

This is a preview of "BS EN 12101-6:2022". [Click here to purchase the full version from the ANSI store.](#)



**BSI Standards Publication**

## **Smoke and heat control systems**

---

Part 6: Specification for pressure differential systems — Kits

This is a preview of "BS EN 12101-6:2022". [Click here to purchase the full version from the ANSI store.](#)

## National foreword

This British Standard is the UK implementation of EN 12101-6:2022. Together with BS EN 12101-13:2022, it supersedes BS EN 12101-6:2005, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee FSH/25, Smoke, heat control systems and components.

A list of organizations represented on this committee can be obtained on request to its committee manager.

The UK committee notes that this standard is written to give guidance on the use of kits in specific applications. The scope refers to components and kits but the UK committee emphasizes that this standard is not intended to be a substitute for or change the requirements of harmonised standards mandated under the Construction Products (Amendment etc.) (EU Exit) Regulations 2020. All testing referred to in this standard is for kits only in the applications defined in this standard. This standard is not harmonised and therefore the systems defined therein cannot be CE marked. Furthermore, no system component can be certified individually against this standard.

This standard is not intended for corridor/lobby extract or Mechanical Smoke Ventilation Systems (MSVS)". These systems generally create a lower pressure in protected spaces, such as lobbies and corridors and are outside of the scope of this standard.

This standard covers product testing for kits for the specific applications described therein. BS EN 12101-13:2022 covers the design of systems to be used in these specific applications. Both BS EN 12101-6:2022 and BS EN 12101-13:2022 should be considered in their entirety and only for the types of applications described. No clauses, designs or values in whole or in part should be used in isolation or as justification for system designs that are outside the scope of these standards.

### Contractual and legal considerations

This publication has been prepared in good faith, however no representation, warranty, assurance or undertaking (express or implied) is or will be made, and no responsibility or liability is or will be accepted by BSI in relation to the adequacy, accuracy, completeness or reasonableness of this publication. All and any such responsibility and liability is expressly disclaimed to the full extent permitted by the law.

This publication is provided as is, and is to be used at the recipient's own risk.

The recipient is advised to consider seeking professional guidance with respect to its use of this publication.

This publication is not intended to constitute a contract. Users are responsible for its correct application.

© The British Standards Institution 2022  
Published by BSI Standards Limited 2022

ISBN 978 0 539 03725 8

ICS 13.220.99

This is a preview of "BS EN 12101-6:2022". [Click here to purchase the full version from the ANSI store.](#)

**Compliance with a British Standard cannot confer immunity from legal obligations.**

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 30 September 2022.

**Amendments/corrigenda issued since publication**

Date	Text affected
------	---------------

---

This is a preview of "BS EN 12101-6:2022". [Click here to purchase the full version from the ANSI store.](#)

This is a preview of "BS EN 12101-6:2022". [Click here to purchase the full version from the ANSI store.](#)

## EUROPÄISCHE NORM

April 2022

ICS 13.220.99

Supersedes EN 12101-6:2005

English Version

## Smoke and heat control systems - Part 6: Specification for pressure differential systems - Kits

Systèmes pour le contrôle des fumées et de la chaleur -  
Partie 6 : Spécifications relatives aux systèmes à  
différentiel de pression - Kits

Rauch- und Wärmefreihaltung - Teil 6: Festlegungen  
für Differenzdrucksysteme - Bausätze

This European Standard was approved by CEN on 14 February 2022.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

This is a preview of "BS EN 12101-6:2022". [Click here to purchase the full version from the ANSI store.](#)

## Contents

Page

European foreword .....	3
Introduction .....	4
1 Scope.....	5
2 Normative references.....	5
3 Terms, definitions, symbols and abbreviated terms .....	5
4 Characteristics .....	8
4.1 General.....	8
4.2 Nominal activation conditions/sensitivity.....	9
4.3 Response delay (response time) .....	10
4.4 Operational reliability .....	11
4.5 Effectiveness of smoke/hot gas extraction (air release/powered air release).....	12
4.6 Performance parameters under fire conditions .....	13
4.7 Pressurization performance.....	13
4.8 Fire resistance – Integrity (E).....	14
4.9 Fire resistance – Insulation (I).....	15
4.10 Fire resistance – Smoke leakage (S).....	16
4.11 Fire resistance – Mechanical stability .....	17
4.12 Fire resistance – Maintenance of cross section.....	17
4.13 Durability.....	18
5 Test methods .....	19
5.1 General.....	19
5.2 Nominal activation conditions/sensitivity.....	20
5.3 Response delay (response time) .....	21
5.4 Operational reliability .....	22
5.5 Effectiveness of smoke/hot gas extraction.....	32
5.6 Performance parameters under fire conditions .....	33
5.7 Pressurization performance.....	33
5.8 Fire resistance – Integrity (E).....	34
5.9 Fire resistance – Insulation (I).....	35
5.10 Fire resistance – Smoke leakage (S).....	35
5.11 Fire resistance – Mechanical stability .....	36
5.12 Fire resistance – Maintenance of cross section.....	37
5.13 Durability.....	37
6 Verification of performance.....	38
6.1 Type testing.....	38
6.2 Factory production control (FPC) .....	40
7 Marking, labelling and packaging.....	44
Annex A (normative) Pressure differential kit types (pressurization).....	45
Annex B (normative) Test method for hot gas control damper at elevated temperature.....	58
Annex C (normative) Test method for powered smoke and heat exhaust ventilators with frequency inverter and operated with variable speed at elevated temperature.....	62
Annex D (normative) Installation and maintenance document .....	64
Bibliography .....	65

This is a preview of "BS EN 12101-6:2022". [Click here to purchase the full version from the ANSI store.](#)

## European foreword

This document (EN 12101-6:2022) has been prepared by Technical Committee CEN/TC 191 "Fixed firefighting systems", the secretariat of which is held by BSI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by October 2022, and conflicting national standards shall be withdrawn at the latest by January 2024.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 12101-6:2005.

