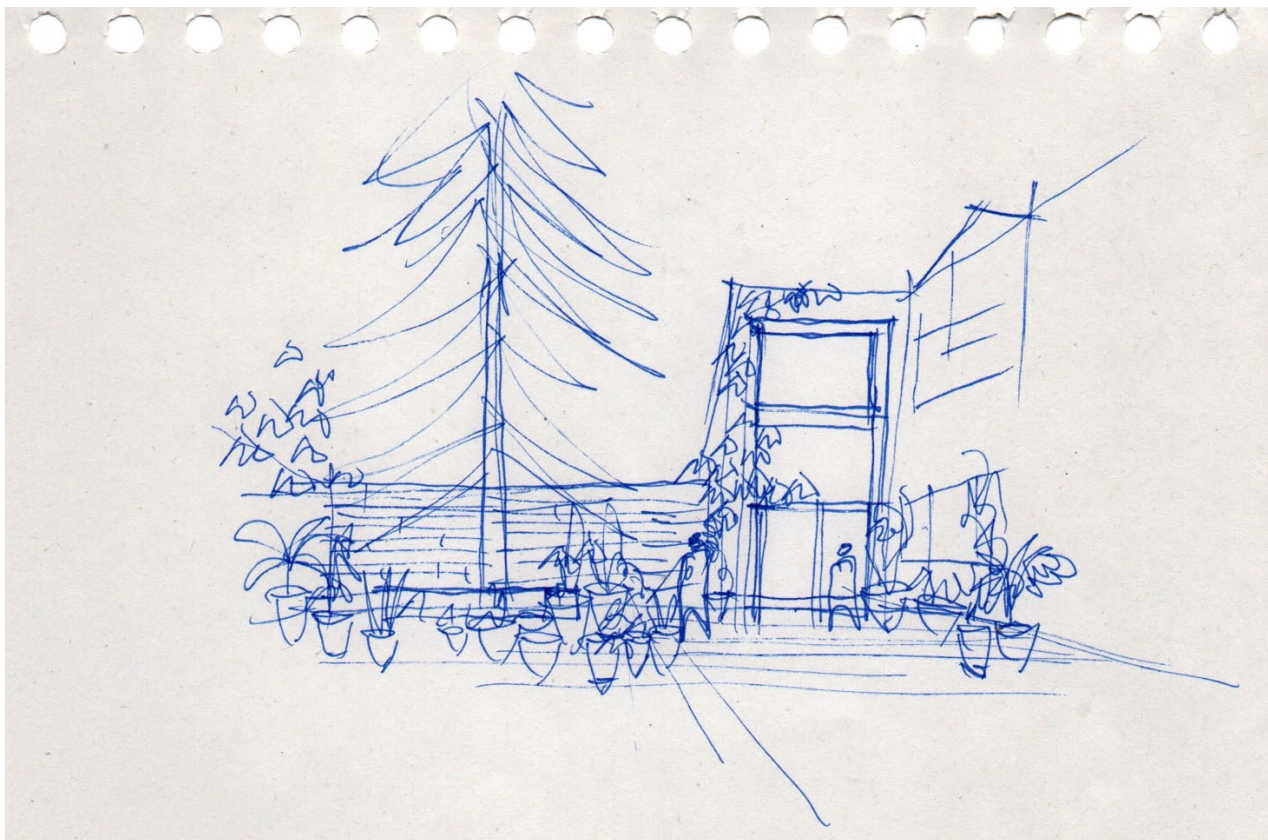




6 Torriano Mews, Camden,
London, NW5 2RZ
Heat Pump Noise Impact Assessment

09/10/2023

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1. Introduction

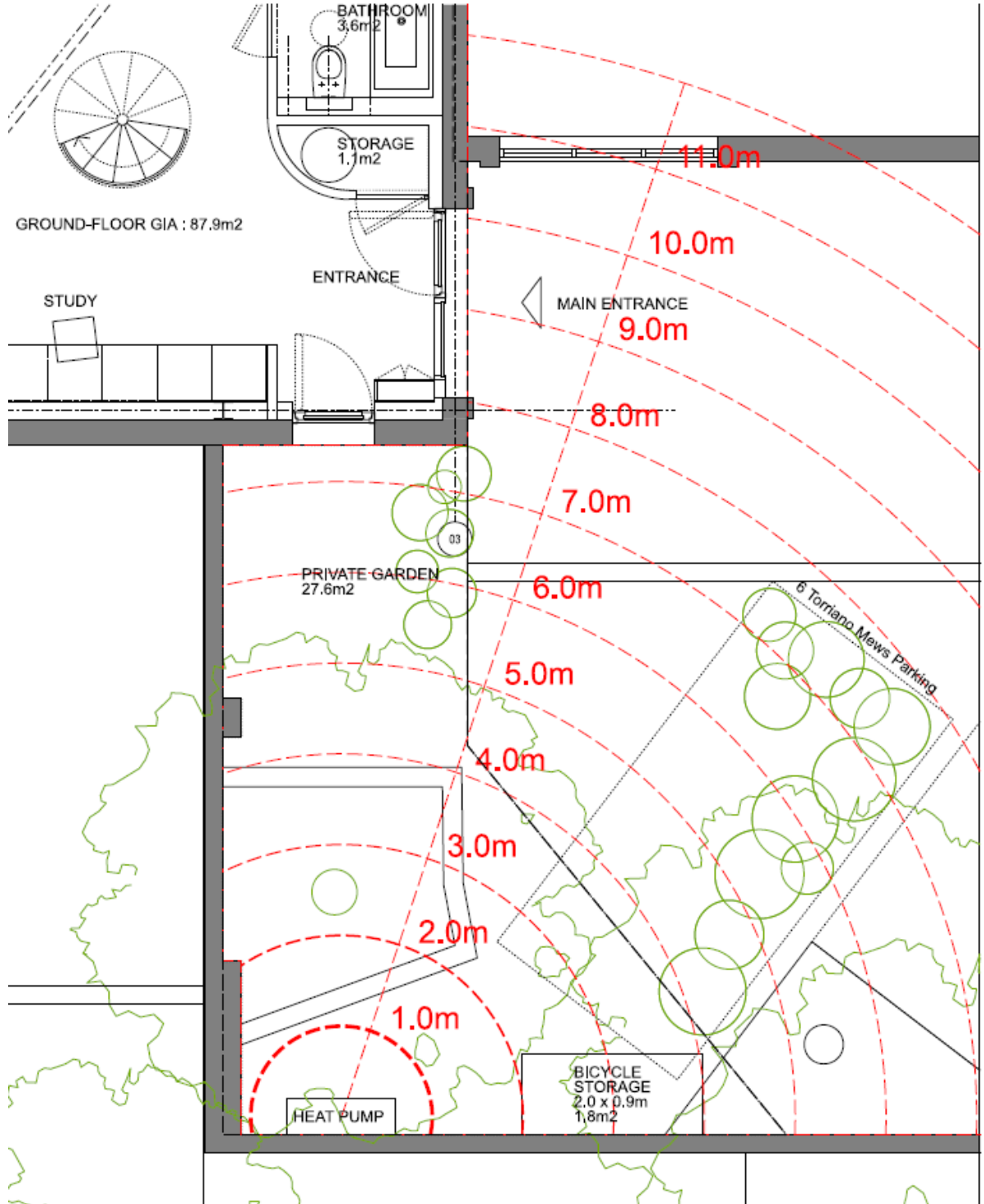
- 1.1.1 The proposal includes the installation of an Air Source Heat Pump (ASHP).
- 1.1.2 The outdoor unit will be located as indicated on the plans, at a minimum distance of 1.0m from the site boundary and away from the neighbours' facades to minimum nuisance.
- 1.1.3 The Committee on Climate Change has stated that "new homes should not be connected to the gas grid from 2025" and the Future Homes consultation indicates that "there is a need to establish heat pumps as a mass market solution for low carbon heating". Domestic heat pumps are installed in the UK under the Microgeneration Certification Scheme, which avoids the need for local authorities to scrutinise their installation and is necessary in order to expedite the reduction of the UK's greenhouse gas emissions. As part of the scheme the installer must complete a noise assessment that requires the total sound pressure level, plus a notional background noise level, not to exceed 42dB LAeq,5mins at the nearest residential receiver.
- 1.1.4 This document is presenting the ASHP calculation procedure based on the MCS 020 issue 1.3 planning standard for air source heat pumps.

