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European scheme for the classification of gas appliances according to the method of evacuation of the combustion products (types)

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National foreword

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The UK participation in its preparation was entrusted to Technical Committee GSE/-/4, To brief SFG_U and consider horizontal issues affecting gas utilization.

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

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European scheme for the classification of gas appliances according to the method of evacuation of the combustion products (types)

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Foreword

This document (CEN/TR 1749:2014) has been prepared by Technical Committee CEN/TC SFG_U "Sector Forum Gas Utilisation", the secretariat of which is held by AFNOR.

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

This document supersedes CEN/TR 1749:2009.

This technical report has been prepared under the aegis of the Sector Forum Gas Utilization committee to provide guidance 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 evacuating the products of combustion. It will be stressed that this scheme only concerns gas appliances that are intended to be installed within buildings. It does not apply to outdoor appliances. Nevertheless, it is recognized that this appliance classification scheme could be utilized in other circumstances. For example, in the case of:

a) appliances capable of utilizing heating oil or kerosene, and

b) gas appliances intended[1)] for installation in a partially protected place external to a building.

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 products of combustion. Appliances classified in this way are generally described as "types" and this description has been retained for the purposes of this general scheme.

The main purpose of the scheme 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 scheme in all circumstances in which it is appropriate. They should not deviate from it unless there are sound technical reasons for so doing.

In the preparation of this scheme it was noted that there were methods of evacuating products of combustion 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 products of combustion. At that time, such specific methods of evacuating products of combustion may be included at the request of the Technical Committees concerned.

Explanatory notes:

The following notes are given in explanation of the classification scheme.

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1) If the appliance is installed in a partially protected place (if this circumstance is explicitly allowed by the manufacturer) it will not change its classification (i.e. a type B_{53} boiler will remain B_{53} if installed in a partially protected place according to manufacturer instructions).These appliances are subject to specific additional requirements and tests.

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NOTE 1 The general scheme classifies appliances as type A, B or C according to the basic principle for the evacuation of the products of combustion. These definitions are written intentionally in very broad terms in order to cover any possible variations in the basic appliance types.

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.

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 products of combustion. Where such 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.

NOTE 2 Diagrams have been given in Annex A, showing examples of the various appliance types. However, it will be noted that diagrams for type C6 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.

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(s) of installation.

NOTE 3 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.

In order to provide information about appliance types that are recognized in certain CEN member states, Annexes B, C and D have been included in which special national appliance classifications may be identified. At present, Annex B identifies appliance types that are particular to Germany.

NOTE 4 In references to a gas appliance / gas appliances connected via **“its”** or **“their”** duct or ducts, the authors of the technical report expressed that the air inlet duct and the discharge duct for carrying any products of combustion are part of the gas appliance. This means that such ducts are certified together with the gas appliance

NOTE 5 In terms of this technical report a **"common duct"** is a flue duct designed and capable to discharging the products of combustion and/or air inlet duct for the air supply for more than one appliance.

NOTE 6 Annex E 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 technical report a **"separate chimney products"** is a flue duct approved and marketed separately from the appliance.

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1 Scope

This Technical Report gives details of a general scheme for the classification of gas appliances according to the method of supplying combustion air and of evacuating the products of combustion. This scheme refers to gas appliances that are intended to be installed within buildings and/or to gas appliances intended[2)] for installation in a partially protected place external to a building.

This Technical Report is a guide for the harmonization of product standards and for the common understanding of the types of gas appliances.

This TR is not intended to be used as an installation standard or as a product standard, nor as a reference for market surveillance.

2 General scheme

2.1 General

The general scheme for type A, type B and type C appliances is given in 2.2, 2.3 and 2.4 respectively. Diagrams are also given in Annex A to assist in the identification of the various appliance types.

2.2 Type A

An appliance not intended for connection to a flue or to a device for evacuating the products of combustion 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.

2.3 Type B

An appliance intended to be connected to a flue that evacuates the products of combustion 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.

Type B_{11}. A natural draught type B_1 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.

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2) If the appliance is installed in a partially protected place (if this circumstance is explicitly allowed by the manufacturer) it will not change its classification (i.e.: a type B53 boiler will remain B53 if installed in a partially protected place according to manufacturer instructions).These appliances are subject to specific additional requirements and tests.

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Type B_2. A type B appliance without a draught diverter.

Type B_{21}.[3] 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.

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 to a common duct system. This common duct system consists of a single natural draught flue. All pressurized parts of the appliance containing products of combustion 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}.[4] 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}.[5] A natural draught type B_5 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) 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.

4) 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.

