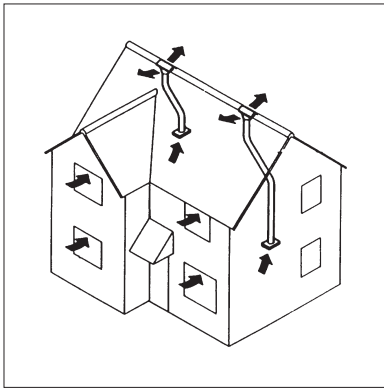


PASSIVENT PSV SYSTEM**Product**

- THIS DETAIL SHEET RELATES TO THE PASSIVENT PSV SYSTEM.
- The system provides extract ventilation for occupants of new or existing dwellings or buildings of similar occupancy and condition.
- The system is designed to satisfy the principles of ventilation described in BRE Information Paper IP 13/94 Passive stack ventilation systems : design and installation.

This Detail Sheet must be read in conjunction with the Front Sheets, which give the product's position regarding the Building Regulations, general information relating to the product, and the Conditions of Certification respectively.

Technical Specification**1 Description**

1.1 The Passivent PSV System comprises a number of components and relies on the stack effect and the effect of air passing over the roof to vent air from wet rooms, eg kitchens, bathrooms, WCs and utility rooms to the outside. The vented air is replaced by air from dry rooms that each have a window or wall-mounted air inlet (see Figures 1 and 2).

1.2 The system components are:

Air inlets

- Passivent External Canopy Grille Vent (PVCG4) — manufactured from aluminium with a polyester paint finish and plastic end caps, mounted on the outside of a straight window frame or head, or on a Passivent Overglass Vent Bar (PVOG). Used in conjunction with an internal Window Inlet Vent (PVFV4) or Window Inlet Humidity-Sensitive Vent (A101)
- Wall Inlet Fresh 90 — plastic internal and external grilles and tubular wall-sleeve
- Airbrick Grille (PV250) — manufactured in plastic. An adaptor is provided for use with the Wall Inlet Humidity-Sensitive Vent (A111) and cavity sleeve.

Air inlets — humidity-sensitive

Units include a humidity-sensitive element which controls the grille flap orientation and hence the area of the ventilation opening. Operating range is 47% to 65% relative humidity providing maximum ventilation only when humidity is high.

- Window Inlet Humidity-Sensitive Vent (A101) — a plastic body fitted internally to a straight window frame or head or on a Passivent Overglass Vent Bar (PVOG). Compatible with the external Canopy Grille (PVCG4)
- Wall Inlet Humidity-Sensitive Vent (A111) — a plastic body fitted internally on a wall and includes a cavity sleeve. The inlet, together with a cavity sleeve, is used in conjunction with an external Airbrick Grille (PV250) and adaptor
- Wall Inlet Humidity-Sensitive Fresh Humatic Vent (99 H) — plastic internal and external grilles and tubular-wall sleeve.

Air inlets — acoustic

- Wall Inlet Fresh 80 dB, Fresh 90 dB and Fresh 100 dB — similar to Fresh 90 but includes a sound absorbing lining to the wall sleeve.

Air inlets — acoustic and humidity-sensitive

- Wall Inlet Acoustic Humidity-Sensitive Vent (A111db) — same as the A111 vent but includes a sound absorbing lining to the wall sleeve
- Wall Inlet Acoustic Humidity-Sensitive Fresh Vent (99HdB) — same as the 99H vent but incorporates an integral sound absorbing lining to the wall sleeve.

Air extract

- Humidity-Sensitive Extract Vent (A161) — a plastic body incorporating the same humidity-sensitive element found in the humidity-sensitive air inlet vents. Fitted to the base of a duct connecting kitchens, bathrooms, WC or utility room to the outside.

