

Power and Energy Totals; Output from HP & Immersion for HW



Heated Floor Area	54	sqm
Property Specific HL	105	W/sqm

External Design Temp (deg C)	-10	Space Heat	Space Heat	HW Heat	HW Heat	HW Heat
Av. Air Temp for floor calc (deg C)	8.8	Power	Energy	Energy	Energy	Energy
		Heat Losses	Heat Loss	from HP	from Immer'n	Total HW
		Area to be heated:	W	kWh	kWh	kWh
		Total	5,620	11,610	3,184	3,184
% covered by heat pump			100%	100%		

Hot Water Energy Calculation

No of Bedrooms	2	Occupation level based on No of bedrooms + 1 person
No of occupants/bedroom	1	Increase this if house likely to have > 1 person/room
Hot water / occupant (L)	45	litres/day
kW per occupant	0.25	kW
Hp hot water heating (kW)	0.75	kW
Final HP HW temperature (degC)	60	e.g. if the HP flows at 55 °C in HW mode, final HW temp is 50 °C.
HP SPF at HW flow temp (degC)	3.2	From HE Guide
η pipework loss HP to cyl	90	% efficiency for HW system
HW electrical energy HP/day (kWh)	2.73	kWh into HP for HW/day
HW electrical energy immer'n/day (kWh)	0.00	kWh into Immersion for HW/day
Total HW electrical energy/day (kWh)	2.73	kWh for HW/day
HW heat energy from HP (kWh)	3,184	kWh
Cylinder Volume	180	L
Cylinder Reheat time from 40 to 55 degC	24	mins

Space Heating Energy Calculation

Space heat energy (kWh)	11610	kWh
HP Space Heat Cap'ity @ 0 °C/emitter	8.46	kW From Manufacturer's info and emitter temp space
FLEQ space heating	1372	running hours (Full Load Equivalent Run Hours)
SPF space heating	3	Space Heating from HE Guide
Electrical Energy HP HW heating (kWh)	995	kWh
Electrical Energy HP space heating (kWh)	4644	kWh
HP kW Cap'ity @ 0 °C/emitter temp (kW)	8	kW From Manufacturer's info and emitter temp HW heating
FLEQ heating	398	running hours (Full Load Equivalent Run Hours)
Running Hours CH pump	1770	Either running hours HW + space heating or 8760 if 24/7 operation
Power CH Pump (W)	105	W
Running Hours Ground HX pump	1770	
Power Ground HX pump (W)	212	W 2.5% of space heating power (lower if > 2.5% space heating power)

Estimated Running Costs

Marginal Electricity Cost (p/kWh)	12	p/kWh Cost of Electricity beyond standing charges
Cost HW Heating from HP	£119.39	
Cost HW heating from immersion	£0.00	
Cost Space Heating	£557.27	
Cost CH Pump	£22.31	
Cost Ground HX pump	£44.93	
Total Annual Running Costs	£743.90	

Constants and Assumptions

SHC Water J/kgK	4,187
J to kWh	3,600,000
water mains input temp °C	10
kg to litres water	1

Disclaimer

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.

Information about the calculations

Estimates of heat loss have been calculated based on a survey of the property. Where insulation could not be seen minimum building standards for house age has been assumed. All calculations are carried out using CIBSE location data for design temperatures/kWh.