

NOISE IMPACT ASSESSMENT

BS 4142:2014+A1:2019

Noise from a Residential
Care Home External Plant



NOISE
ASSESSMENTS LTD
YOUR LOCAL ACOUSTIC SPECIALIST

REPORT DETAILS

Report Title	Noise Assessment: Noise from a Residential Care home External Plant
Site Address	Care Home, Hook Lane, Pagham, PO21 3PB
Project No.	NALPRO081225.01
Consultant Contact	[REDACTED]

QUALITY ASSURANCE

Issue No.	Status	Issue Date	Comments	Author	Approved
1	Final	20/01/26	-	[REDACTED]	[REDACTED]
				J Mape BSc (Hons) PgDip IOA Cert. Environ. Noise Noise Consultant	D Warren Director

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Assessment Summary

Planning has been approved for a residential care home, and the developer is wanting to install several plant (Air Source Heat Pumps, VRF) within the grounds of the site to be used for heating and cooling.

As part of Condition 5 there is a requirement that the proposed new noise will need to meet the noise guidance at Care Home, Hook Lane, Pagham, PO21 3PB to the nearest sensitive receptors.

- ASHPs and VRF units within a screened 2.4m closed boarded enclosure

The proposed hours of operation will be intermittent during the day and night-time.

The aim is to achieve a Sound Rating Level below the background noise level is indicative of Low Impact.

Low impact at the sensitive receptor locations can be achieved during the daytime and night-time when all plant in operation.

1. Proposal

- 1.1 Planning has been approved for a residential care home, and the developer is wanting to install several plant (Air Source Heat Pumps, VRF) within the grounds of the site to be used for heating and cooling.
- 1.2 As part of Condition 5 there is a requirement that the proposed new noise will need to meet the noise guidance at Care Home, Hook Lane, Pagham, PO21 3PB to the nearest sensitive receptors.
- ASHPs and VRF units within a screened 2.4m closed boarded enclosure
- 1.3 The proposed hours of operation will be intermittent during the day and night-time.
- 1.4 The aim is to achieve a Sound Rating Level below the background noise level is indicative of Low Impact.

2. Existing Context

- 2.1 The site is set within a residential area, which is generally quiet during the day and night-time.

3. Criteria

- 3.1 The following targets have been selected in accordance with 'BS 4142:2014+A1:2019 – Methods for rating and assessing industrial and commercial sound.' This will be achieved when the Rating Level is at or below the background noise level is indicative of Low Impact.

4. Noise Policy and Guidance

Noise Policy Statement for England (NPSE)

- 4.1 The NPSE sets out the Government's policy on noise and includes the long-term vision of promoting good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development.
- 4.2 This long-term vision is supported by the following aims:
- 4.3 Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:
- avoid significant adverse impacts on health and quality of life;
 - mitigate and minimise adverse impacts on health and quality of life; and
 - where possible, contribute to the improvement of health and quality of life.

4.4 There are two established concepts from toxicology that are currently being applied to noise impacts, for example, by the World Health Organisation. They are:

- NOEL (No Observed Effect Level) – this is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise;
- LOAEL (Lowest Observed Adverse Effect Level) – this is the level above which adverse effects on health and quality of life can be detected.

4.5 Extending these concepts further, NPSE leads to the concept of a significant observed adverse effect level:

- SOAEL (Significant Observed Adverse Effect Level) – this is the level above which significant adverse effects on health and quality of life occur.

4.6 NPSE acknowledges that it is not possible to have a single objective noise-based measure that defines NOEL, LOAEL and SOAEL that is applicable to all sources of noise in all situations. It is therefore suggested that more specific advice from other applicable noise standards and guidance could be employed to determine suitable noise level criteria within the overall principles of the NPSE.

National Planning Policy Framework (NPPF)

4.7 The revised NPPF was updated in December 2024 and sets out the government's planning policies for England and how these are expected to be applied. This document replaces the first NPPF published in March 2012 and includes minor clarifications to the revised version published in July 2018, February 2019, July 2021, and 2023.

4.8 Where issues of noise impact are concerned the NPPF provides brief guidance in Chapter 15 '*Conserving and enhancing the natural environment*' as follows:

Paragraph 170:

Planning policies and decisions should contribute to and enhance the natural and local environment by preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability.

