BS EN 1749:2020

BSI Standards Publication

Classification of gas appliances according to the method of supplying combustion air and of evacuation of the combustion products (types)

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National foreword

This British Standard is the UK implementation of EN 1749:2020. It supersedes PD CEN/TR 1749:2014, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee GSE/26, Test gases.

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

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English Version

Classification of gas appliances according to the method of supplying combustion air and of evacuation of the combustion products (types)

Classification des appareils utilisant les combustibles gazeux selon le mode d'amenée d'air comburant et le mode d'évacuation des produits de combustion (types)

Klassifizierung von Gasgeräten nach der Art der Verbrennungsluftzuführung und Abgasabführung (Arten)

This European Standard was approved by CEN on 13 October 2019.

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Full document details: BS EN 1749:2020

Contents

Page

European foreword 3
Introduction 5
1 Scope 6
2 Normative references 6
3 Terms and definitions 6
4 General scheme 6
4.1 General 6
4.2 Type A 7
4.3 Type B 7
4.4 Type C 9
5 Supplementary classification scheme for type A and type B appliances fitted with particular safety devices 14
6 Supplementary classification scheme for type B appliances for use in limited installation conditions 14
6.1 Type B appliance utilizing a third subscript "D"[)] 14
6.2 Type B appliances utilizing a third subscript "P"[)] 14
7 Supplementary classification scheme for type C appliances for use in limited installation conditions — Type C_1 appliances utilizing a third subscript "R" 15
Annex A (normative) Classification according to the evacuation of the combustion products and air inlet 16
Annex B (informative) Special appliance classification (types) 37
Annex C (informative) Appliance types designed for connection to separate chimney products 48

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Document Sharing Hub
Full document details: BS EN 1749:2020

European foreword

This document (EN 1749:2020) has been prepared by Technical Committee CEN/TC 238 "Test gases, test pressures, appliance categories and gas appliance types", the secretariat of which is held by AFNOR.

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 July 2020, and conflicting national standards shall be withdrawn at the latest by July 2020.

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 CEN/TR 1749:2014.

The main changes compared to the previous edition are listed below:

— editorial changes, a reviewed wording and a reviewed structure compared to the TR version (CEN/TR 1749:2014);

— some technical items generally described in the foreword of the former TR are now included in the scope or in other clauses of the standard (1; 4.1; 4.4);

— a clause on normative references has been included (Clause 2);

— a clause on terms and definitions has been included (Clause 3);

— examples of reworded clauses:

  — Type B (4.3);

  — Type C6 (4.4);

  — Type C(11) (4.4);

  — Type C(13) (4.4);

  — Type C(14) (4.4).

— a key for figures has been added and some figures have been modified, according to the key adopted (Annex A);

— Annex B has a wider application than Germany. Due to this change, the former Annex D has been deleted;

— Annex C replaces the former Annex E;

— The former Annex C has been deleted.

The user is advised to compare the previous text with the current version.

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Full document details: BS EN 1749:2020

Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

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Introduction

This document has been prepared to provide reference scheme for classification of gas appliances to CEN Technical Committees who are preparing European Standards for appliances burning combustible gases.

It gives details of a general scheme for the classification of such appliances according to the method of air supply and evacuating the combustion products. This document concerns gas appliances that are intended to be installed within buildings or outside buildings. Nevertheless, it is recognized that this appliance classification scheme could be utilized in other circumstances. For example, in the case of appliances capable of utilizing other fuels.

This form of appliance classification is widely used in the preparation of European Standards for gas appliances to identify the requirements and methods of test that are applicable to the various methods of evacuating the combustion products and air supply. Appliances classified in this way are generally described as “types” and this description has been retained for the purposes of this document.

The definitions are written intentionally in very general terms in order to cover any possible variations in the basic appliance types.

The main purpose of the document is to promote harmonization in the classification of appliance types. This should ensure that there is a clear understanding of the various appliance types and will avoid confusion arising from Technical Committees describing them in different ways. CEN Technical Committees are therefore requested to use this document as reference in all circumstances in which it is appropriate. They should not deviate from it unless there are relevant technical reasons for doing so.

In the preparation of this scheme it was noted that there were methods of evacuating combustion products that were particular to a specific Technical Committee or to a particular gas appliance. These particular methods have not been included in the present scheme because, as indicated above, the main purpose of the scheme is to promote harmonization across Technical Committees.