Figure 1 Components

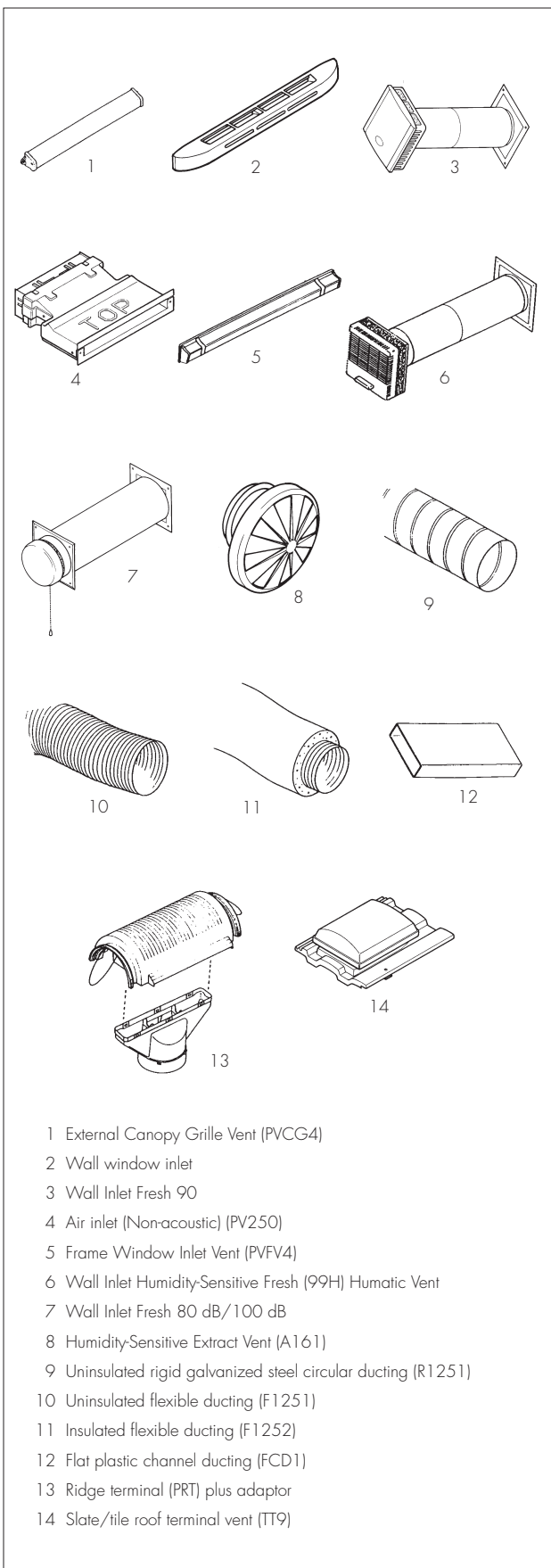
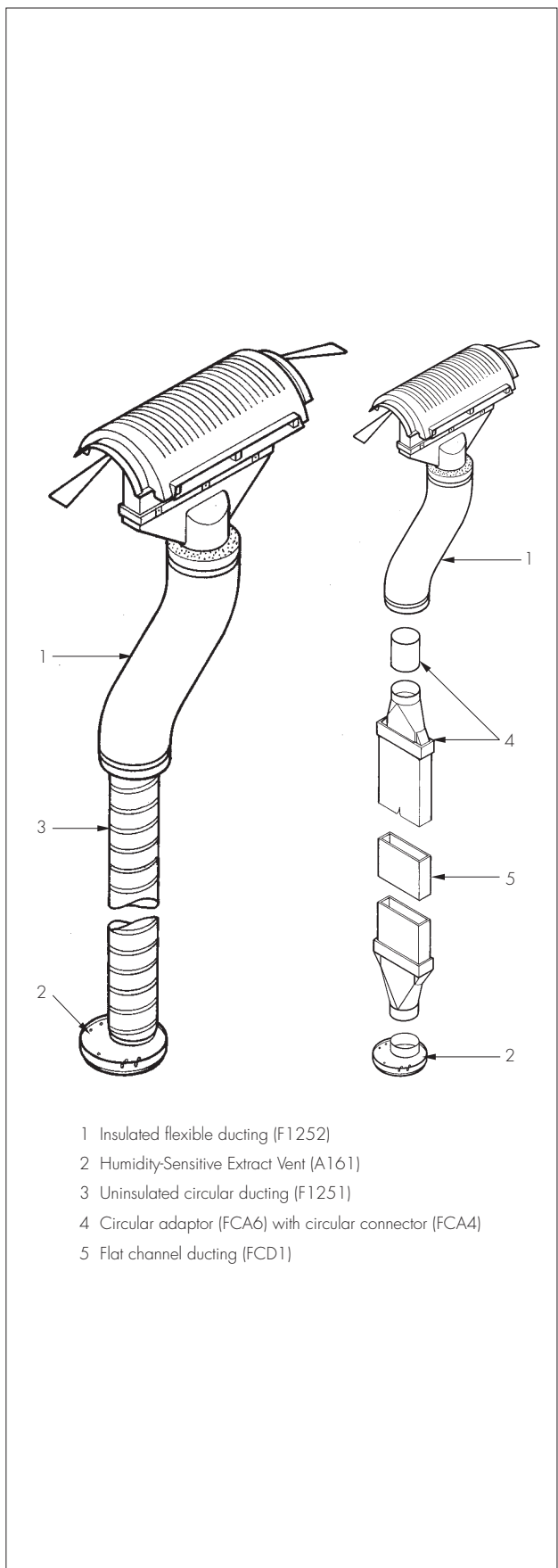


