

Inchkeith Drive, Fife - GES Energy with Inline Duct Heater

Based on dwg / file ref(s). add 051 110 First Floor Plan.PDF, add 051 100 Ground floor plan.PDF, add 051 300 Elevations.PDF

Envelope Performance Criteria						
U-values:	Ext Walls:	0.11 W/m2 oC	Roof:	0.11 W/m2 oC	Party Floor:	
	Party Walls:	0.11 W/m2 oC	Windows:	0.70 W/m2 oC	Party Ceiling:	
	Ground Floor:	0.09 W/m2 oC	Doors:	0.80 W/m2 oC	Air Tightness:	0.60 ACH
Roof construction:	Warm	Degree Days:	2577	External temp:	-3.4 oC	

Heatloss Calculation - BS5449:pt 1 (assuming static conditions)							
Location	Design temp (°C)	Air changes (per hour)	Room Volume	Flow rate (m³/h)	Heat Losses (watts)		Total
					Fabric	Ventilation*	
Living/Dining/Kitchen	21	0.5	64.1	32.0	209	258	467
Hall/store	21	0.5	20.2	10.1	83	81	164
WC	21	0.5	5.0	2.5	22	20	42
Bed 1	18	0.5	26.4	13.2	89	93	182
Bed 2	18	0.5	26.2	13.1	82	92	174
Bed 3	18	0.5	17.3	8.6	55	61	116
Bathroom	21	0.5	10.6	5.3	46	43	89
Landing	18	0.5	13.9	7.0	20	49	69
Air Tightness Losses*					50		50
Total			183.6	91.8	655 <i>(48.4%)</i>	698 <i>(51.6%)</i>	1,353 <i>(100.0%)</i>

Note(s): * BS5449 allowances for uncontrolled ventilation loss are based on minimum standards of air tightness (B Reg min requirement for air permeability is 10 m³/h.m²). Furthermore, an additional allowance is not taken for incidental opening of windows and doors by the occupants. These figures can therefore be very pessimistic, possibly being in excess of 100% above current best practice.

Heatloss Calculation - Incorporating Genvex MHRV with integral exhaust air source heat pump			
Total fabric & ventilation heat losses (as above):			1,353 W
Less heat recovery of controlled ventilation: @ 91%	92 m3/h		673 W
Less heat input from exhaust air source heat pump:		1,250 W	= 570 W

Effectively, this residual heat loss represents the load required to maintain temperature under static conditions. To correctly size the maximum supplementary heating load requirement a further allowance must be made to accommodate temperature recovery (e.g. after a period of absence). This can be assumed to be an additional 50% for buildings with a low thermal inertia (eg SIP panels) and up to 100% for buildings with a high thermal inertia (eg masonry & concrete).

Schedule of Performance at various External Temperatures (assuming static conditions)							
Ext Temp (°C)	Space Heat Losses (W)			Total Reheat Loads (W)	Genvex HR + Heater Output‡ (W)	Supplementary Heating (W)	Contribution %
	Fabric	Ventilation*	Total				
-3.0	645	686	1,331	2,867	1,912	0	100
0.0	570	595	1,165	2,743	1,829	0	100
3.0	495	504	999	2,619	1,746	0	100
6.0	420	413	833	2,495	1,664	0	100
9.0	345	322	667	2,371	1,581	0	100
12.0	270	231	501	2,247	1,498	0	100
15.0	195	140	335	2,123	1,415	0	100

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