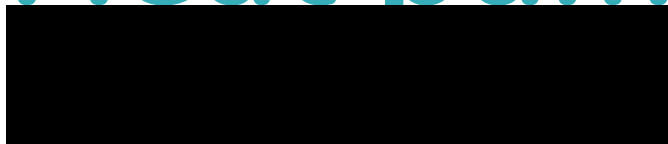


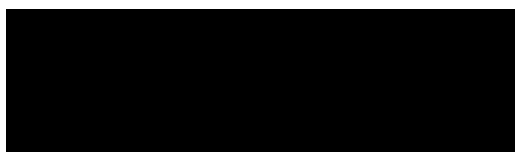


Heat pump



Jan

13 2025



Property Details

Year built Pre 2000

Design Data

Outside Design Temp – ODT (°C) -3

Degree Days (DD) 2254

Mean air temp – MAT (°C) 10

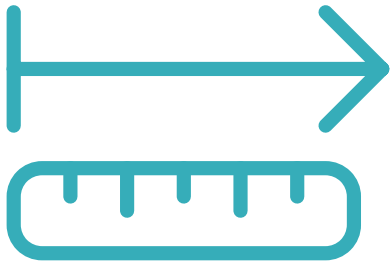
Altitude (m) 5

Building Requirements

Space Heating load (W) 6388

Total area of building (m²) 120.01

Average Watts per metre square (W/m²) heat loss 53



Survey

Materials

Windows



PVC Double Glazed

U-value: 2.8

Doors



solid wood door (external)

U-value: 3



PVC-U door double glazed

U-value: 2.8

Radiators



P+ - two panels, one fins



K2 - two panels, two fins



K3 - three panels, three fins



K1 - one panel, one fins

External walls



Brick 102mm, mineral wool slab in cavity 50mm, 100mm standard aerated block (k=0.17), 12.5mm plasterboard on dabs

U-value: 0.43

Internal walls



Plasterboard 12.5mm, studding 75mm, plasterboard 12.5mm

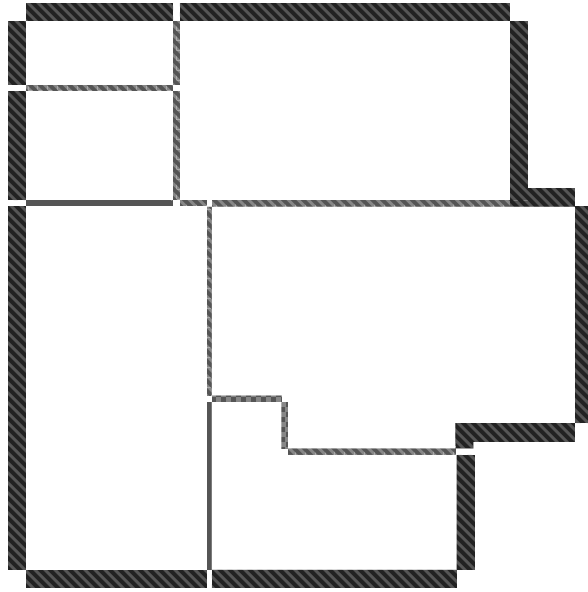
U-value: 1.72



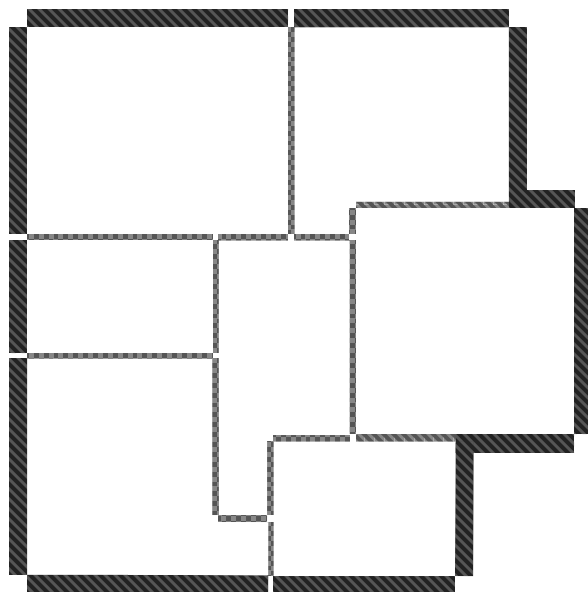
Plaster 13mm, standard aerated block 100mm, plaster 13mm

U-value: 1.66

Ground floor



First floor





Building Regs 1999

U-value: 1.92

Floor



Solid floor with 0mm of insulation



Building Regs 1999

U-value: 0.45

Intermediate floors



Intermediate floors, boarding 19mm,
airspace 100mm insulation between joists,
9.5mm plasterboard

