

Victoria Riverside Manchester

Condition Discharge Noise Impact Assessment Report

28499/NIA1

25 October 2024

For:
CR Construction (U.K) Company Limited
39 Harrington Gardens
London
SW7 4JU



Hann Tucker Associates

Consultants in Acoustics Noise & Vibration

Head Office: Duke House, 1-2 Duke Street, Woking, Surrey, GU21 5BA (t) +44 (0) 1483 770 595

Manchester Office: First Floor, 346 Deansgate, Manchester, M3 4LY (t) +44 (0) 161 832 7041

(w) hanntucker.co.uk (e) enquiries@hanntucker.co.uk



Condition Discharge Noise Impact Assessment Report 28499/NIA1

Document Control

Rev	Date	Comment	Prepared by	Reviewed by	Approved by
0	25/10/2024	Updated to include plant assessment for Condition 21(a) and plant noise transfer assessment for 23(a)			
			Nick Mitchell Senior Consultant BSc (Hons) AMIOA	Tom Bonnert Senior Associate BEng(Hons), MIOA	
0	27/03/2024	-			
			Nick Mitchell Senior Consultant BSc (Hons) TechIOA	Michael Hartley Senior Consultant MEng (Hons), MIOA	Tom Bonnert Senior Associate BEng (Hons), MIOA



Condition Discharge Noise Impact Assessment Report Report 28499/NIA1

Contents	Page
1.0 Introduction	1
2.0 Planning Conditions	1
3.0 Acoustic Terminology	3
4.0 Site Description	3
5.0 Planning Policies, Standards & Guidance	5
6.0 Condition 21(a) Assessment	5
7.0 Condition 22(a) Assessment	21
8.0 Condition 23(a) Assessment	28
9.0 Conclusions	46

Attachments

Appendix A – Acoustic Terminology

Appendix B – Relevant Planning Policies and Guidance

Appendix C – Specifications and Other Data



1.0 Introduction

Hann Tucker Associates Limited (Hann Tucker) has been commissioned by CR Construction (U.K.) Company Limited to undertake noise assessments and prepare supplementary evidence to assist with the discharge of planning conditions 21(a), 22(a), and 23(a) for the development referred to as Victoria Riverside, Manchester.

Consent was granted in 2020 (Planning Reference 126944/FO/2020) for erection of a residential-led mixed use development comprising 3no. towers (37, 26 and 18 storeys) and podium levels (6 storey) to form 634 residential apartments and townhouse accommodation (Use Class C3) together with commercial accommodation (91222 sqm) (Use Classes A1,A2,A3,A4,A5,B1,D1 and D2); with associated residential amenity areas, refuse storage, plant (including substation), car parking, cycle storage, landscaping and new public realm including the re-instatement of Bromley Street and other associated works.

The decision notice included a number of conditions which relate to noise and this assessment has been prepared to support the discharge of these planning conditions. The planning conditions relate to the residential and commercial aspects of the proposed development.

The assessment draws upon the results of a baseline noise survey previously undertaken by ARUP to support the developed design stages with review of design elements to ensure each condition has been met. Supplementary minimum L_{90} octave band noise levels measured on Dantzic Street have been utilised for the control of limiting noise breakout to off-site receptors.

2.0 Planning Conditions

The Decision Notice associated with the planning application details several planning conditions. Planning conditions 21(a), 22(a), and 23(a) relate to noise prior to occupation and state the following:

Planning Condition 21(a)

“Notwithstanding the Chapter 12 Noise and Vibration, prepared by ARUP of the ES stamped as received by the City Council, as Local Planning Authority, on the 17 May 2020, (a) Prior to the first occupation of each phase of the development hereby approved (save for the enabling works phase), details of any externally mounted ancillary plant, equipment and servicing shall be submitted for approval in writing by the City Council, as Local Planning Authority. For the avoidance of doubt, externally mounted plant, equipment, and servicing shall be selected and/or acoustically treated



in accordance with a scheme designed so as to achieve a rating level of 5 dB (L_{Aeq}) below the typical background (L_{A90}) level at the nearest noise sensitive location."

Planning Condition 22(a)

"Notwithstanding the Chapter 12 Noise and Vibration, prepared by ARUP of the ES stamped as received by the City Council, as Local Planning Authority, on the 19 May 2020, prior to the first use of each the commercial units as indicated on drawing DAST-HBA-00-00-DR-A-PL20_0100 Rev P1 stamped as received by the City Council, as Local Planning Authority, on the 19 May 2020, a scheme of acoustic insulation for that commercial unit shall be submitted for approval in writing by the City Council, as Local Planning Authority."

Planning Condition 23(a)

"Notwithstanding the Chapter 12 Noise and Vibration, prepared by ARUP of the ES stamped as received by the City Council, as Local Planning Authority, on 19 May 2020, (a) prior to the first occupation of each phase of the development (save for the enabling works phase), a scheme for acoustically insulating the proposed residential accommodation within that phase of the development against noise from Dantzic Street, local traffic network and the adjacent railway/tram line shall be submitted for approval in writing by the City Council, as Local Planning Authority. The approved noise insulation scheme shall be completed before the first occupation of the phase of development.

Noise survey data must include measurements taken during a rush-hour period and night-time to determine the appropriate sound insulation measures necessary. The following noise criteria will be required to be achieved:

- *Bedrooms (night-time – 23:00 – 07:00 dB L_{Aeq} (individual noise events shall not exceed 45 dB L_{AFmax} by more than 15 times per night)*
- *Living rooms (daytime – 07:00 – 23:00) 35 dB L_{Aeq}*
- *Gardens and terraces (daytime) 55 dB L_{Aeq} (where practically possible)*

This technical report details design mitigation measures implemented before and during construction in order to reduce noise to within acceptable levels in accordance with relevant standards/guidance and conditions set by Manchester City Council (MCC).



3.0 Acoustic Terminology

For an explanation of the acoustic terminology used in this report please refer to Appendix A enclosed.

4.0 Site Description

4.1 Location

The site is located within Manchester City Centre. To the north and west of the site is bounded by Dantzic Street and Gould Street, the river Irk immediately beyond. Immediately to the south the site is bound by a stretch of railway lines running southeast to northwest, and to the east the site is boarded by the proposed North View development. The location is shown in the figure below.



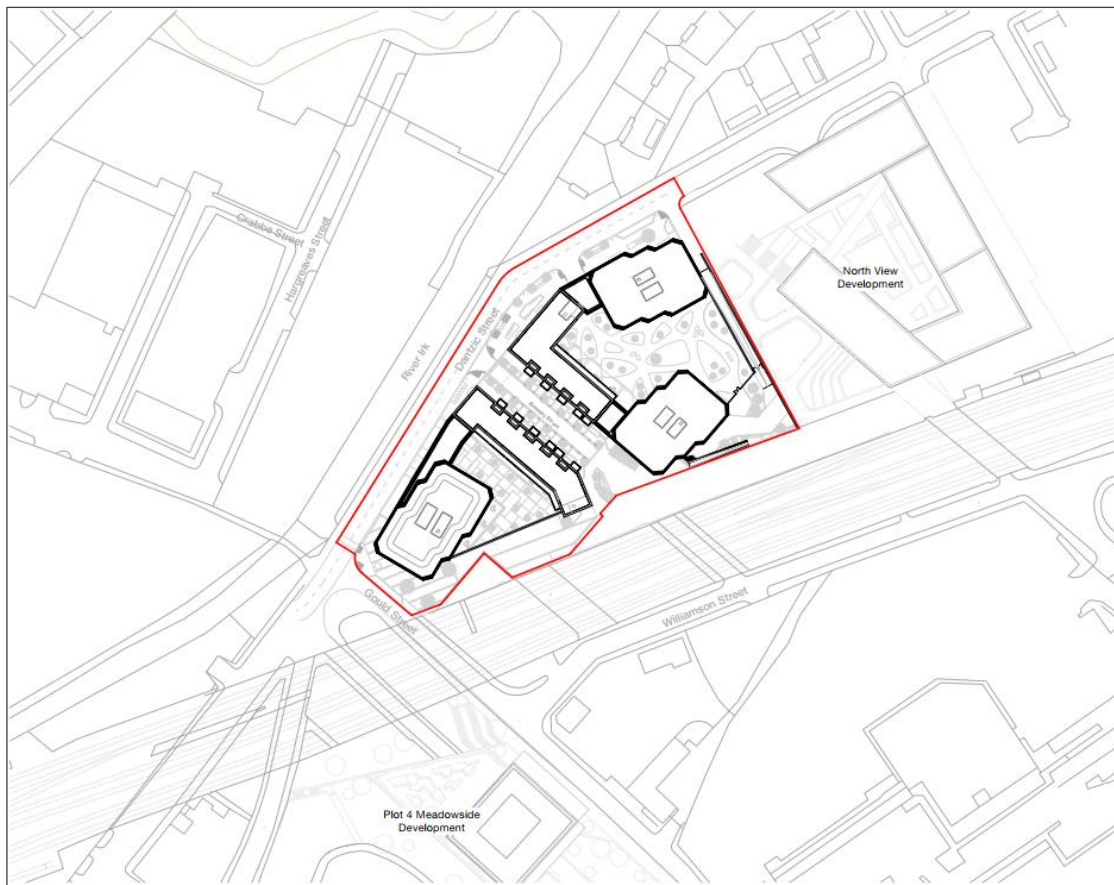


4.2 Proposed Development

The development includes the following elements:

- 3 no. towers (37, 29 and 18 storeys);
- 634 residential apartments and townhouse accommodation (Use Class C3);
- Commercial accommodation (Use Classes A1, A2, A3, A4, A5, B1, D1 and D2);
- Associated residential amenity areas;
- Refuse storage;
- Plant (including substation)
- Car parking and Cycle storage; and
- Landscaping

The figure below shows the proposed site layout. This assessment looks at aspects of the proposed development in regard to commercial and residential areas. These areas have been considered within the following assessment, in support of discharging planning conditions 22(a) and 23(a).



Drawing Reference: DAST-HBA-00-XX-DR-A-PL20_0002_P1 dated May 2020



5.0 Planning Policies, Standards & Guidance

5.1 Policies & Guides

In order to provide a suitable assessment a number of national planning policies have been considered, including:

- The National Planning Policy Framework (NPPF), 2023
- The Noise Policy Statement for England (NPSE), 2010
- Planning Practice Guidance – Noise (PPGN), 2019

The above documents highlight the importance of considering the potential noise effects on any new residential development and provide a qualitative approach to assessment. However, each of the above does not provide any quantitative guidance. As such, all guidance used to form a noise impact assessment is taken from various standards, guidance, and Local Authority requirements as summarised below:

- Local Planning Policy (Manchester City Council Planning and Noise Technical Guidance: 2015)
- Building Regulations' Approved Document E: 2003 Edition (ADE) with 2004, 2010, 2013 & 2015 amendments.
- British Standard BS 8233: 2014 'Guidance on sound insulation and noise reduction for buildings'.
- British Standard BS 4142:2014+A1:2019 'Methods for rating and assessing industrial and commercial sound'.

Detailed information for relevant planning policies and guidance can be found within Appendix B.

6.0 Condition 21(a) Assessment

6.1 Introduction

Condition 21(a) relates to noise from fixed building services plant and this section of the report sets out the desktop study regarding the noise egress from the proposed plant.

Communications with the Client and review of the Architect drawings detail a variety of fixed plant items in differing locations, including the following:

- 2no. plant rooms dedicated for substations.



- Mechanical extract ventilation for bin store areas, fan located internally and ducted to the façade;
- Heat Recovery units which serve ancillary rooms, fan located internally and ducted to the façade;
- Apartment MVHR systems ducted to the façade;
- Ground floor induction fans located within the car park, installed to ceiling points for smoke extraction in the event of fire emergency are located internally and disperse through air vents to the façade; and
- Roof mounted smoke extraction fans in the event of a fire emergency.

6.2 Project Criteria

6.2.1 External Plant Noise Emissions

Based on the planning requirements and the measured background noise levels documented in the Employers Requirements Report produced by ARUP (document reference: VRS-ARP-ZZ-ZZ-SP-D-00006_P01). The document sets limits at 5dB below the measured background sound level for nearby residential developments including North View (adjacent to the northwest boundary), and Angel Meadows (south).

Furthermore, Manchester City Council have requested that external plant, or plant ducted to atmosphere, be assessed to the Riverside development itself. **Please note this is not a standard approach and is typically not required for 'on-site' receptors as these are not existing established, and they typically include embedded mitigation in the façade design to allow windows to be left shut day to day.** The latter point is not often the case for existing and established off-site receptors, hence it is accepted that external plant noise limits 5dB below background be appropriate.

The following plant noise emission limits for the development and surrounding developments are to be achieved at 1 metre from noise sensitive windows, resultant from proposed plant operating cumulatively.

Location	BS 4142 Plant Noise Rating Limit, $L_{Ar, Tr}$ (dB)	
	Daytime (07:00 to 23:00)	Night-time (23:00 to 07:00)
Victoria Riverside Development (on-site receptors)	44	41
North View Development (off-site receptors)	44	41
Angel Meadows Development (off-site receptors)	48	38



In most areas the nearest noise sensitive receptors are likely to be apartment windows within the development sites. In such instances where an assessment to on-site receptors is being considered, the assessment has been conducted to the nearest adjacent “Block” of the development itself (refer to Section 6.3 for further details).

6.2.2 Emergency Plant

It is suggested that the noise level from any emergency plant is relaxed when compared to normal operating plant, to be no more than 10dB(A) greater than the existing background noise level at any proposed or existing residential receptor. The emergency criteria are therefore 10 dB above the measured background sound level and 15 dB above the normal operating plant limits, detailed below.

Location	BS 4142 Emergency Plant Noise Rating Limit, $L_{Ar, Tr}$ (dB)
	Daytime (07:00 to 23:00)
Victoria Riverside Development (on-site receptors)	59
North View Development (off-site receptors)	59
Angel Meadows Development (off-site receptors)	63

6.2.3 Tenant Requirements

A suitable form of words should be included in the tenant’s handbook making tenants responsible for controlling noise from their activities (including plant) to suitable levels. This ensures that future plant selections, the responsibility of future tenants, are suitably assessment and mitigated if necessary.

6.3 Noise Sensitive Receptors

Externally, the nearest noise sensitive receptors to proposed plant areas are the adjacent Tower Blocks which form part of the Victoria Riverside, Manchester development (Tower A, Tower B, and Tower C). Within this Report these can be regarded as “on-site” receptors.

The other off-site receptors that could be affected are the North View consented development (Receptor D) and Angel Meadows (Receptor E), though given their increased distance from the Riverside development are not considered to be the “worst affected” given that on-site receptors are being considered in this case.



The following image, presented overleaf, highlights the location of each of the noise sensitive receptors.



Satellite image highlighting the location of Receptor A to E (Map Data, Google Maxar Technologies © 2024)

6.4 Summary of Building Services Proposals

The following assessments will be split up into separate plant items and concluded with an assessment of cumulative noise impact assessment. The plant item categories are as follows:

- **Internally Mounted Plant (Ducted to Atmosphere)**
 - Mechanical Extract Fans (MEV) with in-duct attenuators
 - Mechanical Ventilation Heat Recovery (MVHR) Units to Apartments with acoustically lined flexi-duct
 - Heat Recovery Units (HRU) with in-duct attenuators at Tower B & C
- **Internally Mounted Plant (Not Ducted to Atmosphere)**
 - Heat Recovery Units (HRU) with in-duct attenuators at Tower A



- Induction Fans (smoke extraction in event of emergency)
- **Externally Mounted Plant**
 - Smoke Extract Fans on tower roofs

6.5 Plant Locations

Below details the summary of plant locations:

- The MEV fans are located within the ceiling voids at ground and first floor level which serve all the bin stores associated with Towers B & C and are ducted to the atmosphere.
- The Mechanical Ventilation Heat Recovery Fans are located within a dedicated utility room inside each dwelling type, and are wall mounted and ducted to the atmosphere.
- The HRUs are located in the ceiling void above ancillary offices including a Staff Office, Staff Room, Parcel Room, CCTV, and Accessible WC. The HRUs are ducted internally to the car park for Towers B & C.
- 6no. Ground floor induction fans located within the car park, installed to ceiling points for smoke extraction in the event of fire emergency are located internally and disperse through air vents to the façade; and
- Smoke Extract Fans are located on the roof of each Tower Block and will only activate upon emergency or for periodical testing during the daytime.

6.6 Mechanical Ventilation Heat Recovery Units (MVHRs)

6.6.1 Introduction

We understand that Nuaire Units have been installed for each of the Apartment Types.

The octave band sound power level data for the above units at the design flow rates are provided in Appendix D and have been used to inform our assessment.

Our assessment considers typical 1, 2, 3-bedroom apartment types, along with 2-storey and 3-storey dwellings as per the Briggs & Forrester layouts.

The TM59 overheating assessment resulted in the northwest facing 3-bedroom apartment types (unit ref: 3B4P-A) to require 100% duty, all other dwelling types include an overheating setting which run between 72-82% duty. Therefore, the assessment considers the plots running at their maximum duty (ie overheating) to consider a worst-case scenario of noise egress.