Paragraph 180:

Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

- a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;
- b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason; and
- c) limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.

Paragraph 182:

Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed.

Planning Practice Guidance (PPG)

- 4.9 PPG is written in support of the NPPF and provides an increased level of specific planning guidance.
- 4.10 It suggests that noise needs to be considered when new developments may create additional noise and when new developments would be sensitive to the prevailing acoustic environment. It is also suggested that noise should not be considered in isolation and separately from issues such as the economic, social and other environmental dimensions of proposed development.
- 4.11 Local planning authorities' plan-making and decision taking should take account of the acoustic environment and in doing so consider:
 - whether or not a significant adverse effect is occurring or likely to occur;
 - whether or not an adverse effect is occurring or likely to occur; and
 - whether or not a good standard of amenity can be achieved.

Technical Guidance

BS 4142:2014+A1:2019 – Methods for rating and assessing industrial and commercial sound'

BS4142 is a recognised standard for assessing the noise impact of fixed plant machinery via relation of noise emissions to current background noise levels.

5. Nearest Sensitive Receptor Locations

- 5.1 The nearest noise sensitive receptors (NSRs) have been identified as a detached two-storey residential building (50m to nearest window south of the site).

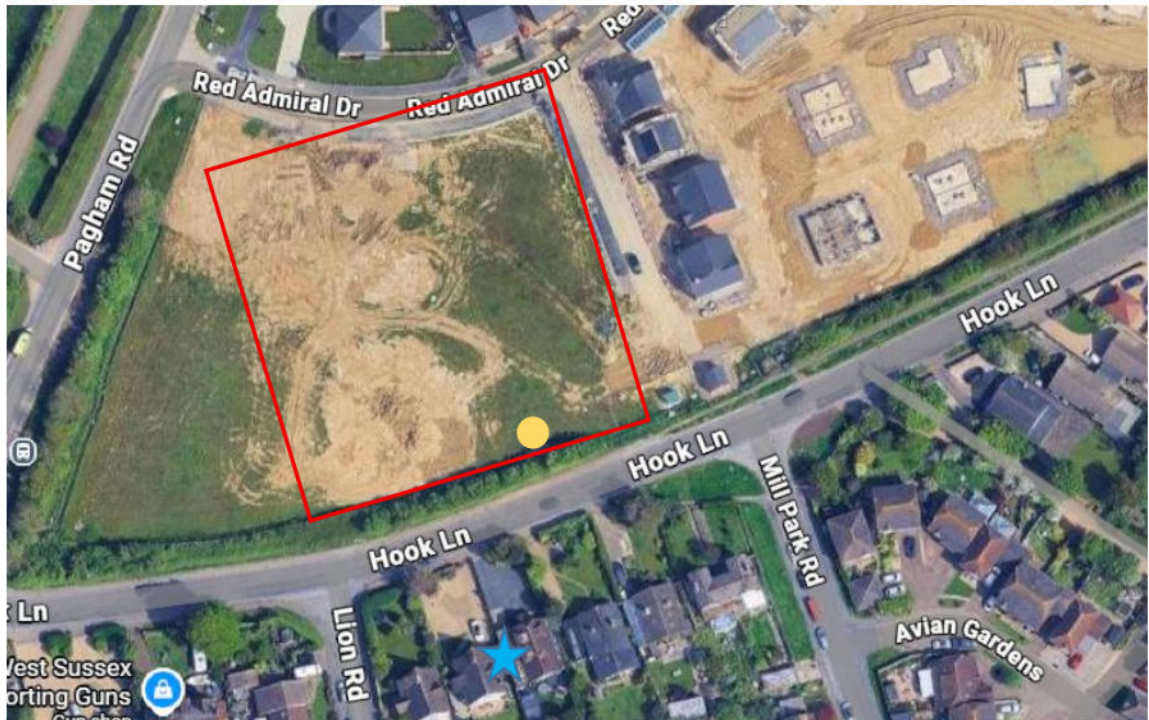
6. Subjective Impressions

- 6.1 The noise climate is dominated by bird song, traffic noise. Secondary noise sources have been identified as occasional road noise and people chatting in nearby.

