BS EN 16798-17:2017

BSI Standards Publication

Energy performance of buildings - Ventilation for buildings

Part 17: Guidelines for inspection of ventilation and air conditioning systems (Module M4-11, M5-11, M6-11, M7- 11)

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National foreword

This British Standard is the UK implementation of EN 16798-17:2017. It supersedes BS EN 15240:2007 and BS EN 15239:2007, which are withdrawn.

The UK participation in its preparation was entrusted to Technical Committee RHE/2, Ventilation for buildings, heating and hot water services.

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

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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

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European foreword

This document (EN 16798-17:2017) has been prepared by Technical Committee CEN/TC 156 "Ventilation for buildings", 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of an identical text or by endorsement, at the latest by December 2017, and conflicting national standards shall be withdrawn at the latest by December 2017.

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 15239:2007 [1] and EN 15240:2007 [2].

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association.

The necessary editorial revisions were made to comply with the requirements for each EPB standard.

In addition to a number of editorial revisions, the following main changes have been made with respect to EN 15239:2007 and EN 15240:2007 which were developed during the first EPBD mandate [9]:

— formatting in accordance with the new rules set in CEN/TS 16629 [6], this includes the transfer of all informative points in the associated technical report CEN/TR 16798-18;

— merger between the previous standards (EN 15239:2007 and EN 15240:2007) dealing with the inspection of ventilation and air conditioning systems into a single document. The general aspects of the inspection that concern both ventilation and air conditioning systems are covered in Clause 5. This includes the description of the pre-inspection procedure prior to on-site visit;

— clarification of the outputs of each inspection phase (pre-inspection, on-site inspection methodology, report). Clause 8 includes check lists of items to be included in the inspection report;

— introduction of three inspection levels (level 1, level 2 and level 3) taking into consideration the results of the Concerted Action, lessons from research projects and practical applications. The less demanding level (level 1) does not require measurements and is sufficient to comply with the requirements of the EPBD recast [9];

— clarification of the inspection of air filters (6.4.2.4);

— emphasis on advice for improvement to be included in the report (including economic justification).

For the convenience of Standards users CEN/TC 156, together with responsible Working Group Conveners, have prepared a simple table below relating, where appropriate, the relationship between the 'EPBD' and 'recast EPBD' standard numbers prepared by Technical Committee CEN/TC 156 "Ventilation for buildings".

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EPBD EN Number	Recast EPBD EN Number	Title
EN 15251	EN 16798-1	Energy performance of buildings — Ventilation for buildings — Part 1: Indoor environmental input parameters for design and assessment of energy performance of buildings addressing indoor air quality, thermal environment, lighting and acoustics (Module M1-6)
N/A	CEN/TR 16798-2	Energy performance of buildings — Ventilation for buildings — Part 2: Interpretation of the requirements in EN 16798-1 — Indoor environmental input parameters for design and assessment of energy performance of buildings addressing indoor air quality, thermal environment, lighting and acoustics (Module M1-6)
EN 13779	EN 16798-3	Energy performance of buildings — Ventilation for buildings — Part 3: For non-residential buildings — Performance requirements for ventilation and room-conditioning systems (Modules M5-1, M5-4)
N/A	CEN/TR 16798-4	Energy performance of buildings — Ventilation for buildings — Part 4: Interpretation of the requirements in EN 16798-3 — For non-residential buildings — Performance requirements for ventilation and room-conditioning systems(Modules M5-1, M5-4)
EN 15241	EN 16798-5-1	Energy performance of buildings — Ventilation for buildings — Part 5-1: Calculation methods for energy requirements of ventilation and air conditioning systems (Modules M5-6, M5-8, M6-5, M6-8, M7-5, M7-8) — Method 1: Distribution and generation
EN 15241	EN 16798-5-2	Energy performance of buildings — Ventilation for buildings — Part 5-2: Calculation methods for energy requirements of ventilation systems (Modules M5-6.2, M5-8.2) — Method 2: Distribution and generation
N/A	CEN/TR 16798-6	Energy performance of buildings — Ventilation for buildings — Part 6: Interpretation of the requirements in EN 16798-5-1 and EN 16798-5-2 — Calculation methods for energy requirements of ventilation and air conditioning systems (Modules M5-6, M5-8, M 6-5, M6-8 , M7-5, M7-8)
EN 15242	EN 16798-7	Energy performance of buildings — Ventilation for buildings — Part 7: Calculation methods for the determination of air flow rates in buildings including infiltration (Module M5-5)
N/A	CEN/TR 16798-8	Energy performance of buildings — Ventilation for buildings — Part 8: Interpretation of the requirements in EN 16798-7 — Calculation methods for the determination of air flow rates in buildings including infiltration — (Module M5-5)