6.6.2 MVHR Noise Data

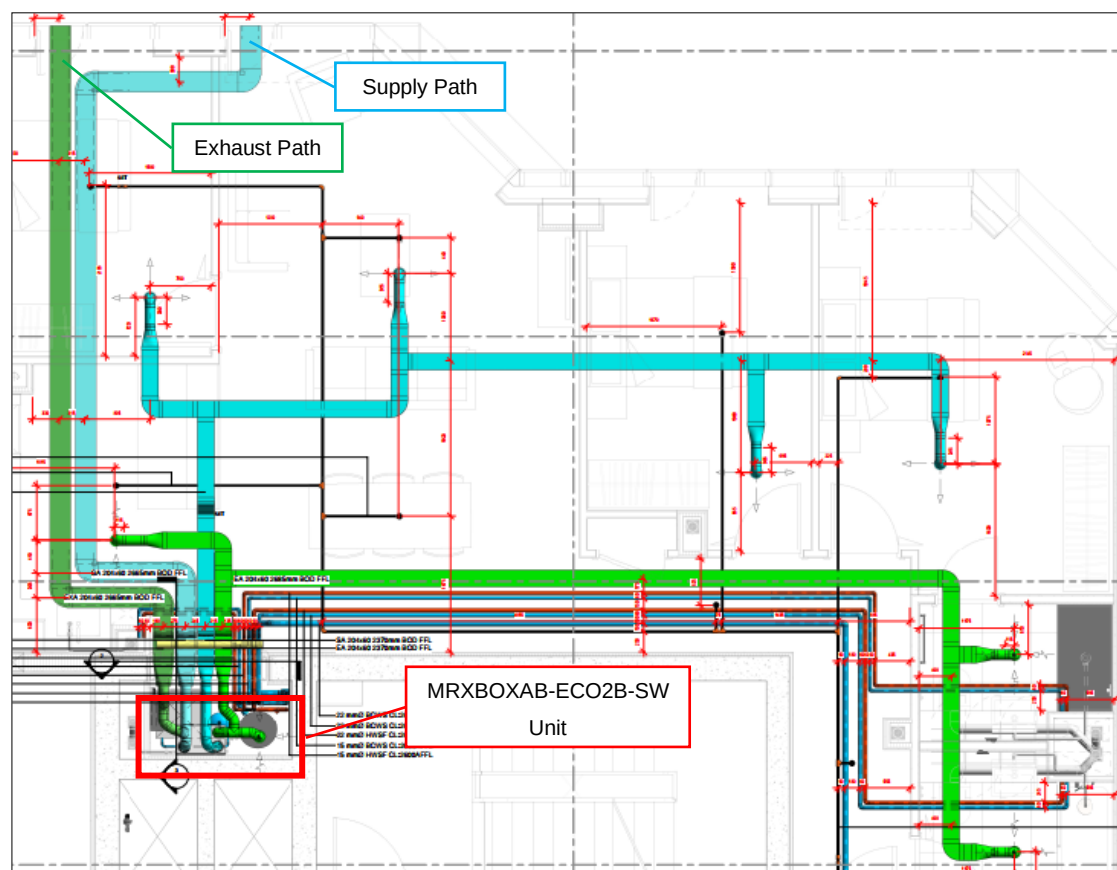
Each MVHR will be fitted with acoustic flexi-duct with an active length of 0.5m when installed to the atmospheric side of each unit. The attenuating performance is detailed in the table below.

Length	Insertions Loss (dB), IL @ Octave Band Centre Frequency (Hz)							
	63	125	250	500	1000	2000	4000	8000
500 mm	6	7	15	20	20	26	17	13

Titon Semi-Flexi Duct – 125mm diameter – 500mm length section

6.6.3 MVHR Locations

The following plans highlight the duct path for a 3-bedroom apartment.



Typical 3-bed apartment ventilation layout plan

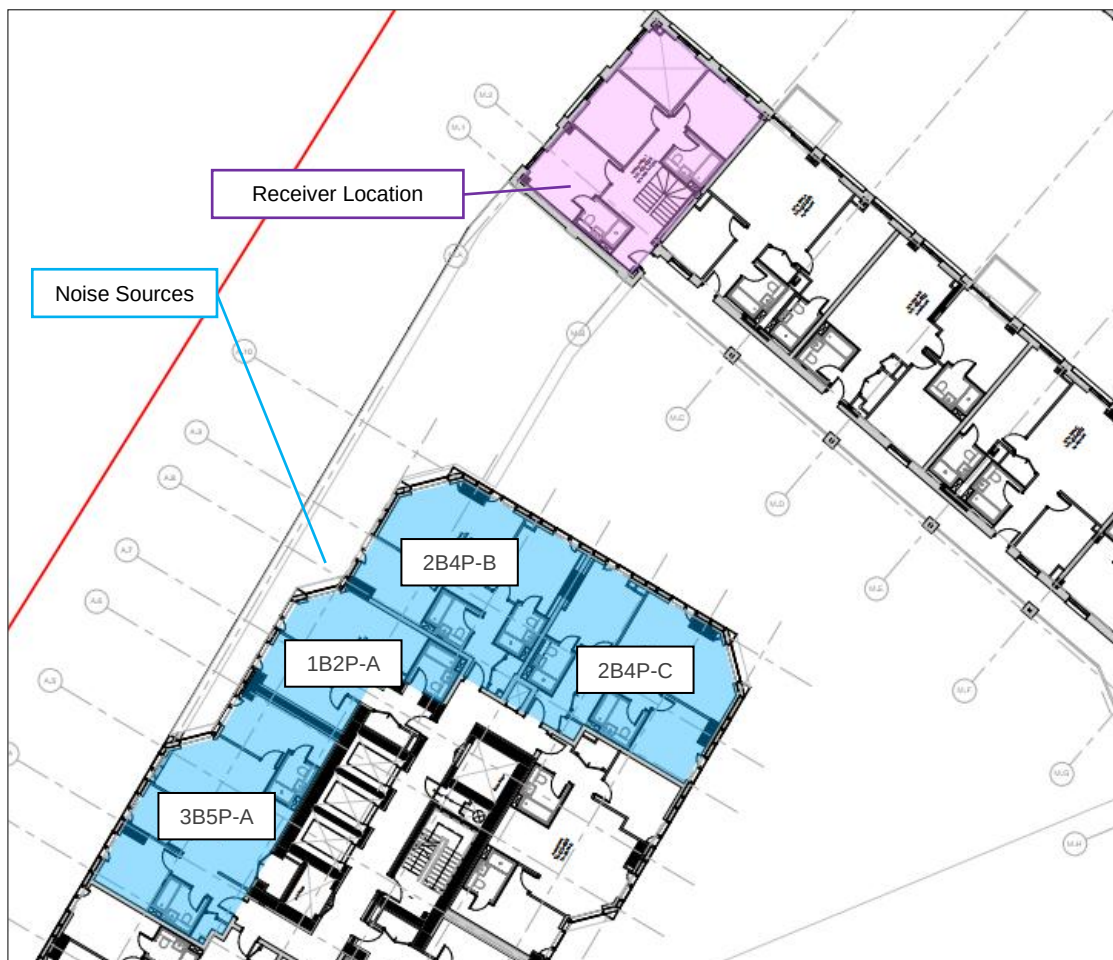
The worst affected source to receptor location has been identified as Tower A to Podium A. The calculation takes into account the cumulative impact of intake and exhaust points from the following apartment types across 8No. floors to a singular receptor point:

- 4no. intake & 4no. exhausts associated with 3B5P-A to Maisonette 5
- 4no. intake & 4no. exhausts associated with 1B2P-A to Maisonette 5



- 4no. intake & 4no. exhausts associated with 2B4P-B to Maisonette 5
- 4no. intake & 4no. exhausts associated with 2B4P-C to Maisonette 5

The total number of intake & exhaust points calculated is 32No, and considers the 8no floor levels above, as it has been calculated that any other MVHR units are located far enough away, and/or are screened, to the source and receptor locations noted above. The following plans, presented overleaf, highlight the location of the 3-bed, 2-bed and 1-bed apartments on Tower A with regards to Podium A receptor.



6.6.4 MVHR Assessment

It is assumed that the units could operate at any time of the day or night-time. Therefore, the assessment considers the impact against the most stringent criteria during the night-time period, as presented in Section 6.2.1.

It should be noted that the proposed plant is not anticipated to exhibit any tonal or impulsive characteristics provided it is well maintained.



The following table summarise our predictions of atmospheric noise emissions from each of the MVHRs at the receptor.

Apartment Ref	Podium A – Maisonette 5 Predicted SPL at 1m from each Receptor	
	Intake	Exhaust
3B5P-A	4	15
2B4P-B	1	17
2B4P-C	6	19
1B4P-A	4	15
Cumulative of all apartments across 1no. floor	10	23
Cumulative of all apartments across 8no. floor levels	19	32
Overall Cumulative Impact	32	

As indicated in the table above, plant noise emissions from the proposed units with the corresponding acoustic flexi duct should be compliant with the limits at the worst affected noise sensitive receptors.

6.7 Mechanical Extract Ventilation (MEV) Assessment

6.7.1 Introduction

Extract ventilation is proposed on ground floor within the bin store areas of Tower A and Tower C. It is noted that Tower C extract also serves the Tower B bins.

6.7.2 Mechanical Extract Fan Proposals

We understand that the proposed extract fans are as follows:

Unit Ref	Plant Description	Location	Plant Make/Model	Serving	Nearest Noise Sensitive Receptor
MEV-A-01	Extract Ventilation	Ground Floor (Level 00)	Elta Fans SH150-1LC	Podium A Refuse Bin Store	Tower A Maisonette 5
MEV-A-02	Extract Ventilation	Ground Floor (Level 00)	Elta Fans SLC450-1EC	Tower A Refuse Bin Store	Tower A Maisonette 5
MEV-B-01	Extract Ventilation	First Floor (Level 01)	Elta Fans SH250-1LC	Tower B Refuse Bin Store	Apartment TB-02-001



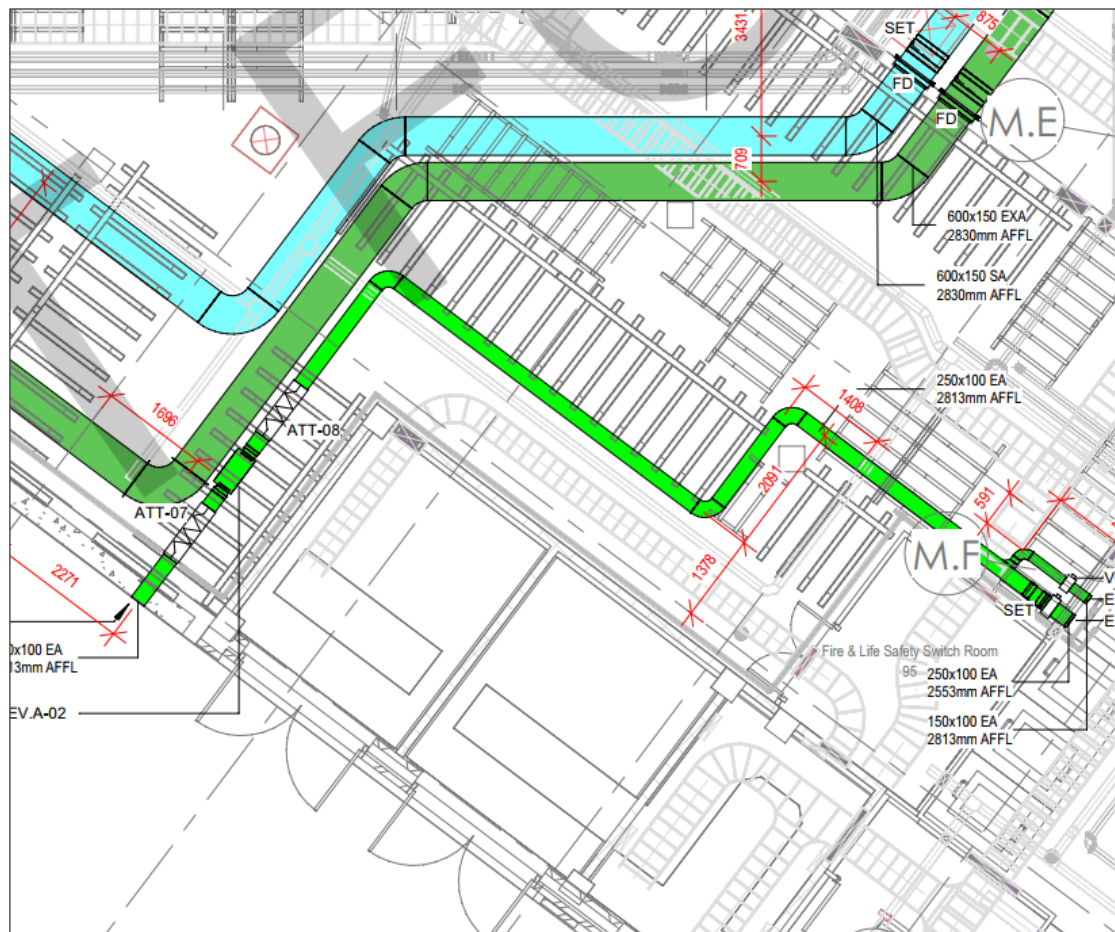
Unit Ref	Plant Description	Location	Plant Make/Model	Serving	Nearest Noise Sensitive Receptor
MEV-C-01	Extract Ventilation	Ground Floor (Level 00)	Elta Fans SH315-1LC	Tower C Refuse Bin Store	Apartment TC-01-001
MEV-C-02	Extract Ventilation	Ground Floor (Level 00)	Elta Fans SH200-1LC	Podium B Refuse Bin Store	Apartment TC-01-001

6.7.3 Extract Fan Noise Data

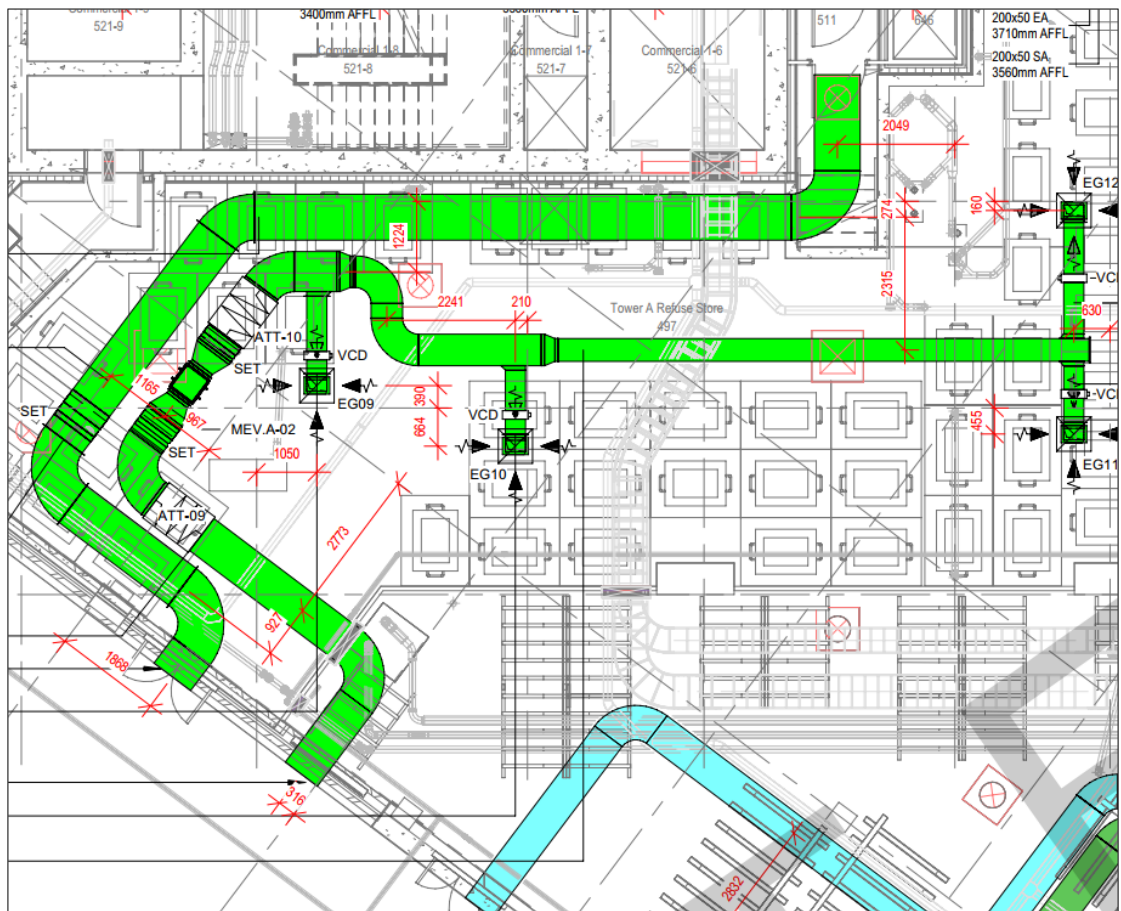
Octave band noise data for each extract fan is provided in Appendix D. Each extract fan will be fitted with attenuators and the performance of each attenuator proposed is also provided in Appendix D.