7. Measurement Locations

- 7.1 To understand any potential noise impact from the operation of the proposed ASHP unit, an unattended background noise measurement was collected within the grounds of the rear of the site.
- 7.2 Measurement and NSR locations are shown in figure 1 below:

Figure 1: Site & Measurement Location



- Background location M1
- ✗ Site location
- ★ NSR1 (50m)

Figure 2: Plant locations



8. Measurement Procedure

8.1 Noise levels were measured on 11th and 12th January 2026. Full measurement times and durations can be found in **Appendix A**.

9. Measurement Equipment

9.1 Measurements were undertaken using a calibrated, Pulsar N45 class 1 sound level meter. Full equipment details can be found in **Appendix B**.

9.2 During all measurements the microphone was protected with an outdoor windshield.

9.3 Measurements at all monitoring locations were 'free field' (no vertical reflective surfaces within 3.5 metres of the microphone) and at a height of between 1.2 – 1.5 metres above ground level.

9.4 The following set-up parameters were used on the sound level meters:

- Time Weighting: Fast

- Frequency Weighting: A
- Averaging-Integrating Period: 15 minutes
- Data Logging: Repeat (Contiguous)

9.5 With the equipment set up in the configuration used during measurement, field calibration checks were performed on site immediately before and after the survey period using a sound calibrator. No significant drift (i.e. no greater than ± 0.5 dB) in the calibration value was observed between the initial and final checks.

9.6 Full calibration details can be provided.

10. Weather Conditions

10.1 Weather conditions were deemed acceptable for background noise measurement. Full meteorological conditions are detailed in **Appendix D**.

11. Noise Source Levels

11.1 The noise level of the various plant was provided by the manufacturer.

11.2 The various plant noise levels are tabulated below:

Table 2: Various Plant Noise Levels

Plant	LAeq
ASHP units (x4)	58
VRF units (x4)	56

BS4142:2014 Assessment

12. Specific Sound Levels

12.1 The specific sound level is denoted LAs and is the A-weighted, equivalent noise level at the NSR location over the reference time period.

12.2 It is noted that additional attenuation will occur to noise levels experienced at the NSR1 and NSR2 property due to the distance between the source and receivers. Full calculations are shown in **Appendix E**.

12.3 The specific sound level is summarised below:

Table 3: Specific Sound Levels NSR1

Source	LAeq	r1	r2	Barrier	dBA At NSR 1	Window open
ASPH units within enclosure	58	50	1	-5	19	7
VRF units within screened enclosure	56	50	1	-5	17	5
SUM					21	

13. Background Sound Level

13.1 Environmental noise levels were measured on site 11th and 12th January 2026.

13.2 The lowest daytime background sound level was measured between 21:30-21:45 as 40 dB LA90,15min.

13.3 The lowest night-time background sound level was measured between 02:00-02:15 as 37 dB LA90,15min.

14. Rating Level

14.1 The specific sound level may be corrected for certain characteristics that make a sound more noticeable at the NSR locations. Corrections for tonality, impulsivity and intermittency may be applied.

14.2 The AHSP units has an associated intermittency due to them being turned on and off, however, when the unit is turned on, the fan starts at a slow speed with no associated initial humming or “kicking in” noise.

15. Rating Level Vs Background

15.1 The rating level is to be compared to the background sound level to determine the resultant noise impact in accordance with BS4142:

A Sound Rating Level at or below the background noise level is indicative of *Low Impact*;

A Sound Rating Level that exceeds the background noise level by around + 5dB is likely an indication of *Adverse Impact*, depending on the context;

A Sound Rating Level that exceeds the background noise level by around + 10dB is likely an indication of *Significant Adverse Impact*, depending on the context;

15.2 The noise impact at NSR1 is tabulated below:

Table 5: Noise Impact at NSR1

Source	L _{Aeq}	r1	r2	Barrier	rating	dBA At NSR 1	Window open
ASPH units within enclosure	58	50	1	-5	3	22	10
VRF units within screened enclosure	56	50	1	-5	3	20	8
SUM						24	

15.3 The daytime noise at NSR1 is below the background noise and therefore classed at low impact noise at NSR1, therefore no mitigation is required.

15.4 The night-time noise at NSR1 is below the background noise and therefore classed at low impact noise at NSR1, therefore no mitigation is required.

16. Summary

16.1 Planning has been approved for a residential care home, and the developer is wanting to install several plant (Air Source Heat Pumps, VRF) within the grounds of the site to be used for heating and cooling.

