

Building Heat Loss

Project Reference: Outbuilding 11 Sheldon Ave - N6 4JS

Building Heat Loss Results

Fabric Heat Loss (W)	2061	Floor Area (m ²)	164.54999999999998
Ventilation Heat Loss (W)	2005	Heat Loss per m ² (W/m ²)	26
Total Heat Loss (W)	4273	Annual Heat Loss (kWh)	9215

Room by Room Heat Loss

Room	Design Temp (°C)	Heat loss per m ² (W/m ²)	Floor Area (m ²)	Total Heat Loss (W)	Fabric Heat Loss (W)	Ventilation Heat Loss (W)
Bedroom	21	58.00	9.26	533	192	321
Boys Changing / Shower Room	22	60.00	5.80	347	104	232
Girls Changing / Shower Room	21	49.00	5.94	290	73	210
Gym	21	27.00	35.00	961	348	578
Hall (Bed/Kitchen)	21	17.00	2.43	42	10	31
Kitchen	21	49.00	9.34	459	172	270
Leisure Room	21	32.00	61.50	1948	624	1261
Lobby	21	41.00	5.97	243	109	123
Store / Plant Room	21	68.00	5.14	351	90	252
Salon	21	43.00	17.47	745	220	503
WC	21	52.00	2.37	124	41	79
Shower Room	22	50.00	3.30	166	60	100

WC (Girls Changing)	21	68.00	1.03	70	18	50
Totals			164.55	n/a	2061	n/a

Note: Within the BS12831 standard for heat loss calculation, the Ventilation Heat Loss for the building (or zone) is calculated differently to the Ventilation Heat Loss for each room. Therefore, the Ventilation Heat Loss for the building (or zone) is not usually equal to the Ventilation Heat Losses for each room added together.

Ventilation Heat Loss (per Zone)				
Zone	Ventilation Type	Volume (m ³)	Envelope Area (m ²)	Ventilation Heat Loss (W)
Zone 1	Natural Ventilation	414.62	307.75	2005
Building Total Ventilation Heat Loss				2005

Design Inputs			
Regulations Region	England	Heat loss methodology	BS12831:2017
Date property built	2023 onwards	Ventilation type	Natural Ventilation
Outside design temperature source	99% dry-bulb (CIBSE Guide A Table 2.5)	Supply / extract flow rate	N/A
Outside design temperature (°C)	-2.29	MVHR recovery rate (%)	N/A
Degree days	2033	Air permeability method	Estimated (CIBSE DHDG)
Altitude (m)	105.86	Air permeability (m ³ /hm ²)	9.00
Average ground temperature (°C)	11.3	Allowance for intermittent heat (%)	10
Design flow temperature (°C)	45	Thermal bridging parameter (W/m ² K) *	0.05

* Thermal bridging parameter may vary by room in the case of partial renovation / extension.

Proposed Underfloor Heating Log

Project REF: Outbuilding 11 Sheldon Ave - N6 4JS

Room Name	Power Loss (W)	Watts per metre squared (W/m²)	Emitter Description	Pipe Spacing Recommendation (Heat Emitter Guide)	Pipe Spacing Selected (mm)
Bedroom	533	58.00	UFH (Screed with Tile)	PS≤300 UFH pipes should be placed at 300mm or less to achieve the design condition.	null
Boys Changing / Shower Room	347	60.00	UFH (Screed with Tile)	PS≤300 UFH pipes should be placed at 300mm or less to achieve the design condition.	null
Girls Changing / Shower Room	290	49.00	UFH (Screed with Tile)	PS≤300 UFH pipes should be placed at 300mm or less to achieve the design condition.	null
Gym	961	27.00	UFH (Screed with Tile)	PS≤300 UFH pipes should be placed at 300mm or less to achieve the design condition.	null
Hall (Bed/Kitchen)	42	17.00	UFH (Screed with Tile)	PS≤300 UFH pipes should be placed at 300mm or less to achieve the design condition.	null
Kitchen	459	49.00	UFH (Screed with Tile)	PS≤300 UFH pipes should be placed at 300mm or less to achieve the design condition.	null
Leisure Room	1948	32.00	UFH (Screed with Tile)	PS≤300 UFH pipes should be placed at 300mm or less to achieve the design condition.	null
Lobby	243	41.00	UFH (Screed with Tile)	PS≤300 UFH pipes should be placed at 300mm or less to achieve the design condition.	null

	GO AHEAD - System can perform at the stated efficiencies with the selected emitter design.
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Proposed Underfloor Heating Log

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Room Name	Power Loss (W)	Watts per metre squared (W/m²)	Emitter Description	Pipe Spacing Recommendation (Heat Emitter Guide)	Pipe Spacing Selected (mm)
Store / Plant Room	351	68.00	UFH (Screed with Tile)	PS≤300 UFH pipes should be placed at 300mm or less to achieve the design condition.	null
Salon	745	43.00	UFH (Screed with Tile)	PS≤300 UFH pipes should be placed at 300mm or less to achieve the design condition.	null
WC	124	52.00	UFH (Screed with Tile)	PS≤300 UFH pipes should be placed at 300mm or less to achieve the design condition.	null
Shower Room	166	50.00	UFH (Screed with Tile)	PS≤300 UFH pipes should be placed at 300mm or less to achieve the design condition.	null
WC (Girls Changing)	70	68.00	UFH (Screed with Tile)	PS≤300 UFH pipes should be placed at 300mm or less to achieve the design condition.	null

GO AHEAD - System can perform at the stated efficiencies with the selected emitter design.