This document is to be read in conjunction with EN 12101-13.

The EN12101 series has the general title "Smoke and heat control systems" and currently consists of the following parts, which may be expanded in the future:

- Part 1: *Specification for smoke barriers;*
- Part 2: *Natural smoke and heat exhaust ventilators;*
- Part 3: *Specification for powered smoke and heat exhaust ventilators (fans);*
- Part 4: *Installed SHEVS systems for smoke and heat ventilation (published as CEN/TR 12101-4);*
- Part 5: *Design and calculation for smoke and heat exhaust ventilation systems using a steady-state fire (published as CEN/TR 12101-5);*
- Part 6: *Specification for pressure differential systems – Kits;*
- Part 7: *Smoke duct sections;*
- Part 8: *Smoke control dampers;*
- Part 10: *Power supplies;*
- Part 13: *Pressure differential systems (PDS) design and calculation methods, acceptance testing, maintenance and routine testing of installation.*

Any feedback and questions on this document should be directed to the users' national standards body. A complete listing of these bodies can be found on the CEN website.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

This is a preview of "BS EN 12101-6:2022". [Click here to purchase the full version from the ANSI store.](#)

## Introduction

### Objectives of pressure differential systems

Pressure differential systems offer the facility of maintaining tenable conditions in protected spaces, for example: escape routes, firefighting access routes, firefighting lift shafts, lobbies, staircases, and other spaces that require being kept free of smoke. It is necessary to determine not only where the fresh air supply for pressurization is to be introduced into a building, but also where that air and smoke will leave the building and what paths it will follow in the process.

The aim therefore is to establish a pressure gradient from the protected space to the unprotected space (fire room) while the doors are closed, and an airflow while the doors are open.

### Smoke control methods

The effect of the air movement forces, described above, are to create pressure differentials across the partitions, walls and floors and can cause smoke to spread to spaces remote from the fire source. The technique most commonly used to limit the degree of smoke spread, or to control its effects, is pressurization.

### System components

A typical pressure differential system will comprise three basic components:

- a) components for providing supply air and to extract air;
- b) components for controlling the pressure difference between the space with higher pressure and the adjoining space with lower pressure;
- c) components for releasing air flowing through the door between the space with higher pressure to those with lower pressure (to prevent unwanted pressure build up in this space).

Installations of pressure differential systems (PDS) may comprise:

- fans (temperature rated) if necessary;
- air or smoke control ducts to provide a passageway for the transmission of air or smoke;
- ventilation openings to provide leakage of air (including dampers, active or passive controlled);
- power supply;
- connecting cables;
- means of activation;
- means of pressure control;
- control panel;
- smoke control dampers in branches from the ductwork where the ductwork is situated outside the protected enclosure;
- grilles and diffusers;
- door closers.

The design of pressure differential systems is covered in EN 12101-13.



This is a preview of "BS EN 12101-6:2022". [Click here to purchase the full version from the ANSI store.](#)

## 1 Scope

This document applies to pressure differential system kits and components, positioned on the market and intended to operate as part of a pressure differential system. The purpose of a pressure differential system is to prevent protected spaces from smoke spread by using pressure difference and airflow. This document specifies characteristics and test methods for components and kits for pressure differential systems to produce and control the required pressure differential and airflow between protected and unprotected space.

## 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 1363-1, *Fire resistance tests - Part 1: General requirements*

EN 12101-2, *Smoke and heat control systems - Part 2: Natural smoke and heat exhaust ventilators*

EN 12101-3, *Smoke and heat control systems - Part 3: Specification for powered smoke and heat control ventilators (Fans)*

EN 12101-8, *Smoke and heat control systems - Part 8: Smoke control dampers*

EN 13501-4, *Fire classification of construction products and building elements - Part 4: Classification using data from fire resistance tests on components of smoke control systems*

EN ISO 13943, *Fire safety - Vocabulary (ISO 13943)*

EN 1366-8, *Fire resistance tests for service installations - Part 8: Smoke extraction ducts*

EN 1366-9, *Fire resistance tests for service installations - Part 9: Single compartment smoke extraction ducts*

EN 1366-10, *Fire resistance tests for service installations - Part 10: Smoke control dampers*

## 3 Terms, definitions, symbols and abbreviated terms

### 3.1 Terms, definitions and abbreviated terms

For the purposes of this document, the terms and definitions given in EN ISO 13943 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <https://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

#### 3.1.1

##### **air release**

means by which pressurizing air or a mixture of pressurizing air and smoke is able to escape from the accommodation or other unpressurized space to outside the building