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- ASHPs and VRF units within a screened 2.4m closed boarded enclosure

16.3 The proposed hours of operation will be intermittent during the day and night-time.

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16.5 Low impact at the sensitive receptor locations can be achieved during the daytime and night-time when all plant in operation.

Appendices

APPENDIX A - Measurement Details				
Measurement	Start Date	Start Time	End Date	End Time
M1	11/01/26	11:00	12/01/26	11:30

APPENDIX B - Equipment Details				
Equipment	Make	Model	Class	Serial Number
Sound Meter	Pulsar	N45	1	1365
Calibrator	Pulsar	PM1	1	011121C

APPENDIX C - Calibration Details					
Measurement	Calibrator Ref Level (dB)	Level Before (dB)	Deviation Before (dB)	Level After (dB)	Deviation After (dB)
M1	94.0	94.0	0	94.0	0

APPENDIX D - Meteorology Details						
Date	Temp C	Wind Speed m/s*	Wind Direction	Humidity %	Precipitation mm	Cloud Cover (Oktas)
11/01/26	8	1.4	W	82	0.0	5/8

*Windspeeds measured on site using a Skywatch Xplorer 2 Anemo-Thermometer.

APPENDIX E - Noise Attenuation

Point source distance attenuation

$$L_y = 20 \times \log \frac{r_1}{r_2}$$

Where L_y is the distance attenuation factor and $r_{1,2}$ are the source -> measurement distance and source -> NSR distance in metres respectively

APPENDIX F – Terminology and Definitions

Noise

Sound only becomes noise (often defined as ‘unwanted sound’ or sound that is considered undesirable or disruptive) when it causes or contributes to some harmful or otherwise unwanted effect, like annoyance or sleep disturbance.

Acoustic Environment

Sound from all sound sources as modified by the environment.

Equivalent continuous A-weighted sound pressure level $L_{Aeq,T}$

Value of the A-weighted sound pressure level of a continuous, steady sound that, within a specified time interval T, has the same mean square sound pressure as a sound under consideration whose level varies with time.

A-weighting

The human ear is most sensitive to frequencies in the range 1 kHz to 5 kHz. On each side of this range the sensitivity falls off. A-weighting is used in sound level meters to replicate this sensitivity and respond in the same way as the human ear.

Octave Band

Band of frequencies in which the upper limit of the band is twice the frequency of the lower limit.

Maximum Sound Pressure Level $L_{Amax,T}$

Highest value of the A-weighted sound pressure level with a specified time weighting that occurs during a given event or measuring period.

The $L_{A10,T}$ Sound Level

The A-weighted sound pressure that is exceeded for 10% of a given time interval, T. It is often used to evaluate road traffic noise.

The $L_{A90,T}$ Sound Level

The A-weighted sound pressure that is exceeded for 90% of a given time interval, T, measured using time weighting F. It is often referred to as the background noise level and which might in part be an indication of relative quietness at a given location

Free-field Level

The sound pressure level away from reflecting surfaces.

NOTE Measurements made 1.2 m to 1.5 m above the ground and at least 3.5 m away from other reflecting surfaces are usually regarded as free-field. To minimize the effect of reflections the measuring position has to be at least 3.5 m to the side of the reflecting surface (i.e. not 3.5 m from the reflecting surface in the direction of the source).

Façade Level

The sound pressure level 1 m in front of the façade.

NOTE Facade level measurements of LpA are typically 1 dB to 2 dB higher than corresponding free-field measurements because of the reflection from the facade.

Indoor Ambient Noise

Noise in a given situation at a given time, usually composed of noise from many sources, inside and outside the building, but excluding noise from activities of the occupants.