However, it is intended that this scheme should be reviewed from time to time in order to consider its extension to other, possibly new, methods of evacuating combustion products. At that time, such specific methods of evacuating combustion products may be included at the request of the Technical Committees concerned.

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1 Scope

This document gives details for the classification of gas appliances according to the method of supplying combustion air and of evacuating the combustion products (types). This classification refers to gas appliances that are intended to be installed within buildings and/or outside of the building[1].

The document classifies appliances as type A, B or C according to the basic principle for the evacuation of the combustion products and air inlet.

This document is the reference for the harmonization of product standards, for the preparation of installation standards and for the common understanding of the types of gas appliances.

This document is neither an installation standard nor a product standard.

In references to a gas appliance or gas appliances connected via "**its**" or "**their**" duct or ducts, it is intended that the air inlet duct and/or the discharge duct for carrying any combustion products are part of the gas appliance. This means that such ducts are certified together with the gas appliance. Informative Annex C identifies appliance types that are designed for connection to separate chimney products, which may be part of the construction of the building.

In terms of this document, a "**single duct**" is a flue duct designed and capable of discharging the combustion products and/or air inlet duct for the air supply for only one appliance.

In terms of this document, a "**common duct**" is a flue duct designed and capable of discharging the combustion products and/or air inlet duct for the air supply for more than one appliance.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

No terms and definitions are listed in this document.

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

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at https://www.iso.org/obp/ui

4 General scheme

4.1 General

The general scheme for Type A, Type B and Type C appliances is given in 4.2, 4.3 and 4.4 respectively.

A series of subscript numbers is used in addition to these letters to identify specific variations within these basic principles.

Where this first subscript number exceeds "9" it is given in brackets to clarify that it is a single subscript number and not two subscript numbers.

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1) If the appliance is installed outside of the building (if this circumstance is explicitly allowed by the manufacturer) it will not change its classification (i.e.: a type B_{53} appliance will remain a type B_{53} if installed outside according to manufacturer instructions). These appliances are subject to specific additional requirements and tests, according to specific product standards.

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The last subscript number of each specific variation indicates the absence or presence of an integral fan for the supply of combustion air and/or for the evacuation of the combustion products.

If the last subscript number is “1”, no integral fan for the supply of combustion air and/or for the evacuation of the combustion products is present. Where a fan is present, the numbers 2, 3 or 4 are given. These three numbers are used solely to identify the location of this fan.

Figures are also given in Annex A to assist in the identification of the various appliance types.

Those pictures are to be considered as examples; for each type, they do not represent all the possible details of applications.

In order to provide information about appliance types that are recognized in certain CEN Member States, Annex B has been included with reference to subscript letter “X".

4.2 Type A

An appliance not intended for connection to a flue or to a device for evacuating the combustion products to the outside of the room in which the appliance is installed.

Type A_1. An appliance without a fan.

Type A_2. An appliance with a fan downstream of the combustion chamber/heat exchanger.

Type A_3. An appliance with a fan upstream of the combustion chamber/heat exchanger.

4.3 Type B

An appliance intended to be connected to a flue that evacuates the combustion products to the outside of the room containing the appliance. The combustion air is drawn directly from the room.

Type B_1. A type B appliance incorporating a draught diverter, marketed without duct systems, intended to be connected to a separately approved and marketed system for discharge of the combustion products.

Type B_{11}. A natural draught type B1 appliance.

Type B_{12}. A type B_1 appliance designed for a natural draught flue incorporating a fan downstream of the combustion chamber/heat exchanger and upstream of the draught diverter.

Type B_{13}. A type B_1 appliance designed for a natural draught flue incorporating a fan upstream of the combustion chamber/heat exchanger.

Type B_{14}. A type B_1 appliance having an integral fan downstream of both the combustion chamber/heat exchanger and the draught diverter.

Type B_2. A type B appliance without a draught diverter, marketed without duct systems, intended to be connected to a separately approved and marketed system for discharge of the combustion products.

Type B_{21}. [2)] A natural draught type B_2 appliance.

Type B_{22}. A type B_2 appliance incorporating a fan downstream of the combustion chamber/heat exchanger.