6.7.4 Extract Fan Locations

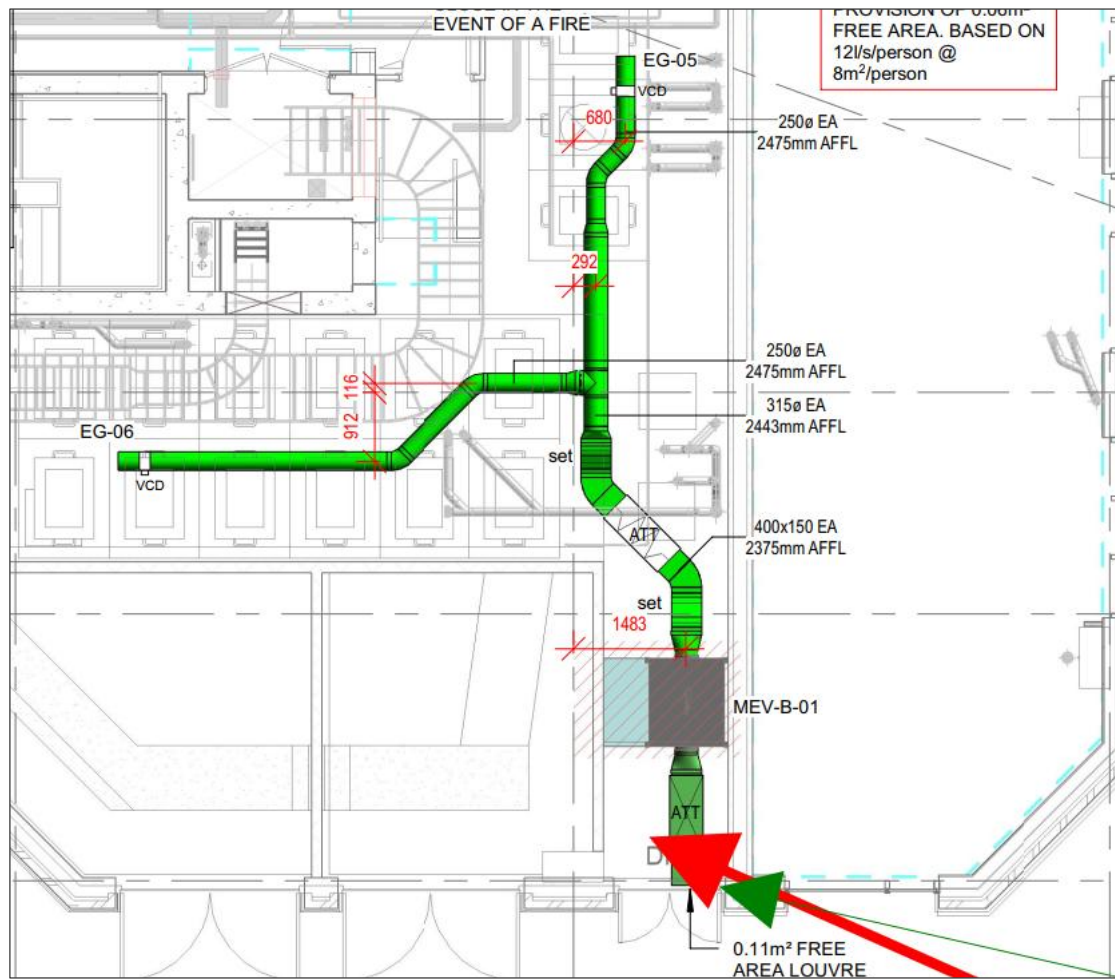
The following plans highlight the location of each of the proposed extract fans:



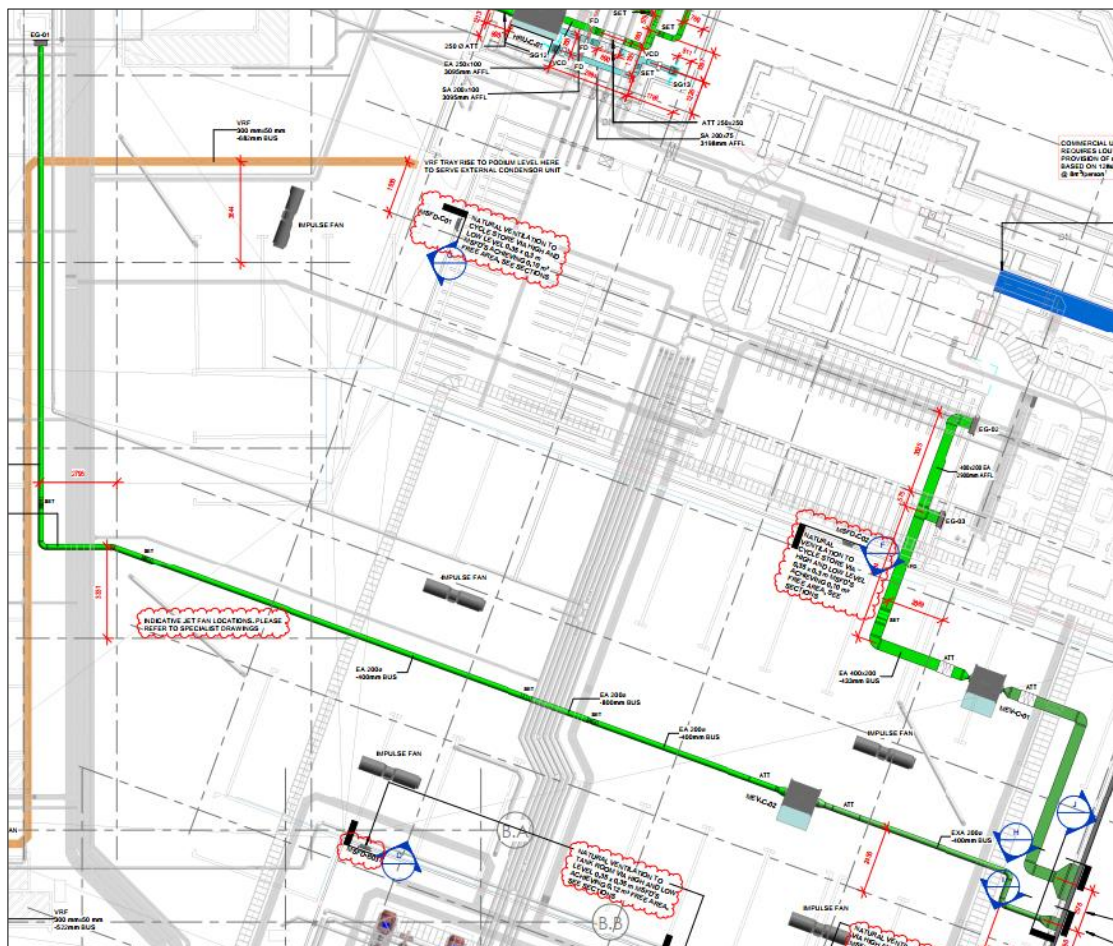
Tower A (MEV-A.01) Document Ref: VRS-BFL-Z2-GF-DR-M-57-1400_C04



Tower A (MEV-A.02) Document Ref: VRS-BFL-Z2-GF-DR-M-57-1400_C04



Tower B (MEV-B.01) Document Ref: VRS-BFL-Z2-01-DR-M-57-1501_C04



Tower C (MEV-C.01 & MEV-C.02) Document Ref: VRS-BFL-ZZ-GF-DR-M-57-1500_C05

6.7.5 Mechanical Extract Fan Assessment (Including Proposed Attenuation)

We understand that the proposed extract fans could operate 24/7, and so a night-time assessment is necessary.

It should be noted that the proposed plant is not anticipated to exhibit any tonal or impulsive characteristics provided it is well maintained.

Worst-case plant noise emission levels from the proposed extract fans are detailed in the table below. It should be noted that for the sake of brevity, the results from more favourable receptors, i.e. where the extract fans are significantly below the requirements, have not been noted as a

‘-’.



MEV Ref	Predicted SPL at 1m from each Receptor		
	Tower A Maisonette 5	Tower B Apartment TB-02-001	Tower C Apartment TC-01-001
MEV-A-01	9	-	-
MEV-A-02	19	-	-
MEV-B-01	-	39	-
MEV-C-01	-	-	36
MEV-C-02	-	-	15
Cumulative	19	39	36

As indicated in the table above, plant noise emissions from the proposed extract fans and corresponding attenuators should be compliant with the limits at each of the nearest noise sensitive receptors.

6.8 Heat Recovery Units (HRUs) Including Proposed Attenuation

6.8.1 HRU Proposals

We understand that the proposed extract fans are as follows:

Unit Ref	Plant Description	Location	Plant Make/Model	Serving	Nearest Noise Sensitive Receptor
HRU-A-01	Heat Recovery Unit	Tower A Ground Floor	Elta Fans HRH 40	Water Tank Room	Tower A Maisonette 02
HRU-A-02	Heat Recovery Unit	Tower A Ground Floor	Elta Fans HRH 15	Office, Staff room, CCTV, Acc W/C	Tower A Apartment TA-03-002
HRU-C-01	Heat Recovery Unit	Tower C Ground Floor	Elta Fans HRH 05	Staff room, Staff office, Parcel room, Acc W/C	Tower C Apartment TC-02-001

6.8.2 HRU Assessment

It is uncertain the operation times, however, it is assumed that the HRUs could operate 24/7 and so a night-time assessment is necessary.

It should be noted that the proposed plant is not anticipated to exhibit any tonal or impulsive characteristics provided it is well maintained.

The following tables summarise our predictions of atmospheric noise emissions from each of the HRU's to each affected receptor. It should be noted that for the sake of brevity, the results from more favourable receptors, i.e. where the fans are significantly below the requirements, have not been noted as a '-'.



HRU Ref	Predicted SPL at 1m from each Receptor		
	Tower A Maisonette 02	Tower A Apartment TA-03-002	Podium B Townhouse 9 M2-01-004
HRU-A-01 – Supply	19	-	-
HRU-A-01 – Extract	< 5	-	-
HRU-A-02 – Supply	-	6	-
HRU-A-02 – Extract	-	< 5	-
HRU-C-01 – Supply	-	-	12
HRU-C-01 – Extract	-	-	< 5
Cumulative	19	6	12

As indicated in the table above, plant noise emissions from the proposed units with the corresponding attenuators should be compliant with the limits at each of the nearest noise sensitive receptors.

6.9 Induction Ventilation Assessment (Car Park Extraction)

6.9.1 Induction Fan Proposals

It is proposed to install ceiling mounted fan units at 6No. locations spread around the car park in the event of a fire emergency

We understand that the proposed induction fan units are as follows:

Element Ref	Plant Description	Location	Plant Make/Model	Serving	Nearest Noise Sensitive Receptor
Induction Fan	Induction fans for circulating and dissipating vehicle exhaust fumes	Ground Floor Car Park	Nuaire SVTC-50T8	Ground Floor Car Park	Tower C

6.9.2 Induction Fan Noise Data

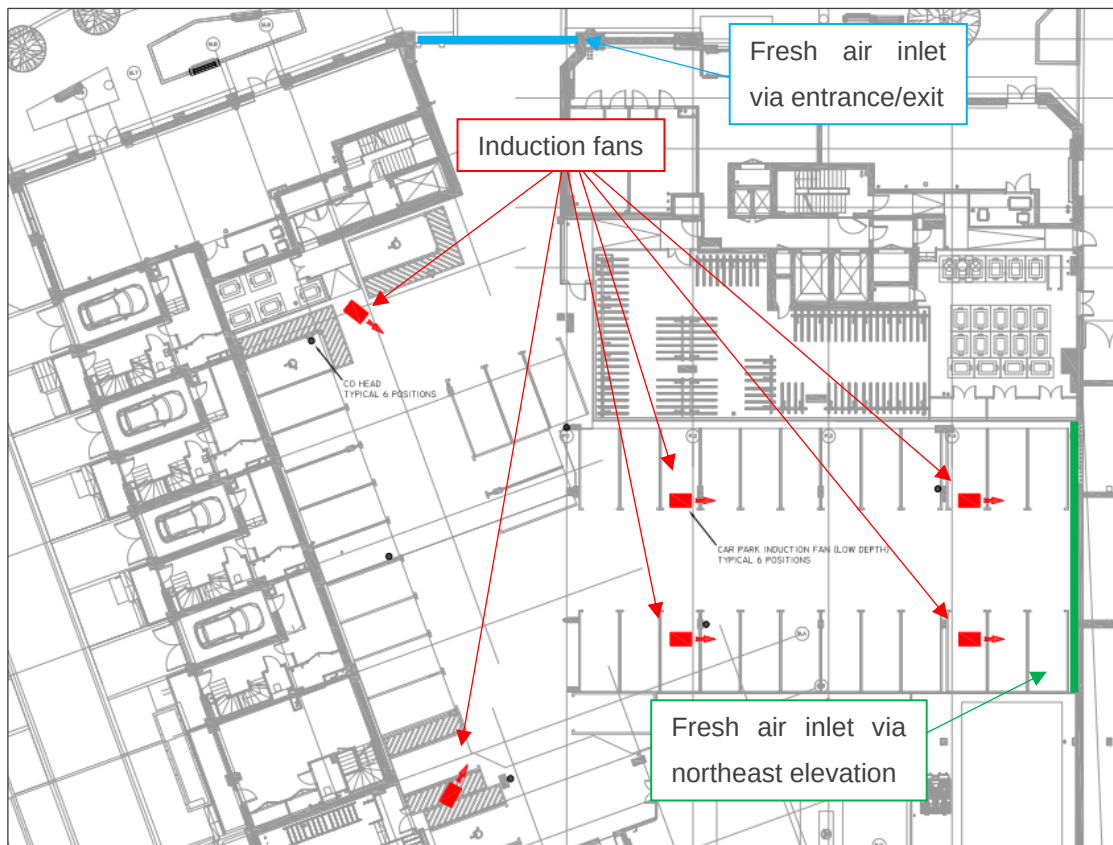
Noise data for the proposed units, as provided by the manufacturer is provided in the table below.

Unit Ref	Sound power levels L_w (dB) in octave band frequencies (Hz)							
	63	125	250	500	1000	2000	4000	8000
SVTC-50T8 (Breakout)	79	95	89	89	87	83	80	72
SVTC-50T8 (Breakout at low speed)	74	78	75	79	73	70	59	51



6.9.3 Induction Fan Locations

The following plans highlight the location of each of the proposed induction fans within the car park at ground floor.



Drawing Reference: 6779-011_Briggs & Forrester-Car Park Layout

6.10 Emergency Induction Fan Assessment

The induction fans will operate in the event of a fire emergency only, and for testing during typical daytime hours.

It should be noted that the proposed plant is located internally and is not anticipated to exhibit any tonal or impulsive characteristics provided the distance between source and façade exit points.

The assessment considers both speeds as displayed in Section 6.9.2. The assessment considers the worst affected area at the northeastern elevation. The nearest receptor is to an on-site window at Level 02 of Tower C. The 2no. nearest fans to the elevation are driving the assessment as those further away have been found to have negligible input to the overall noise level.



The following tables summarise our predictions of atmospheric noise emissions from the façade to each affected receptor (Tower C, and North View).

Unit Ref	Predicted SPL at 1m from each Receptor				
	Receptor A	Receptor B	Receptor C	Receptor D	Receptor E
SVTC-50T8 (Breakout)	N/A	N/A	67 See below	56	N/A
SVTC-50T8 (Breakout at low speed)	N/A	N/A	53	44	N/A

As indicated in the table above, it is calculated that the breakout level at Receptor C could be 8 dB above the emergency plant limits. However, it should be noted that this exceedance is when the fans are operating on their highest mode of operation, expected to occur during the event of a fire. In such instances, emergency operation, the imposition of a plant limit is not considered appropriate and therefore the limit would not apply to the development itself.

6.11 Emergency Smoke Extraction Fans Noise Data (Roof)

The life-safety smoke extraction fans are proposed at roof of Tower A, Tower B, and Tower C. Manufacturer noise data detail sound power levels for outlet and breakout for each system, detailed in the table below.

Description	Sound Power Level L_w (dB) Octave Band Centre Frequency (Hz)							
	63	125	250	500	1k	2k	4k	8k
Tower A Smoke Extract Duty Fan – Induct Outlet	107	113	110	104	99	90	85	79
Tower A Smoke Extract Standby Fan – Breakout	83	91	95	79	71	72	67	54
Tower B Smoke Extract Duty Fan – Induct Outlet	103	108	113	109	104	97	89	81
Tower B Smoke Extract Standby Fan – Induct Breakout	80	85	96	83	75	78	70	55
Tower C Smoke Extract Duty Fan – Induct Outlet	105	115	109	105	98	90	83	77
Tower C Smoke Extract Standby Fan – Induct Breakout	81	92	94	80	70	72	65	52



Noise levels have been calculated to the adjacent Tower Blocks. The following scenarios have been assessed:

- Tower A to B;
- Tower B to A;
- Tower B to C; and
- Tower C to B.

Smoke Extraction Unit	Predicted SPL at 1m from each Receptor			
	Tower A to B	Tower B to A	Tower B to C	Tower C to B
Induct Outlet	39	51	58	47
Breakout	29	43	51	33
Cumulative	39	52	59	47

6.12 Summary of Condition 21(a) Assessment

Based on the above, it has considered to have been demonstrated that Condition 21(a) be discharged from the Planning Application Decision Notice (ref: 126944/FO/2020).

