# EKW-Herald V3 Flue Guide

Models covered:
EKW-HCB117
EKW-HCB190
EKW-HCB235
EKW-HCB295

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DOCUMENT CONTROL

| Article | Language | Version | Modified by |
|---|---|---|---|
| EKW flue guide | English | V2 April 2025 | S ADDIS |

# Contents

GENERAL

Lochinvar EcoKnight water heaters and Herald boilers are certified for use on the following flue categories:

| Installation type | Category | Description |
|---|---|---|
| **B23** | Open flue | 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. |
| **C13** | Closed Flue | An appliance connected to either a concentric or twin-pipe flue system with a Horizontal flue terminal. Both the air inlet and flue exhaust must be in the same pressure zone. |
| **C33** | Closed Flue | An appliance connected to either a concentric or twin-pipe flue system with a Vertical flue terminal. Both the air inlet and flue exhaust must be in the same pressure zone. |
| **C53** | Closed Flue | An appliance connected to a twin-pipe flue system with a Horizontal or Vertical flue terminal. Both air inlet and flue exhaust may be in different pressure zones. |
| **C63** | Closed Flue | An appliance intended to be connected to a separately approved and marketed system for the supply of combustion air and discharge of combustion products (i.e. other than that supplied by the water heater manufacturer). |

Due to the pressure drop within the standard M&G flue system only B23 flue systems can be supplied. As such only B23 and C63 systems are covered in this document.

All installations should comply with the requirements of:

1. For appliances up to 70kW net input- BS5440-1:2008- Flueing and ventilation for gas appliances of rated input not exceeding 70 kW net (1st, 2nd, and 3rd family gases). Specification for installation of gas appliances to chimneys and for maintenance of chimneys.
    a. Refer to drawing 1 and table 1 for details of terminal locations.
2. For appliances over 70kW net input- IGEM/UP/10 Edition 4 +A: 2016 - Installation of flued gas appliances in industrial and commercial premises, specific attention should be paid to the following sections.
    a. Refer to drawing 1 and table 1 for details of terminal locations.
    b. Horizontal terminations shall be located according to the minimum distances given in table 1, and subject to the risk assessment criteria shown in table 2.
    c. Horizontal flue terminations (other than for fan dilution systems) must not be installed for any single appliance or group of appliances with a total nett input exceeding 333kW net heat input.
    d. For any single appliance or group of appliances with a total net heat input exceeding 333 kW, the general requirements of IGEM/UP/10 Edition 4 +A: 2016 shall apply and approval must be sought from the Local Authority prior to commencement of the installation.
3. The Clean Air Act for installations exceeding 333kW nett input.

