21-23 Shorts Gardens & 17 NEAL'S YARD
LONDON
WC2H 9DP

24 HOUR ENVIRONMENTAL NOISE ASSESSMENT

Our Ref: CPT/010721/010
Rev: 02 (27/07/21)

Written By:

Cliff Tucker AMIOA

Date: 5th July 2021

CONTENTS

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1.0 Brief

1.1 To carry out an Environmental Noise Assessment & Report in order to establish the prevailing environmental noise levels enjoyed by the site.

1.2 From these measurements and through liaison with the Local Authority we establish an acoustic design criterion (the Rating Level) at the nearest noise sensitive boundary (the Assessment Position).

1.3 To analyse the published acoustic data for the proposed equipment in relation to the Rating Level including any proposed acoustic control hardware in order to establish compliance or otherwise.

1.4 We have excluded the following from our brief:

- Construction noise
- Any Building Regulations noise considerations
- Traffic noise/traffic count per se, although we have recorded LA10 percentiles.
- Health and safety acoustics.

2.0 Executive Summary

2.1 An Environmental Noise Assessment has been carried out at 21-23 Shorts Gardens & 17 Neal's Yard, London WC2H 9DP.

2.2 A minimum background noise level of 42 (42.4) dB $LA_{90,\ 15mins}$ has been measured for the hours of operation of the proposed plant.

2.3 A Rating Level is set at 10 dB below the relevant background noise levels, as per Camden Council's normal conditions.

2.4 The maximum Rating Level is therefore be 32 dB $LA_{eq,\ 15\ mins}$.

2.5 The proposed plant is to be installed at rooftop level.

2.6 The screening provided by the building fabric is sufficient for the condensers and refridgeration unit not to require any addition noise control to mitigate noise.

2.7 The exhaust duct of the kitchen extract fan should have a duct attenuator installed that provides the following minimum dynamic insertion loss:

	Octave Band Mid Frequency Hz						
63	**125**	**250**	**500**	**1K**	**2K**	**4K**	**8K**
8	18	31	49	50	50	38	24

2.8 In order to control breakout noise the extract fan will require additional screening from the Assessment Position by a louvred screen providing the following minimum transmission loss:

	Octave Band Mid Frequency Hz						
63	**125**	**250**	**500**	**1K**	**2K**	**4K**	**8K**
6	7	10	13	17	19	13	11

2.9 The calculated resultant noise level at the Assessment Position with the unit operating at full duty is then 32 dB LAeq.

2.10 This is equal to the maximum permissable Rating Level and the Local Authority's requirements in regard to noise will therefore be met.

3.0 Location

3.1 21-23 Shorts Gardens & 17 Neal's Yard is a five storey (inc. basement) mixed use property in a street of similar properties within the London Borough of Camden.

3.2 The building is bounded by 16 Neal's Yard to the North East; Shorts Gardens with further mixed use property beyond to the South East; 19 Shorts Gardens to the South West; and 1A Neal's Yard to the North West.

4.0 Instrumentation

4.1 The instrumentation employed was:

- Rion NL-32/NX-22RT Class 1 Environmental Noise Analyser
- Rion NC74 Class1 Acoustic Calibrator
- Rion 12 mm Condenser Microphone & Foam Windshield on 1.5 meter Extension Pole.
- Rion Weatherproof Security Box

4.2 The instruments carry current calibration certificates a copies of which are available from our offices on request.

5.0 Time, Date & Environmental Conditions

5.1 The survey was conducted from 10.07 on the 29th June 2021 through until 09.52 on the 30th June 2021.

5.2 The weather throughout the survey period was overcast, an occasional light breeze, and light rain.

5.3 The site engineer was Cliff Tucker: the results were analysed & reported by Cliff Tucker.

6.0 Methodology.

6.1 The survey and report generally follow the procedures, method and assessments as described in BS 4142: 2014 ‘Methods for rating and assessing industrial and commercial sound’.

6.2 The standard requires a comparison between the typical measured background noise level and the equivalent continuous A-weighted sound pressure level of the proposed plant at the Assessment Position.

6.3 BS4142: 2014 also requires uncertainty to be considered as part of the assessment.

- We have undertaken a 24 hour background noise survey and the data gathered has been analysed to ensure that any influences from the weather conditions have been accounted for in the assessment.
- The calibration of the sound level meter was checked before and after the survey period and no significant drift found.
- Standard acoustic theory has been applied in the noise propagation calculations.

It is therefore considered that the uncertainty associated with the assessment is minimal and the results, as stated, are therefore valid.

6.4 The Reference Time Interval used for the survey was 15 minutes.

6.5 The microphone position (the measurement position) was the terrace of the top floor apartment of 17 Neal’s Yard.

6.6 The background level as measured at the microphone position is considered to be representative of the levels enjoyed at the Assessment Position.

6.7 The Assessment Position is adjacent to the measurement position, a distance of not less than 4.2 m from the proposed installation location and visually and acoustically screened from the installation location by the building fabric.

6.8 The measurement position; assessment positions; and the other relevant points of interest are shown on the plan within Appendix ‘A’.

6.9 The measured levels were the principle LA percentiles as prescribed in BS 4142.

6.10 The most significant of the measured percentiles for our purposes are as follows:

- LA_{eq}, (the mean sound pressure level corresponding to a fluctuation level across time period 't'). Used for the measurement and assessment of the Ambient Noise Level; The Specific Noise Level; The Residual Level and the Rating Level
- LA_{10} ('A' weighted level exceeded for 10% of the time) is used for traffic noise assessment.
- LA_{90}, ('A' weighted level exceeded for 90% of the time). Represents the Background Level and is often used as the target threshold against which the acoustic design criteria are set.

  We also measured the maximum and minimum levels.

6.11 You will note the basic objective is to establish a Rating Level at the Assessment Point for comparison with the specific noise level from any new plant in order to predict the likelihood of noise complaint.

