compliant; therefore, its safety can't be guaranteed and a DoP cannot be issued.

Although there is a EN12101-2:2017 version of the standard, this has been blocked from citation in the OJEU by the European Commission. This means that it is not yet possible to CE Mark products according to this standard. Until the new standard is cited, CE Marking of products in scope must follow EN12101-2:2003.

More information is available in our Tested Solutions Document Portal on our website.

Q. Do the vent and actuator need to be tested together to be compliant?

A. Compliance to the EN12101-2 smoke vent standard was mandated into UK law via the Construction Products Regulation in 2013.

To comply both actuator and vent profile have to be tested together, as a single product, to the test annexes of the standard.

Proof of compliance is the issuing of a Declaration of Performance (DoP) by the company placing the product onto the market.

Q. What Free Area Calculations should I use?

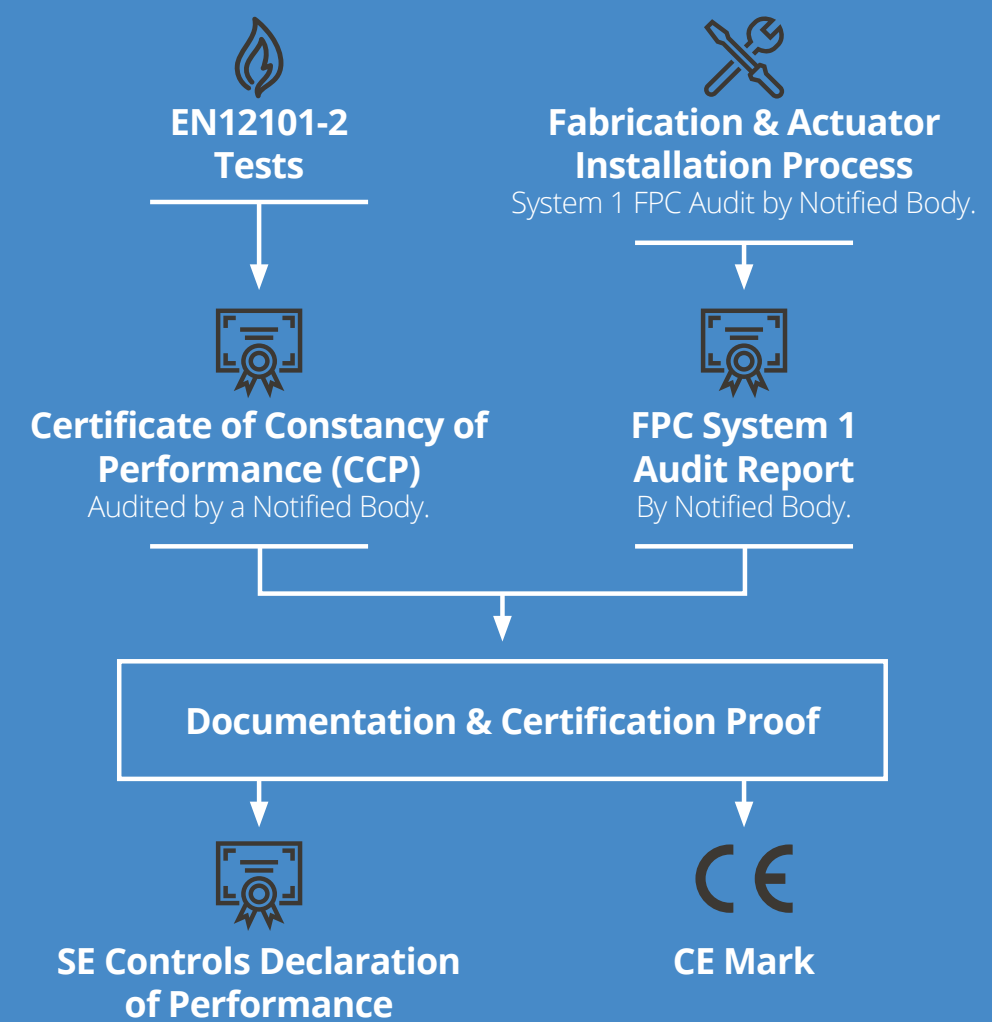
A. The type of Free Area Calculation you should use depends on the building and if it is a high rise residential or non-high rise residential building.

Detailed Free Area guidance is contained within the Tested Solutions documents. Register for access at www.secontrols.com/register. Your dedicated Account Manager will also assist with your enquiry.

Q. What is the Declaration of Performance (DoP)?

A. The DoP is the document to prove compliance in accordance with the Construction Products Regulation 2013. It will be requested by the client, contractor or approved inspectors as proof of compliance.

No DoP, No Compliance.



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