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EPBD EN Number	Recast EPBD EN Number	Title
EN 15243	EN 16798-9	Energy performance of buildings — Ventilation for buildings — Part 9: Calculation methods for energy requirements of cooling systems (Modules M4-1, M4-4, M4-9) — General
N/A	CEN/TR 16798-10	Energy performance of buildings — Ventilation for buildings — Part 10: Interpretation of the requirements in EN 16798-9 — Calculation methods for energy requirements of cooling systems (Module M4-1,M4-4, M4-9) — General
EN 15243	EN 16798-13	Energy performance of buildings — Ventilation for buildings — Part 13: - Calculation of cooling systems (Module M4-8) — Generation
EN 15243	CEN/TR 16798-14	Energy performance of buildings — Ventilation for buildings — Part 14: Interpretation of the requirements in EN 16798-13 — Calculation of cooling systems (Module M4-8) — Generation
N/A	EN 16798-15	Energy performance of buildings — Ventilation for buildings — Part 15: Calculation of cooling systems (Module M4-7) — Storage
N/A	CEN/TR 16798-16	Energy performance of buildings — Ventilation for buildings — Part 16: Interpretation of the requirements in EN 16798-15 — Calculation of cooling systems (Module M4-7) — Storage
EN 15239 and EN 15240	EN 16798-17	Energy performance of buildings — Ventilation for buildings — Part 17: Guidelines for inspection of ventilation and air conditioning systems (Module M4-11, M5-11, M6-11, M7-11)
N/A	CEN/TR 16798-18	Energy performance of buildings — Ventilation for buildings — Part 18: Interpretation of the requirements in EN 16798-17 — Guidelines for inspection of ventilation and air conditioning systems (Module M4-11, M5-11, M6-11, M7-11)

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

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Introduction

This standard is part of a series of standards aiming at international harmonization of the methodology for the assessment of the energy performance of buildings, called “set of EPB standards”.

All EPB standards follow specific rules to ensure overall consistency, unambiguity and transparency.

All EPB standards provide a certain flexibility with regard to the methods, the required input data and references to other EPB standards, by the introduction of a normative template in Annex A and Annex B with informative default choices.

For the correct use of this standard a normative template is given in Annex A to specify these choices. Informative default choices are provided in Annex B.

The main target group for this standard (and the associated technical report CEN/TR 16798-18) is national regulators charged with implementing the EPBD [9]. The contents can also be useful as source material for the building services sector, including professional building owners, as well as persons or organizations in charge of the inspection, training inspectors and providing quality assurance services in this area.

Use by or for regulators: In case the standard is used in the context of national or regional legal requirements, mandatory choices may be given at national or regional level for such specific applications. These choices (either the informative default choices from Annex B or choices adapted to national / regional needs, but in any case following the template of this Annex A) can be made available as national annex or as separate (e.g. legal) document (national data sheet).

NOTE So in this case:

— the regulators will **specify** the choices;

— the individual user will apply the standard to assess the energy performance of a building, and thereby use the choices made by the regulators.

Topics addressed in this standard can be subject to public regulation. Public regulation on the same topics can override the default values in Annex B of this standard. Public regulation on the same topics can even, for certain applications, override the use of this standard. Legal requirements and choices are in general not published in standards but in legal documents. In order to avoid double publications and difficult updating of double documents, a national annex may refer to the legal texts where national choices have been made by public authorities. Different national annexes or national data sheets are possible, for different applications.

It is expected, if the default values, choices and references to other EPB standards in Annex B are not followed due to national regulations, policy or traditions, that:

— national or regional authorities prepare data sheets containing the choices and national or regional values, in accordance with the model in Annex A. In this case the national annex (e.g. NA) refers to this text; or

— by default, the national standards body will consider the possibility to add or include a national annex in agreement with the template of Annex A, in accordance to the legal documents that give national or regional values and choices.

Further target groups are parties wanting to motivate their assumptions by classifying the building energy performance for a dedicated building stock.

More information is provided in the Technical Report accompanying this standard (CEN/TR 16798-18:2017).

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Air conditioning systems differ among the member countries due to climate, traditions and national regulations. In some cases requirements are given as levels so national or individual needs can be accommodated. So Member States are free to choose between different objects and extent of inspection, within a harmonized framework.

Many air-conditioning systems also provide a ventilation service or use air transfer to provide cooling. This standard covers the inspection of the air handling sub-systems. Inspection of ventilation-only systems is not called for in the EPBD [9]. Considering the impact of ventilation on the energy consumption of the buildings, the Article 4 of the EPBD [9] stating that "requirements shall take account of general indoor climate conditions, in order to avoid negative effects such as inadequate ventilation", and the technical similarities between air handling subsystems of air conditioning systems and ventilation-only systems, this standard also covers the inspection of ventilation-only systems.

Air conditioning systems, in addition to providing a cooling function to spaces within buildings, commonly also provide heating, humidity control, air filtration and mechanical ventilation services.