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2) A type B_{21} appliance will not generally be included in the scope of European Standards for gas appliances. However, it may apply in special circumstances, e.g. gas-fired incinerators.

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Type B_{23}. A type B_2 appliance incorporating a fan upstream of the combustion chamber/heat exchanger.

Type B_3. A type B appliance without a draught diverter, which is designed for connection via its concentric duct to a common duct system. This common duct system consists of a single natural draught flue. All pressurized parts of the appliance containing combustion products are completely enclosed by parts of the appliance supplying combustion air. Combustion air is drawn into the appliance from the room by means of a concentric duct, which encloses the flue. The air enters through defined orifices situated in the surface of the duct.

Type B_{31}. A natural draught type B_3 appliance.

Appliances of this type are not foreseen.

Type B_{32}. A type B_3 appliance incorporating a fan downstream of the combustion chamber/heat exchanger.

Type B_{33}. A type B_3 appliance incorporating a fan upstream of the combustion chamber/heat exchanger.

Type B_4. A type B appliance, incorporating a draught diverter, that is designed for connection via its flue duct to its flue terminal.

Type B_{41}. [3)] A natural draught type B_4 appliance.

Type B_{42}. A type B_4 appliance designed for a natural draught flue incorporating a fan downstream of the combustion chamber/heat exchanger and upstream of the draught diverter.

Type B_{43}. A type B_4 appliance designed for a natural draught flue incorporating a fan upstream of the combustion chamber/heat exchanger.

Type B_{44}. A type B_4 appliance having an integral fan downstream of both the combustion chamber/heat exchanger and the draught diverter.

Type B_5. A type B appliance, without a draught diverter, that is designed for connection via its flue duct to its flue terminal.

Type B_{51}. [4)] A natural draught type B5 appliance.

Type B_{52}. A type B_5 appliance incorporating a fan downstream of the combustion chamber/heat exchanger.

Type B_{53}. A type B_5 appliance incorporating a fan upstream of the combustion chamber/heat exchanger.

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3) Type B_{41} appliances installed in mobile homes (caravan holiday homes) are commonly described as “closed flue” appliances; this terminology being used in EN 1949, which covers the installation of such appliances.

4) A type B_{51} appliance will not generally be included in the scope of European Standards for gas appliances. However, it may apply in special circumstances, e.g. gas-fired incinerators.

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4.4 Type C

An appliance in which the combustion circuit (air supply, combustion chamber, heat exchanger and evacuation of the combustion products) is sealed with respect to the room in which the appliance is installed.

Type C_1. A type C appliance that is designed for connection via its ducts to its horizontal terminal, which at the same time admits fresh air to the burner and discharges the combustion products to the outside through orifices that are either concentric or close enough to come under similar wind conditions.

Type C_{11}. A natural draught type C_1 appliance.

Type C_{12}. A type C_1 appliance incorporating a fan downstream of the combustion chamber/heat exchanger.

Type C_{13}. A type C_1 appliance incorporating a fan upstream of the combustion chamber/heat exchanger.

Type C_2. A type C appliance connected via its two ducts to a common duct system[5)] serving more than one appliance. This system consists of a single duct, which supplies the combustion air and evacuates the combustion products[6)].

Type C_{21}. A natural draught type C_2 appliance.

Type C_{22}. A type C_2 appliance incorporating a fan downstream of the combustion chamber/heat exchanger.

Type C_{23}. A type C_2 appliance incorporating a fan upstream of the combustion chamber/heat exchanger.

Type C_3. A type C appliance that is designed for connection via its ducts to a vertical terminal, which at the same time admits fresh air to the burner and discharges the combustion products to the outside through orifices that are either concentric or close enough to come under similar wind conditions.

Type C_{31}. A natural draught type C_3 appliance.

Type C_{32}. A type C_3 appliance incorporating a fan downstream of the combustion chamber/heat exchanger.

Type C_{33}. A type C_3 appliance incorporating a fan upstream of the combustion chamber/heat exchanger.

Type C_4. A type C appliance connected via its two ducts to a common natural draught duct system[7)] designed for more than one appliance. This common duct system consists of two ducts connected to a terminal, which at the same time admits fresh air to the burner and discharges the combustion products to the outside through orifices that are either concentric or close enough to come under similar wind conditions.