2. ERRATUM

- 2.1.1 After further reviews with the MCS certified EDF nominated installer CB Heating, the type of Air Source Heat Pump (ASHP) specified in the Design and Access Statement - Daikin Altherma 3 Monobloc- is no longer considered appropriate.
- 2.1.2 The Ideal Heating Logic Air Monobloc Air Source Heat Pump or the Daikin Altherma 3 H HT have been identified as more suitable.
- 2.1.3 They are both quiet operation ASHP, with the highest declared sound pressure level of 55dBA for the Ideal Heating Logic Air and 54dBA for the Daikin Altherma 3 H HT, measured in accordance with EN 12102.
- 2.1.4 The manufacturer's technical data about the Ideal Heating Logic Air Monobloc Air Source Heat Pump and the Daikin Altherma 3 H HT can be found in appendix of that document.

3. Description of assessment position

- 3.1.1 The ASHP will be located as indicated below on the plan. It is situated 10m away from the nearest neighbouring property windows.



4. ASHP Calculation Procedure

Step	Instructions	Results
1	From manufacturer's data, obtain the A-weighted sound power level of the heat pump. See "Note 1: Sound power level". The highest sound power level specified should be used (the power in "low noise mode" should not be used).	Manufacturer's data states the sound power level of the heat pump is 55 dB(A)
2	Use 'Note 2: Sound pressure level' and "Note 3: Determination of directivity" below to establish the directivity 'Q' of the heat pump noise.	The heat pump is to be installed on the ground and against two walls hence the directivity (Q) of the heat pump noise is Q8
3	Measure the distance from the heat pump to the assessment position in metres.	Distance between heat pump and assessment position is 10 metres.
4	Use table in 'Note 4: dB distance reduction' below to obtain a dB reduction.	10 metres@ Q8 = -22 db.
5	Establish whether there is a solid barrier between the heat pump and the assessment position using "Note 5: Barriers between the heat pump and the assessment position" and note any dB reduction.	0 dB There is no solid barrier between the heat pump and the assessment position.
6	Calculate the sound pressure level (see "Note 2: Sound pressure level") from the heat pump at the assessment position using the following calculation: (STEP 1) + (STEP 4) + (STEP 5)	$(55) + (-22) + (0) = 55 - 22 = 33 \text{ dB(A) } L_p$
7	Background noise level. For the purposes of the MCS Planning Standard for air source heat pumps 40 dB(A) the background noise level is assumed to be 40 dB(A) Lp. For information see "Note 6: MCS Planning Standard for air source heat pump background noise level".	Background noise level is 40 dB(A)
8	Determine the difference between STEP 7 background noise level and the heat pump noise level using the following calculation: (STEP 7) - (STEP 6)	$40 \text{ dB(a) (background)} - 33 \text{ dB(A) (heat pump)} = 7 \text{ dB(A)}$
9	Using the table in "Note 7: Decibel correction" obtain an adjustment figure and then add this to whichever is the higher dB figure from STEP 6 and STEP 7. Round this number up to the nearest whole number.	Adjustment figure is 0.8 dB and the higher figure is 40 dB(A) $40 + 0.8 = 40.8 \text{ dB(A)}$ Rounded up to 41 dB(A) Final result at this assessment position is 41 dB(A)
10	Is the FINAL RESULT in STEP 9 equal to or lower than the permitted development noise limit of 42.0 dB(A)?	41 dB(A) is equal to or lower than 42.0 dB(A)

MCS 020 Standard Planning Notes can be found in appendix.

5. Conclusion

- 5.1.1 The final result at this assessment position is 41 dB(A). This is lower than 42.0 dB(A). The air source heat pump will comply with the noise limit for this assessment position.

6. APPENDIX

The Logic Air.