7.0 Condition 22(a) Assessment

7.1 Introduction

As part of Condition 22(a) discharge for the scheme, MCC have requested that an assessment of noise transfer between retail units to apartments adjacent/above, and noise breakout to the street, is sufficiently controlled by the separating construction elements.

7.2 Proposed Development

The proposed development is to include commercial units at the Proposed Ground Floor Level. The proposed units include mezzanine floors that sit adjacent to Townhouses/Apartments via separating walls and sit below proposed Apartments at Level 02 throughout each block.

The location of the commercial units as indicated on drawing *DAST-HBA-00-00-DR-A-PL20_0100 Rev P1* are detailed below.



7.3 Standards and Guidance

7.3.1 Manchester City Council (MCC) Planning and Noise Technical Guide:2022

Manchester City Council (MCC) state the following for mixed use developments:

“Where a planning application includes a proposal to contain a potentially noisy development within the same building as a noise sensitive use or vice versa the noise survey should consider the transfer of noise between the noisy and noise sensitive uses...”

Consultants should demonstrate that the structure of the development will be sufficient to adequately contain the noise generated within the development. In doing so the consultants should consider:

- *Flanking noise;*



- *Structure borne noise;*
- *The overall level of noise (L_{Aeq}) generated by the use in question and any tonal or impulsive characteristics that the noise may contain; and*
- *The acoustic properties of the development (including the construction of party floors and/or walls, windows, and doors, ventilation systems, and structural columns.)*

It is unknown at this stage what the proposed use types will be, therefore, an assessment of a sample 'unit shell' has been undertaken herein to provide limiting noise levels for the commercial units based on the proposed construction between party floors and/or walls.

Given that industry standards effectively dictate background noise levels within the residential dwellings, it is considered that there are two potential methods in controlling noise transfer between these particular spaces – i.e., ensuring appropriate sound insulation performance of the separating structure and/or limiting source noise levels within the commercial/amenity units.

7.4 Sound Insulation Between Residential and Non-Residential Areas

7.4.1 Separating Walls

Commercial units 3, 4 and 5 sit adjacent to habitable areas within the Townhouses and Apartments at Level 01.

The proposed separating walls between commercial and residential spaces include wall types referenced WT-04, WT-06, WT-08 and WT-11. All these proposed constructions are masonry walls with 100mm block either side of a varying cavity between 85mm to 160mm in width (see drawing VRS-HBA-00-XX-DR-A-22-0400_Rev C3). The cavity is to be infilled with dense Rockwool with the overall performance capable of exceeding $50 \text{ dB } D_{nT,w} + C_{tr}$.

7.4.2 Separating Floors

Commercial units 3, 4, 5, 6 and 7 sit below habitable areas adjacent to the Townhouses and Apartments at Level 01 and Level 02.

It is understood that the minimum installed floor slab is 225mm between commercial and residential, increased to 250mm in other areas between commercial and residential (min density 1850 kg/m^3). Empirical test data for a 203.2mm concrete slab has been utilised for the assessment. Furthermore, empirical test data for 225mm thick concrete slabs and no ceilings, undertaken by Hann Tucker, would be expected to achieve at least $50 \text{ dB } D_{nT,w} + C_{tr}$ when tested in-situ.



The transmission loss data is presented in the table below.

Laboratory Tested Element	Sound Reduction Index (SRI) Octave Band Centre Frequency (Hz)						
	63	125	250	500	1k	2k	4k
203.5mm concrete slab	35	39	45	54	60	65	71

7.4.3 Noise Transmission Assessment

The Decision Notice (ref: 126944/FO/2020), Condition 30 states the following regarding opening hours for the commercial units:

30) The commercial units hereby approved, as indicated on drawing DAST-HBA-00-00-DR-A-PL20_0100 Rev P1 stamped as received by the City Council, as Local Planning Authority, on the 19 May 2020, shall not be open outside the following hours:

Monday to Saturday 08.00hrs – 23.hrs

Sundays 09.00hrs – 23.00 hrs

Based on MCC guidance, octave band noise levels in the 63 Hz and 125 Hz octave centre frequency bands (L_{eq}) are suggested to be controlled not to exceed (in bedrooms) 47 dB and 41 dB, respectively. In our experience, it is also appropriate to set limits for all other frequencies based on achieving a daytime criteria of NR 20 $L_{eq,5min}$ (i.e. 5 dB below typical NR25 criteria for bedrooms/living rooms during daytime operations). These limits would apply any time commercial units are operational during daytime periods.

The methodology adopted to determine the acoustic transmission of airborne sound insulation between the proposed commercial units and the adjacent residential areas, takes into account the area of each separation element together with each relevant flanking element and correspondent rooms volumes in line with BS EN ISO 16283-1:2014. The method can be briefly described as follows:

Determination of global noise levels within each relevant space in line with the following equation:

$$R_r = L_1 - L_2 + 10 \log \left(\frac{S_s}{A} \right)$$

Where:

- a) L_1 is the average sound pressure level in the source room, in decibels;
- b) L_2 is the average sound pressure level in the receiving room, in



decibels;

- c) A is the equivalent sound absorption area in the receiving room, in square meters; and
- d) S_s is the area of the separating element, in square meters.

Assessment of Separating Floors/Walls Between Residential and Non-Residential Areas

The wall specifications have been modelled in Industry Standard Acoustic Modelling Software *INSUL™ version 10.0.2 – Marshall Day Acoustics Ltd.* The airborne sound insulation performance of the weakest construction (i.e. smallest cavity) is predicted to achieve ca. 61dB $R_w + C_{tr}$. Furthermore, the Robust Details Handbook provide similar types of construction for twin masonry walls, providing a range of performances between $D_{nT, w} + C_{tr}$ 47 – 60 dB when tested on-site.

An assessment of the weakest element (separating floor) has been undertaken to provide a maximum limiting level for the commercial units. The table presented below outlines the summary calculations for the maximum operational noise levels. It is noted that the adopted MCC criteria is to achieve a level of 5 dB below background within the apartment, and we have presented daytime limiting levels, in line with Condition 30 of the Decision Notice.

Assessment to Residential Receptor	Octave Band Centre Frequency (Hz)						
	63	125	250	500	1k	2k	4k
NR20 criteria	47 ^[1]	41 ^[1]	31	24	20	17	14
Receiver room reverberation time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Sound reduction of separating floor (dB) <i>SRI</i>	-35	-39	-45	-54	-60	-65	-71
Maximum Internal noise level (dB L _{eq}) <i>SPL_{in}</i>	80	77	74	76	78	79	83

¹ Based upon threshold of audibility, see Section 7.4.3.

The maximum limiting level in the commercial units therefore must meet the octave band criteria as detailed above, resulting in a maximum overall internal sound pressure level of 87 dBA.

It should be noted that the sound reduction performance of a 203.2mm solid concrete slab has been utilised in the absence of laboratory test data for 225mm concrete slab. Hann Tucker performed airborne sound insulation testing between the proposed residential amenity and apartment within Tower C. The results provided were $D_{nT, w} + C_{tr}$ 57 dB, so it is likely the above results are robust with some margin for increase through tenant specific assessment.



7.5 External Noise Breakout Assessment to Off-Site Residential Areas

To inform our assessment of the spaces regarding noise break-out, we have drawn upon the calculated maximum operational noise levels to control noise transfer via floors/walls of the development itself.

MCC recommends that noise (L_{eq}) breaking out through the building frontage of any commercial venue should not exceed 5 dB below the background noise level (L_{90}) at all octave band frequencies at the nearest noise sensitive windows. For this development, the nearest proposed receptor boundary is 5m to the north of the site (North View Development).

We therefore propose the following noise limits when measured at 1m from nearby noise sensitive windows. These limits are 5 dB below the typical lowest background noise levels at each octave band during the operational hours.

Description	Entertainment Noise Level Limit (dB $L_{90,15min}$) at Octave Band Centre Frequency (Hz)						
	63	125	250	500	1k	2k	4k
Daytime (07:00 – 23:00)	48	41 ^[1]	38	37	39	32	23

¹ Based upon threshold of audibility, see Section 7.4.3.

Test data from Guardian Glass has been provided. Calculations have been undertaken using the proposed podium glass and SFS external façade data to demonstrate the ability to comply with the criteria.

The assessment of noise breakout to the nearest receptors based on standard calculation procedures for reverberant noise breakout and source noise levels as previously mentioned. The resultant external noise level has been calculated using the following equation detailed below.

$$SPL_{out} = SPL_{in} - SRI + 10 \log_{10} \left(\frac{S}{r^2} \right) - 14$$

Where:

- a) SRI is the estimated sound reduction performance of the façade element.
- b) r is the distance from radiating element to receptors.
- c) S is the approximate surface area of radiating element.



The tables presented below outline summary calculations for the different operational noise levels assumed. Daytime criterion has been used to ensure a worst-case assessment of minimum glazing performances required.

Assessment to Residential Receptor	Octave Band Centre Frequency (Hz)						
	63	125	250	500	1k	2k	4k
Maximum Internal noise level (dB L _{eq}) <i>SPL_{in}</i>	80	77	74	76	78	79	83
Composite sound reduction of glazing elements (dB) <i>SRI</i>	-22	-32	-40	-42	-40	-49	-58
Distance & radiating area propagation correction (dB) $10\log_{10}\left(\frac{S}{r^2}\right)$	-13	-13	-13	-13	-13	-13	-13
Internal diffuse field to external free-field hemispherical radiation correction (dB) <i>-14</i>	-14	-14	-14	-14	-14	-14	-14
External noise level at nearest receptor (dB L _{eq}) <i>SPL_{out}</i>	45	32	21	21	25	17	12
Criteria at nearest receptor (dB L _{eq})	48	41 ^[1]	32	31	30	22	15
Noise Impact at Receptor (dB)	-3	-9	-11	-10	-5	-5	-3

¹ Based upon threshold of audibility, see Section 7.4.3.

7.6 Commercial Noise Levels – Comparison of Calculated vs Typical

The table below sets out typical highest L_{Aeq,1hour} measured noise levels from a number of different commercial space uses to allow a comparison against the maximum internal noise limits (ref Sections 7.4 and 7.5) calculated for the units in “shell” form.

Description	Reverberant Noise Level (dB L _{Aeq,1hr}) at Octave Band Centre Frequency (Hz)							dBA
	63	125	250	500	1k	2k	4k	
Calculated Maximum Internal noise level (dB L _{eq})	80	77	74	76	78	79	83	80
Commercial Retail unit with low background music	59	62	59	59	57	53	55	62
Restaurant with no music	61	63	63	66	62	59	58	68
Restaurant with background music playing:	68	67	70	73	72	67	63	76
Typical internal noise levels in a bar with background music playing:	71	74	75	75	72	68	63	77

As can be seen above, there maximum operation noise limits are in excess of the typical operational noise levels for the different potential commercial units, with the exception of 1dB shortfall at 250 Hz if operated as bar with music. Notwithstanding, it would be expected that tenants be responsible for upgrades to the units should they operate at higher levels of noise.



It should be noted that our assessment presented above has been undertaken with consideration to daytime operation, in line with the operational hours detailed in Condition 30 of the Decision Notice. Ultimately, the above demonstrates the proposed external façade systems, and party wall/floor build-ups, are commensurate with sufficient control of noise break-out from commercial units to nearby receptors.

Based on the above, it has been demonstrated that Condition 22(a) be discharged from the Planning Application Decision Notice (ref: 126944/FO/2020).

8.0 Condition 23(a) Assessment

8.1 Introduction

As part of the condition discharge for the scheme, Manchester City Council (MCC) have requested that an assessment of the sound insulation scheme of external noise ingress be assessed in accordance with the criteria as per the Condition as stated in Section 2.0.

Furthermore, MCC have requested assessment of plant room noise transfer from ground floor to apartments above. It is noted from the drawings that there is a dedicated substation room that serves each tower. Assessment of noise transfer has been included considering the noise data from substation, construction build up from the dedicated plant room and room dimensions for source and receiver rooms.

8.1.1 Planning Input – ARUP (ref: Chapter 12.4 – Site suitability assessment, Section A7.3.2)

The ARUP assessment provided early input advice during the planning application for the scheme based on typical values for apartment dimensions and façade areas when calculating noise intrusion into different rooms. The assessment considered 35% glazed façade when viewed from the outside, with performance ratings detailed below.

Performance option	<u>Minimum sound reduction performance</u>		
	Glazing	Opaque Section	Total (composite)
Standard	$R_w + C_{tr} \geq 34$ $R \geq 20 @ 63 \text{ Hz}$	$R_w + C_{tr} \geq 42$ $R \geq 25 @ 63 \text{ Hz}$	$R_w + C_{tr} \geq 38$ $R \geq 22 @ 63 \text{ Hz}$
Enhanced	$R_w + C_{tr} \geq 29$	$R_w + C_{tr} \geq 35$	$R_w + C_{tr} \geq 32$



8.1.2 Design Stage Input – Hann Tucker Associates (ref: 28499-PMT2-Rev0-TVB Window and External Door Review)

The planning stage specifications were preliminary, providing only broadband specifications to demonstrate the suitability of the scheme for residential use. More detailed and accurate octave band calculations were undertaken by Hann Tucker Associates at design/construction stage to determine more refined specifications for tender and are defined in the table overleaf.

Type		Sound Reduction Index (dB) at Octave Band Centre Frequency (Hz)							Overall (dB) $R_w + C_{tr}$
		63	125	250	500	1k	2k	4k	
Standard	Orange	20	24	21	28	36	38	31	29
Enhanced	Blue	22*	26	27	36	45	46	53	34

*In line with the ARUP Planning Report low frequency requirement

A review of the proposed glazing markups detailed that the elevation drawings have been undertaken (ref: VRS-HBA-XX-XX-DR-A-31_0204-Rev C3).

Hann Tucker has reviewed and confirm that the uplifted locations for glazing has been implemented into the pre-completion design. The following images illustrate the extent of the above Glazing Type Zones determined during the design stage input on the scheme.



1 External Window Types - Bromley Street Facing Tower A

1:100





8.2 Windows and Door Test Data

8.2.1 Windows

We have rereviewed 3No DELTA Test Reports that provide the measured laboratory sound reduction indices for the proposed window configurations. These are as follows:

- Futura+ outward opening window with a 6-14-4-16-4mm argon-filled insulating glass unit
- Futura+ outward opening window with a 6-12-4-14-8.8(SI)mm argon-filled insulating glass unit
- Futura+ outward opening window with an 8.8(SI)-10-6-10-8.8(SI)mm argon-filled insulating glass unit.

Glazing Configuration	Measured Sound Reduction Index (dB) at Octave Band Centre Frequency (Hz)							Overall (dB) $R_w + C_{tr}$
	63	125	250	500	1k	2k	4k	
6-14-4-16-4mm	24	20	25	34	42	40	39	31
6-12-4-14-8.8(SI)mm	25	20	30	39	45	44	49	33
8.8(SI)-10-6-10-8.8(SI)mm	25	25	32	41	45	48	54	37

8.2.2 Doors

We have reviewed a set of test data for IC-Sliding doors with various glazing confirmations installed. The data that is relevant to this assessment is summarised below.

Glazing Configuration	Measured Sound Reduction Index (dB) at Octave Band Centre Frequency (Hz)							Overall (dB) $R_w + C_{tr}$
	63	125	250	500	1k	2k	4k	
4-16-4-16-8.8mm	24	24	28	32	39	42	44	33
8.8-12-6-12-8.8mm	26	25	33	36	41	45	50	36

Based on the test data provided for the proposed systems a comparison has been undertaken in Section 8.3.



8.3 Site Installation

8.3.1 Specification Comparison – Windows

The contractor CR Construction (U.K.) Company Limited have confirmed the chosen glazing systems that are to be installed. The Idealcombi quote (486212-5) shows the glazing proposed on the podium levels. Each window has been labelled “Standard Acoustic” or “Enhanced Acoustic” and correlate to the specification set out in Section 8.2.

For ease of reference the following glazing configurations are proposed overleaf:

Standard Acoustic	Enhanced Acoustic
6.8-13-4-14-6.8	6.8-12-4-13-8.8
-	8.8-10-6-10-8.8
-	6.8-14-4-15-8.8

A direct comparison of installed windows against the Hann Tucker acoustic specification provided at the design stage has been undertaken.