This standard deals with the following points requested by the EPBD [9]:

— measures to establish a regular inspection of the accessible parts of air-conditioning systems of an effective rated output of more than 12 kW;

— assessment of the air-conditioning efficiency and the sizing compared to the cooling requirements of the building;

— advice for the users on the replacement of air-conditioning systems or on other modifications to the air-conditioning system;

— inspection of ventilation systems, and of the associated air distribution and exhaust systems taking into account general indoor climate conditions, in order to avoid negative effects such as inadequate ventilation;

— inspection report handed to the owner or tenant of the building after each inspection of a heating or air-conditioning system. The result of the inspection performed and recommendations for the cost-effective improvement of the energy performance of the inspected system should be included. The recommendations can be based on a comparison of the energy performance of the system inspected with that of the best available feasible system and a system of similar type for which all relevant components achieve the level of energy performance required by the applicable legislation.

Member States may alternatively opt to take measures to ensure the provision of advice to users on the replacement of air-conditioning systems or on other modifications to the air-conditioning system which may include inspections to assess the efficiency and appropriate size of the air-conditioning system.

It is not intended that a full audit of the air conditioning or ventilation system is carried out, but a correct assessment of its functioning and main impacts on energy consumption, and as a result determine any recommendations for improving the system or use of alternative solutions. National regulations and guidelines targeting energy efficiency and in line with the main objectives of this standard are also applicable.

A technical report accompanies and complements each part of the package. It provides informative explanations and guidance to support the application of the normative content of the part considered taking into account the requirements and options of the EPBD [9].

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1 Scope

This European Standard specifies the common methodology and the requirements for inspection of air conditioning systems in buildings for space cooling and/or heating and/or ventilation systems from an energy use standpoint. It can be used to fulfil the EPBD requirements (Energy Performance of Buildings Directive 2010/31/EU [9]) as well as in other contexts where such inspections are specified. The methodology specified in this standard deals with indoor climate problems that can be due to the systems inspected.

This standard applies to both residential and non-residential buildings equipped with:

— air conditioning system(s) without mechanical ventilation; or

— air conditioning system(s) with mechanical ventilation; or

— natural and mechanical ventilation system(s).

This standard applies to:

— fixed systems;

— accessible parts that contribute to the cooling and mechanical ventilation services.

This standard is also applicable to some systems for which the Directive does not require inspection, such as:

— fixed systems of less than 12 kW output;

— ventilation-only systems.

The inspection of systems given in this standard is applicable to:

— all types of comfort cooling and air conditioning systems. This includes air conditioning systems of an effective rated output of less than 12 kW not covered by Directive 2010/31/EU;

— all types of ventilation systems that is to say mechanical, natural, hybrid (including mechanical and natural ventilation). Parts of this standard are also applicable to check ventilation requirements when there is no ventilation system.

The inspection of systems includes but is not limited to the following components:

— reverse-cycle operation of air-conditioning equipment;

— associated water and air distribution and exhaust systems that form a necessary part of the system;

— controls that are intended to regulate the use of associated water and air distribution and exhaust systems.

Table 1 shows the relative position of this standard within the offset of EPB standards in the context of the modular structure as set out in EN ISO 52000-1:2017.

NOTE 1 In CEN ISO/TR 52000-2:2017 [7] the same table can be found, with, for each module, the numbers of the relevant EPB standards and accompanying technical reports that are published or in preparation.

NOTE 2 The modules represent EPB standards, although one EPB standard may cover more than one module and one module may be covered by more than one EPB standard, for instance a simplified and a detailed method respectively. See also Clause 2, Table A.1 and Table B.1.

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This standard is not applicable to:

— qualification of the persons or organization in charge of inspections;

— frequency of the mandatory inspection (defined at national level);

— components supporting the heating function (specified in EN 15378-1:2017 [8] and the accompanying technical report CEN/TR 15378-2:2017 [8] covering the inspection of heating-only systems using boilers).

The following information can be found in other standards or technical reports:

— guidance regarding features affecting the frequency and duration of inspection are given in CEN/TR 16798-18:2017;

— procedures and methods for the inspection of boilers and heating systems are given in prEN 15378 (all parts) [8].

Table 1 shows the relative position of this standard within the set of EPB standards in the context of the modular structure as set out in EN ISO 52000-1:2017.

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Table 1 — Position of this standard (in casu M4–11, M5–11, M6–11, M7–11), within the modular structure of the set of EPB standards

	Overarching		Building (as such)		Technical Building Systems									
Submodule	Descriptions		Descriptions		Descriptions	Heating	Cooling	Ventilation	Humidification	Dehumidification	Domestic Hot water	Lighting	Building automation and control	PV, wind, ..
sub1		M1		M2		M3	M4	M5	M6	M7	M8	M9	M10	M11
1	General		General		General									
2	Common terms and definitions; symbols, units and subscripts		Building Energy Needs		Needs								[a]	
3	Applications		(Free) Indoor Conditions without Systems		Maximum Load and Power									
4	Ways to Express Energy Performance		Ways to Express Energy Performance		Ways to Express Energy Performance									
5	Building categories and Building Boundaries		Heat Transfer by Transmission		Emission and control									
6	Building Occupancy and Operating Conditions		Heat Transfer by Infiltration and Ventilation		Distribution and control									
7	Aggregation of Energy Services and Energy Carriers		Internal Heat Gains		Storage and control									
8	Building zoning		Solar Heat Gains		Generation and control									

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