DRAWING 1 WATER HEATER TERMINAL LOCATIONS

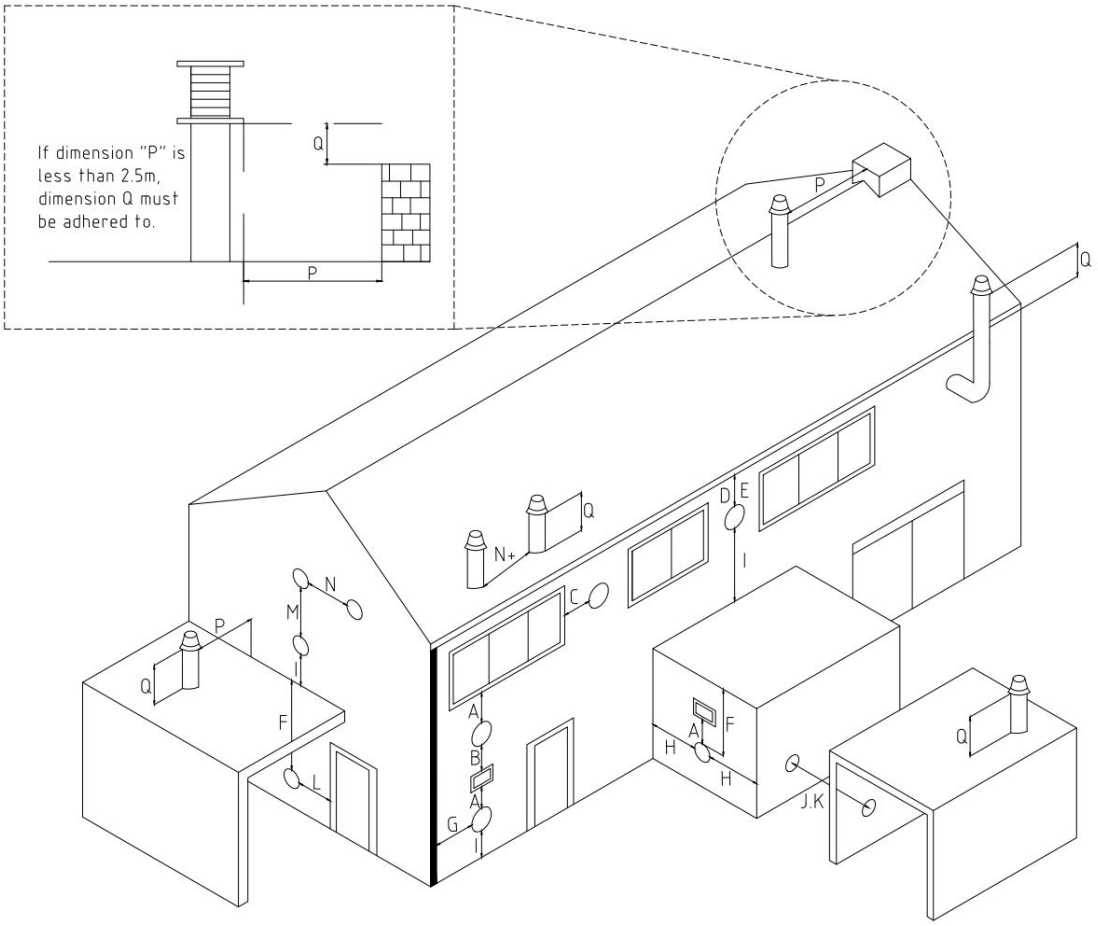



TABLE 1 WATER HEATER TERMINAL LOCATIONS

| Location | Description | EKW-HCB117 | EKW-HCB190 | EKW-HCB235 | EKW-HCB295 |
|---|---|---|---|---|---|
| A | Directly below an opening, air brick, opening windows etc. | 2500 | 2500 | 2500 | n/a |
| B | Above an opening, air brick, opening windows etc. | 940 | 1468 | 1793 | n/a |
| C | Horizontally to an opening, air brick, opening windows etc. | 940 | 1468 | 1793 | n/a |
| D | Below a gutter or sanitary pipework | 200 | 200 | 200 | n/a |
| E | Below the eaves | 200 | 200 | 200 | n/a |
| F | Below a balcony or car port roof | Not recommended see UP10 risk assessment | | | |
| G | From a vertical drain or soil pipe | 150 | 150 | 150 | n/a |
| H | From an internal or external corner | 2087 | 3775 | 4816 | n/a |
| I | Above ground, roof or balcony level | 300 | 300 | 300 | n/a |
| J | From a surface facing the terminal | 2087 | 3775 | 4816 | n/a |
| K | From a terminal facing the terminal | 2908 | 4318 | 5188 | n/a |
| L | From an opening in the car port (e.g. door, window) into the dwelling | Not recommended see UP10 risk assessment | | | |
| M | Vertically from a terminal on the same wall | 940 | 1468 | 1793 | n/a |
| N | Horizontally from a terminal on the same wall | 940 | 1468 | 1793 | n/a |
| P | From a vertical structure on the roof | 425 | 620 | 740 | n/a |
| Q | Above intersection with the roof | 425 | 620 | 740 | n/a |

TABLE 2 RISK ASSESMENT

## The table below is an excerpt from IGEMUP10 and should be used in conjunction with that document

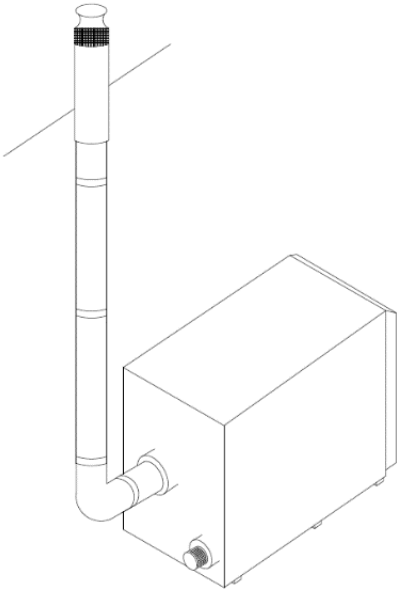
Further to the requirements in IGEM/UP/10 Edition 4 +A: 2016 Section 8 under clause 8.7.3.3 and Figure 7 the following risk assessment gives guidance for the positioning of horizontal flues. This form should be completed before work commences and undertaken by a person who is competent to undertake the risk assessment.