Figure 2 Ducting/terminals



Ducting

- rigid or flexible circular ducting (F1251) — available with an internal diameter of 125 mm. Flexible ducting (F1252) with 25 mm of insulation (thermal conductivity $\leq 0.04 \text{ Wm}^{-1}\text{K}^{-1}$), is provided for use in unheated parts of a building
- flat plastic channel ducting (FCD1), 204 mm by 60 mm — can be accommodated within a stud wall.

Roof terminals

- ridge terminals (PRT) — manufactured in ABS in a range of profiles with acrylic resin surface finishes
- slate/tile terminal vent (TT9) — manufactured in ABS in a range of profiles with acrylic resin surface finish. Used only at high level, a maximum 0.5 m down from the ridge.

Accessories

1.3 A range of accessories is available:

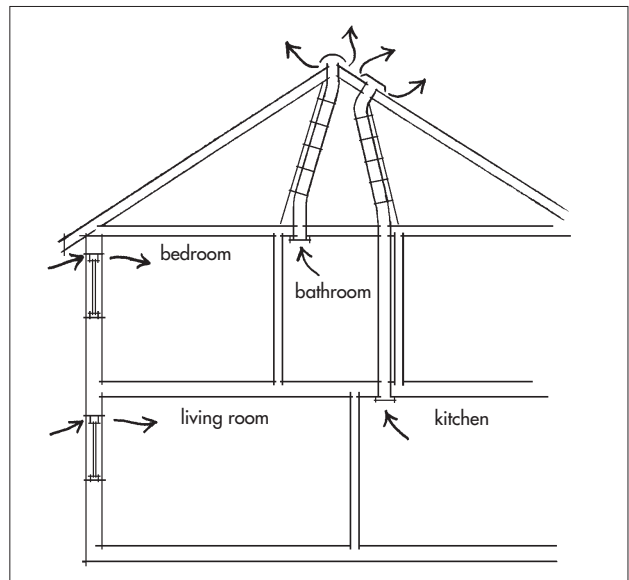
- Overglass Vent Bar (PVOG)
- acoustic wall cowl, for use with 99HdB
- air transfer wall grille (ATG1), for internal walls
- air transfer door grille (K145), for internal doors
- ductwork fire damper (FD125) and backplate (FD180)
- sleeved fire damper (FDA125)
- duct tape (X331)
- speedclamps (X332)
- circular ducting straight connector (MC01) (FC01)
- ridge terminal adaptor (G504), for use with circular ducts
- flat channel; rectangular/circular adaptor (FCA6), end cap (FCA2), straight connector (FCA3), wall plate (FCA5) and circular connector (FCA4).

Design Data

2 General

2.1 The Passivent System comprises separate ducts taken from the ceilings or walls of the kitchen, bathroom, WC and utility room to separate terminals on the roof (see Figure 3). The extract grille on the lower end of each duct includes a humidity controlled louvre which modulates the level of extraction dependent on the level of humidity. Wall- or window-mounted background ventilators are provided in the remaining rooms and, where necessary, internal grilles are used to aid airflow from the dry rooms to replace the air extracted from the wet rooms.