6.12 Camden Council's requirements are that the specific noise from the proposed plant shall be no greater than 10 dB-A below the minimum measured background noise level measured for the proposed hours of operation of the plant.

6.13 The plant has the propensity to operate 24 hours per day, 7 days per week.

7.0 Results Summary & Assessment of Required Rating Level

7.1 The full set of measured levels are presented in Appendix C of this report

7.2 The plant has the propensity to operate 24 hours per day 7 days per week.

7.3 The minimum L_{A90} level measured was 42.4 dB L_{A90} at 03.07 and again at 05.22 on the 30th June 2021.

7.4 The maximum permissible Rating Level is therefore set at 32 dB $L_{Aeq,\ 15\ mins}$.

8.0 Analysis

8.1 Proposed Plant & Location

The proposed items of plant are:

- 3 no. Samsung AM050NXMDER Air cooled condenser (air source heat pumps).
- 1 no. Tecumseh Silensys SILG4467Z Refrigeration unit (air source heat pumps).
- 1 no. Nuaire SQFA44 Kitchen Extract Fan.

The plant is to be installed at rooftop level.

The Assessment Position is taken to be the measurement position, a distance of not less than 4.2 m from the proposed installation location and visually and acoustically screened from the installation location.

The plant has the propensity to operate 24 hours per day 7 days per week.

The manufacturers published Sound Pressure Level for the condenser units under full load is as follows:

	Octave Band Mid Frequency Hz							
	63	**125**	**250**	**500**	**1K**	**2K**	**4K**	**8K**
Lp @ 1 m	52	51	49	46	44	43	35	25

Tecumseh do not publish acoustic data for their units in spectrum format, however, the selected unit has a published Sound Pressure Level at 1 m of 49 dB-A. This is 1 dB-A quieter than the Samsung units and we have therefore assumed the same Samsung spectrum for the purpose of calculation.

Nuaire's publish Sound Power Level for the kitchen extract fan at operating duty is as follows:

	Octave Band Mid Frequency Hz							
	63	**125**	**250**	**500**	**1K**	**2K**	**4K**	**8K**
Lw Outlet	82	85	83	84	76	77	77	63
Breakout	77	82	78	75	63	64	60	42

8.2 Plant Analysis

8.2.1 Condeners & Refridgeration Unit

	Octave Band Mid Frequency Hz							
	63	**125**	**250**	**500**	**1K**	**2K**	**4K**	**8K**
AM050	52	51	49	46	44	43	35	25
AM050	52	51	49	46	44	43	35	25
AM050	52	51	49	46	44	43	35	25
4467Z	52	51	49	46	44	43	35	25
Cumulative	58	57	55	52	50	49	41	31
Dist. Loss	12	12	12	12	12	12	12	12
Screening	12	15	18	20	23	26	29	32
Lp Ass	33	30	25	19	14	10	-1	-14
A weight	26	16	9	3	0	-1	-1	1
Lp-A Ass	7	14	16	16	14	11	0	-15

This is equivalent to 22 dB-A.

8.2.2 Kitchen Extract Exhaust

The kitchen exxtract exhaust duct will incoirporate a duct attenuator with a minimum insertion loss as follows;

	Octave Band Mid Frequency Hz							
	63	**125**	**250**	**500**	**1K**	**2K**	**4K**	**8K**
	8	18	31	49	50	50	38	24

	Octave Band Mid Frequency Hz							
	63	**125**	**250**	**500**	**1K**	**2K**	**4K**	**8K**
Lw Outlet	82	85	83	84	76	77	77	63
Duct Loss	2	2	1	1	1	1	1	1
Bend Loss	0	1	3	4	4	3	3	3
Equip. Loss	0	0	0	0	0	0	0	0

	Octave Band Mid Frequency Hz							
	63	**125**	**250**	**500**	**1K**	**2K**	**4K**	**8K**
End Ref.	6	3	0	0	0	0	0	0
Dist Loss	21	21	21	21	21	21	21	21
Att. D.I.L.	8	18	31	49	50	50	38	24
Lp Ass	46	41	28	10	1	3	15	15
A weight	26	16	9	3	0	-1	-1	1
Lp-A Ass	20	25	19	7	1	4	16	14

This is equivalent to 28 dB-A.

8.2.3 Kitchen Extract Breakout

In addition to the scrceening provided by the building fabric an additional louvred screen is required between the fan set and the Assesment Position. The louvre should prevent direct line of sight betwene the fan set and the edge of the building fabric and provide a mnimum transmisison loss as follows:

	Octave Band Mid Frequency Hz							
	63	**125**	**250**	**500**	**1K**	**2K**	**4K**	**8K**
	6	7	10	13	17	19	13	11

	Octave Band Mid Frequency Hz							
	63	**125**	**250**	**500**	**1K**	**2K**	**4K**	**8K**
Breakout	77	82	78	75	63	64	60	42
Dist. Loss	18	18	18	18	18	18	18	18
Screening	12	15	18	20	23	26	29	32
Louvre Loss	6	7	10	13	17	19	13	11
Lp Ass	41	43	33	24	5	1	0	-19
A weight	26	16	9	3	0	-1	-1	1
Lp-A Ass	15	27	24	21	5	2	1	-20

This is equivalent to 29 dB-A.

8.2.4 Resultant Level

The resultant level at the Assesment Position is the logarithmic addition of the above calculated levels and equals 32 dB-A.

This is equal to the maximum permissable Rating Level and the Local Authority's requirements in terms of noise will therefore be met.

8.3 Vibration

As the proposed plant is to be installed on the rooftop the unit should be resiliently mounted such that a vibration isolation efficiency of not less than 95% is achieved at the operating duties in order to prevent the transfer of vibration or structure borne noise.

Additionally, any gas and liquid lines should be fixed on the outside of the insulation.