U-value: 0.31



Intermediate floors, boarding 19mm,
airspace between joists, 9.5mm
plasterboard

U-value: 1.41

Roof



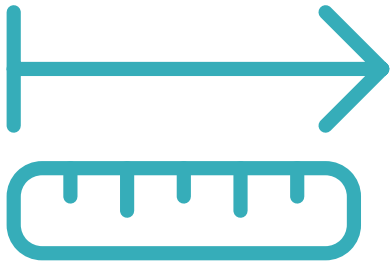
Pitched roof - Slates or tiles, sarking felt,
ventilated air space, 300mm insulation
between rafters, 9.5 mm plasterboard

U-value: 0.12



Pitched roof - Slates or tiles, sarking felt,
ventilated air space, 200mm insulation
between rafters, 9.5 mm plasterboard

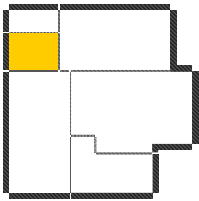
U-value: 0.18



Room by room

Ground floor

Utility



Design temp: **18°C**
Air changes: **3/hr**
Area: **3.67 m²**
Volume: **8.59 m³**
Heat loss: **380 W,**
104 W/m²

 **K2**

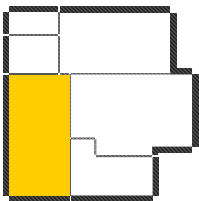
400 x 900 mm
Output at 55°C, 548 W

As surveyed

The expected heat loss is met.



Kitchen



Design temp: **18°C**
Air changes: **2/hr**
Area: **15.02 m²**
Volume: **35.14 m³**
Heat loss: **640 W,**
43 W/m²

 **K3**

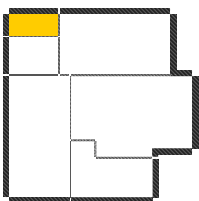
900 x 700 mm
Output at 55°C, 1395 W

As surveyed

The expected heat loss is met.



Cloak/WC



Design temp: **18°C**
Air changes: **2/hr**
Area: **2.14 m²**
Volume: **5.00 m³**
Heat loss: **199 W,**
94 W/m²

 **P+**

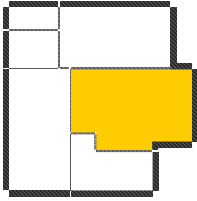
500 x 500 mm
Output at 55°C, 330 W

As surveyed

The expected heat loss is met.



Lounge



Design temp: **21°C**
Air changes: **3/hr**
Area: **18.52 m²**
Volume: **43.33 m³**

Heat loss: **1856 W**,
100 W/m²



K2

1000 x 600 mm
Output at 55°C, 874 W

As surveyed



K2

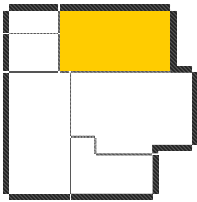
1500 x 450 mm
Output at 55°C, 1038 W

As surveyed

The expected heat loss is met.



Garage



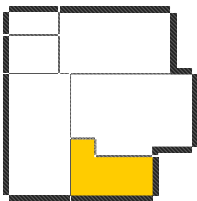
Design temp: **5°C**
Air changes: **3/hr**
Area: **13.55 m²**
Volume: **31.71 m³**

Heat loss: **-245 W**,
-18 W/m²

The expected heat loss is met.



Hall



Design temp: **18°C**
Air changes: **2/hr**
Area: **7.30 m²**
Volume: **17.08 m³**

Heat loss: **419 W**,
57 W/m²



K2

800 x 600 mm
Output at 55°C, 795 W

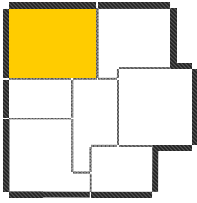
As surveyed

The expected heat loss is met.



First floor

Bed & Ensuite



Design temp: **21°C**
Air changes: **2/hr**
Area: **12.39 m²**
Volume: **29.00 m³**
Heat loss: **874 W**,
71 W/m²



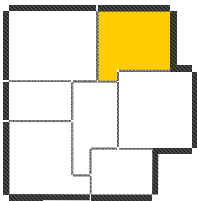
1400 x 450 mm
Output at 55°C, 968 W

As surveyed

The expected heat loss is met.