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5) This common duct system is part of the building and not a part of the appliance.

6) This appliance type is now obsolete and unlikely to be called up in future European Standards for gas appliances.

7) This common duct system is part of the building and not a part of the appliance.

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Type C_{41}. A natural draught type C_4 appliance.

Type C_{42}. A type C_4 appliance incorporating a fan downstream of the combustion chamber/heat exchanger.

Type C_{43}. A type C_4 appliance incorporating a fan upstream of the combustion chamber/heat exchanger.

Type C_5. A type C appliance connected via its separate ducts to its separate terminals for the supply of combustion air and the evacuation of the combustion products. These ducts may terminate in zones of different pressure.

Type C_{51}. A natural draught type C_5 appliance.

Type C_{52}. A type C_5 appliance incorporating a fan downstream of the combustion chamber/heat exchanger.

Type C_{53}. A type C_5 appliance incorporating a fan upstream of the combustion chamber/heat exchanger.

Type C_6. A type C appliance which is intended to be connected to a separately approved and marketed system for the supply of combustion air and discharge of the combustion products.

Pictures for type C_6 appliances have not been included. This is because such appliances are marketed without duct systems. When installed such an appliance will have a configuration similar to one of the arrangements shown for other type C appliances, according to manufacturer's instructions.

Appliance Technical Committees have the responsibility for inclusion of requirements and methods of test in their standards to ensure that type C_6 appliances are suitable for their intended method of supplying combustion air and of evacuation of the combustion product.

Type C_{61}. A natural draught type C_6 appliance.

Type C_{62}. A type C_6 appliance incorporating a fan downstream of the combustion chamber/heat exchanger.

Type C_{63}. A type C_6 appliance incorporating a fan upstream of the combustion chamber/heat exchanger.

Type C_7. A type C appliance in which the combustion air supply and the combustion products evacuation is provided by its two vertical ducts. The combustion air is taken from a loft and the combustion products are discharged above the roof. A draught diverter is incorporated in the combustion products evacuation duct at a location above the combustion air inlet orifice(s)[8].

Type C_{71}. A natural draught type C_7 appliance.

Type C_{72}. A type C_7 appliance incorporating a fan downstream of the combustion chamber/heat exchanger.

Type C_{73}. A type C_7 appliance incorporating a fan upstream of the combustion chamber/heat exchanger.

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8) This appliance type is now obsolete and unlikely to be called up in future European Standards for gas appliances.

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Type C_8. A type C appliance connected via one of its ducts to a single or common duct system[9]. This duct system consists of a natural draught duct (i.e. not incorporating a fan) that evacuates the combustion products. The appliance is connected via a second of its ducts to a terminal, which supplies air to the appliance from outside the building.

Type C_{81}. A natural draught type C_8[10] appliance.

Type C_{82}. A type C_8 appliance incorporating a fan downstream of the combustion chamber/heat exchanger.

Type C_{83}. A type C_8 appliance incorporating a fan upstream of the combustion chamber/heat exchanger.

Type C_9. A type C appliance that is designed for connection via its flue duct to its vertical terminal and via its air inlet duct to an existing vertical duct. The terminal at the same time admits fresh air to the burner and discharges the combustion products to the outside through orifices that are either concentric or close enough to come under similar wind conditions.

The air inlet duct[11], or part of it, is an existing vertical duct within the building, e.g. a converted chimney.

Type C_{91} .A natural draught type C_9 appliance.

Type C_{92}. A type C_9 appliance incorporating a fan downstream of the combustion chamber/heat exchanger.

Type C_{93}. A type C_9 appliance incorporating a fan upstream of the combustion chamber/heat exchanger.

Type $C_{(10)}$ A type C appliance connected via its two ducts to a common duct system[12] designed for more than one appliance. This common duct system consists of two ducts connected to a terminal, which at the same time admits fresh air to the burner and discharges the combustion products to the outside through orifices that are either concentric or close enough to come under similar wind conditions.

The $C_{(10)}$ appliance is designed to become connected to a common duct system that is designed to operate under the conditions where the static pressure in the common flue duct might exceed the static pressure in the common air duct.

Type $C_{(10)2}$. A type $C_{(10)}$ appliance incorporating a fan downstream of the combustion chamber/heat exchanger.