9.0 Conclusion

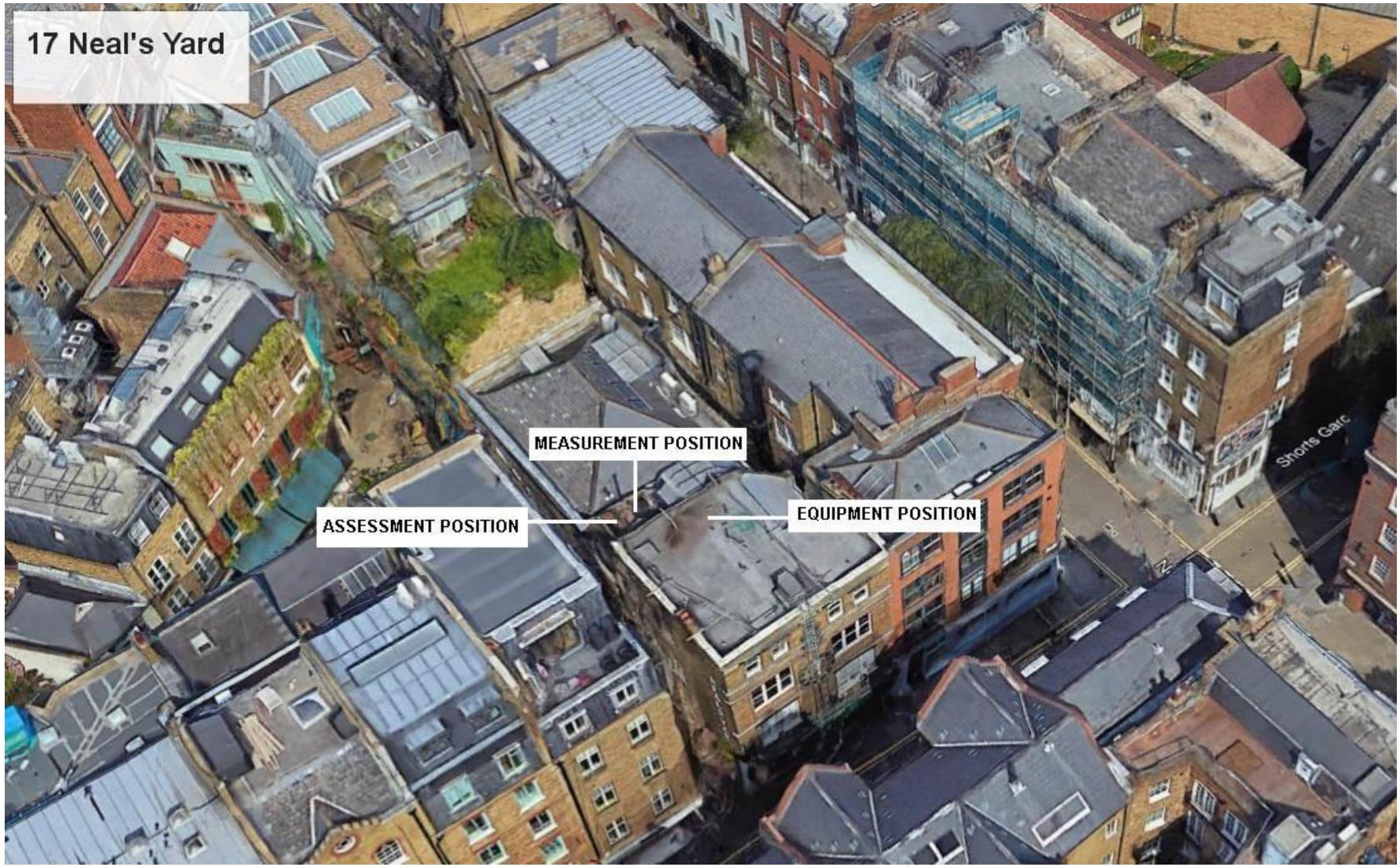
The new plant that is to be installed should be designed, selected, located and acoustically treated in line with the above objectives.

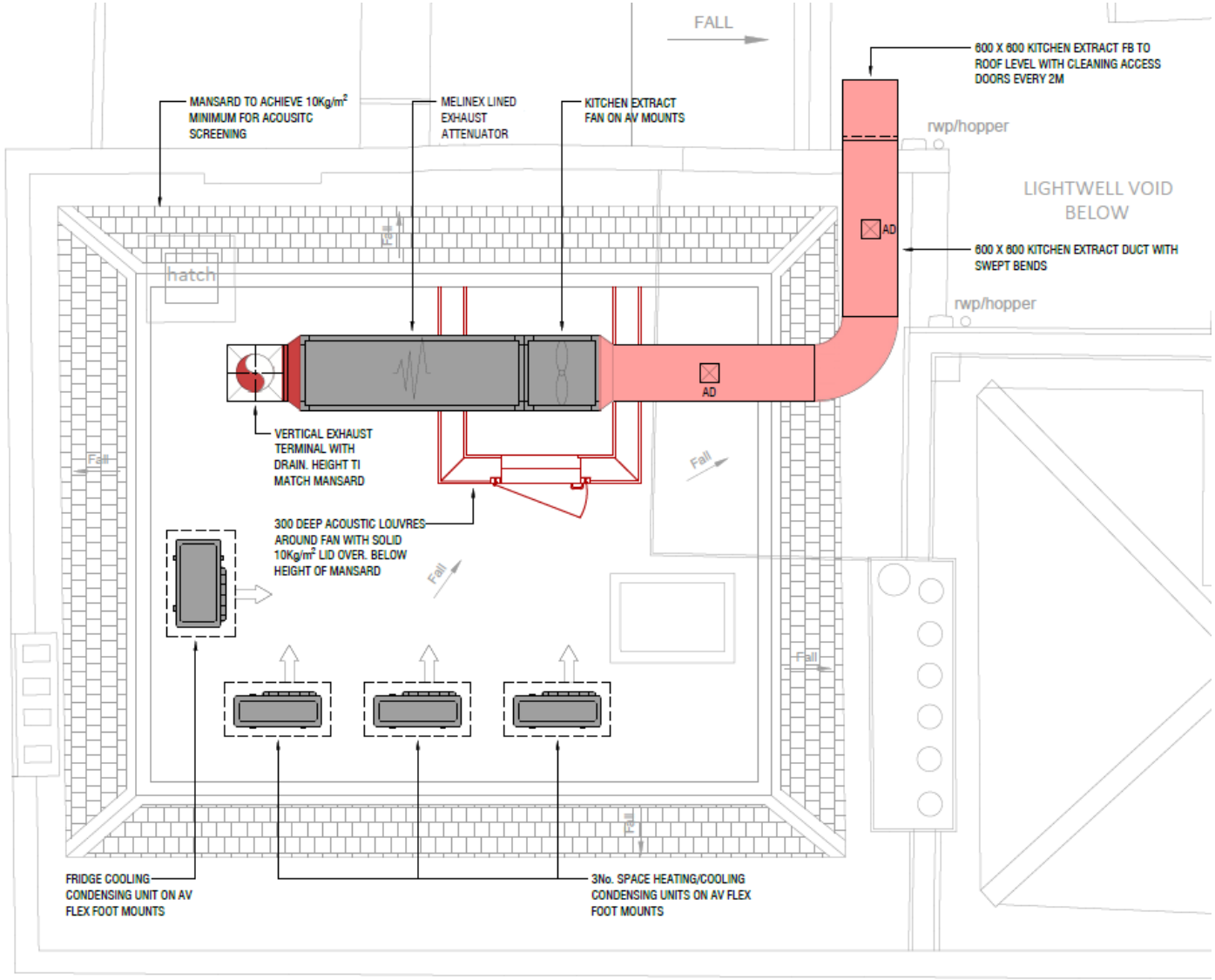
Assuming this is achieved as outlined above then the Local Authority's requirements in terms of noise will be met.