5) 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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2.4 Type C

An appliance in which the combustion circuit (air supply, combustion chamber, heat exchanger and evacuation of the products of combustion) 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 products of combustion 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 [6)] serving more than one appliance. This system consists of a single duct, which supplies the combustion air and evacuates the products of combustion[7)].

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 products of combustion 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 duct system[8)] 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 products of combustion to the outside through orifices that are either concentric or close enough to come under similar wind conditions.

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 separate terminals for the supply of combustion air and the evacuation of the products of combustion. These ducts may terminate in zones of different pressure.

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

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

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

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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. (see note 2 given in the foreword).

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 products of combustion 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)[9].

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.

Type C_8. A type C appliance connected via one of its ducts to a single or common duct system[10]. This duct system consists of a single natural draught duct (i.e. not incorporating a fan) that evacuates the products of combustion. 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[11] 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 a 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 products of combustion to the outside through orifices that are either concentric or close enough to come under similar wind conditions.

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

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

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

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The air inlet duct[12)], 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[13)] 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 products of combustion 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.

Type $C_{(11)}$ A type C appliance connected via its two ducts to its common ducts which are designed for more than one appliance.

These common ducts consist of two ducts connected to their terminals, which at the same time admit fresh air to the burner and discharge the products of combustion to the outside through orifices that are either concentric or close enough to come under similar wind conditions.

The $C_{(11)}$ appliance is designed to become connected to its common ducts where the static pressure in the common flue duct might exceed the static pressure in the common air duct.

NOTE 1 The $C_{(11)}$ appliance is designed and/or specified as an integral part of a specific combined system including a number of type C appliances and its complete air/flue ducts and terminals. This complete system is evaluated and certified under the GAD (in analogy with the types C1, C3, C5).

Type $C_{(11)2}$. A type $C_{(11)}$ appliance incorporating a fan downstream of the combustion chamber/heat exchanger.

Type $C_{(11)3}$. A type $C_{(11)}$ appliance 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[14)]. The appliance is connected via a second of its ducts to a 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.

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

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

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

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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 connected via one of its ducts to a common duct system which is designed for more than one appliance. The appliance is connected via a second of its ducts to a terminal, which supplies air to the appliance from outside the building.

The $C_{(13)}$ appliance is designed to become connected to its common duct where the static pressure might exceed the static pressure in its individual air supply duct.

NOTE 2 The $C_{(13)}$ appliance is designed and/or specified as an integral part of a specific combined system including a number of type C appliances and its complete air/flue ducts and terminals. This complete system is evaluated and certified under the GAD (in analogy with the types C1, C3, C5).

Type $C_{(13)2}$. A type $C_{(13)}$ appliance incorporating a fan downstream of the combustion chamber/heat exchanger.

Type $C_{(13)3}$. A type $C_{(13)}$ appliance incorporating a fan upstream of the combustion chamber/heat exchanger.

Type $C_{(14)}$. A type C appliance connected via its flue duct to its common flue duct which is designed for more than one appliance. The appliance is connected via its air inlet duct to a common existing vertical duct, which supplies air to the appliance from outside the building.

These common duct consist of two ducts connected to their terminals, which at the same time admit fresh air to the burner and discharge the products of combustion to the outside through orifices that are either concentric or close enough to come under similar wind conditions.

The $C_{(14)}$ appliance is designed to become connected to its common duct where the static pressure might exceed the static pressure in the common air supply duct.

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

NOTE 3 The $C_{(14)}$ appliance is designed and/or specified as an integral part of a specific combined system including a number of type C appliances and its complete flue ducts and terminal. The complete flue system is evaluated and certified under the GAD (in analogy with the types C1, C3, C5).

Type $C_{(14)2}$. A type $C_{(14)}$ appliance incorporating a fan downstream of the combustion chamber/heat exchanger.

Type $C_{(14)3}$. A type $C_{(14)}$ appliance 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 products of combustion to the outside through orifices that are either concentric or close enough to come under similar wind conditions.

The common air inlet vertical duct[16)], or part of it, is an existing vertical duct within the building e.g. a converted chimney.

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

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

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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.

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

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}.

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

4.1 Type B appliance utilizing a third subscript "D"[17)]

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

4.2 Type B appliances utilizing a third subscript "P"[18)]

4.2.1 General

Indicating 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 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.

4.2.2 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.

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

18) This identification "P" is in accordance with the designation of the classes of tightness, agreed by CEN/TC 166: Chimneys, depending on the pressure of operation of the duct (e.g. see EN 1443).

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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.

4.2.3 Type B appliances with draught diverters

Type B_{14P}. A type B_{14} appliance intended to be connected to a flue system that is designed to operate at a positive pressure.

Type B_{44P}. A type B_{44} appliance intended to be connected to a flue system that is designed to operate at a positive pressure.