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DHW Design Calculations	
Project Reference: Outbuilding 11 Sheldon Ave - N6 4JS	

System Details	
Hot Water Temperature Required (°C)	45
Heat losses associated with hot water storage (°C)	5
Incoming water temperature (°C)	10
Pipework Efficiency from HP to Cylinder (%)	85
Legionella purge	Yes
Legionella purge frequency	Weekly
Legionella purge hours (per day or per week)	2
Legionella total purge hours	104
Legionella purge demand (Annual) (kWh/yr)	312
Legionella purge demand (Daily) (kWh/yr)	0.85
Total annual demand (kWh/yr)	3146
Heat supplied by primary heat source (kWh/yr)	3146
Heat supplied by auxiliary heat source (kWh/yr)	0
Heat supplied by immersion heater (kWh/yr)	312

Primary & Auxiliary Heat Source Details	
Output Capacity of Primary Heat Source (kW)	7
Flow temp while providing hot water (°C)	50
Efficiency of Auxiliary Heat Sources (%)	0
kW Capacity (kW)	0

DHW Cylinder Details	
Make	Stiebel Eltron
Model	HSBC 220
EN8558 DHW capacity calculation (ltr)	90
DHW chosen cylinder capacity (ltr)	220
Electric immersion heater size (If required)	3
DHW Cylinder Recovery Rate (mins)	88

Heat Pump Design Calculations		
Project Reference: Outbuilding 11 Sheldon Ave - N6 4JS		

SPACE HEATING ANNUAL HEAT DEMAND		
Demand	kWh/yr	9215
Heat supplied by HP, excluding auxiliary heaters	kWh/yr	9215
Seasonal Coefficient of performance SCOP	SCOP	4.1
Electricity consumed by HP, excluding auxiliary heaters	kWh/yr	2248
Renewable heat supplied by HP	kWh/yr	6967
Remaining heat to be supplied by auxiliary heaters and other heat source	kWh/yr	0
Remaining heat, supplied by other heat sources	kWh/yr	0
Remaining heat, supplied by auxiliary heaters	kWh/yr	0
Electricity consumed by HP, including auxiliary heaters	kWh/yr	2248
Where other heat sources are used:		
Fuel used	N/A	
Efficiency of other heat sources	%	0
Consumed by other heat sources	kWh/yr	0

WATER HEATING ANNUAL HEAT DEMAND		
Demand	kWh/yr	3146
Heat Supplied by HP, excluding immersion heater	kWh/yr	3146
SCOP of HP in Hot water mode	SPF/SCOP	1.7
Electricity consumed by HP, excluding immersion heater	kWh/yr	1851
Renewable heat supplied by HP	kWh/yr	1295
Remaining heat to be supplied by immersion heater and other heat sources	kWh/yr	312
Remaining heat, supplied by other heat sources	kWh/yr	0
Remaining heat, supplied by immersion heater	kWh/yr	312
Electricity consumed by HP, including immersion heater	kWh/yr	2163
Where other heat sources are used:		
Fuel used	N/A	
Efficiency of other heat sources	%	0
Consumed by other heat sources	kWh/yr	0

Heat Pump Design Calculations

PROPORTIONS, ENERGY CONSUMPTION, AND PERFORMANCE

Proportion of space heating and water heating demand provided by heat pump (excluding auxiliary/immersion heaters)	%	100
Capacity @ design conditions	kW	7
Renewable heat	kWh/yr	8262
Electricity consumed by HP (excluding auxiliary/immersion heaters)	kWh/yr	4098
Electricity consumed by immersion (supplied as part of HP)	kWh/yr	312
Fuel consumed by auxiliary/other heat sources	kWh/yr	0
HP combined performance SCOP	SCOP	2.87
Star Rating / Flow Temperature	4 / 45°C	
Outside air temperature	-2.29°C	

RUNNING COSTS (Based on Calculations)

Cost per unit of electricity for HP	p/kWh	28
Cost per unit of fuel for other heat sources	p/kWh	0
Cost of electricity for HP (including auxiliary/immersion heaters)	£/yr	1235
Cost of fuel for other heat sources	£/yr	0

Disclaimer

The performance of Microgeneration heat pump systems is impossible to predict with certainty due to the variability of the climate and its subsequent effect on both heat supply and demand. This estimate is based upon the best available information but is given as guidance only and should not be considered as a guarantee.