Report ends

Cliff Tucker AMIOA
Eurovib (Acoustic Products) Ltd

APPENDIX A – Positions, Distances, & Locations

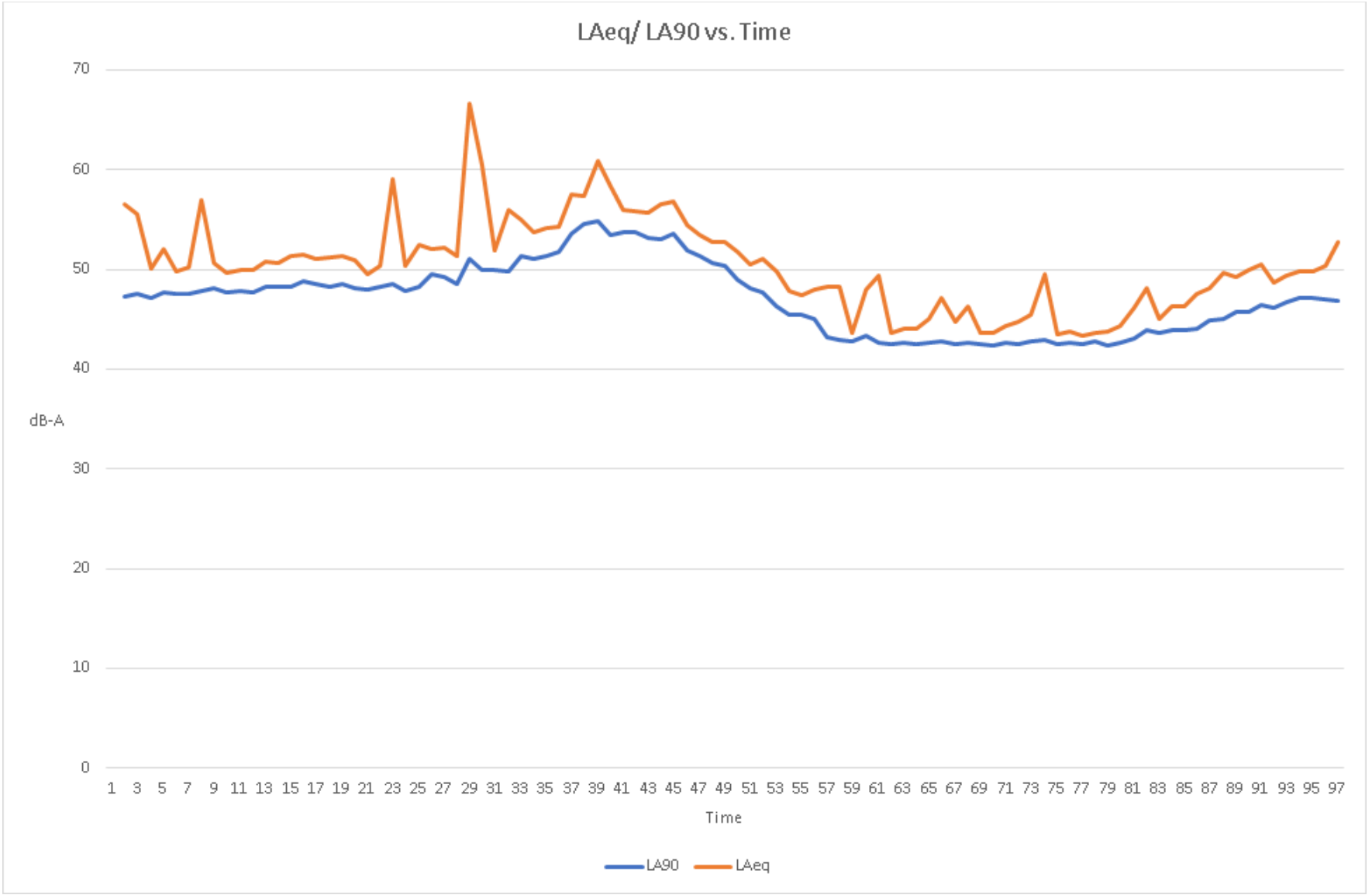

17 Neal's Yard
MEASUREMENT POSITION
ASSESSMENT POSITION
EQUIPMENT POSITION
Shorts Garc


FALL
MANSARD TO ACHIEVE 10Kg/m² MINIMUM FOR ACOUSITC SCREENING
MELINEX LINED EXHAUST ATTENUATOR
KITCHEN EXTRACT FAN ON AV MOUNTS
600 X 600 KITCHEN EXTRACT FB TO ROOF LEVEL WITH CLEANING ACCESS DOORS EVERY 2M
rwp/hopper
LIGHTWELL VOID BELOW
AD
600 X 600 KITCHEN EXTRACT DUCT WITH SWEPT BENDS
rwp/hopper
hatch
AD
VERTICAL EXHAUST TERMINAL WITH DRAIN. HEIGHT TI MATCH MANSARD
Fall
Fall
300 DEEP ACOUSTIC LOUVRES AROUND FAN WITH SOLID 10Kg/m² LID OVER. BELOW HEIGHT OF MANSARD
Fall
Fall
FRIDGE COOLING CONDENSING UNIT ON AV FLEX FOOT MOUNTS
3No. SPACE HEATING/COOLING CONDENSING UNITS ON AV FLEX FOOT MOUNTS

Appendix B – Full Measured Levels

Ref	Time	Measurment Time	LAmax	LAmin	LA10	LA90	LAeq
1	29/06/2021 10:07	0:15:00	83.2	45.9	52.7	47.3	56.5
2	29/06/2021 10:22	0:15:00	74.6	45.8	56.5	47.5	55.6
3	29/06/2021 10:37	0:15:00	68.4	46.0	51.9	47.2	50.1
4	29/06/2021 10:52	0:15:00	68.0	46.2	53.6	47.7	52.0
5	29/06/2021 11:07	0:15:00	63.8	45.9	51.6	47.6	49.8
6	29/06/2021 11:22	0:15:00	64.5	46.0	52.2	47.6	50.2
7	29/06/2021 11:37	0:15:00	79.9	46.2	54.3	47.8	57.0
8	29/06/2021 11:52	0:15:00	72.9	46.7	51.9	48.1	50.7
9	29/06/2021 12:07	0:15:00	66.4	46.2	51.3	47.7	49.7
10	29/06/2021 12:22	0:15:00	69.4	46.7	51.5	47.9	50.0
11	29/06/2021 12:37	0:15:00	70.5	46.4	51.4	47.7	49.9
12	29/06/2021 12:52	0:15:00	69.2	46.7	52.4	48.3	50.8
13	29/06/2021 13:07	0:15:00	69.5	46.6	52.1	48.2	50.7
14	29/06/2021 13:22	0:15:00	66.8	46.3	53.3	48.2	51.3
15	29/06/2021 13:37	0:15:00	65.9	47.0	53.5	48.8	51.5