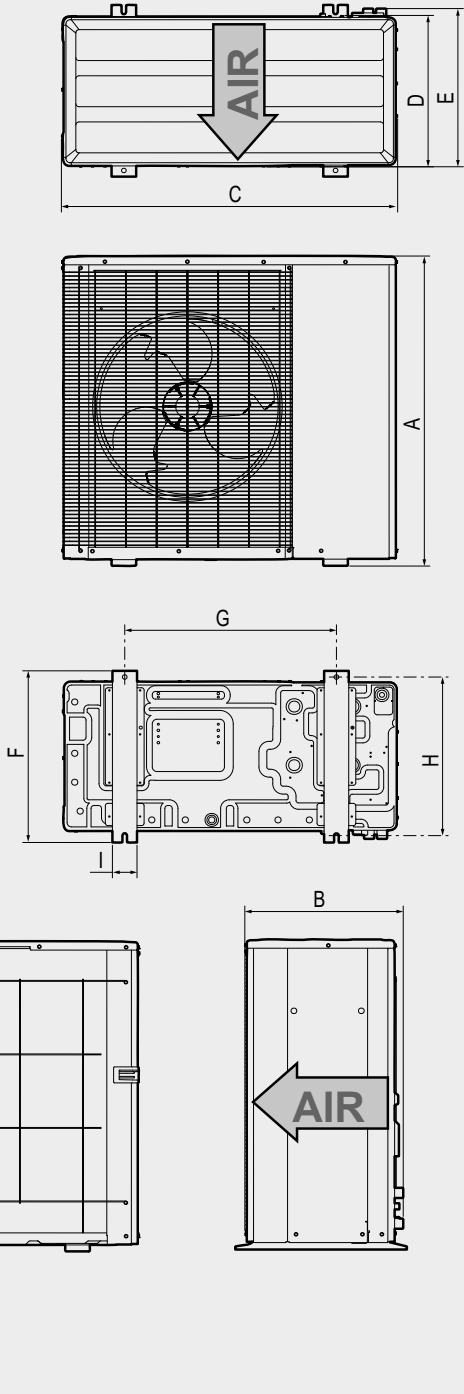
The Logic Air heat pump range is our new range of monobloc heat pumps, offering great efficiencies both in heating and hot water. The Logic Air is designed to deliver efficient, simple and reliable low carbon heating in homes throughout the UK.

Taking the learnings from the award winning Logic boiler, the Logic Air heat pump integrates seamlessly with UK homes, partnered with our best in class pre-plumbed hot water cylinder and our connected Halo Air room thermostat, the Logic Air is quick to install, easy to commission and simple to use.

Our new heat pumps are supported by our industry leading customer service and warranty team which is based in the UK and is open 364 days a year, providing customer service and technical support.

DIMENSIONS

	4kW & 5kW	8kW & 10kW
A	798	1008
B	518	518
C	1095	1095
D	499	499
E	518	518
F	558	558
G	688	688
H	516	516
I	80	80
J	184	184
K	140	140
L	95	95
M	84	84
N	48	48
O	90	90
P	103	105



KEY FEATURES

-  Quiet operation
-  Highly efficient: SCOP up to 5.19*
-  Compatibility: radiator and underfloor heating systems
-  Intuitive control: smart weather compensating controls
-  Low carbon refrigerant: zero ozone depletion and low global warming potential
-  Smart grid and solar PV compatible
-  Monobloc technology enables easy installation and servicing
-  Domestic hot water: hot, efficient and fast re-heat times with the Ideal heat pump cylinder range



HALO AIR

The Halo Air heat pump programmable room thermostat has a simple to use modern design with intelligent control.

- Simple, connected, and easy to use heat pump thermostat
- Remote control and remote diagnostics via mobile app
- Connected and non-connected options
- Time and temperature zone control

4 models:

- Halo Air RF Single Zone [234819](#)
- Halo Air RF Two Zone [234791](#)
- Halo Air Wi-Fi Single Zone [234790](#)
- Halo Air Wi-Fi Two Zone [234792](#)

Technical Specification.

			Logic Air 4kW	Logic Air 5kW	Logic Air 8kW	Logic Air 10kW
Ideal Product Code			AH750664	AH750665	AH750666	AH750667
MCS Certification No.			KIWA 00027/024 HP	KIWA 00027/023 HP	KIWA 00027/021 HP	KIWA 00027/022 HP
Heat Pump Space Heating [35°C]*	ErP Rating		A+++	A+++	A+++	A+++
	ηs		195	200	203	205
	SCOP (EN14825)		4.96	5.07	5.16	5.19
Heat Pump Space Heating [55°C]*	ErP Rating		A++	A++	A++	A++
	ηs		136	143	145	146
	SCOP (EN14825)		3.48	3.65	3.7	3.73
Heating [A 7°C / W 35°C]*	Capacity (kW)		4.0	5.0	8.2	10.3
	Power Input (kW)		0.75	0.97	1.58	2.1
	COP		5.34	5.0	5.19	4.9
Heating [A 7°C / W 55°C]*	Capacity (kW)		4.0	5.0	8.2	10.3
	Power Input (kW)		1.33	1.64	2.67	3.42
	COP		3.00	3.04	3.07	3.01
Sound Power Level (EN 12102 - 1)	35°C	db(A)	52	52	55	55
	55°C	db(A)	52	52	55	55
Pipework Connection Sizes	Heating F/R (mm)		28mm	28mm	28mm	28mm
Dimensions Outdoor Unit (mm)	Width		1095	1095	1095	1095
	Depth		521	521	518	518
	Height		798	798	1008	1008
Weight (kg)	Outdoor Unit		86	86	110	110
Electrical Data	Electrical Supply (50 Hz)		230v	230v	230v	230v
	Phase		Single Phase	Single Phase	Single Phase	Single Phase
Refrigerant Charge (kg)*	R32		0.88	0.88	1.47	1.47
Certification	EN 14511:2018, EN 14825:2016, EN 12102 - 1:2022					