Orange – Standard Glazing Zone (Windows)

Type	Configuration (glass / airspace / glass)	Sound Reduction Index (dB) at Octave Band Centre Frequency (Hz)						
		63	125	250	500	1k	2k	4k
Installed Specification	6.8-13-4-14-6.8mm	24	20	25	34	42	40	39
Hann Tucker Specification	Standard	20	24	21	28	36	38	31

Blue – Enhanced Glazing Zone (Windows Option 1)

Type	Configuration (glass / airspace / glass)	Sound Reduction Index (dB) at Octave Band Centre Frequency (Hz)						
		63	125	250	500	1k	2k	4k
Installed Specification	6.8-12-4-13-8.8mm	25	20	30	39	45	44	49
Hann Tucker Specification	Enhanced	22	26	27	36	45	46	53

Blue – Enhanced Glazing Zone (Windows Option 2)

Type	Configuration (glass / airspace / glass)	Sound Reduction Index (dB) at Octave Band Centre Frequency (Hz)						
		63	125	250	500	1k	2k	4k
Installed Specification	8.8-10-6-10-8.8mm	25	25	32	41	45	48	54



Type	Configuration (glass / airspace / glass)	Sound Reduction Index (dB) at Octave Band Centre Frequency (Hz)						
		63	125	250	500	1k	2k	4k
Hann Tucker Specification	Enhanced	22	26	27	36	45	46	53

Blue – Enhanced Glazing Zone (Windows Option 3)

Type	Configuration (glass / airspace / glass)	Sound Reduction Index (dB) at Octave Band Centre Frequency (Hz)						
		63	125	250	500	1k	2k	4k
Installed Specification	8.8-10-6-10-8.8mm	25	20	30	39	45	44	49
Hann Tucker Specification	Enhanced	22	26	27	36	45	46	53

Based on the above glazing confirmations and the test data provided for the Futura+ window units we provide the following comments:

- The performance of the “Standard Acoustic” windows are in excess of the minimum requirements for these windows, with the exception of 125 Hz which is 4 dB below the Hann Tucker Specification. This is unlikely to be a problem as the performances at all other octave bands is higher than the minimum specification and calculations undertaken show no exceedances above the required internal ambient noise level criteria for daytime and night-time periods, respectively.
- The performance of the “Enhanced Acoustic Option 1” windows are in excess of the minimum requirements for these windows, with the exception of 125 Hz which is 6 dB below, and 2000 Hz which is 2 dB below. However, the overall sound reduction performance exceeds the minimum requirements for this glazing system and calculations undertaken show no exceedances above the required internal ambient noise level criteria for daytime and night-time periods, respectively.
- The performance of “Enhanced Acoustic Option 2” windows sound reduction index at 125 Hz of the “Enhanced Acoustic would likely be below the specification in this octave band by 1 dB. This margin of difference is considered negligible. Furthermore, the overall sound reduction performance exceeds the minimum requirements for this glazing system.
- The performance of “Enhanced Acoustic Option 3” windows sound reduction index at 125 Hz of the “Enhanced Acoustic would likely be below the specification in this octave



band by 6 dB. However, the overall sound reduction performance exceeds the minimum requirements for this glazing system and calculations undertaken show no exceedances above the required internal ambient noise level criteria for daytime and night-time periods, respectively.

8.3.2 Specification Comparison – Doors

The external sliding doors are IC Sliding doors and the glazing configurations for the 'Standard Acoustics' and 'Enhanced Acoustics' areas are noted below:

Standard Acoustic	Enhanced Acoustic
6.8-15-4-16-6.8	8.8-12-6-12-8.8

A direct comparison of installed glazed doors against the Hann Tucker acoustic specification provided at the design stage has been undertaken.

Orange – Standard Glazing Zone (Glazed Doors)

Type	Configuration (glass / airspace / glass)	Sound Reduction Index (dB) at Octave Band Centre Frequency (Hz)						
		63	125	250	500	1k	2k	4k
Installed Specification	6.8-15-4-16-6.8mm	24	24	28	32	39	42	44
Hann Tucker Specification	Standard	20	24	21	28	36	38	31

Blue – Enhanced Glazing Zone (Glazed Doors)

Type	Configuration (glass / airspace / glass)	Sound Reduction Index (dB) at Octave Band Centre Frequency (Hz)						
		63	125	250	500	1k	2k	4k
Installed Specification	8.8-12-6-12-8.8mm	26	25	32	41	45	48	54
Hann Tucker Specification	Enhanced	22	26	27	36	45	46	53

Based on the above glazing confirmations and the test data provided for the IC Sliding Door Set units we provide the following comments:

- The performance of the "Standard Acoustic" windows should be in-excess of the minimum requirements for these windows as the test data for a 6-14-4-16-4 window achieves the Standard Acoustic requirements.



- The sound reduction index at 125 Hz of the “Enhanced Acoustic” windows with the 8.8mm external panes is noted to be below the specification in this octave band by 1 dB. This margin of difference is considered negligible, and in any case, the calculations when considering the system as a whole are considered sufficient.

8.4 Example Noise Intrusion Calculations

We have calculated the resultant internal noise level within habitable rooms using the following equation (Equation G.1) contained within BS 8233:2014:

$$L_{eq,2} = L_{eq,ff} + 10 \log_{10} \left(\frac{A_0}{S} 10^{-\frac{D_{n,e}}{10}} + \frac{S_{wi}}{S} 10^{-\frac{R_{wi}}{10}} + \frac{S_{ew}}{S} 10^{-\frac{R_{ew}}{10}} + \frac{S_{rr}}{S} 10^{-\frac{R_{rr}}{10}} \right) + 10 \log_{10} \left(\frac{S}{A} \right) + 3$$

To inform our worst-case assessment, a detailed noise model was generated based on the results of the baseline noise survey undertaken by ARUP to predict the daytime and night-time noise propagation across the site during Design Stage. The highest external Daytime $L_{Aeq,16hr}$, Night-time $L_{Aeq,8hr}$, and L_{Amax} were corrected to calculate the normalised frequency spectra.

The predicted noise levels at the receptor windows of the residential dwellings are 67 dB $L_{Aeq,16hr}$ during daytime and 65 dB $L_{Aeq,8hr}$ during the night-time. L_{AFmax} noise levels are predicted to be 80 dB.

The ventilation strategy is to be mechanically ventilated with heat recovery throughout.

8.4.1 Detailed Calculation – Windows (Standard Acoustics)

The following information for proposed residential units have been provided by the client and included within the calculations. It is proposed to include mechanical ventilation with heat recovery systems to all habitable areas of the residential units, The following information has been included in the calculation parameters:

- Façade make up of SFS (external facing rain screen panel with insulated cavity, external galvanised metal panel and CP board, insulated cavity and two layers of plasterboard lining) = $\geq R_w + C_{tr}$ 41 dB.
- Living room dimensions (W = 4.7m x H = 2.4m x D = 7.0m)
- Bedroom dimensions (W = 2.2m x H = 2.4m x D = 5.5m)
- Glazing Dimensions (W = 2.4 x H = 1.36)



Based on the above, the following tables shown overleaf present our BS 8233:2014 assessment for worst case daytime $L_{Aeq,16hr}$, night-time $L_{Aeq,8hr}$, and night-time L_{AFmax} noise levels.

Daytime $L_{Aeq,16hr}$

Description	Octave Band Centre Frequency (Hz)						Single Figure
	125	250	500	1k	2k	4k	
External noise level, $L_{eq,ff}$	63	59	57	57	54	48	61 dB $L_{Aeq,16hr}$
External wall, R_{ew}	33	42	45	50	50	55	41 dB $R_w + C_{tr}$
Glazing, R (manufacturer)	20	25	34	42	40	39	31 dB $R_w + C_{tr}$
Equivalent absorption area, A	11	11	11	11	11	11	11
Internal noise level, $L_{eq,2}$	38	28	18	11	9	3	25 dB $L_{Aeq,16hr}$

Night-time $L_{Aeq,8hr}$

Description	Octave Band Centre Frequency (Hz)						Single Figure
	125	250	500	1k	2k	4k	
External noise level, $L_{eq,ff}$	58	54	52	52	49	43	56 dB $L_{Aeq,16hr}$
External wall, R_{ew}	33	42	45	50	50	55	41 dB $R_w + C_{tr}$
Glazing, R (manufacturer)	20	25	34	42	40	39	31 dB $R_w + C_{tr}$
Equivalent absorption area, A	11	11	11	11	11	11	11
Internal noise level, $L_{eq,2}$	36	26	16	8	7	1	23 dB $L_{Aeq,16hr}$

Night-time L_{AFmax}

Description	Octave Band Centre Frequency (Hz)						Single Figure
	125	250	500	1k	2k	4k	
External noise level, $L_{eq,ff}$	76	72	70	70	67	61	74 dB $L_{Aeq,16hr}$
External wall, R_{ew}	33	42	45	50	50	55	41 dB $R_w + C_{tr}$
Glazing, R (manufacturer)	20	25	34	42	40	39	31 dB $R_w + C_{tr}$
Equivalent absorption area, A	11	11	11	11	11	11	11
Internal noise level, $L_{eq,2}$	54	44	34	26	25	19	41 dB $L_{Aeq,16hr}$

8.4.2 Detailed Calculation – Windows (Enhanced Option 1 Acoustics)

The following information has been included in the calculation parameters:

- Façade make up of SFS (external facing rain screen panel with insulated cavity, external galvanised metal panel and CP board, insulated cavity and two layers of plasterboard lining) = $\geq R_w + C_{tr}$ 41 dB.



- Living room dimensions (W = 4.7m x H = 2.4m x D = 7.0m)
- Bedroom dimensions (W = 2.2m x H = 2.4m x D = 5.5m)
- Glazing Dimensions (W = 2.1 x H = 2.2)

Daytime $L_{Aeq,16hr}$

Description	Octave Band Centre Frequency (Hz)						Single Figure
	125	250	500	1k	2k	4k	
External noise level, $L_{eq, ff}$	63	59	57	57	54	48	61 dB $L_{Aeq,16hr}$
External wall, R_{ew}	33	42	45	50	50	55	41 dB $R_w + C_{tr}$
Glazing, R (manufacturer)	20	25	34	42	40	39	31 dB $R_w + C_{tr}$
Equivalent absorption area, A	11	11	11	11	11	11	11
Internal noise level, $L_{eq,2}$	39	39	19	12	10	5	26 dB $L_{Aeq,16hr}$

Night-time $L_{Aeq,8hr}$

Description	Octave Band Centre Frequency (Hz)						Single Figure
	125	250	500	1k	2k	4k	
External noise level, $L_{eq, ff}$	58	54	52	52	49	43	56 dB $L_{Aeq,16hr}$
External wall, R_{ew}	33	42	45	50	50	55	41 dB $R_w + C_{tr}$
Glazing, R (manufacturer)	20	25	34	42	40	39	31 dB $R_w + C_{tr}$
Equivalent absorption area, A	11	11	11	11	11	11	11
Internal noise level, $L_{eq,2}$	37	28	17	9	8	3	24 dB $L_{Aeq,16hr}$

Night-time L_{AFmax}

Description	Octave Band Centre Frequency (Hz)						Single Figure
	125	250	500	1k	2k	4k	
External noise level, $L_{eq, ff}$	76	72	70	70	67	61	74 dB $L_{Aeq,16hr}$
External wall, R_{ew}	33	42	45	50	50	55	41 dB $R_w + C_{tr}$
Glazing, R (manufacturer)	20	25	34	42	40	39	31 dB $R_w + C_{tr}$
Equivalent absorption area, A	11	11	11	11	11	11	11
Internal noise level, $L_{eq,2}$	55	46	35	27	26	21	42 dB $L_{Aeq,16hr}$

8.4.3 Detailed Calculation – Windows (Enhanced Option 2 Acoustics)

The following information has been included in the calculation parameters:

- Façade make up of SFS (external facing rain screen panel with insulated cavity, external galvanised metal panel and CP board, insulated cavity and two layers of plasterboard lining) = $\geq R_w + C_{tr}$ 41 dB.



- Living room dimensions (W = 4.7m x H = 2.4m x D = 7.0m)
- Bedroom dimensions (W = 2.2m x H = 2.4m x D = 5.5m)
- Glazing Dimensions (W = 2.0 x H = 2.4)

Daytime $L_{Aeq,16hr}$

Description	Octave Band Centre Frequency (Hz)						Single Figure
	125	250	500	1k	2k	4k	
External noise level, $L_{eq,ff}$	69	65	63	63	60	54	67 dB $L_{Aeq,16hr}$
External wall, R_{ew}	33	42	45	50	50	55	41 dB $R_w + C_{tr}$
Glazing, R (manufacturer)	25	32	41	45	48	54	37 dB $R_w + C_{tr}$
Equivalent absorption area, A	11	11	11	11	11	11	11
Internal noise level, $L_{eq,2}$	41	29	20	15	10	-1	27 dB $L_{Aeq,16hr}$

Night-time $L_{Aeq,8hr}$

Description	Octave Band Centre Frequency (Hz)						Single Figure
	125	250	500	1k	2k	4k	
External noise level, $L_{eq,ff}$	67	63	61	61	58	52	65 dB $L_{Aeq,16hr}$
External wall, R_{ew}	33	42	45	50	50	55	41 dB $R_w + C_{tr}$
Glazing, R (manufacturer)	25	32	41	45	48	54	37 dB $R_w + C_{tr}$
Equivalent absorption area, A	11	11	11	11	11	11	11
Internal noise level, $L_{eq,2}$	41	30	20	16	10	-2	28 dB $L_{Aeq,16hr}$

Night-time L_{AFmax}

Description	Octave Band Centre Frequency (Hz)						Single Figure
	125	250	500	1k	2k	4k	
External noise level, $L_{eq,ff}$	82	78	76	76	73	67	80 dB $L_{Aeq,16hr}$
External wall, R_{ew}	33	42	45	50	50	55	41 dB $R_w + C_{tr}$
Glazing, R (manufacturer)	25	32	41	45	48	54	37 dB $R_w + C_{tr}$
Equivalent absorption area, A	11	11	11	11	11	11	11
Internal noise level, $L_{eq,2}$	56	45	35	31	25	13	43 dB $L_{Aeq,16hr}$

8.4.4 Detailed Calculation – Windows (Enhanced Option 3 Acoustics)

The following information has been included in the calculation parameters:

- Façade make up of SFS (external facing rain screen panel with insulated cavity, external galvanised metal panel and CP board, insulated cavity and two layers of plasterboard lining) = $\geq R_w + C_{tr}$ 41 dB.



- Living room dimensions ($W = 4.7\text{m} \times H = 2.4\text{m} \times D = 7.0\text{m}$)
- Bedroom dimensions ($W = 2.2\text{m} \times H = 2.4\text{m} \times D = 5.5\text{m}$)
- Glazing Dimensions ($W = 1.3 \times H = 2.5$)

Daytime $L_{Aeq,16hr}$

Description	Octave Band Centre Frequency (Hz)						Single Figure
	125	250	500	1k	2k	4k	
External noise level, $L_{eq, ff}$	69	65	63	63	60	54	67 dB $L_{Aeq,16hr}$
External wall, R_{ew}	33	42	45	50	50	55	41 dB $R_w + C_{tr}$
Glazing, R (manufacturer)	24	28	32	39	42	44	33 dB $R_w + C_{tr}$
Equivalent absorption area, A	11	11	11	11	11	11	11
Internal noise level, $L_{eq,2}$	40	32	26	19	14	5	29 dB $L_{Aeq,16hr}$

Night-time $L_{Aeq,8hr}$

Description	Octave Band Centre Frequency (Hz)						Single Figure
	125	250	500	1k	2k	4k	
External noise level, $L_{eq, ff}$	67	63	61	61	58	52	65 dB $L_{Aeq,16hr}$
External wall, R_{ew}	33	42	45	50	50	55	41 dB $R_w + C_{tr}$
Glazing, R (manufacturer)	24	28	32	39	42	44	33 dB $R_w + C_{tr}$
Equivalent absorption area, A	11	11	11	11	11	11	11
Internal noise level, $L_{eq,2}$	41	33	27	20	14	6	30 dB $L_{Aeq,16hr}$

Night-time $L_{Aeq,8hr}$

Description	Octave Band Centre Frequency (Hz)						Single Figure
	125	250	500	1k	2k	4k	
External noise level, $L_{eq, ff}$	82	78	76	76	73	67	80 dB $L_{Aeq,16hr}$
External wall, R_{ew}	33	42	45	50	50	55	41 dB $R_w + C_{tr}$
Glazing, R (manufacturer)	24	28	32	39	42	44	33 dB $R_w + C_{tr}$
Equivalent absorption area, A	11	11	11	11	11	11	11
Internal noise level, $L_{eq,2}$	56	48	42	35	29	21	45 dB $L_{Aeq,16hr}$

8.4.5 Detailed Calculation – Windows (Standard Doors Acoustics)

The following information has been included in the calculation parameters:

- Façade make up of SFS (external facing rain screen panel with insulated cavity, external galvanised metal panel and CP board, insulated cavity and two layers of plasterboard lining) = $\geq R_w + C_{tr}$ 41 dB.



- Living room dimensions (W = 4.7m x H = 2.4m x D = 7.0m)
- Bedroom dimensions (W = 2.2m x H = 2.4m x D = 5.5m)
- Glazing Dimensions (W = 2.7 x H = 2.4)

Based on the above, the following tables shown overleaf present our BS 8233:2014 assessment for worst case daytime $L_{Aeq,16hr}$, night-time $L_{Aeq,8hr}$, and night-time L_{AFmax} noise levels.