16	29/06/2021 13:52	0:15:00	65.6	47.0	52.7	48.5	51.1
17	29/06/2021 14:07	0:15:00	66.0	46.8	52.9	48.3	51.2
18	29/06/2021 14:22	0:15:00	66.6	47.0	53.0	48.6	51.3
19	29/06/2021 14:37	0:15:00	68.0	46.7	53.1	48.1	50.9
20	29/06/2021 14:52	0:15:00	62.5	46.5	50.6	48.0	49.5
21	29/06/2021 15:07	0:15:00	65.8	46.8	52.2	48.2	50.4
22	29/06/2021 15:22	0:15:00	77.2	46.9	57.7	48.6	59.0
23	29/06/2021 15:37	0:15:00	68.1	46.4	52.2	47.8	50.3
24	29/06/2021 15:52	0:15:00	70.1	46.6	52.9	48.3	52.5
25	29/06/2021 16:07	0:15:00	67.3	47.0	54.1	49.5	52.0
26	29/06/2021 16:22	0:15:00	71.2	46.9	54.7	49.2	52.2
27	29/06/2021 16:37	0:15:00	70.7	46.5	53.4	48.5	51.4
28	29/06/2021 16:52	0:15:00	82.8	48.4	71.1	51.1	66.6
29	29/06/2021 17:07	0:15:00	75.0	47.5	65.1	50.0	60.4
30	29/06/2021 17:22	0:15:00	69.9	48.0	53.5	49.9	51.9
31	29/06/2021 17:37	0:15:00	70.3	47.5	59.5	49.8	56.0
32	29/06/2021 17:52	0:15:00	68.1	48.9	57.5	51.4	55.0
33	29/06/2021 18:07	0:15:00	65.2	48.8	55.8	51.1	53.7
34	29/06/2021 18:22	0:15:00	68.6	48.9	55.9	51.4	54.1
35	29/06/2021 18:37	0:15:00	66.3	49.0	56.0	51.7	54.3
36	29/06/2021 18:52	0:15:00	67.9	50.5	60.1	53.6	57.5
37	29/06/2021 19:07	0:15:00	70.3	51.4	59.4	54.6	57.4
38	29/06/2021 19:22	0:15:00	79.0	51.6	62.9	54.9	60.9
39	29/06/2021 19:37	0:15:00	78.5	50.7	58.4	53.4	58.4
40	29/06/2021 19:52	0:15:00	68.3	50.3	57.9	53.7	56.0
41	29/06/2021 20:07	0:15:00	66.4	51.1	57.7	53.7	55.9
42	29/06/2021 20:22	0:15:00	70.0	50.6	57.6	53.1	55.7
43	29/06/2021 20:37	0:15:00	77.5	49.1	57.1	53.0	56.5
44	29/06/2021 20:52	0:15:00	70.1	50.7	59.0	53.6	56.8
45	29/06/2021 21:07	0:15:00	66.7	48.7	56.2	51.9	54.4
46	29/06/2021 21:22	0:15:00	64.5	49.2	55.0	51.3	53.4
47	29/06/2021 21:37	0:15:00	61.0	48.2	54.5	50.7	52.8
48	29/06/2021 21:52	0:15:00	65.1	47.6	54.6	50.3	52.7