*Performance data in accordance with EN 14825 : 2016, EN 12102-1 :2022, EN 14511 : 2018. The energy efficiency provided may not correspond to the actual energy once installed in a building, as the efficiency is influenced by other factors such as heat loss in the distribution system and the capacity of the products in relation to building size and characteristics.

Daikin Altherma 3 H HT

Floor standing air-to-water heat pump
for heating and hot water

- › A combined stainless steel domestic hot water tank of 180 or 230L and heat pump for easy installation
- › Inclusion of all hydraulic components means no third-party components are required
- › PCB board and hydraulic components are located in the front for easy access
- › Small installation footprint of 595 x 625 mm
- › Integrated back-up heater of 6kW
- › Heat pump operation down to -28°C



Indoor Units (Floor Standing)			Single Phase	
			ETVH16SU18E6V	ETVH16SU23E6V
Compatible outdoor unit			EPRA14/16/18DV3/W1	EPRA14/16/18DV3/W1
User interface (must be ordered separately)			BRC1HDD(W/S/K)	BRC1HDD(W/S/K)
G3 Kit (must be ordered separately)			EKUHWG3D	EKUHWG3D
Function			Heating only	Heating only
Casing	Colour		White	White
	Material		Resin + Sheet Metal	Resin + Sheet Metal
Dimensions	Height x Width x Depth	mm	1,650 x 595 x 625	1,850 x 595 x 625
Weight	Unit / Packed Unit	kg	109 / 126	118 / 135
Operating range	Heating	Min-Max.	10°C - 63°C	10°C - 63°C
	DHW	Max.	63°C ^[1]	63°C ^[1]
Sound power level	Nom.	dBA	44	44
Sound pressure level	Nom.	dBA	30	30
Tank	Water Volume	Litres	180	230
	Maximum water pressure	bar	10	10
	Material		Stainless steel (EN 1.4521)	Stainless steel (EN 1.4521)
	Load profile EN16147		L	XL
	Standing heat loss	W	56	73
	Energy efficiency rating		C	B
	Standing heat loss @ 45K dT	kWh/24h	1.8	1.4
Hydraulic characteristics	Water connections Indoor / outdoor	inch	G 1" (female)	G 1" (female)
	Water connections DHW / Recirc	inch	G 3/4" (female)	G 3/4" (female)
	Water connections Space heating	inch	G 1" (female)	G 1" (female)
Minimum water volume		litres	20	20
Minimum flow rate		l/min	20	20
Backup heater power supply ^[2]	Phase		1~ / 3~	1~ / 3~
	Frequency	Hz	50	50
	Voltage	V	230	230
	Maximum capacity	kW	6 (2 step) ^[3]	6 (2 step) ^[3]
	Maximum running current	A	26	26
	Recommended fuse rating	A	20 ^[4]	20 ^[4]

Notes - Indoor unit

- [1] Tank temperature up to 75°C possible with booster heater only operation (if available in the system).
- [2] Power supply is for backup heater only. Indoor unit switch box and circulation pump are supplied via the outdoor unit
- [3] Backup heater steps electronically setup on the indoor unit interface.
- [4] 4 pole 20A curve 400V tripping class C (refer to wiring diagram)

Notes - Outdoor unit

- [1] Excludes aesthetic grill
- [2] Spare pump capacity can be utilised to extend the interconnecting pipe length using the Daikin HSN pipe sizing tool.