5 Supplementary classification scheme for type C appliances for use in limited installation conditions — Type C_1 appliances utilizing a third subscript "R"

Indicating that the appliance is also capable of being installed via its ducts to a horizontal terminal on a roof. The following types exist.

Type C_{1R}. A type C_1 appliance which is capable of roof termination as well as wall termination.

Type C_{11R}. A natural draught type C_{1R} appliance.

Type C_{12R}. A type C_{1R} appliance incorporating a fan downstream of the combustion chamber/heat exchanger.

Type C_{13R}. A type C_{1R} appliance incorporating a fan upstream of the combustion chamber/heat exchanger.

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Annex A
(normative)

Classification according to the mode of evacuation of the products of combustion

NOTE 1 The diagrams given in this annex have been included as examples to assist in the identification of the various appliance “types”. However, it is important to stress:

a) that alternatives to any given example are equally valid if they fit the description of that particular appliance type, and

b) that these diagrams are not intended to be used as a guide to installation of such appliances; in all matters concerning installation, it is essential to refer to the installation rules in force in the CEN member country in which the appliance type is to be installed.

NOTE 2 For convenience the diagrams for type C_2, type C_4, type C_8, type $C_{(10)}$, type $C_{(11)}$, type $C_{(12)}$, type $C_{(13)}$ and type $C_{(14)}$, show the common duct system with each of the specific variations in type connected to it. For the reasons given in NOTE 1 above, this will not be regarded as accepted installation practice.

NOTE 3 In order to make sure that the sense of definitions is clear, each part of the flue and air system (appliance, chimney, part of the buildings) is shown with different marks to define if the part of the system is to be considered as an integral part of the appliance or as a separate chimney product (see the legend below).

Where the connecting flue pipes are not shown they are not an integral part of the appliance.

Key

———	Thin black line means that the flue duct and/or the air inlet duct is an integral part of the appliance (this applies to connecting air/flue pipes and to vertical air/flue ducts);
▬▬▬	Thick grey line means that the vertical flue duct and/or air inlet duct is a separate chimney product.

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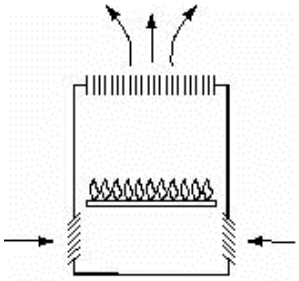
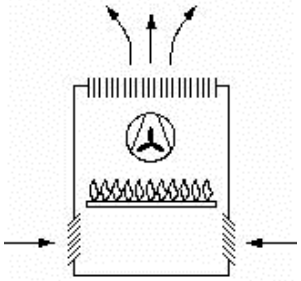
Type A

Type A_1



Type A_2



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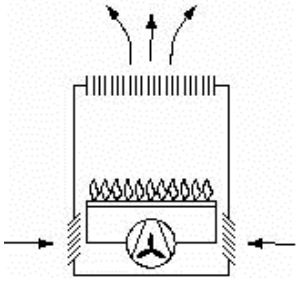

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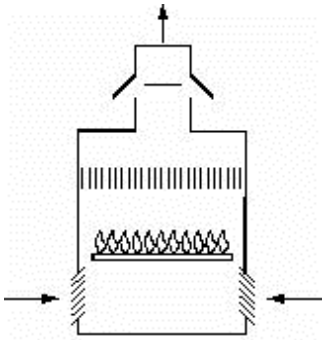
Type B_1

Type B_{11}



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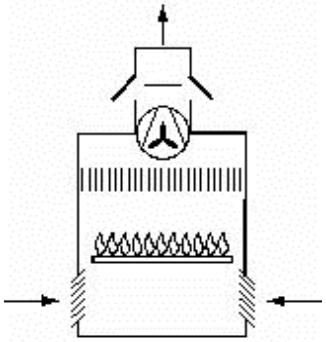

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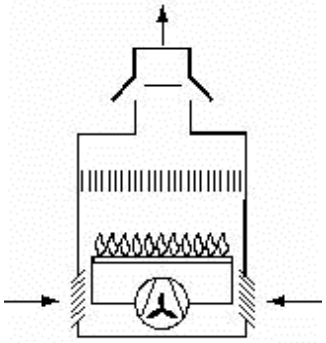

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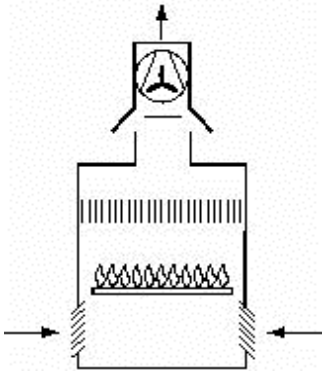

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