Ref	Time	Measurment Time	LAmax	LAmin	LA10	LA90	LAeq
49	29/06/2021 22:07	0:15:00	67.4	46.6	53.6	48.9	51.8
50	29/06/2021 22:22	0:15:00	61.4	46.3	52.5	48.1	50.5
51	29/06/2021 22:37	0:15:00	72.6	45.1	53.2	47.7	51.0
52	29/06/2021 22:52	0:15:00	68.9	44.8	51.5	46.3	49.8
53	29/06/2021 23:07	0:15:00	76.8	44.2	47.8	45.4	47.9
54	29/06/2021 23:22	0:15:00	63.3	44.1	49.0	45.5	47.4
55	29/06/2021 23:37	0:15:00	64.4	42.8	49.2	45.0	48.0
56	29/06/2021 23:52	0:15:00	71.1	41.7	48.2	43.2	48.2
57	30/06/2021 00:07	0:15:00	68.3	41.6	52.7	42.9	48.2
58	30/06/2021 00:22	0:15:00	57.1	41.2	44.3	42.8	43.6
59	30/06/2021 00:37	0:15:00	69.5	41.7	49.9	43.3	48.0
60	30/06/2021 00:52	0:15:00	69.0	41.7	51.8	42.6	49.4
61	30/06/2021 01:07	0:15:00	54.9	41.5	44.5	42.5	43.6
62	30/06/2021 01:22	0:15:00	62.5	41.4	44.7	42.7	44.1
63	30/06/2021 01:37	0:15:00	56.4	41.3	44.4	42.5	44.1
64	30/06/2021 01:52	0:15:00	63.2	41.5	44.6	42.6	45.1
65	30/06/2021 02:07	0:15:00	67.2	41.6	45.9	42.8	47.2
66	30/06/2021 02:22	0:15:00	68.1	41.3	45.2	42.5	44.8
67	30/06/2021 02:37	0:15:00	68.2	41.6	45.5	42.6	46.3
68	30/06/2021 02:52	0:15:00	57.3	41.5	44.0	42.5	43.6
69	30/06/2021 03:07	0:15:00	52.7	41.4	45.0	42.4	43.7
70	30/06/2021 03:22	0:15:00	58.5	41.5	45.1	42.7	44.3
71	30/06/2021 03:37	0:15:00	60.1	41.4	45.9	42.5	44.7
72	30/06/2021 03:52	0:15:00	57.8	41.3	47.9	42.8	45.4
73	30/06/2021 04:07	0:15:00	61.3	41.6	53.6	42.9	49.5
74	30/06/2021 04:22	0:15:00	54.2	41.3	44.5	42.5	43.5
75	30/06/2021 04:37	0:15:00	52.8	41.6	44.7	42.7	43.8
76	30/06/2021 04:52	0:15:00	50.9	41.5	44.3	42.5	43.4
77	30/06/2021 05:07	0:15:00	48.4	41.7	44.4	42.8	43.6
78	30/06/2021 05:22	0:15:00	54.5	41.5	44.8	42.4	43.8
79	30/06/2021 05:37	0:15:00	62.5	41.4	44.8	42.6	44.3
80	30/06/2021 05:52	0:15:00	67.8	41.7	45.7	43.1	46.2
81	30/06/2021 06:07	0:15:00	65.8	42.4	50.1	43.9	48.1
82	30/06/2021 06:22	0:15:00	56.5	42.5	46.1	43.6	45.0
83	30/06/2021 06:37	0:15:00	62.7	42.5	47.1	43.9	46.3
84	30/06/2021 06:52	0:15:00	66.3	42.3	47.7	43.9	46.3
85	30/06/2021 07:07	0:15:00	69.2	42.6	49.3	44.0	47.5
86	30/06/2021 07:22	0:15:00	64.1	43.5	48.8	44.9	48.1
87	30/06/2021 07:37	0:15:00	70.3	43.5	50.9	45.0	49.7
88	30/06/2021 07:52	0:15:00	64.9	44.0	51.6	45.8	49.2
89	30/06/2021 08:07	0:15:00	70.3	43.9	52.9	45.8	50.0
90	30/06/2021 08:22	0:15:00	65.1	44.9	52.6	46.4	50.5
91	30/06/2021 08:37	0:15:00	65.3	44.5	50.4	46.2	48.7
92	30/06/2021 08:52	0:15:00	68.5	45.1	51.0	46.7	49.4
93	30/06/2021 09:07	0:15:00	63.0	45.4	51.5	47.2	49.8
94	30/06/2021 09:22	0:15:00	65.5	45.3	51.8	47.2	49.8
95	30/06/2021 09:37	0:15:00	65.9	45.2	52.0	47.0	50.3
96	30/06/2021 09:52	0:11:28	80.3	45.6	53.4	46.9	52.7

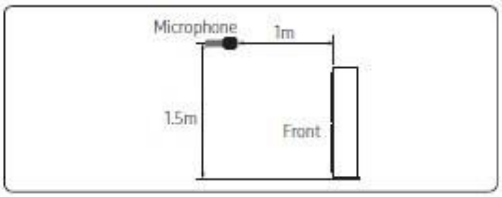

LAeq/ LA90 vs. Time
70
60
50
40
dB-A
30
20
10
0
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49 51 53 55 57 59 61 63 65 67 69 71 73 75 77 79 81 83 85 87 89 91 93 95 97
Time
LA90
LAeq

Appendix C – Equipment Data

7. Sound Data

Sound Pressure level

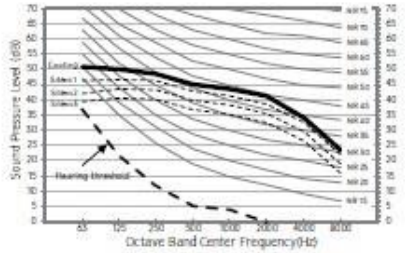
Unit: dB(A)