Heat Pump System Performance Estimate

Installer Project Reference	Outbuilding 11 Sheldon Ave - N6 4JS
Client Name	Mr and Mrs Laufer
Installation Address Line 1	Outbuilding at 11 Sheldon Avenue
Installation Address Line 2	
Installation Address Line 3	Middlesex
Installation Postcode	N6 4JS



Energy Performance Certificate (EPC) Information

Does this estimate relate to a new build or proposal for extension or reduction in size of an existing building? No

Estimate based on draft EPC

Energy required to heat property 9,215 kWh

Energy required for hot water 3,146 kWh

New Renewable System Information

Type of System	Air Source Heat Pump	* This calculator is not designed to be used for Solar Assisted Heat Pumps
Manufacturer Name	Stiebel Eltron HPA-O 07.02 Plus HC 230	
Manufacturer Model	HPA-O 07.2 Trend HC 230	
MCS Certification Number	011-1W0981_02	* Available from the MCS Product Directory
Flow Temperature	45 °C	* Determined by the temp. of the water leaving the HP when supplying space heating at the external design temp.
MCS SCOP Heating	4.1	* SCOP - Seasonal Coefficient of Performance. This value is based on the MCS HP SCOP Table below
MCS SCOP Hot Water	1.7	* If providing space heating and DHW, default value from SAP2012. If DHW only see methodology in MIS3005
Renewable System Provides	Heating and Hot Water	
Hot Water Immersion Use	Once per week	* based on 50°C up to 60°C, 3kW
Size of Hot Water Cylinder	220 ltr	

Existing Heating System

Existing heating system fuel	Electric	* If new build model the most likely alternative fuel.
Hot Water heated by	Electric	* If new build model the most likely alternative fuel.
Age of existing system	Post-2007	
Efficiency of existing system	100 %	

Estimated System Performance / Comparison

Energy Requirement for the building

	Heating	Hot water	Total	
Net Energy required to heat property	9,215	3,146	12,361	kWh
Existing System Consumption	9,215	3,146	12,361	kWh

New HP System Estimated Consumption

Full Heat Pump System (if selected above)

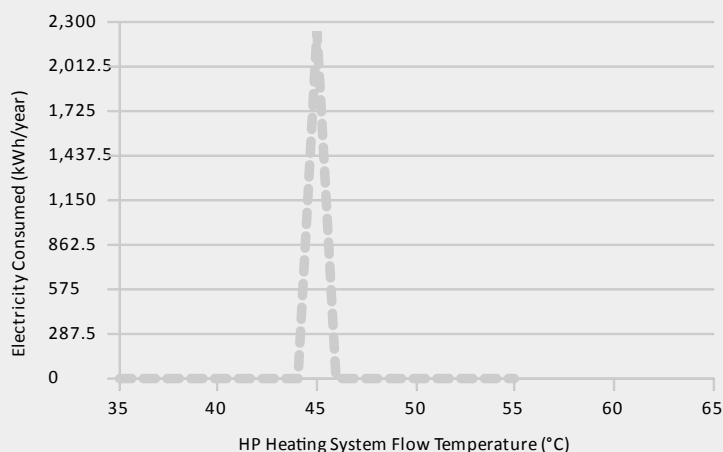
HP System Electricity Consumption	2,248	1,984	4,232	kWh
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Hybrid System (if selected above)

HP System Electricity Consumption	0	0	0	kWh
Hybrid system other Consumption	0	0	0	kWh
Hybrid Total Consumption			0	kWh

Note: There are different types of hybrid system. This calculation presumes a hybrid where both sources of heat supply the same hydraulic circuits (heating and hot water) according to the proportion selected above.

Electricity Consumption of Proposed Heat Pump for Space Heating versus Flow Temperature



Flow temperature	SCoP
35°C	0
36°C	0
37°C	0
38°C	0
39°C	0
40°C	0
41°C	0
42°C	0
43°C	0
44°C	0
45°C	4.1
46°C	0
47°C	0
48°C	0
49°C	0
50°C	0
51°C	0
52°C	0
53°C	0
54°C	0
55°C	0
56°C	0
57°C	0
58°C	0
59°C	0
60°C	0
61°C	0
62°C	0
63°C	0
64°C	0
65°C	0

SCoP Definition

SCoP = Seasonal Coefficient of Performance:

MCS SCoP is a theoretical indication of the anticipated efficiency of a heat pump aggregated over a year using standard climate data across Europe. It indicates the units of total heat energy generated (output) for each unit of energy (electricity) consumed (input). It is slightly different to ErP SCoP as it contains efficiency losses due to controls and brine pumps (for a GSHP). As a guide a heat pump with a MCS SCoP of 3 generates 3 kWh of heat energy for every 1 kWh of electrical energy it consumes.

This also means that 2/3rds of the heat output could be eligible for RHI payments. MCS SCoP is based on stringent factory based tests for equipment but does not specifically include the energy consumption of heating circulating pump(s) nor does it model the transient conditions typically experienced in practice in the consumers home and hence the overall final system efficiency is likely to be different from the MCS SCoP.

Important Information

This performance estimate should be accompanied by the Key Facts which explain the factors that can affect the performance of a heat pump.

Any technical variation to the specification could affect the performance of the Heat Pump System in which case the MCS Contractor MUST update and re-issue this document and advise the customer of their Consumer Rights.