Figure 3 Typical layout



2.2 The system is designed to satisfy the principles of ventilation described in BRE Information Paper IP 13/94, including:

- separate ducting and outlets for each wet room to avoid crossflow
- design/location of ducting outlets to minimise risk of adverse airflow due to prevailing wind speed and direction
- maintaining vertical or near vertical ducting to minimise resistance to airflow.

2.3 Stack ventilation is recognised as an energy-efficient means of ventilation.

2.4 It is essential that the systems are designed and installed in accordance with this Certificate and the Certificate holder's instructions.

3 Ventilation

3.1 The system can provide adequate means of ventilation for people in a building as given in:

England and Wales

Table 1.2b (see also Table 1.4)

Scotland

Mandatory Standard 3.14, clauses 3.14.1⁽¹⁾ and 3.14.6⁽¹⁾

(1) Technical Handbook Domestic.

Northern Ireland

In the opinion of the BBA, this product is acceptable.

3.2 Ventilation performance is calculated in accordance with the design principles of CIBSE Guide A: *Environmental design*. The pressure driving the airflow is the sum of the wind and stack induced pressure which exceeds the sum of the duct loss and duct inlet and outlet loss. The Certificate holder provides a comprehensive design service for each building type to determine

adequate ventilation rates, taking into account the following parameters:

- internal/external temperature difference
- average wind velocity at roof terminal height
- pressure loss coefficients for ducts, inlet, outlet and extract grilles
- degree of shelter
- orientation of façade elements
- air leakage through gaps in building elements
- air inlet area through vents
- moisture vapour generation rates.



3.3 Air inlets are not required in 'wet' rooms but should otherwise be sited in accordance with the following provisions:

England and Wales

Approved Document F

Scotland

Regulation 9, Mandatory Standard 3.14, clauses 3.14.4⁽¹⁾, 3.14.5⁽¹⁾, 3.14.6⁽¹⁾ (see also section 1.1 of this Detail Sheet)

(1) Technical Handbook (Domestic).

Northern Ireland

Regulation K2.



3.4 Extract terminals should be located in the ceiling or on a wall less than 400 mm below the ceiling in accordance with Approved Document F (Table 1.4).

4 Condensation



4.1 The use of the system will contribute to satisfying the requirements for limiting the risk of surface condensation in:

England and Wales

Approved Document C2(c)

Scotland

Mandatory Standard 3.15, clauses 3.15.1⁽¹⁾ and 3.15.3⁽¹⁾

(1) Technical Handbook (Domestic).

4.2 The risk of condensation is greatest when a building is drying out after construction. Guidance on preventing condensation from this and other sources is given in BRE Digest 369 *Interstitial condensation and fabric degradation* and in BRE report (BR 262 : 2002) *Thermal insulation : Avoiding risks*.

5 Behaviour in relation to fire



5.1 Ventilation grilles mounted on an internal wall or ceiling are of limited area and need not be taken into account when considering the classification of the lining's resistance to fire spread.



5.2 The use of wall-mounted air bricks or grilles in an otherwise protected area is unrestricted provided the minimum distances from other unprotected areas are maintained as given in:

England and Wales

Approved Document B, Diagram 20

Northern Ireland

Technical Booklet E, Diagram 4.4.



5.3 In Scotland, ventilators mounted on an external wall that is on a boundary or within 500 mm of a boundary must not project beyond the boundary. (See also section 10.2).



5.4 The introduction of slate or ridge vents in a traditional roof construction does not affect the normal AA rating of such a construction.

5.5 A single house is a single fire compartment, however, as for other services penetrating an element of construction, care should be taken to ensure that the edges of an opening in the floor are adequately constructed to ensure that the integrity of the remainder of the floor is maintained. However, in three-storey houses care should be taken not to prejudice escape routes, eg by encasing ductwork in half-hour fire-resistant boarding.