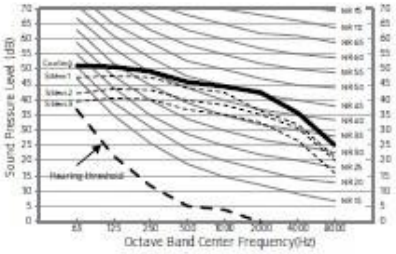
Model	Cooling	Silent1	Silent2	Silent3
AM040NXMD*R/EU	50	47	44	41
AM050NXMD*R/EU	50	48	45	42
AM060NXMD*R/EU	51	50	47	44

- NR Curve

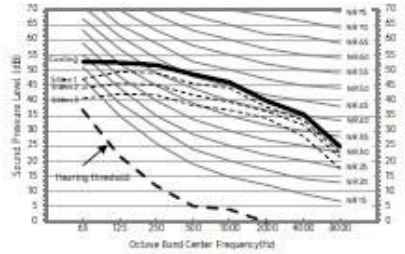
1) AM040NXMD*R/EU



2) AM050NXMD*R/EU



3) AM060NXMD*R/EU



NOTE

- Specifications may be subject to change without prior notice.
- Sound pressure Level
  - Sound pressure level is obtained in an anechoic room.
  - Sound pressure level is a relative value, depending on the distance and acoustic environment.
  - Sound pressure level may differ depending on operation condition.
  - dBA = A weighted sound pressure level
  - Reference acoustic pressure 0 dB = 20μPa
- Silent mode available by option setting.
  - In cooling mode can be choose depending outdoor temperature/external contact signal
  - In heating mode can be choose only external contact signal

R-404A COMMERCIAL POSITIVE REFRIGERATION

SILENSYS®

Models	Technology	Rated voltage code (max (A))	Capacity in W EN 13215 Ambient temperature 32 °C Superheating 10K Subcooling 3K Evaporation temperature: -15 °C	-10 °C	-5 °C	0 °C	5 °C	EN 13215 to -10 °C evaporation and 32 °C ambient Suction gas 20 °C Cooling capacity (W)	Power input (W)	Pressure at 10 m	Pressure at 1 m	Acoustic power	Air flow	Diameter of connection Suction (inch)	Liquid (inch)	Other available voltages	Receiver volume	Net / Gross weight	Panels
										Acoustics dB(A)*			m³/h				Liters	Kg	see p18
SILAE4560Z		FZ / 4,4	600	740	950	1180	1450	843	469	30	50	61	1650	3/8	1/4	-	0,75	59 / 79	S
SILAE4540Z		FZ / 6	710	890	1100	1350	1660	987	627	30	50	61	1650	3/8	1/4	•	0,75	59 / 79	S
SILRG4467Z		FZ / 5	720	900	1110	1350	1620	999	682	29	49	60	1650	3/8	1/4	-	1,5	59 / 80	S
SILRG4480Z		FZ / 5,8	880	1090	1340	1620	1960	1214	581	30	50	61	1650	3/8	1/4	•	1,5	59 / 80	S
SILRG4492Z		FZ / 6,4	980	1210	1480	1780	2140	1349	627	29	49	60	1650	1/2	1/4	-	1,5	60 / 80	S
SILA/H4402		FZ / 7,2	1000	1250	1540	1870	2240	1391	724	29	49	60	1650	1/2	3/8	KZ/TZ	1,5	68 / 88	S
SILA/H5102		FZ / 8,5	1230	1530	1870	2260	2700	1706	879	29	49	60	1650	5/8	3/8	KZ/TZ	1,5	69 / 89	S
SILRG4512Z		FZ / 7,2	1270	1560	1880	2240	2690	1736	794	29	49	60	1650	1/2	3/8	•	1,5	62 / 83	S
SILA/H5112		FZ / 10,7	1500	1870	2290	2780	3330	2087	1022	31	51	62	1650	5/8	3/8	KZ/TZ	1,5	71 / 91	S
SILA/A5112		FZ / 13,8	1660	2080	2550	3080	3680	2326	1265	36	56	67	2700	5/8	3/8	KZ/TZ	2,35	70 / 92	M
SILVS9510Z		XD / 6,7	1860	2260	2730	3270	3900	2540	1478	36	56	67	2700	3/4	3/8	XC	2,35	86 / 106	M
SILA/A5192		FZ / 16,3	2170	2700	3300	3980	4750	3030	1676	38	58	69	2700	5/8	3/8	KZ/TZ	2,35	71 / 93	M
SILFH4524Z		TZ / 8,8	2360	3020	3750	4570	5490	3388	1836	37	57	68	2700	5/8	3/8	FZ	2,35	83 / 106	M
SILVS9514Z		XD / 7,1	2470	3060	3690	4440	5290	3414	2020	36	56	67	2700	3/4	3/8	XC	2,35	85 / 107	M
SILFH4531Z		TZ / 10,1	3060	3850	4710	5630	6690	4338	2240	41	61	72	2700	7/8	5/8	FZ	3,9	87 / 109	M
SILVS9517Z		XD / 7,7	3370	4080	4900	5830	6880	4590	2128	37	57	68	2700	7/8	1/2	XC	3,9	86 / 108	M
SILFH4540Z		TZ / 10,3	3630	4480	5410	6440	7520	5090	3014	40	60	71	2700	7/8	1/2	FZ	3,9	87 / 109	M
SILVS9521Z		XD / 9,9	3960	4800	5740	6760	7870	5607	2515	37	57	68	2700	7/8	1/2	XC	3,9	86 / 108	M

* Presentation of the acoustic values in maximum ventilation speed in free field according to the reference point of standard EN13215. We comply with the acoustic standard EN ISO 3743-1
The refrigeration performances are given for information purposes and may change, without prior notice, with improvements that Tecumseh Europe is always making to its products.
The Silensys are dimensioned for operation at 46 °C ambient with the exception of the six largest models of the XL panels +43 °C max.