| **Type C appliances with net heat input exceeding 70 kW and not exceeding 333 kW low level flue discharge risk assessment (including net heat input for groups of appliances)** | | | |
|---|---|---|---|
| **No.** | **Regarding the flue position** | **No** | **Yes** |
| 1 | Is the proposed flue termination within the distance in Figure K of a road, path, track, thoroughfare, walkway, property boundary or area, which is used for general public access other than for maintenance purposes? | No | Yes |
| 2 | Is the proposed flue termination within the distance in Figure K to a playground, school, yard, seating area, or area where there may be a public gathering | No | Yes |
| 3 | If the proposed flue termination enclosed on more than two sides, then does it comply with the requirements of Figure 11B? | No | Yes |
| 4 | Is the proposed flue termination within the distance in Figure K of a surface or building element that may be affected by corrosion or deterioration from plume condensate? | No | Yes |
| 5 | Is the proposed flue position in an area where vehicles could be parked within distances from Figure 12 Line G to the flue? | No | Yes |
| 6 | Are there shrubs or trees within minimum distances shown on Figure K of the proposed terminal position? | No | Yes |
| 7 | Is the proposed flue termination within a light well? | No | Yes |
| 8 | Are the products of combustion from the proposed flue position likely to build up under unfavourable atmospheric conditions, due to poor cross flow of air caused by enclosures or adjacent structures and/or likely to cause nuisance? | No | Yes |
| 9 | Is the flue termination position likely to cause a nuisance to adjoining properties? | No | Yes |
| **Building Regulations part J** | | | |
| 10 | Is the proposed flue termination less than 300 mm from the boundary of the property, as measured from the side of the terminal to the boundary? | No | Yes |
| **Regarding the Clean Air Act** | | | |
| 11 | Is the total output of the individual, or group of flue terminals (if within 5U (see A3.7)), greater than 333 kW net heat input? | No | Yes |
| **General** | | | |
| 12 | Are there any other considerations that are required for this risk assessment, see separate sheet. | No | Yes |
| 13 | Comments: | | |
| | | | |
| If all answers are Blue, then the flue position should be suitable | | | |
| If any answer is Orange, then the flue position is unsuitable, consider revising the position or type of flue outlet or contact the local Environmental Health officer for assistance and/or approval | | | |

| Model Number | | EKW-HCB117 | EKW-HCB190 | EKW-HCB235 | EKW-HCB295 |
|---|---|---|---|---|---|
| **FLUE DATA TYPE All except C63** | | | | | |
| Nominal flue diameter | mm | 150* | 150 | 150 | 200* |
| Nominal air inlet diameter | mm | 100 | 100 | 100 | 200* |
| Minimum flue gas temp | °C | 35 | | | |
| Average flue gas temp | °C | 70 | | | |
| Maximum flue gas temp | °C | 120 | | | |
| Maximum equivalent length | m | 27 | 27 | 16 | 24.9 |
| Equivalent length 90° bend | mm | 7.1 | 7.1 | 7.1 | 1.1 |
| Equivalent length 45° bend | mm | 1.8 | 1.8 | 1.8 | 0.7 |

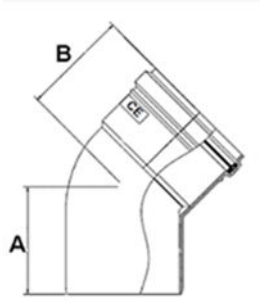
* Flue size used is larger than the flue outlet of the appliance.