6 Noise

6.1 Noise ingress through external vents can in some circumstances be intrusive, for example close to busy roads or near airports. In such circumstances the use of sound attenuating ductwork should be considered at the design stage. In accordance to BS 5925 : 1991. Additional information can be found in CIBSE Guide B : 2005 *Heating, Ventilating, Air Conditioning, Refrigeration*, Sections 2, 3 and 12.

6.2 The acoustic air inlets achieve appreciable reductions in airborne sound transmission when compared to non-acoustic components. The results of sound insulation measurements to BS EN ISO 140-3 : 1995 are shown in Table 1.

Table 1 Airborne sound insulation

	Fresh 99H	A111	Fresh 80	Fresh 90
$D_{n,e,w}$ (dB)	45	41	46	43

7 Maintenance

7.1 In general, no maintenance will be required. However, periodic removal and washing of the extract grilles and filter is recommended. The humidity controlled lever which controls the grille flap orientation is pre-set in the factory and should not require adjustment.

7.2 There is little risk of blockage or damage to ducts and air terminals in normal use; however, should they occur, performance would be impaired. Occasional inspection, therefore, is recommended.

8 Durability



8.1 The components are made of durable materials and, should have a life equal to that of the building in which they are installed.

8.2 During the lifetime of externally mounted products some fading should be expected due to UV degradation but this will not affect the product's performance.

8.3 Data obtained by the BBA show that the humidity-sensitive control element retains its properties when subject to accelerated conditions of grease vapour and dust accumulation. Assessments of performance in use also support the element's durability.

Installation

9 General

9.1 Installation of the Passivent System must comply with the provisions of this Certificate and the Certificate holder's instructions and preferably be carried out by a Passivent Mastercare trained installer holding a current certificate issued by the Certificate holder.

9.2 The Certificate holder provides a comprehensive design service and layout plans for each project.

10 Procedure

10.1 Air inlets must be appropriately sited on external walls or windows. Ventilator sleeves in wall-mounted inlets should be installed with a slight downward tilt to the outside.

10.2 Systems are more effective if they are placed in the ceiling or wall near (but not directly over) a cooker. The positioning of the duct that runs from the kitchen ceiling is usually constrained by the layout of the rooms above, since the duct needs to run either in a corner, where it can be boxed in, or in a cupboard or stud partition wall. If the extract is not near the cooker it should preferably be away from the window, on the opposite side of the

cooker. Each extract must have its own duct running to the roof. For buildings subject to the Building (Scotland) Regulations, a fire damper is installed behind the extract, unless the ducting is non-combustible, or encased in half-hour fire-resistant boarding.

10.3 All ductwork should be as near vertical as possible, take the shortest possible path and be firmly secured. Care should be taken to ensure flexible ducting does not sag and has smooth bends. Insulated ductwork must be used in unheated spaces. No section of duct should be at an angle of more than 45° to the vertical and have no more than two bends per duct.

10.4 Ridge terminals must be sited to allow as near vertical duct runs as possible. Where ridge terminals are not practical, slate/tile terminals may be used, but they must be as close to the ridge as possible and a maximum of 0.5 m down.

Technical Investigations

The following is a summary of the technical investigations carried out on the Passivent System.

11 Investigations

11.1 An examination was made of data relating to:

- airflow characteristics
- resistance to rain ingress
- effect of UV and heat ageing
- resistance to impact
- durability of humidity sensing element
- acoustic performance.

11.2 The fabrication process and the assembly procedure, including the methods adopted for factory production control, were examined and found satisfactory by the BBA.

11.3 Visits to sites were conducted and the practicability of installation assessed.

11.4 A survey of users of the system was conducted.

11.5 The effect of the installation of the system on security against intrusion was assessed.

Bibliography

BS 5925 : 1991 *Code of practice for ventilation principles and designing for natural ventilation*

BS EN ISO 140-3 : 1995 *Acoustics — Measurement of sound insulation in buildings and of building elements — Laboratory measurements of airborne sound insulation of building elements*



On behalf of the British Board of Agrément

Date of Third issue: 5th June 2007



Chief Executive

**Original Detail Sheet issued 19th September 1996. This amended version includes, changes to component specification and reference to revised Building Regulations.*