Options/Kits

Silensys®
- Fuse plug
- Sight glass on liquid receiver
- HP/LP pressure switch with manual reset function

Voltage codes

Previous code letter	New code letter	Description
F	FZ	220-240V~50Hz
K	KZ	220V 3~50Hz 220V 3~60Hz
T	TZ	400V 3~50Hz 440V 3~60Hz
A	XA	100V 1~50Hz 115V 1~60Hz
G	GZ	208-220V 1~60Hz

nuaire SUMMARY FAN DATA SHEET

Nuaire Limited, 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 30 Jun 2021 15:39 using software version 3.6.19.2088 - 12-Mar-2018

Technical Data

SQF - Squif Single In-line Fan
In Line Single Fan

Fan Code:	**SQFA44**
Installation Manual Links:	671175
Required Duty:	1800 l/s @ 300 Pa
Actual Duty:	2201 l/s @ 449 Pa
Actual at Required Flow:	1800 l/s @ 580 Pa
Velocity at Actual Duty:	3.931 m/s
When Speed Controlled to Required Duty (81.7%):	
Velocity at Required Duty:	3.214 m/s
Fan Input Power:	**1.169 kW**
Motor Input Power:	**1.469 kW**
Specific Fan Power:	**0.8 W/(l/s)**
Motor Efficiency:	84.3 %
Fan Total Efficiency:	47 %
Fan Input Power:	2.137 kW
Maximum Fan Input Power:	2.161 kW
Motor Input Power:	2.687 kW
Specific Fan Power:	1.2 W/(l/s)
Nominal Fan Speed:	4 Pole 1,450 RPM
Electrical Supply:	400 V 3 Phase 50 Hz
Motor Rating:	2.2 kW
Motor Current:	flc: 4.6 A
Motor Current:	sc: 28.8 A
Starting currents are nominal for D.O.L. starting.	
Max. Operating Temp.:	90°C
Weight:	100 kg

Sound Data

Acoustic perfomance to ISO 13347 and AMCA 300.

Sound Power Levels re 1 pWatts (Hz):

	63	125	250	500	1k	2k	4k	8k	dBA
Induct Inlet	81	91	86	79	72	75	75	66	
Induct Outlet	82	85	83	84	76	77	77	63	
Breakout	77	82	78	75	63	64	60	42	55

The above spectrums running speed controlled to required duty (81.8%). When running at full speed:

Induct Inlet	83	93	89	82	77	80	80	71	
Induct Outlet	84	87	86	87	81	82	82	68	
Breakout	79	84	81	78	68	69	65	47	58

dBA is spherical at 3 metres. For hemi-spherical add 3 dBA.
Values shown are for inlet Lw, outlet Lw sound power & breakout levels for: Installation Type D: ducted inlet, ducted outlet. Ratings include the effects of duct end correction.

Please note that the noise data stated on this data sheet for the unit and/or silencer is tested in accordance with UK, European and International industry laboratory standards. However onsite conditions may vary and we would recommend that this information is verified by an acoustic specialist in order to ensure its suitability for the intended application.

Specification

In-line centrifugal fan suitable for both vertical & horizontal mounting. The unit casing shall be heavy gauge galvanised steel. The fans shall be of high efficiency backward curved centrifugal design, manufactured in galvanised steel. Fans shall be direct drive with IE2 high efficiency motors to BS5000 as standard, where appropriate. The unit motor shall be positioned outside the ventilation airflow path. The unit shall be capable of continuous operation at 90°C. .

NAV5
Resilient rubber anti-vibration mountings, supplied as a set of 4.

Selected Ancillaries

1 x NAV5	Anti-vibration mounting kit

Appendix D – Definitions

DECIBEL - The ratio of sound pressures that we can hear is a ratio of 10^6. A logarithmic measurement scale is therefore used for convenience. The resulting parameter is called the 'sound pressure level' (Lp) and the associated measurement unit is the decibel (dB). As the decibel is a logarithmic ratio, the laws of logarithmic addition and subtraction apply.

The threshold of normal hearing is in the region of 0 dB, and 140 dB is the threshold of pain.

A change of 1 dB is only perceptible under controlled conditions.

dB(A) - The unit generally used for measuring environmental, traffic or industrial noise is the A-weighted sound pressure level in decibels, denoted dB(A). An 'A'-weighting network can be built into a sound level measuring instrument such that sound levels in dB(A) can be read directly from a meter. The weighting is based on the frequency response of the human ear and has been found to correlate well with human subjective reactions to various sounds. A change of 3 dB(A) is the minimum perceptible under normal conditions, and a change of 10 dB(A) corresponds to a subjective halving or doubling of the loudness of a sound.

EQUIVALENT CONTINUOUS SOUND LEVEL (LEQ) - An index often used for the assessment of overall noise exposure is the equivalent continuous sound level, (LEQ). This is a notional steady level which would, over a given period of time, deliver the same sound energy as the actual time-varying sound over the same period. Hence fluctuating levels can be described in terms of a single figure level.

The 'A' weighted statistical sound level over a time period, T, is denoted $LA_{EQ,T}$.

AMBIENT NOISE - The total encompassing sound in a given situation at a given time. Most often described in terms of the index $LA_{EQ,.T}$.

SPECIFIC NOISE ($LA_{EQ,T}$) - The equivalent continuous A-Weighted sound pressure level at the assessment position produced by the specific noise source over a time interval T.

STATISTICAL NOISE LEVELS - For levels of noise that vary widely with time, for example road traffic noise, it is necessary to employ an index which allows for this variation.

- The L10, the level exceeded for ten per cent of the time period under consideration, has been adopted in this country for the assessment of road traffic noise.
- The L90, the level exceeded for ninety per cent of the time, has been adopted to represent the background noise level.

'A' weighted statistical noise levels are generally used and are denoted LA10, LA90 etc. The reference time period (T) is normally included, e.g. $LA_{10,}$