Bedroom



Design temp: **18°C**
Air changes: **1/hr**
Area: **9.01 m²**
Volume: **21.09 m³**
Heat loss: **323 W**,
36 W/m²



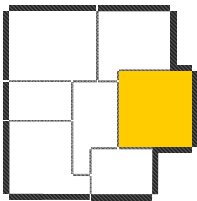
1200 x 450 mm
Output at 55°C, 944 W

As surveyed

The expected heat loss is met.



Bedroom



Design temp: **18°C**
Air changes: **1/hr**
Area: **11.33 m²**
Volume: **26.52 m³**
Heat loss: **323 W**,
29 W/m²



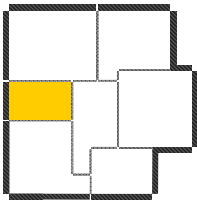
1100 x 450 mm
Output at 55°C, 487 W

As surveyed

The expected heat loss is met.



Bed & Ensuite



Design temp: **21°C**
Air changes: **2/hr**
Area: **4.81 m²**
Volume: **11.24 m³**
Heat loss: **295 W**,
61 W/m²



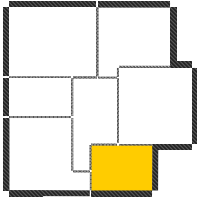
600 x 600 mm
Output at 55°C, 405 W

As surveyed

The expected heat loss is met.



Bath



Design temp: **22°C**
Air changes: **3/hr**
Area: **5.62 m²**
Volume: **13.16 m³**
Heat loss: **579 W**,
103 W/m²



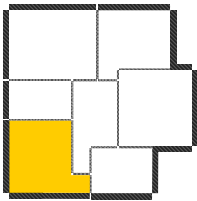
1000 x 600 mm
Output at 55°C, 835 W

As surveyed

The expected heat loss is met.



Study



Design temp: **21°C**
Air changes: **1.5/hr**
Area: **9.90 m²**
Volume: **23.17 m³**
Heat loss: **656 W**,
66 W/m²



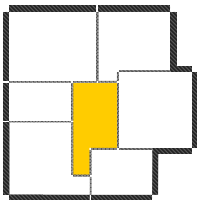
1100 x 450 mm
Output at 55°C, 761 W

As surveyed

The expected heat loss is met.



Landing



Design temp: **18°C**
Air changes: **2/hr**
Area: **6.75 m²**
Volume: **15.80 m³**
Heat loss: **83 W**,
12 W/m²

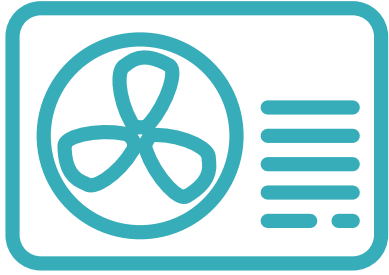


600 x 600 mm
Output at 55°C, 461 W

As surveyed

The expected heat loss is met.





Heat pump

Vaillant aroTHERM plus 7

Model: 0010037213

Specifications

| | |
|---------------------------|----------------|
| ENA registration number | VAILL/08677/V1 |
| Proposed flow temperature | 55 °C |
| Nominal output | 7.00 kW |
| Actual output at 55 °C | 7.40 kW |
| Heating SCOP at 55 °C | 3.39 |
| Sound power level | 55.0 dB |



Heat pump sizing

The heat pump is sufficiently large to meet the maximum anticipated space heating demand.



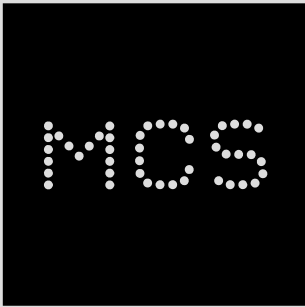


Sound level check



MCS020 sound level calculation

| | |
|--|------------------------------|
| 1. Sound power level (dB) | 55.0 |
| 2. Sound pressure level (dB) | Q4 (two reflective surfaces) |
| 3. Distance from heat pump to assessment position (meters) | 10 |
| 4. dB Distance Reduction | -25 |
| 5. Barriers Between heat pump and assessment position | Barrier (no view) |
| 6. Sound pressure level @ assessment position (dB) | 20 |
| 7. Background noise level (dB) | 40 |
| 8. Differential between 6. & 7. | 20 |
| 9. Decibel Correction (dB) | 0.1 |
| 10. Final Result (dB) | 41 |



The sound check assesses how much sound from the heat pump will be transmitted to neighbouring properties. If the likely sound level is less than 42dB then the installation can usually proceed without a planning application under the 'permitted development' rules.

Full details on the method used can be found in the MCS020 document on the MCS website.



Sound check

The max sound pressure at the assessment position is expected to be within the permitted development threshold of 42dB. A planning application is not required.