Type $C_{(10)3}$. A type $C_{(10)}$ appliance incorporating a fan upstream of the combustion chamber/heat exchanger.

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9) This single or common duct system is part of the building and not a part of the appliance.

10) A type C_{81} appliance will not generally be included within the scope of European Standards for gas appliances.

11) The vertical air inlet duct is part of the building and not a part of the appliance.

12) This common duct system is part of the building and not a part of the appliance.

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Full document details: BS EN 1749:2020

Type $C_{(11)}$. A type C appliance consisting of an assembly of two or more generally identical appliance modules, connecting ducts, a common flue duct, a common air duct, where the static pressure in the common flue ducts might exceed the static pressure in the air ducts and where the orifices of air duct and the flue duct to the outside are either concentric, or close enough to come under similar wind conditions.

A $C_{(11)}$ appliance is designed to be assembled by connecting its appliance modules via its ducts to its common ducts. These common ducts consist of two ducts connected to their terminals, which at the same time admit fresh air to the burner of each appliance module, and discharges the combustion products of each appliance module to the outside through orifices that are either concentric or close enough to come under similar wind conditions. The appliance has a single air inlet and a single flue outlet.

The $C_{(11)}$ appliance, made by an assembly of two or more modules, is designed as a single appliance; each appliance module is capable of independent operation and it consists of a heat exchanger, burner, control and safety devices.

The $C_{(11)}$ appliance is evaluated and certified in analogy with the types C_1, C_3, C_5.

Type $C_{(11)2}$. A type $C_{(11)}$ appliance is an assembly of two or more appliance modules each incorporating a fan downstream of the combustion chamber/heat exchanger.

Type $C_{(11)3}$. A type $C_{(11)}$ appliance is an assembly of two or more appliance modules each incorporating a fan upstream of the combustion chamber/heat exchanger.

Type $C_{(12)}$. A type C appliance connected via one of its ducts to a common flue duct system[13]. The appliance is connected via a second of its ducts to its terminal, which supplies air to the appliance from outside the building.

A type $C_{(12)}$ appliance is designed to become connected to a common flue duct that is designed to operate under the conditions where the static pressure in the common flue duct might exceed the static pressure in the individual air ducts.

Type $C_{(12)2}$. A type $C_{(12)}$ appliance incorporating a fan downstream of the combustion chamber/heat exchanger.

Type $C_{(12)3}$. A type $C_{(12)}$ appliance incorporating a fan upstream of the combustion chamber/heat exchanger.

Type $C_{(13)}$. A type C appliance consisting of an assembly of two or more generally identical appliance modules, single air ducts, connecting ducts and a common flue duct. The static pressure in the common flue duct might exceed the static pressure in its individual air supply duct.

A type $C_{(13)}$ appliance is designed to be assembled by connecting its appliance modules via its connecting ducts to its common flue duct. Each module is connected via its air supply duct to its terminal.

The $C_{(13)}$ appliance, made by an assembly of two or more modules, is designed as a single appliance; each module is capable of independent operation.

Each $C_{(13)}$ appliance module consists of a heat exchanger, burner, control and safety devices.

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13) This single or common duct system is part of the building and not a part of the appliance.

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Document Sharing Hub
Full document details: BS EN 1749:2020

The $C_{(13)}$ appliance is evaluated and certified in analogy with the types C_1, C_3, C_5.

Type $C_{(13)2}$. A type $C_{(13)}$ appliance is an assembly of two or more appliance modules each incorporating a fan downstream of the combustion chamber/heat exchanger.

Type $C_{(13)3}$. A type $C_{(13)}$ appliance is an assembly of two or more appliance modules each incorporating a fan upstream of the combustion chamber/heat exchanger.

Type $C_{(14)}$. A type C appliance consisting of an assembly of two or more generally identical appliance modules, connecting ducts and a common flue duct. The appliance modules are connected via their air inlet ducts to a common vertical air inlet duct, which supplies air to the appliance from outside the building. The static pressure in the common flue duct might exceed the static pressure in the air duct and the orifices of air duct and the flue duct to the outside are either concentric, or close enough to come under similar wind conditions.