Daytime $L_{Aeq,16hr}$

Description	Octave Band Centre Frequency (Hz)						Single Figure
	125	250	500	1k	2k	4k	
External noise level, $L_{eq, ff}$	63	59	57	57	54	48	61 dB $L_{Aeq,16hr}$
External wall, R_{ew}	33	42	45	50	50	55	41 dB $R_w + C_{tr}$
Glazing, R (manufacturer)	24	28	32	39	42	44	33 dB $R_w + C_{tr}$
Equivalent absorption area, A	11	11	11	11	11	11	11
Internal noise level, $L_{eq,2}$	38	29	23	16	11	2	26 dB $L_{Aeq,16hr}$

Night-time $L_{Aeq,8hr}$

Description	Octave Band Centre Frequency (Hz)						Single Figure
	125	250	500	1k	2k	4k	
External noise level, $L_{eq, ff}$	58	54	52	52	49	43	56 dB $L_{Aeq,16hr}$
External wall, R_{ew}	33	42	45	50	50	55	41 dB $R_w + C_{tr}$
Glazing, R (manufacturer)	24	28	32	39	42	44	33 dB $R_w + C_{tr}$
Equivalent absorption area, A	11	11	11	11	11	11	11
Internal noise level, $L_{eq,2}$	35	27	21	14	8	0	24 dB $L_{Aeq,16hr}$

Night-time L_{AFmax}

Description	Octave Band Centre Frequency (Hz)						Single Figure
	125	250	500	1k	2k	4k	
External noise level, $L_{eq, ff}$	76	72	70	70	67	61	74 dB $L_{Aeq,16hr}$
External wall, R_{ew}	33	42	45	50	50	55	41 dB $R_w + C_{tr}$
Glazing, R (manufacturer)	24	28	32	39	42	44	33 dB $R_w + C_{tr}$
Equivalent absorption area, A	11	11	11	11	11	11	11
Internal noise level, $L_{eq,2}$	53	45	39	32	26	18	42 dB $L_{Aeq,16hr}$



8.4.6 Detailed Calculation – Windows (Enhanced Doors Acoustics)

The following information has been included in the calculation parameters:

- Façade make up of SFS (external facing rain screen panel with insulated cavity, external galvanised metal panel and CP board, insulated cavity and two layers of plasterboard lining) = $\geq R_w + C_{tr}$ 41 dB.
- Living room dimensions (W = 4.7m x H = 2.4m x D = 7.0m)
- Bedroom dimensions (W = 2.2m x H = 2.4m x D = 5.5m)
- Glazing Dimensions (W = 2.7 x H = 2.4)

Daytime $L_{Aeq,16hr}$

Description	Octave Band Centre Frequency (Hz)						Single Figure
	125	250	500	1k	2k	4k	
External noise level, $L_{eq,ff}$	69	65	63	63	60	54	67 dB $L_{Aeq,16hr}$
External wall, R_{ew}	33	42	45	50	50	55	41 dB $R_w + C_{tr}$
Glazing, R (manufacturer)	25	32	41	45	48	54	37 dB $R_w + C_{tr}$
Equivalent absorption area, A	11	11	11	11	11	11	11
Internal noise level, $L_{eq,2}$	43	32	23	19	15	3	30 dB $L_{Aeq,16hr}$

Night-time $L_{Aeq,8hr}$

Description	Octave Band Centre Frequency (Hz)						Single Figure
	125	250	500	1k	2k	4k	
External noise level, $L_{eq,ff}$	67	63	61	61	58	52	65 dB $L_{Aeq,16hr}$
External wall, R_{ew}	33	42	45	50	50	55	41 dB $R_w + C_{tr}$
Glazing, R (manufacturer)	25	32	41	45	48	54	37 dB $R_w + C_{tr}$
Equivalent absorption area, A	11	11	11	11	11	11	11
Internal noise level, $L_{eq,2}$	43	32	22	18	13	2	30 dB $L_{Aeq,16hr}$

Night-time L_{AFmax}

Description	Octave Band Centre Frequency (Hz)						Single Figure
	125	250	500	1k	2k	4k	
External noise level, $L_{eq,ff}$	82	78	76	76	73	67	80 dB $L_{Aeq,16hr}$
External wall, R_{ew}	33	42	45	50	50	55	41 dB $R_w + C_{tr}$
Glazing, R (manufacturer)	25	32	41	45	48	54	37 dB $R_w + C_{tr}$
Equivalent absorption area, A	11	11	11	11	11	11	11
Internal noise level, $L_{eq,2}$	58	47	37	33	28	17	45 dB $L_{Aeq,16hr}$



8.4.7 Summary of Octave Band Calculations

The tables below summarise the findings of our octave band calculations and presented the calculated internal noise level with reference to the agreed internal noise criteria.

Standard Window Glazing Zone

Dwelling	Daytime $L_{Aeq,16hr}$	Night-time $L_{Aeq,8hr}$	Night-time $L_{A_{fmax}}$
Worst Case External Incident Noise Level	61 dB	56 dB	74 dB
Resultant Internal Noise Level	25 dB	23 dB	41 dB

Enhanced Option 1 Glazing Zone

Dwelling	Daytime $L_{Aeq,16hr}$	Night-time $L_{Aeq,8hr}$	Night-time $L_{A_{fmax}}$
Worst Case External Incident Noise Level	61 dB	56 dB	74 dB
Resultant Internal Noise Level	26 dB	22 dB	40 dB

Enhanced Option 2 Glazing Zone

Dwelling	Daytime $L_{Aeq,16hr}$	Night-time $L_{Aeq,8hr}$	Night-time $L_{A_{fmax}}$
Worst Case External Incident Noise Level	67 dB	61 dB	80 dB
Resultant Internal Noise Level	27 dB	28 dB	43 dB

Enhanced Option 3 Glazing Zone

Dwelling	Daytime $L_{Aeq,16hr}$	Night-time $L_{Aeq,8hr}$	Night-time $L_{A_{fmax}}$
Worst Case External Incident Noise Level	67 dB	61 dB	80 dB
Resultant Internal Noise Level	29 dB	30 dB	45 dB



Standard Doors Glazing Zone

Dwelling	Daytime $L_{Aeq,16hr}$	Night-time $L_{Aeq,8hr}$	Night-time $L_{A_{fmax}}$
Worst Case External Incident Noise Level	61 dB	56 dB	74 dB
Resultant Internal Noise Level	26 dB	24 dB	42 dB

Enhanced Doors Glazing Zone

Dwelling	Daytime $L_{Aeq,16hr}$	Night-time $L_{Aeq,8hr}$	Night-time $L_{A_{fmax}}$
Worst Case External Incident Noise Level	67 dB	61 dB	80 dB
Resultant Internal Noise Level	30 dB	30 dB	45 dB

The calculations from our assessment indicate the installed glazing systems provide adequate sound reduction to achieve internal noise levels below the limits set by Manchester City Council (MCC) for all glazing configurations in their respective locations.

Based on the above, it has been demonstrated that Condition 23(a) be discharged from the Planning Application Decision Notice (ref: 126944/FO/2020).

8.5 Plant Room Noise Transfer Assessment

8.5.1 Plant Room Proposals

A noise transfer assessment has been undertaken between plant rooms to habitable rooms above. It has been identified that Tower B substation is located directly below Apartment TB-02-002, at first floor level (01). Therefore, a noise transfer assessment of direct and reverberant sound builds up from the substation has been undertaken.

8.5.2 Manchester City Council Criteria

Based on MCC guidance, octave band noise levels in the 63 Hz and 125 Hz octave centre frequency bands (L_{eq}) are suggested to be controlled not to exceed (in bedrooms) 47 dB and 41 dB, respectively. In our experience, it is also appropriate to set limits for all other frequencies based on achieving night-time criteria of NR 15 $L_{eq,5min}$ (i.e. 5 dB below typical NR20 criteria for bedrooms/living rooms during night-time operation).



8.5.3 Substation Noise Data

The noise data for the proposed substation has been attached within Appendix D of this Report. The data is presented in a broadband level.

Empirical data for a 1000kVA substation unit has been utilised for the purpose of assessment, and octave band levels have been adjusted to match the broadband figure.

The sound power level is presented below.

Reference	Sound Power Level L_w (dB) Octave Band Centre Frequency (Hz)						
	63	125	250	500	1k	2k	4k
1000kVA Substation	65	54	51	42	37	36	36

8.5.4 Plant Room Assessment

As presented in Section 7.4.2, empirical laboratory test data for a 203.5mm concrete slab has been utilised for the purpose of assessment.

The methodology adopted to determine the acoustic transmission of airborne sound insulation takes into account the area of each separation element together with each relevant flanking element and correspondent rooms volumes in line with BS EN ISO 16283-1:2014. The method can be briefly described as follows:

Determination of global noise levels within each relevant space in line with the following equation:

$$R_t = L_1 - L_2 + 10 \log \left(\frac{S_s}{A} \right)$$

Where:

- a) L_1 is the average sound pressure level in the source room, in decibels;
- b) L_2 is the average sound pressure level in the receiving room, in decibels;
- c) A is the equivalent sound absorption area in the receiving room, in square meters; and
- d) S_s is the area of the separating element, in square meters.

The table presented below outlines the summary calculations for the plantroom transfer against the adopted MCC criteria is to achieve a level of 5 dB below background within the apartment.



Assessment to Residential Receptor	Octave Band Centre Frequency (Hz)						
	63	125	250	500	1k	2k	4k
Substation L_{prev} (dB)	61	49	49	40	35	34	34
Receiver room reverberation time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Sound reduction of separating floor (dB) <i>SRI</i>	-35	-39	-45	-54	-60	-65	-71
NR15 criteria	47 ^[1]	41 ^[1]	26	19	15	12	9
Receiver room internal noise level (dB L_{eq}) <i>SPL_{in}</i>	33	17	10	-9	-21	-29	-34

¹ Based upon threshold of audibility, see Section 7.4.3.

The assessment demonstrates compliance with the limits and noise transfer would be expected to be “perceptually inaudible” in the receiving space.

Based on the above, it has been demonstrated that Condition 23(a) be discharged from the Planning Application Decision Notice (ref: 126944/FO/2020).



9.0 Conclusions

The assessment of plant noise impact resulted in compliance with the ER's and MCC criteria for the discharge of condition 21(a), with provision of tenant plant compounds to be assessed upon handover of the commercial units to future tenants.

The assessment of sound insulation performance between commercial units to residential areas within adjacent spaces, as well as off-site receptors have been assessed. An assessment of the proposed sound insulation, the predicted internal noise level limits, and comparison against noise levels generated by a number of different uses that are with/without music noise as a potential source within a sample unit was undertaken. Based on a review of the information provided, and a combination of measured on-site performances from past-projects, the proposed constructions should be capable of mitigating noise transfer and noise breakout to off-site receptors from proposed commercial units.

The assessment of proposed façade mitigation developed during the design stages has been undertaken. The assessment indicates that, with the review of installed glazing as per drawing reference VRS-HBA-XX-XX-DR-A-31_0204-Rev C3, an appropriate level of protection could be afforded to future noise sensitive receptors on the Site. An assessment of plant noise transfer resulted in compliance with MCC criteria.

It has been demonstrated above that the conditions relating to noise prior to first occupation meet the requirements of the Planning Conditions imposed. It is therefore recommended that this Report and Assessment included be commensurate with the discharge of Conditions 21(a), 22(a), and 23(a).

Appendix A

The acoustic terms used in this report are defined as follows:

dB Decibel - Used as a measurement of sound level. Decibels are not an absolute unit of measurement but an expression of ratio between two quantities expressed in logarithmic form. The relationships between Decibel levels do not work in the same way that non-logarithmic (linear) numbers work (e.g. 30dB + 30dB = 33dB, not 60dB).

dBA The human ear is more susceptible to mid-frequency noise than the high and low frequencies. The 'A'-weighting scale approximates this response and allows sound levels to be expressed as an overall single figure value in dBA. The _A subscript is applied to an acoustical parameter to indicate the stated noise level is A-weighted.

It should be noted that levels in dBA do not have a linear relationship to each other; for similar noises, a change in noise level of 10dBA represents a doubling or halving of subjective loudness. A change of 3dBA is just perceptible.

L_{90,T} L₉₀ is the noise level exceeded for 90% of the period *T* (i.e. the quietest 10% of the measurement) and is often used to describe the background noise level.

L_{eq,T} L_{eq,T} is the equivalent continuous sound pressure level. It is an average of the total sound energy measured over a specified time period, *T*.

L_{max} L_{max} is the maximum sound pressure level recorded over the period stated. L_{max} is sometimes used in assessing environmental noise where occasional loud noises occur, which may have little effect on the L_{eq} noise level.

Sound Pressure Level (L_p) is the sound pressure relative to a standard reference pressure of 2×10^{-5} Pa. This level varies for a given source according to a number of factors (including but not limited to: distance from the source; positioning; screening and meteorological effects).

Sound Power Level (SWL or L_w) is the total amount of sound energy inherent in a particular sound source, independent of its environment. It is a logarithmic measure of the sound power in comparison to a specified reference level (usually 10^{-12} W).

Appendix B

Planning Policies, Standards & Guidance

B.1 Noise Policy Statement for England

The Noise Policy Statement for England (NPSE) was published in March 2010 (i.e. before the NPPF). The NPSE is the overarching statement of noise policy for England and applies to all forms of noise other than occupational noise, setting out the long term vision of Government noise policy which is to:

“Promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development.”

That vision is supported by the following NPSE noise policy aims which are reflected in three of the four aims of planning policies and decisions in paragraph 123 of the NPPF (see paragraph 8.2 (b) below):

“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.”*

The Explanatory Note to the NPSE has three concepts for the assessment of noise in this country:

NOEL – No Observed Effect Level

This is the level below which no effect can be detected and below which there is no detectable effect on health and quality of life due to noise.

LOAEL – Lowest Observable Adverse Effect Level

This is the level above which adverse effects on health and quality of life can be detected.

SOAEL – Significant Observed Adverse Effect Level

This is the level above which significant adverse effects on health and quality of life occur.

None of these three levels are defined numerically and for the SOAEL the NPSE makes it clear that the noise level is likely to vary depending upon the noise source, the receptor and the time of day/day of the week, etc. The need for more research to investigate what may represent an SOAEL for noise is acknowledged in the NPSE and the NPSE asserts that not stating specific SOAEL levels provides policy flexibility in the period until there is further evidence and guidance.

The NPSE concludes by explaining in a little more detail how the LOAEL and SOAEL relate to the three NPSE noise policy aims listed above. It starts with the aim of avoiding significant adverse effects on health and quality of life, then addresses the situation where the noise impact falls between the LOAEL and the SOAEL when *“all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life while also taking into account the guiding principles of sustainable development.”* The final aim envisages pro-active management of noise to improve health and quality of life, again taking into account the guiding principles of sustainable development which include the need to minimise travel distance between housing and employment uses in an area.

B.2 National Planning Policy Framework (NPPF)

The following paragraphs are from the NPPF (published December 2023):

191. 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.

193. 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.”

Paragraph 185 also references the Noise Policy Statement for England (NPSE). This document does not refer to specific noise levels but instead sets out three aims:

- “Avoid significant adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.
- Mitigate and minimise adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.
- Where possible, contribute to the improvement of health and quality of life through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.”

B.3 Planning Practice Guidance on Noise

Planning Practice Guidance (PPG) under the NPPF has been published by the Government as a web based resource at <http://planningguidance.planningportal.gov.uk/blog/guidance/>. This includes specific guidance on Noise although, like the NPPF and NPSE the PPG does not provide any quantitative advice. It seeks to illustrate a range of effect levels in terms of examples of outcomes as set out in the following table:

Perception	Examples of Outcomes	Increasing effect level	Action
Not noticeable	No effect	No Observed Effect	No specific measures required
Noticeable and not intrusive	Noise can be heard, but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect	No specific measures required
		Lowest Observed Adverse Effect Level	

Perception	Examples of Outcomes	Increasing effect level	Action
Noticeable and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance.	Observed Adverse Effect	Mitigate and reduce to a minimum
		Significant Observed Adverse Effect Level	
Noticeable and disruptive	The noise causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Noticeable and very disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable hard, e.g. auditory and non-auditory.	Unacceptable Adverse Effect	Prevent

B.4 BS 4142:2014 + A1:2019

When setting plant noise emission criteria reference is commonly made to BS 4142:2014 “*Methods for rating and assessing industrial and commercial sound*”.

The procedure contained in BS 4142:2014 provides an assessment of the likely effects of sound on people when comparing the specific noise levels from the source with representative background noise levels. Where the noise contains “a tone, impulse or other characteristic” then various corrections can be added to the specific (source) noise level to obtain the “rating level”.

BS 4142 states that: “*The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occurs*”. An estimation of the impact of the specific noise can be obtained by the difference of the rating noise level and the background noise level and considering the following:

- “*Typically, the greater this difference, the greater the magnitude of the impact.*”
- “*A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context.*”

- “A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context.”

- “The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.”

The determination of the “rating level” and the “background level” are both open to interpretation, depending on the context.

B.5 World Health Organisation Guidelines on Community Noise

BS8233:2014 is based upon the current World Health Organisation (WHO) guidance “Guidelines on Community Noise”. A summary of the noise guidelines relevant to the proposed scheme is presented in the table below.