APPENDIX G – Plant Specification and Site Layout



SUMMARY FAN DATA SHEET

Nuaire, Western Industrial Estate, Caerphilly, CF83 1NA, United Kingdom. email: info@nuaire.co.uk

UK Commercial enquiries T:029 2085 8200 UK Residential enquiries T:029 2085 8500 International enquiries T:+44.29 2085 8497

Whilst the information given on this data sheet is fan specific, it is in summary and reference to the product selection catalogue and installation & maintenance documents is recommended.
This data sheet produced on 10 Feb 2025 12:29 using software version 5.8.4599.0

Technical Data

NVU - Roof Upblast

Fan Code: NVU500-4F8

Required duty: 1.4 m³/s at 300 Pa
Actual duty: 1.629 m³/s at 406 Pa
Actual at required flow: 1.4 m³/s at 540 Pa

When speed controlled to required duty (85.97%):

Fan Input Power: 0.697 kW
Motor Input Power: 0.899 kW
Specific Fan Power: 0.6 W/(l/s)
Fan Total Efficiency: 60%

At full speed:

Fan Input Power: 1.097 kW
Maximum Fan Input Power: 1.12 kW
Motor Input Power: 1.397 kW
Specific Fan Power: 0.9 W/(l/s)
Fan Total Efficiency: 45%
Maximum Fan Speed: 4 pole, 1,450 RPM
Electrical Supply: 400V, 3 Phase, 50 Hz
Nominal Motor Rating: 1.342 kW
Motor current (flc): 2.6 A
Motor starting current (sc): 18.2 A
Motor Efficiency: IE3 / Premium Efficiency

Weight: 83.7 kg
Protection Class: IP55
Insulation: F



0086-CPR-741804 CE 2797-CPR-672476 EN 12101-3:2015:
Powered Smoke and heat exhaust ventilators for use in buildings. Application Classes; Thermally uninsulated; Out of smoke reservoir; Vertical shaft upwards; Dual purpose Class F400 – 400°C / 120 mins. Motor rating Class F, B

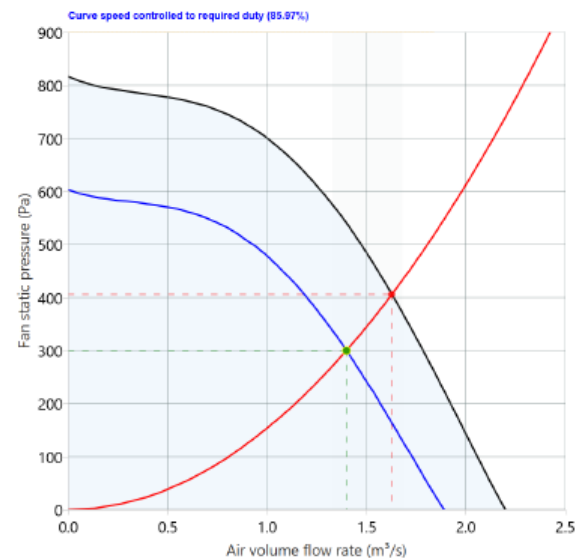
Sound Data

Noise calculated speed controlled to required duty (85.97%)

Sound Power Levels re 1 pWatts (Hz):

Hz	63	125	250	500	1k	2k	4k	8k	dBA
Inlet Inlet	80	94	83	75	71	68	65	68	80
Open Inlet	73	90	82	75	71	68	65	68	59
Open Outlet	75	90	85	79	75	69	66	66	61
For 100% speed:	+1	+2	+2	+3	+4	+4	+4	+4	

Performance Chart



ErP Directive 2015 Compliant

The following information confirms compliance with EU 327/2011 as required by ErP Directive 2009/125/EC. Only applicable within EU states.

Efficiency grade: 72
Overall efficiency: 63.7 %
Measurement category: A
Efficiency category: Static
Variable speed drive: A variable speed drive must be installed with this fan
Input power at best point: 1.506 kW
Volume flow at best point: 1.63 m³/s
Pressure at best point: 576 Pa
Speed: 1,450 RPM
Specific ratio: 1.02



VRV 5 heat recovery Air Conditioning Technical Data REYA-A

REYA8A7Y1B
REYA10A7Y1B
REYA12A7Y1B
REYA14A7Y1B
REYA16A7Y1B
REYA18A7Y1B
REYA20A7Y1B
REYA10A7Y1B.
REYA13A7Y1B
REYA16A7Y1B.
REYA18A7Y1B.
REYA20A7Y1B.
REYA22A7Y1B
REYA24A7Y1B
REYA26A7Y1B
REYA28A7Y1B
REMA5A7Y1B