A $C_{(14)}$ appliance is designed to be assembled by connecting its appliance modules via its connecting ducts to its common duct, to the common air inlet duct and to its terminal, which at the same time admit fresh air to the burner of each appliance module, and discharges the combustion products of each appliance module to the outside through orifices that are either concentric or close enough to come under similar wind conditions. The appliance has a single air inlet and a single flue outlet.

The common air inlet duct[14)], or part of it, is an existing vertical duct within the building (e.g. a converted chimney).

The $C_{(14)}$ appliance, made by an assembly of two or more modules, is designed as a single appliance; each module is capable of independent operation.

The $C_{(14)}$ appliance is evaluated and certified in analogy with the types C_1, C_3, C_5.

Type $C_{(14)2}$. A type $C_{(14)}$ appliance is an assembly of two or more appliance modules each, incorporating a fan downstream of the combustion chamber/heat exchanger.

Type $C_{(14)3}$. A type $C_{(14)}$ appliance is an assembly of two or more appliance modules each incorporating a fan upstream of the combustion chamber/heat exchanger.

Type $C_{(15)}$. A type C appliance that is designed for connection via its flue duct to a vertical terminal and via its air inlet duct to an existing common air inlet vertical duct. The terminal at the same time admits fresh air to the burner and discharges the combustion products to the outside through orifices that are either concentric or close enough to come under similar wind conditions.

The common air inlet vertical duct[15)], or part of it, is an existing vertical duct within the building, e.g. a converted chimney.

Type $C_{(15)1}$. A natural draught type $C_{(15)}$ appliance.

Type $C_{(15)2}$. A type $C_{(15)}$ appliance incorporating a fan downstream of the combustion chamber/heat exchanger.

Type $C_{(15)3}$. A type $C_{(15)}$ appliance incorporating a fan upstream of the combustion chamber/heat exchanger.

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14) The vertical air inlet duct is part of the building and not a part of the appliance.

15) The vertical air inlet duct is part of the building and not a part of the appliance.

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5 Supplementary classification scheme for type A and type B appliances fitted with particular safety devices

The supplementary classification scheme for type A and type B appliances has been included to clarify the identification of such appliances when fitted with different safety devices. The subscript letters "AS" (atmosphere safety) refer to an atmosphere sensing device and the subscript letters "BS" (blocked safety) refer to a clearance monitoring device, which reacts to blockage or restriction of the flue system.

Type A_{AS}. A type A appliance fitted with an atmosphere sensing device, e.g. type A_{1AS}.

Type B_{AS}. A type B appliance fitted with an atmosphere sensing device, e.g. type B_{11AS}.

Type B_{BS}. A type B appliance fitted with a clearance monitoring device, e.g. type B_{11BS}.

6 Supplementary classification scheme for type B appliances for use in limited installation conditions

6.1 Type B appliance utilizing a third subscript "D"[16)]

The subscript "D" indicates that the appliance is designed for connection to a flexible non-metallic duct that evacuates humid air and combustion products to the outside of the room containing the appliance.

Type B_{22D}. A type B_{22} appliance that is designed for connection to a flexible non-metallic duct that evacuates humid air and combustion products to the outside of the room containing the appliance.

Type B_{23D}. A type B_{23} appliance that is designed for connection to a flexible non-metallic duct that evacuates humid air and combustion products to the outside of the room containing the appliance.

6.2 Type B appliances utilizing a third subscript "P"[17)]

6.2.1 General

The subscript "P" indicates that the appliance is intended to be connected to a flue system that is designed to operate at a positive pressure. This subscript "P" is only used when installation of the appliance is in accordance with the appliance manufacturer's instructions on a flue specified by the appliance manufacturer results in the flue operating at a positive pressure. The following types exist.

6.2.2 Type B appliances without draught diverters

Type B_{22P}. A type B_{22} appliance intended to be connected to a flue system that is designed to operate at a positive pressure.

Type B_{23P}. A type B_{23} appliance intended to be connected to a flue system that is designed to operate at a positive pressure.

Type B_{52P}. A type B_{52} appliance intended to be connected to a flue system that is designed to operate at a positive pressure.

Type B_{53P}. A type B_{53} appliance intended to be connected to a flue system that is designed to operate at a positive pressure.

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16) At present, these types are only applicable to gas-fired tumble dryers.

17) This identification "P" is in accordance with the designation of the classes of tightness of chimneys.

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