Residential Environment	Critical Health Effect(s)	L _{Aeq}	L _{AFmax}	Time Base
Outdoor living area	Serious annoyance, daytime and evening	55	-	07:00-23:00
	Moderate annoyance, daytime and evening	50	-	07:00-23:00
Dwelling, indoors	Speech intelligibility and moderate annoyance, daytime and evening	35	-	07:00-23:00
Inside bedrooms	Sleep disturbance, night-time	30	45	23:00-07:00
Outside bedrooms	Sleep disturbance, window open (outdoor values)	45	60	23:00-07:00

These WHO guidelines are based, in almost all cases, on the lower threshold below which the occurrence rates of any particular effect can be assumed to be negligible.

B.6 British Standard BS8233: 2014

British Standard 8233: 2014 “Guidance on sound insulation and noise reduction for buildings” provides guidance for the control of noise in and around buildings.

BS8233:2014 Section 7.7.2 titled “Internal ambient noise levels for dwellings” states:

“In general for steady external noise sources, it is desirable that internal ambient noise levels

do not exceed the following guideline values:

Activity	Location	Desirable Internal Ambient Criteria	
		07:00 - 23:00	23:00 - 07:00
Resting	Living Rooms	35 dB $L_{Aeq,16hour}$	-
Dining	Dining Room/Area	40 dB $L_{Aeq,16hour}$	-
Sleeping (Daytime Resting)	Bedroom	35 dB $L_{Aeq,16hour}$	30 dB $L_{Aeq,8hour}$

B.7 Statutory Noise Nuisance

There is no quantitative definition of statutory noise nuisance. It is generally accepted however, that if the plant noise level is at least 5dB (or 10dB if tonal) below the minimum background $L_{90(15minutes)}$ at 1m from the nearest noise sensitive residential window, then the risk of a statutory noise nuisance is avoided. By adopting this as a design criterion the guidance contained in BS 4142:2014 should also be complied with.

S79(1)(g) of the Environmental Protection Act 1990 defines a statutory nuisance as “*noise emitted from a premises so as to be prejudicial to health or a nuisance*”. A duty is placed on the Local Authority to serve an abatement notice under S80 if it becomes satisfied that a statutory nuisance exists.

There is however no quantitative definition/objective method in determining statutory noise nuisance, and as such we are not able to definitively advise or determine on such matters. Noise nuisance is subjective and requires multiple factors to be considered, including but not limited to:

- Straining to hear something is *generally* considered not a nuisance, however,
- Noise level (of source and relative to background), timing, duration, type of noise, frequency, location, continuous or repetitive, all factor into judging nuisance.

To mitigate against, though not remove entirely, the risk of a statutory noise nuisance, a noise assessment should be undertaken by a Suitably Qualified Acoustician. Adoption of appropriate and relevant industry standards/guides can provide a structured framework for such assessments, improving the credibility of mitigation efforts. It is also important to also recognise that ongoing management (both active and passive) may also be necessary depending on the context of the situation.

Appendix C

Specifications And Other Information



Technical Submittal

To: CR Construction (UK) Company Ltd Copy: BFL Team	Contract Title: Victoria Riverside – Manchester Contract Number: 4015				
Issue Date: 14/03/23	Technical Submittal No: 4015-TS-021 REV – C				
Technical Submittal for: Nuaire MVHR Unit <u>Documents:</u> - Nuaire Technical Information - Appartment Ventilation Schedule BFL reponses to comments – <table><tr><th>WSP Comments TS021 MVHR Units</th><th>Briggs & Forrester Comments</th></tr><tr><td>The SFP stated in this document are higher that that wihtin the latest SAP calcs issued as indicated in VRS-BFL-XX-XX-RP-M-3016 dated 10.8.22. CRUK / BFL to ensure the SAP calc requirements are satisfied based on these higher SFP's prior to installation</td><td>BC reviewed with WSP, Status A to be awarded</td></tr></table>		WSP Comments TS021 MVHR Units	Briggs & Forrester Comments	The SFP stated in this document are higher that that wihtin the latest SAP calcs issued as indicated in VRS-BFL-XX-XX-RP-M-3016 dated 10.8.22. CRUK / BFL to ensure the SAP calc requirements are satisfied based on these higher SFP's prior to installation	BC reviewed with WSP, Status A to be awarded
WSP Comments TS021 MVHR Units	Briggs & Forrester Comments				
The SFP stated in this document are higher that that wihtin the latest SAP calcs issued as indicated in VRS-BFL-XX-XX-RP-M-3016 dated 10.8.22. CRUK / BFL to ensure the SAP calc requirements are satisfied based on these higher SFP's prior to installation	BC reviewed with WSP, Status A to be awarded				
Confirmation required by (date): 03/01/23 Print Name: Adam Penketh Signature: A. Penketh					



Client Reply:

Status: **Date:**

Print Name: **Signature:**



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 11 Nov 2022 16:03 using software version 5.7.4437.0

Project: 20/01070/RES

VICTORIA RIVERSIDE
Location: VRS 1427 Typical 1 bed LR 15@20 204X60

Technical Data

MRXBOX-ECO - Wall Mounted Multi Room Xbox
Fan Code: MRXBOXAB-ECO2B
Installation Manual Links: 671795

Required duty: 15 l/s at 20 Pa
Actual duty: 59 l/s at 310 Pa
Actual at required flow: 15 l/s at 531 Pa

When speed controlled to required duty (25.48%):
Motor Input Power: 0.007 kW
Specific Fan Power: 0.5 W/(l/s)
Velocity at required duty: 1.222 m/s

At full speed:
Motor Input Power: 0.156 kW
Specific Fan Power: 2.6 W/(l/s)
Maximum Fan Speed: 3,300 RPM
Electrical Supply: 230V, 1 Phase, 50 Hz
Motor current (flc): 1.2 A

Max. operating temp: 50°C
Weight: 20 kg
Starting currents are nominal.

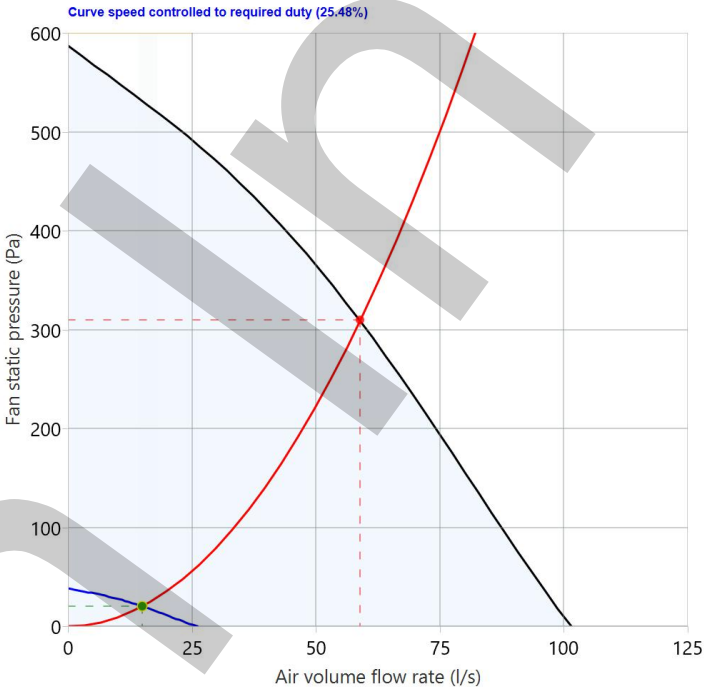
Sound Data

Acoustic performance to ISO 13347 and AMCA 300.
Noise calculated speed controlled to required duty (25.48%)

Sound Power Levels re 1 pWatts (Hz):									
Hz	63	125	250	500	1k	2k	4k	8k	dBA
Breakout	37	34	29	27	17	<16	<16	<16	<16
Open Inlet (Intake & Extract)	38	33	32	29	20	<16	<16	<16	
Open Outlet (Supply & Exhaust)	38	36	36	38	31	22	<16	<16	

dBA is hemi-spherical at 3 metres. For spherical deduct 3 dBA.
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.

Performance Chart



Additional Notes

Specification

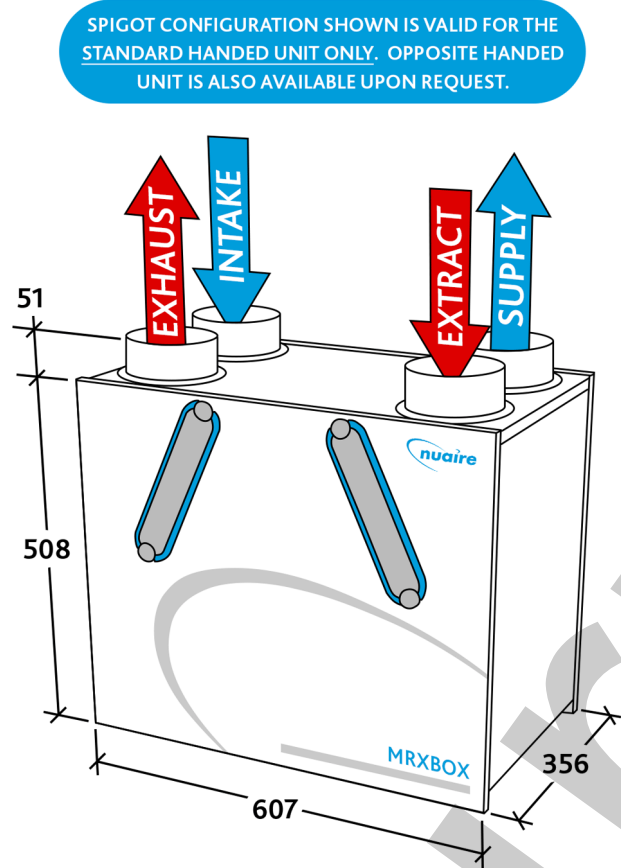
The unit shall be fully insulated providing excellent thermal and acoustic characteristics and shall be complete with a multi plate counter flow high efficiency heat exchanger block, with a thermal efficiency of up to 95%. The heat exchanger shall be protected by filters on fresh air inlet and system extract. The heat exchanger and filters shall be accessible via the front access panel, enabling quick and easy maintenance.
The unit shall have low energy, high efficiency EC fan/motor assemblies with sealed for life bearings, the impellers shall be backward curved centrifugal type. The motors shall be suitable for an ambient temperature of 40°C.
The unit shall be supplied complete with a condensate drip tray and 21.5mm drain connection.
The unit shall be suitable for 125mm circular ducting.
The breakout noise level and power requirements shall be as detailed by the unit manufacturer and in accordance with the ventilation equipment schedule.
The unit shall be offered with a five year warranty. The product warranty applies to the UK mainland and in accordance with Clause 14 of our Conditions of Sale. Customers purchasing from outside of the UK should contact Nuaire International Sales office for further details.



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 11 Nov 2022 16:03 using software version 5.7.4437.0

Fan Dimensions



Length: Width: Height:
356 607 507
Spigot size: 125
Duct size: 125
Drawing is for dimensional purposes only. Dimensions in mm.
Please see selected ancillaries section for additional dimensions for any requested additional ancillaries.

SAP Appendix Q Test Results

Application	Specific Fan Power (W/l/s)	Heat Exchange Efficiency %
Kitchen + 1 wet room	0.55	90%
Kitchen + 2 wet rooms	0.65	89%
Kitchen + 3 wet rooms	0.8	87%
Kitchen + 4 wet rooms	1.01	86%
Kitchen + 5 wet rooms	1.26	86%



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 11 Nov 2022 16:03 using software version 5.7.4437.0

Project: 20/01070/RES

VICTORIA RIVERSIDE
Location: VRS 1427 Typical 1 bed HR 29@105 204X60

Technical Data

MRXBOX-ECO - Wall Mounted Multi Room Xbox
Fan Code: MRXBOXAB-ECO2B
Installation Manual Links: 671795

Required duty: 29 l/s at 105 Pa
Actual duty: 53 l/s at 347 Pa
Actual at required flow: 29 l/s at 474 Pa

When speed controlled to required duty (54.8%):
Motor Input Power: 0.026 kW
Specific Fan Power: 0.9 W/(l/s)
Velocity at required duty: 2.363 m/s

At full speed:
Motor Input Power: 0.155 kW
Specific Fan Power: 2.9 W/(l/s)
Maximum Fan Speed: 3,300 RPM
Electrical Supply: 230V, 1 Phase, 50 Hz
Motor current (flc): 1.2 A

Max. operating temp: 50°C
Weight: 20 kg
Starting currents are nominal.

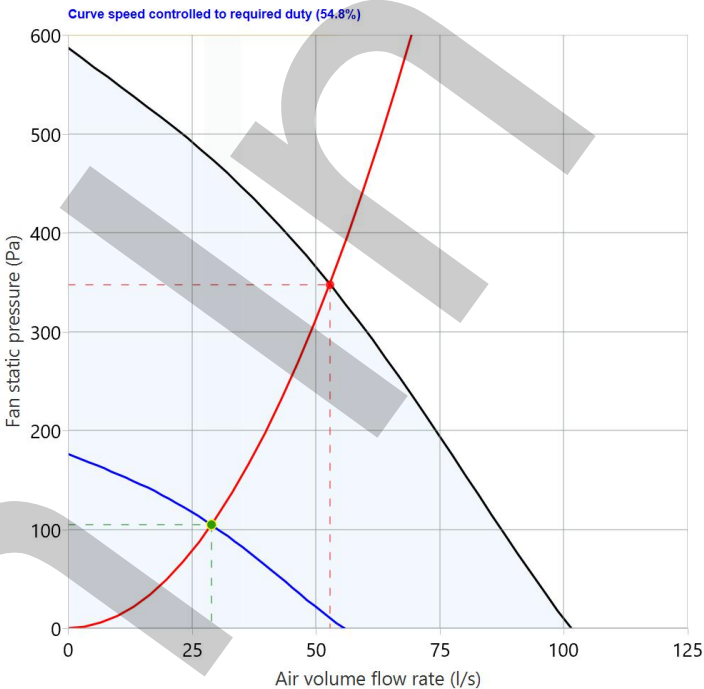
Sound Data

Acoustic performance to ISO 13347 and AMCA 300.
Noise calculated speed controlled to required duty (54.8%)

Sound Power Levels re 1 pWatts (Hz):									
Hz	63	125	250	500	1k	2k	4k	8k	dBA
Breakout	45	52	49	49	40	35	22	<16	30
Open Inlet (Intake & Extract)	41	41	53	47	40	35	20	<16	
Open Outlet (Supply & Exhaust)	51	57	58	61	56	53	43	32	

dBA is hemi-spherical at 3 metres. For spherical deduct 3 dBA.
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.

Performance Chart



Additional Notes

Specification

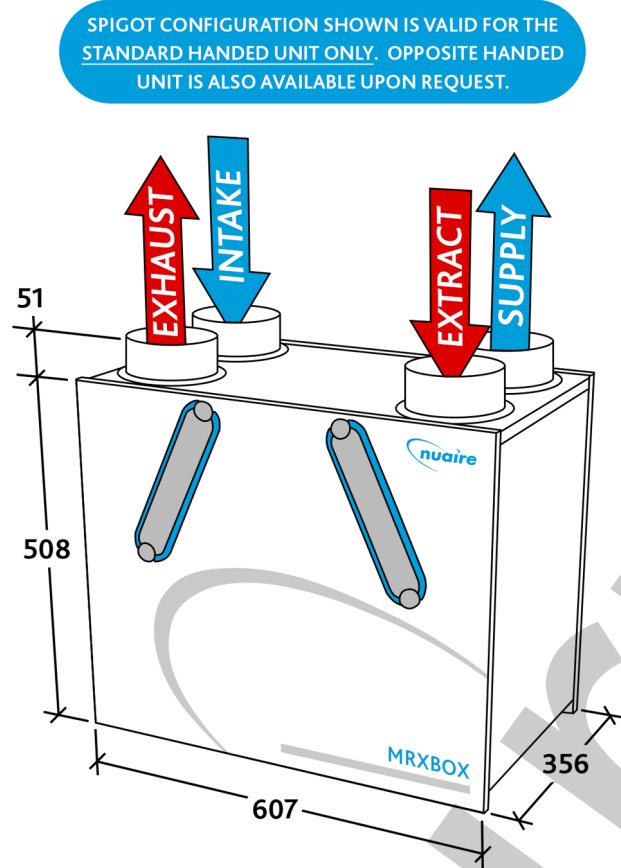
The unit shall be fully insulated providing excellent thermal and acoustic characteristics and shall be complete with a multi plate counter flow high efficiency heat exchanger block, with a thermal efficiency of up to 95%. The heat exchanger shall be protected by filters on fresh air inlet and system extract. The heat exchanger and filters shall be accessible via the front access panel, enabling quick and easy maintenance.
The unit shall have low energy, high efficiency EC fan/motor assemblies with sealed for life bearings, the impellers shall be backward curved centrifugal type. The motors shall be suitable for an ambient temperature of 40°C.
The unit shall be supplied complete with a condensate drip tray and 21.5mm drain connection.
The unit shall be suitable for 125mm circular ducting.
The breakout noise level and power requirements shall be as detailed by the unit manufacturer and in accordance with the ventilation equipment schedule.
The unit shall be offered with a five year warranty. The product warranty applies to the UK mainland and in accordance with Clause 14 of our Conditions of Sale. Customers purchasing from outside of the UK should contact Nuaire International Sales office for further details.