| Item no EKWCF010 | | | |
|---|---|---|---|
| **Starter kit Model 117-B23 1** | | | |
| **Item** | **Item No** | **No** | **Equivalent length mtr** |
| EXPANDER Ø100mm - Ø130mm PP | M85126 | 1 | 0.3 |
| EXPANDER Ø130mm - Ø150mm | M70262 | 1 | 0.3 |
| SAMPLING POINT Ø150mm PP | M70326 | 1 | 0.3 |
| BEND 90° Ø150mm PP | LV310665 | 1 | 7.1 |
| APPLIANCE AIR INLET GUARD Ø100mm | M86787 | 1 | 0 |
| Total equivalent length mtr | | | 8 |

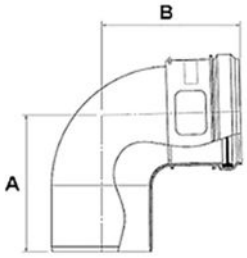


| Item no EKWCF011 | | | |
|---|---|---|---|
| **Starter kit Models 190-235-B23 2** | | | |
| **Item** | **Item No** | **No** | **Equivalent length mtr** |
| SAMPLING POINT Ø150mm PP | M70326 | 1 | 0.3 |
| BEND 90° Ø150mm PP | LV310665 | 1 | 7.1 |
| APPLIANCE AIR INLET GUARD Ø100mm | M86787 | 1 | 0 |
| Total equivalent length mtr | | | 7.4 |

| All versions additional flue available | | |
|---|---|---|
| **Item** | **Item No** | **Equivalent length mtr** |
| EXTENSION Ø150mmPP CUT TO LENGTH (2000mm) | LV310695 | 2 |
| EXTENSION Ø150mmPP CUT TO LENGTH (1000mm) | LV310694 | 1 |
| BEND 45° Ø150mm PP | LV310664 | 1.8 |
| BEND 90° Ø150mm PP | LV310665 | 7.1 |
| ROOF TERMINAL 150MM | M70359 | 1 |
| WALL CLAMP Ø150mm | M87196 | n/a |
| FLAT ROOF FLASHING (170mm) ALU | LV302509 | n/a |
| SLOPING ROOF FLASHING Ø100/150mm (25°-45°) LEAD | LV306017 | n/a |



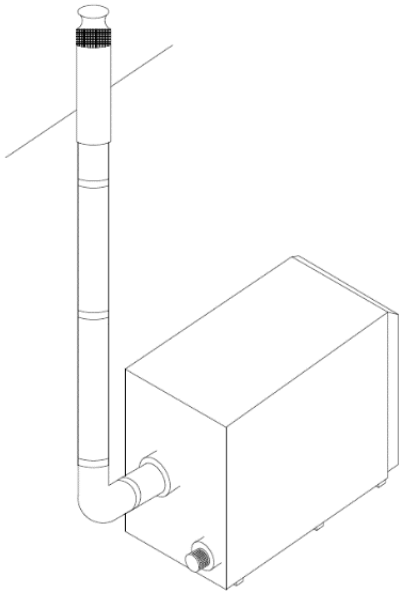

**A=98mm**
**B=103mm**

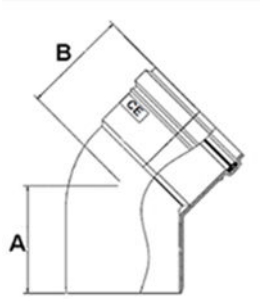



**A=166mm**
**B=183mm**

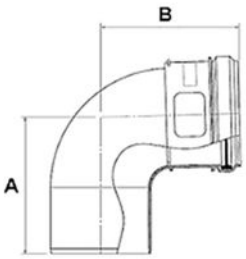
| Item no EKWCF012 | | | |
|---|---|---|---|
| Starter kit Model 295 | | | |
| Item | Item No | No | Equivalent length mtr |
| SAMPLING POINT Ø150mm PP | M70326 | 1 | 0.3 |
| AIR INLET SCREEN (160MM) | LM900205A | 1 | 0 |
| EXPANDER PP 150-200 | M70342 | 1 | 0.3 |
| Total equivalent length mtr | | | 0.6 |

| Model 295 additional flue available | | |
|---|---|---|
| **Item** | **Item No** | **Equivalent length mtr** |
| VERTICAL TERMINAL Ø200mm PP | LV310683 | 8.8 |
| BEND 45° Ø200mm PP | LV310667 | 1.1 |
| BEND 90° Ø200mm PP | LV310668 | 0.7 |
| EXTENSION Ø200MM (500MM) PP | LV310696 | 0.3 |
| EXTENSION Ø200mm(1000mm) PP | LV310697 | 0.6 |
| EXTENSION Ø200mm (2000mm) PP | LV310698 | 1.2 |
| WALL CLAMP Ø200mm | M87198 | n/a |
| FLAT ROOF FLASHING Ø200mm | LV302328 | n/a |