Outdoor Units			Single Phase			Three Phase		
			EPRA14DV3	EPRA16DV3	EPRA18DV3	EPRA14DW1	EPRA16DW1	EPRA18DW1
Description			Class 14	Class 16	Class 18	Class 14	Class 16	Class 18
Dimensions ^[1]	Height x Width x	mm	990 x 1270 x 460	990 x 1270 x 460	990 x 1270 x 460	990 x 1270 x 460	990 x 1270 x 460	990 x 1270 x 460
Weight		kg	146	146	146	151	151	151
Nominal capacity	Heating (a/b)	kW	10.17 / 10.12	11.57 / 11.51	12.11 / 12.04	10.39 / 10.26	11.82 / 11.67	12.37 / 12.21
	Cooling (c/d)	kW	10.55 / 6.90	11.51 / 7.88	12.46 / 8.86	10.55 / 6.90	11.51 / 7.88	12.46 / 8.86
Seasonal space heating efficiency (Heating Only Indoor Unit)	Space heating (Average climate)	Class	A+++	A+++	A+++	A+++	A+++	A+++
		Efficiency	177	177	177	186	186	186
	35°C	SCOP	4.51	4.51	4.51	4.71	4.71	4.71
	Space heating (Average climate)	Class	A++	A++	A++	A++	A++	A++
		Efficiency	140	140	140	140	140	140
	55°C	SCOP	3.58	3.58	3.58	3.57	3.57	3.57
Seasonal space heating efficiency (Reversible Indoor Unit)	Space heating (Average climate)	Class	A+++	A+++	A+++	A+++	A+++	A+++
		Efficiency	180	180	180	180	180	180
	35°C	SCOP	4.57	4.57	4.57	4.57	4.57	4.57
	Space heating (Average climate)	Class	A++	A++	A++	A++	A++	A++
		Efficiency	142	142	142	142	142	142
	55°C	SCOP	3.62	3.62	3.62	3.63	3.63	3.63
COP	Heating (e/f)		4.86 / 3.70	4.86 / 3.70	4.86 / 3.70	4.50 / 3.56	4.50 / 3.56	4.50 / 3.56
EER	Cooling (c/d)		4.13 / 2.70	4.11 / 2.69	4.09 / 2.68	4.13 / 2.70	4.11 / 2.69	4.09 / 2.68
Operation range	Heating	°C	-28 to +35	-28 to +35	-28 to +35	-28 to +35	-28 to +35	-28 to +35
	Cooling	°C	+10 to +43	+10 to +43	+10 to +43	+10 to +43	+10 to +43	+10 to +43
	Domestic Hot water	°C	-28 to +35	-28 to +35	-28 to +35	-28 to +35	-28 to +35	-28 to +35
Sound pressure / power level	Heating	dBA	43 / 54	44 / 54	48 / 54	43 / 54	43 / 54	48 / 54
	Cooling	dBA	43 / 54	44 / 54	48 / 54	43 / 54	43 / 54	48 / 54
Refrigerant charge	R-32	kg	4.2	4.2	4.2	4.2	4.2	4.2
Water Connections (Diameter)		inch	1" (Male)	1" (Male)	1" (Male)	1" (Male)	1" (Male)	1" (Male)
Piping length OU to IU ^[2]		m	10 ^[2]	10 ^[2]	10 ^[2]	10 ^[2]	10 ^[2]	10 ^[2]
Power supply			1-phase / 230V / 50Hz	1-phase / 230V / 50Hz	1-phase / 230V / 50Hz	3-phase / 400V / 50Hz	3-phase / 400V / 50Hz	3-phase / 400V / 50Hz
Recommended fuses	A		32	32	32	16	16	16

Nominal capacity and nominal input tested according to EN 14511

Heating (a): Ambient air temperature -2°CDB and leaving water temperature 55°C (A-2/W55). Heating (b): Ambient air temperature -2°CDB and leaving water temperature 65°C (A-2/W65)

Cooling (c): Ambient air temperature 35°C and leaving water temperature 18°C (A35/W18). Cooling (d): Ambient air temperature 35°C and leaving water temperature 7°C (A35/W7)

Heating (e): Ambient air temperature 7°CDB and leaving water temperature 35°C (A7/W35). Heating (f): Ambient air temperature 7°CDB and leaving water temperature 45°C (A7/W45)

Sound pressure / power measured according to EN 12102 under conditions of EN 14825

NOTE 1: SOUND POWER LEVEL (STEP 1)