2 Specifications

2 - 1 REYA-A

Technical Specifications					REYA8A		REYA10A	REYA12A	REYA14A
Casing	Colour				Daikin White				
	Material				Painted galvanized steel plate				
Heat exchanger	Type				Cross fin coil				
	Indoor side				Air				
	Outdoor side				Air				
	Air flow rate	Cooling	Rated	m³/h	9,145	9,709	10,823	11,576	
		Heating	Rated	m³/h	9,145	9,709	10,823	13,124	
Fan	Quantity				1				2
	External static pressure	Max.	Pa		78				
Fan motor	Quantity				1				2
	Type				DC motor				
	Output				550				750
Compressor	Quantity				1				
	Type				Hermetically sealed scroll compressor				
	Crankcase heater				W				33
Operation range	Cooling	Min.	°CDB		-5				
		Max.	°CDB		46				
	Heating	Min.	°CWB		-20				
		Max.	°CWB		16				
Sound power level	Cooling	Nom.	dBA		78.3 (4)	78.8 (4)	82.5 (4)	78.7 (4)	
	Heating	Nom.	dBA		79.4 (4)	80.7 (4)	83.3 (4)	82.9 (4)	
Sound pressure level	Cooling	Nom.	dBA		56.3 (5)	58.0 (5)	60.8 (5)	58.1 (5)	
	Heating		dBA		58.1 (5)	58.8 (5)	61.9 (5)	61.3 (5)	
Refrigerant	Type				R-32				
	GWP				675.0				
	Charge	TCO2Eq			6.08				7.16
	Charge	kg			9.00				10.6
Refrigerant oil	Type				FW68DE				
Piping connections	Liquid	Type			Brazed connection				
		OD	mm		9.52			12.70	
	Gas	Type			Brazed connection				
		OD	mm		19.1			22.2	
	HP/LP gas	Type			Brazed connection				
		OD	mm		15.90			19.10	
Total piping	System	Actual	m		1,000 (6)				

2



TECHNICAL COMMERCIAL PROPOSAL

Customer : Charles Scott & Ptnr
 Attention : K MacLennan
 From : Hidros UK Ltd D. Neville
 Phone :
 Project : UKI 1781 Rev 2 Simply Care Homes - 4 x Everest 290
 Date : 09/06/2023
 Offer validity : 30 days
 Internal reference:
 230609_9468_000



Emicon AC Spa : Via A. Volta, 49 - 47014 Meldola (FC) Italy
www.emicon.it

Model: PAE 881 Kp
 Option: R290-PA-CI-MF-RL-KCA-KGH5-KIT-KTT-MG-MM-RA-P1-IWG-I1-DELV

HEATING

Performance data		
Heating capacity	kW	59.1
Total input power	kW	31.6
Compressor input power	kW	28.1
Input current	A	58.2
COP	W/W	1.87
SCOP LT ^(B2) /MT ^(B3)	W/W	3.87/-
$\eta_{s,h}$ LT ^(B2) /MT ^(B3)	%	152/-
Source		
Altitude	m	0.0
Dry bulb outdoor air	°C	-4.0
Outdoor air Relative humidity	%	99.9
Air flow rate	m³/h	42705
Fan input power	kW	3.57
Fan input current	A	6.08
Fans available static pressure	Pa	0

User		
Fluid type		Water
Fouling fact.	m²/kW	0.000
In/out fluid temperature	°C	58.0/64.9
Fluid flow rate	m³/h	7.516
Circuit pressure drops	kPa	10.8
Pump available static pressure	kPa	109.7
Max pump available static pressure	kPa	109.7
Sound data		
Calculated sound power	dB(A)	87
Sound pressure ^(C0) [10.0 m]	dB(A)	55

ABOUT US

HERE TO HELP

We undertake various noise assessments and noise survey for a wide range of clients to meet their noise requirements and obligations, including for Planning Applications, new developments, building extensions, change of use, small businesses, restaurants, shops and much more.

QUALIFIED AND EXPERIENCED

Over 15 years UK and international acoustic engineering experience of undertaking Noise Monitoring, acoustic solutions, noise survey and Reporting.

Members of the Institute of Acoustics. Undertaken projects in Manchester, North West and across the UK.

GET THE PROJECT DONE

We offer competitive, cost effective acoustic solutions, delivering a noise survey report which complies with Local Planning Authority requirements and sound insulation or health and safety obligations.

We can also undertake Noise Modelling if required.