**A=111mm**
**B=131mm**




**A=227mm**
**B=195mm**

## C63 FLUE SYSTEMS + COMMON FLUE (SUPPLIED BY OTHERS)

In general, Water heaters are certified with their own purpose supplied Concentric or Twin Pipe flue systems, C63 certified appliances allow the installer to use other flue systems when installing the Water heaters however, they must be of a suitable minimum standard as per Table below.

| Model Number | Item | EKW-HCB117 | EKW-HCB190 | EKW-HCB235 | EKW-HCB295 |
|---|---|---|---|---|---|
| Minimum flue gas temp | °C | 35 | 35 | 35 | 35 |
| Average flue gas temp | °C | 70 | 70 | 70 | 70 |
| Maximum flue gas temp | °C | 120 | 120 | 120 | 120 |
| Flue gas mass rate (@9.0% CO2) | g/sec | 57.72 | 80.73 | 102.18 | 129.94 |
| Pressure available at the flue outlet | Pa | 169 | 183 | 190 | 196 |

| CE string flue gas material | EU standard | Temperature class | Pressure class | Resistance to condensate | Corrosion resistance class | Metal: liner specifications |
|---|---|---|---|---|---|---|
| Min required PP | EN 14471 | T120 | P1 | W | 1 | n/a |
| Min required INOX | EN 1856-1 | T120 | P1 | W | 1 | L20040 |
| **CE string flue gas material** | **Soot fire resistance class** | **Distance to combustible material** | **Plastics location** | **Plastics fire behaviour** | **Plastics enclosure** | |
| Min required PP | O | 30 | I of E | C/E | L | |
| Min required INOX | O | 40 | n/a | n/a | n/a | |

| Material | Water heater | dnom | Doutside | Linsert |
|---|---|---|---|---|
| PP | EKW117 | 100 | 100 +/-0.6 | 50 +20/ -2 |
| PP | EKW190 | 150 | 150 +/-0.6 | 50 +20/ -2 |
| PP | EKW235 | 150 | 150 +/-0.6 | 50 +20/ -2 |
| PP | EKW295 | 150 | 150 +/-0.6 | 50 +20/ -2 |

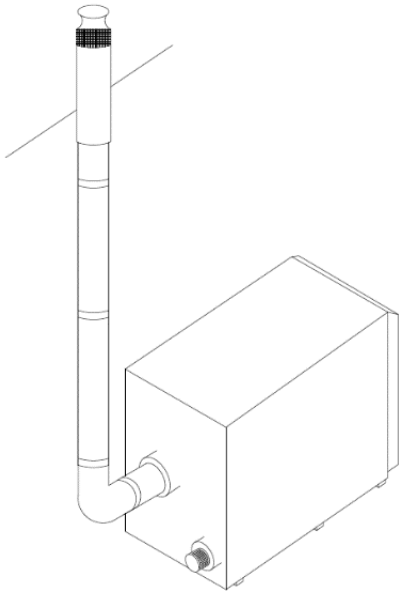
**Caution:**

**When installing the water heater or boiler as a Type C63 appliance, it should be noted that the terminals must not be installed on opposite sides of the building.**

**The maximum allowable recirculation rate is 10% under wind conditions.**

**Aluminium flue pipe must not be used on this appliance as it may lead to premature failure of the heat exchanger and will invalidate the warranty.**

A EKW117 is to be installed in a B23 configuration as shown below. The maximum flue run for this model is 27meters as shown in the table on page 7.



| Model | Model 117 | | |
|---|---|---|---|
| Diameter = 150mm | Quantity | Pa | Pa Total |
| Starter Kit | 1 | 8 | 8 |
| Terminal | 1 | 1 | 1 |
| 90 Bend | 1 | 7.1 | 7.1 |
| 4.5m Length | | 4.5 | 4.5 |
| Total resistance | | | =20.6 |

The total resistance is 20.6 which is less than the max allowed of 27 for this model **so this flue system is acceptable**. .

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