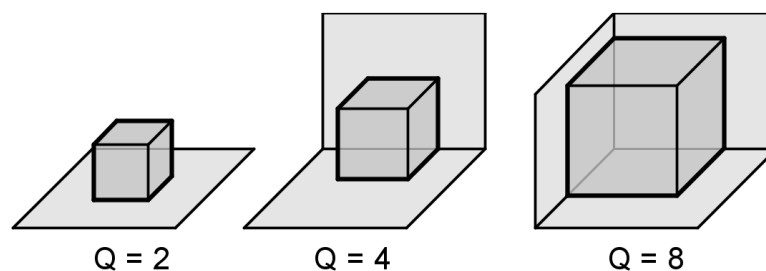
Sound power is the *total* acoustical energy emitted by a sound source and is an absolute value. It is **not** affected by the environment or the location of the listener.

NOTE 2: SOUND PRESSURE LEVEL (STEP 2)

Sound pressure is what we hear. It is a pressure disturbance at a specific point in the atmosphere whose intensity is influenced not only by the sound power of the source, but also by the surroundings and the distance from the source to the point at which the sound is heard.

NOTE 3: DETERMINATION OF 'DIRECTIVITY' (STEP 2)

The sound pressure level increases with the number of reflecting surfaces. Use the illustrations below to establish the directivity 'Q' for the installation. A reflective surface is any surface (including the ground) within 1 metre of the air source heat pump.



The following examples may be used as a guide:

- Q2 = an air source heat pump with one reflecting surface (i.e. the ground or a single wall if mounted on a wall off the ground).
- Q4 = an air source heat pump with two reflecting surfaces (i.e. ground mounted and against a wall or mounted off ground level against two walls)
- Q8 = an air source heat pump with three reflecting surfaces (i.e. ground mounted and against two walls or mounted off ground level between three walls).
- **NOTE – an air source heat pump with more than three reflective surfaces (for example those within small lightwells) will not meet the MCS planning standards.**

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NOTE 4: DB DISTANCE REDUCTION (STEP 4)

Distance from Heat Pump (metres) (STEP 3 RESULT)														
	1	1.5	2	3	4	5	6	8	10	12	15	20	25	30
Q (STEP 2 RESULT)														
	-8	-11	-14	-17	-20	-21	-23	-26	-28	-29	-31	-34	-36	-37
	-5	-8	-11	-14	-17	-19	-20	-23	-25	-26	-28	-31	-33	-34
	-2	-5	-8	-11	-14	-16	-17	-20	-22	-23	-25	-28	-30	-31

Where a precise distance is not indicated in the above table, then the next lowest value for that distance should be used. E.g. if the distance was 2.5m, then the values for 2m should be used.

NOTE 5: BARRIERS BETWEEN THE HEAT PUMP AND THE ASSESSMENT POSITION (STEP 5)

A correction should be made for attenuation due to barriers between the air source heat pump and an assessment position. A correction will be necessary if an MCS Contractor is unable to see an assessment position from the top edge of the air source heat pump. Use the following instructions to determine whether a correction is appropriate:

- For a solid barrier (e.g. a brick wall or a fence) that completely obscures an MCS Contractor's vision of an assessment position from the top edge of the air source heat pump attenuation of -10 dB may be assumed.
- Where a solid barrier completely obscures an MCS Contractor's vision of an assessment position from the top or side edges of the air source heat pump, but moving a maximum distance of 25 cm in any direction to the air source heat pump allows an assessment position to be seen, attenuation of -5 dB may be assumed.
- If it is possible for an MCS Contractor to see any part of an assessment position from the top or side edges of the air source heat pump no attenuation may be assumed.

NOTE 6: MCS PLANNING STANDARD FOR AIR SOURCE HEAT PUMPS BACKGROUND NOISE LEVEL (STEP 7)

The MCS Planning Standard assumes a background noise level of 40 dB(A) for the purposes of the air source heat pump calculation procedure. A different value for background noise should not be used as part of this calculation procedure.

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NOTE 7: DECIBEL CORRECTION (STEP 9)

Please note that the left hand column should be used for both positive and negative differences (e.g. a difference of +3 and -3 both attract a correction of 1.8 dB).

Difference between the two noise levels (db) (+/-)	Add this correction to the higher noise level (db)
0	3.0
1	2.5
2	2.1
3	1.8
4	1.5
5	1.2
6	1.0
7	0.8
8	0.6
9	0.5
10	0.4
11	0.3
12	0.3
13	0.2
14	0.2
15	0.1