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 11 Nov 2022 16:03 using software version 5.7.4437.0

Fan Dimensions



Length: Width: Height:
356 607 507
Spigot size: 125
Duct size: 125
Drawing is for dimensional purposes only. Dimensions in mm.
Please see selected ancillaries section for additional dimensions for any requested additional ancillaries.

SAP Appendix Q Test Results

Application	Specific Fan Power (W/l/s)	Heat Exchange Efficiency %
Kitchen + 1 wet room	0.55	90%
Kitchen + 2 wet rooms	0.65	89%
Kitchen + 3 wet rooms	0.8	87%
Kitchen + 4 wet rooms	1.01	86%
Kitchen + 5 wet rooms	1.26	86%



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 11 Nov 2022 16:03 using software version 5.7.4437.0

Project: 20/01070/RES

VICTORIA RIVERSIDE
Location: VRS 1427 Typical 1 bed MROH 55@173 220X90

Technical Data

MRXBOX-ECO - Wall Mounted Multi Room Xbox
Fan Code: **MRXBOXAB-ECO2B-SW**
Installation Manual Links: 671795

Required duty: 55 l/s at 173 Pa
Actual duty: 67 l/s at 257 Pa
Actual at required flow: 55 l/s at 334 Pa

When speed controlled to required duty (82.34%):
Motor Input Power: 0.087 kW
Specific Fan Power: 1.6 W/(l/s)
Velocity at required duty: 4.482 m/s

At full speed:
Motor Input Power: 0.156 kW
Specific Fan Power: 2.3 W/(l/s)

Maximum Fan Speed: 3,300 RPM
Electrical Supply: 230V, 1 Phase, 50 Hz
Motor current (flc): 1.2 A

Max. operating temp: 50°C
Weight: 20 kg
Starting currents are nominal.

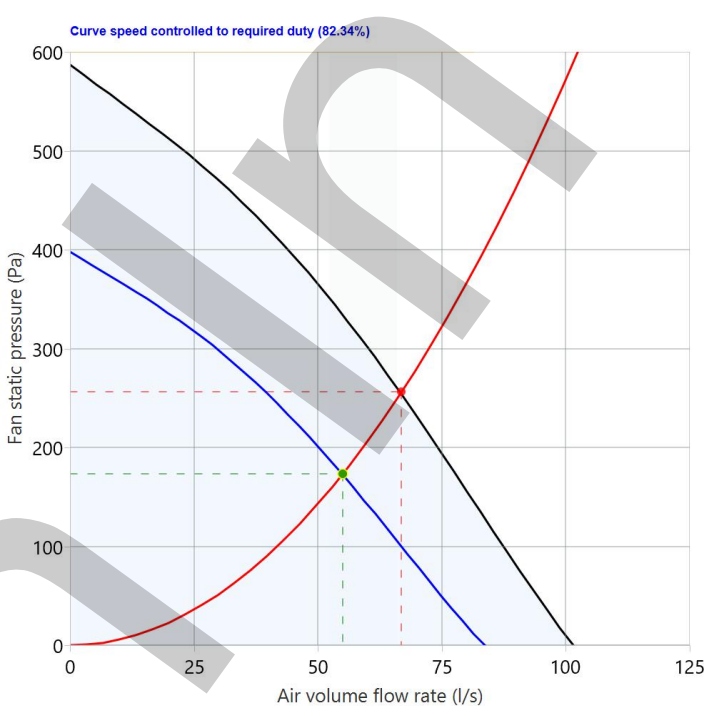
Sound Data

Acoustic performance to ISO 13347 and AMCA 300.
Noise calculated speed controlled to required duty (82.34%)
Sound Power Levels re 1 pWatts (Hz):
Hz 63 125 250 500 1k 2k 4k 8k dBA
Breakout 59 59 56 57 48 45 32 23 39
Open Inlet (Intake & Extract) 45 50 59 56 48 44 31 26
Open Outlet (Supply & Exhaust) 56 63 66 69 66 64 55 45

dBA is hemi-spherical at 3 metres. For spherical deduct 3 dBA.

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.

Performance Chart



Additional Notes

Specification

The unit shall be fully insulated providing excellent thermal and acoustic characteristics and shall be complete with a multi plate counter flow high efficiency heat exchanger block, with a thermal efficiency of up to 95%. The heat exchanger shall be protected by filters on fresh air inlet and system extract. The heat exchanger and filters shall be accessible via the front access panel, enabling quick and easy maintenance.
The unit shall have low energy, high efficiency EC fan/motor assemblies with sealed for life bearings, the impellers shall be backward curved centrifugal type. The motors shall be suitable for an ambient temperature of 40°C.
The unit shall be supplied complete with a condensate drip tray and 21.5mm drain connection.
The unit shall be suitable for 125mm circular ducting.
The breakout noise level and power requirements shall be as detailed by the unit manufacturer and in accordance with the ventilation equipment schedule.
The unit shall be offered with a five year warranty. The product warranty applies to the UK mainland and in accordance with Clause 14 of our Conditions of Sale. Customers purchasing from outside of the UK should contact Nuaire International Sales office for further details.

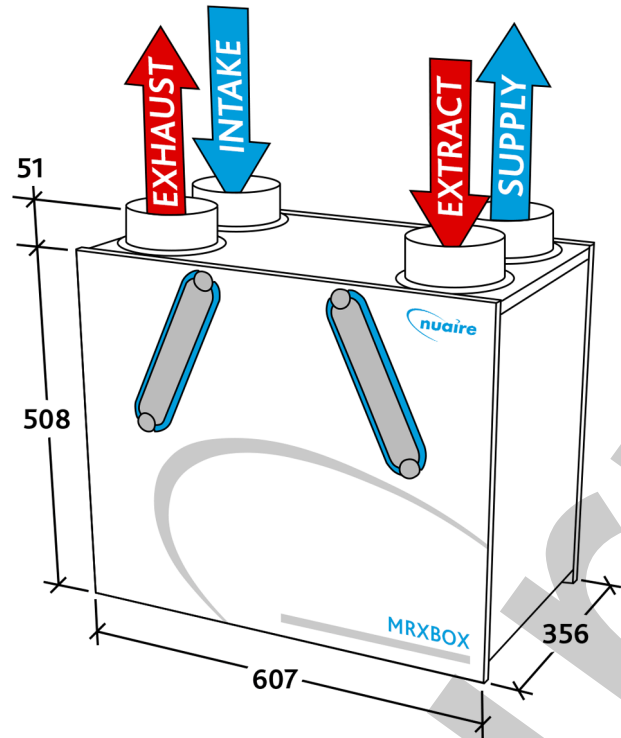


SUMMARY FAN DATA SHEET

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 11 Nov 2022 16:03 using software version 5.7.4437.0

Fan Dimensions

SPIGOT CONFIGURATION SHOWN IS VALID FOR THE STANDARD HANDED UNIT ONLY. OPPOSITE HANDED UNIT IS ALSO AVAILABLE UPON REQUEST.



Length: Width: Height:
356 607 507
Spigot size: 125
Duct size: 125
Drawing is for dimensional purposes only. Dimensions in mm.
Please see selected ancillaries section for additional dimensions for any requested additional ancillaries.

SAP Appendix Q Test Results

Application	Specific Fan Power (W/l/s)	Heat Exchange Efficiency %
Kitchen + 1 wet room	0.55	90%
Kitchen + 2 wet rooms	0.65	89%
Kitchen + 3 wet rooms	0.8	87%
Kitchen + 4 wet rooms	1.01	86%
Kitchen + 5 wet rooms	1.26	86%



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 11 Nov 2022 16:03 using software version 5.7.4437.0

Project: 20/01070/RES

VICTORIA RIVERSIDE
Location: VRS 1429 Typical 2 bed LR 22@50 204X60

Technical Data

MRXBOX-ECO - Wall Mounted Multi Room Xbox
Fan Code: MRXBOXAB-ECO2B
Installation Manual Links: 671795

Required duty: 22 l/s at 50 Pa
Actual duty: 56 l/s at 323 Pa
Actual at required flow: 22 l/s at 504 Pa

When speed controlled to required duty (39.22%):
Motor Input Power: 0.009 kW
Specific Fan Power: 0.4 W/(l/s)
Velocity at required duty: 1.793 m/s

At full speed:
Motor Input Power: 0.156 kW
Specific Fan Power: 2.8 W/(l/s)
Maximum Fan Speed: 3,300 RPM
Electrical Supply: 230V, 1 Phase, 50 Hz
Motor current (flc): 1.2 A

Max. operating temp: 50°C
Weight: 20 kg
Starting currents are nominal.

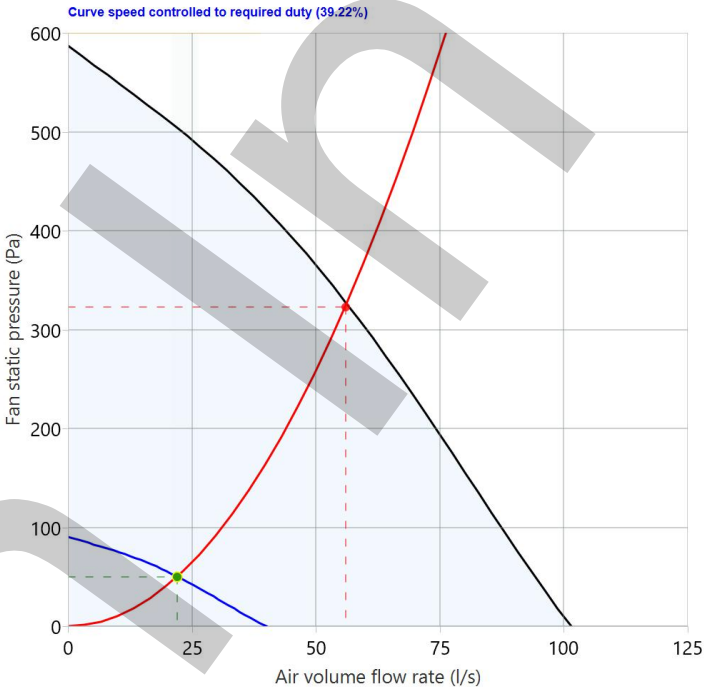
Sound Data

Acoustic performance to ISO 13347 and AMCA 300.
Noise calculated speed controlled to required duty (39.22%)

Sound Power Levels re 1 pWatts (Hz):									
Hz	63	125	250	500	1k	2k	4k	8k	dBA
Breakout	39	44	42	42	32	26	<16	<16	23
Open Inlet (Intake & Extract)	39	37	45	40	33	26	<16	<16	
Open Outlet (Supply & Exhaust)	43	49	51	54	49	44	33	20	

dBA is hemi-spherical at 3 metres. For spherical deduct 3 dBA.
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.

Performance Chart



Additional Notes

Specification

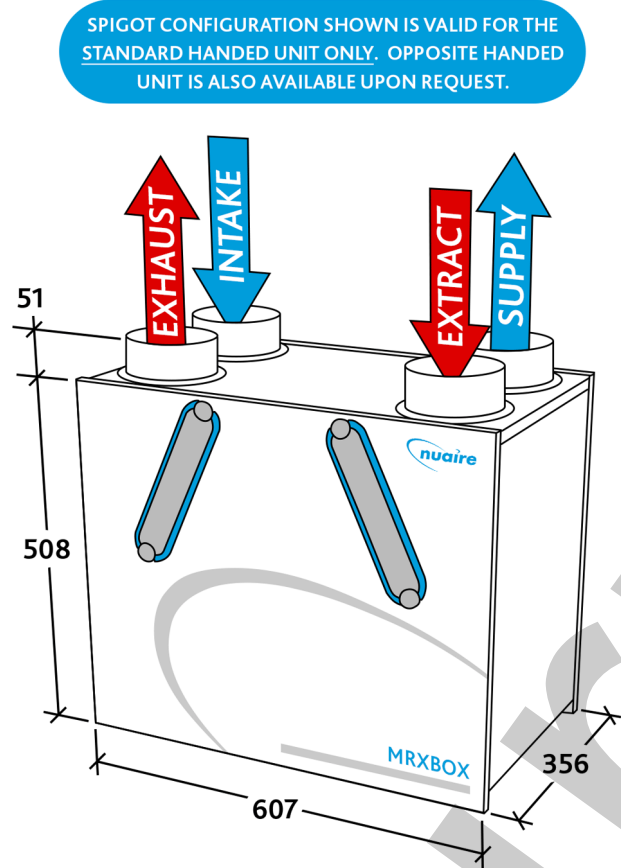
The unit shall be fully insulated providing excellent thermal and acoustic characteristics and shall be complete with a multi plate counter flow high efficiency heat exchanger block, with a thermal efficiency of up to 95%. The heat exchanger shall be protected by filters on fresh air inlet and system extract. The heat exchanger and filters shall be accessible via the front access panel, enabling quick and easy maintenance.
The unit shall have low energy, high efficiency EC fan/motor assemblies with sealed for life bearings, the impellers shall be backward curved centrifugal type. The motors shall be suitable for an ambient temperature of 40°C.
The unit shall be supplied complete with a condensate drip tray and 21.5mm drain connection.
The unit shall be suitable for 125mm circular ducting.
The breakout noise level and power requirements shall be as detailed by the unit manufacturer and in accordance with the ventilation equipment schedule.
The unit shall be offered with a five year warranty. The product warranty applies to the UK mainland and in accordance with Clause 14 of our Conditions of Sale. Customers purchasing from outside of the UK should contact Nuaire International Sales office for further details.



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 11 Nov 2022 16:03 using software version 5.7.4437.0

Fan Dimensions



Length: Width: Height:
356 607 507
Spigot size: 125
Duct size: 125
Drawing is for dimensional purposes only. Dimensions in mm.
Please see selected ancillaries section for additional dimensions for any requested additional ancillaries.

SAP Appendix Q Test Results

Application	Specific Fan Power (W/l/s)	Heat Exchange Efficiency %
Kitchen + 1 wet room	0.55	90%
Kitchen + 2 wet rooms	0.65	89%
Kitchen + 3 wet rooms	0.8	87%
Kitchen + 4 wet rooms	1.01	86%
Kitchen + 5 wet rooms	1.26	86%



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 11 Nov 2022 16:03 using software version 5.7.4437.0

Project: 20/01070/RES

VICTORIA RIVERSIDE
Location: VRS 1429 Typical 2 bed HR 37@157 204X60

Technical Data

MRXBOX-ECO - Wall Mounted Multi Room Xbox
Fan Code: MRXBOXAB-ECO2B
Installation Manual Links: 671795

Required duty: 37 l/s at 157 Pa
Actual duty: 55 l/s at 338 Pa
Actual at required flow: 37 l/s at 437 Pa

When speed controlled to required duty (67.88%):
Motor Input Power: 0.049 kW
Specific Fan Power: 1.3 W/(l/s)
Velocity at required duty: 3.015 m/s

At full speed:
Motor Input Power: 0.156 kW
Specific Fan Power: 2.9 W/(l/s)

Maximum Fan Speed: 3,300 RPM
Electrical Supply: 230V, 1 Phase, 50 Hz
Motor current (flc): 1.2 A

Max. operating temp: 50°C
Weight: 20 kg
Starting currents are nominal.

Sound Data

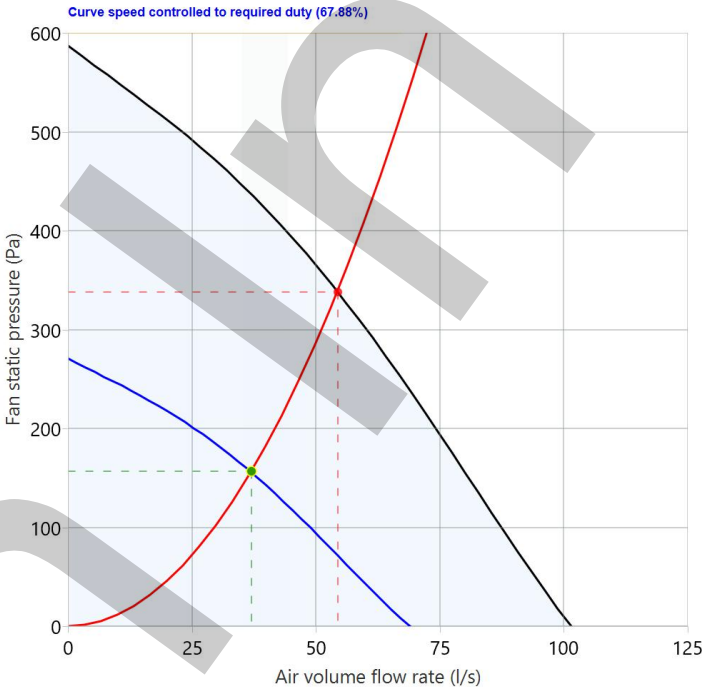
Acoustic performance to ISO 13347 and AMCA 300.
Noise calculated speed controlled to required duty (67.88%)

Sound Power Levels re 1 pWatts (Hz):									
Hz	63	125	250	500	1k	2k	4k	8k	dBA
Breakout	52	57	53	54	45	41	29	18	35
Open Inlet (Intake & Extract)	43	45	58	52	45	41	27	19	
Open Outlet (Supply & Exhaust)	55	62	63	67	62	60	51	41	

dBA is hemi-spherical at 3 metres. For spherical deduct 3 dBA.

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.

Performance Chart



Additional Notes

Specification

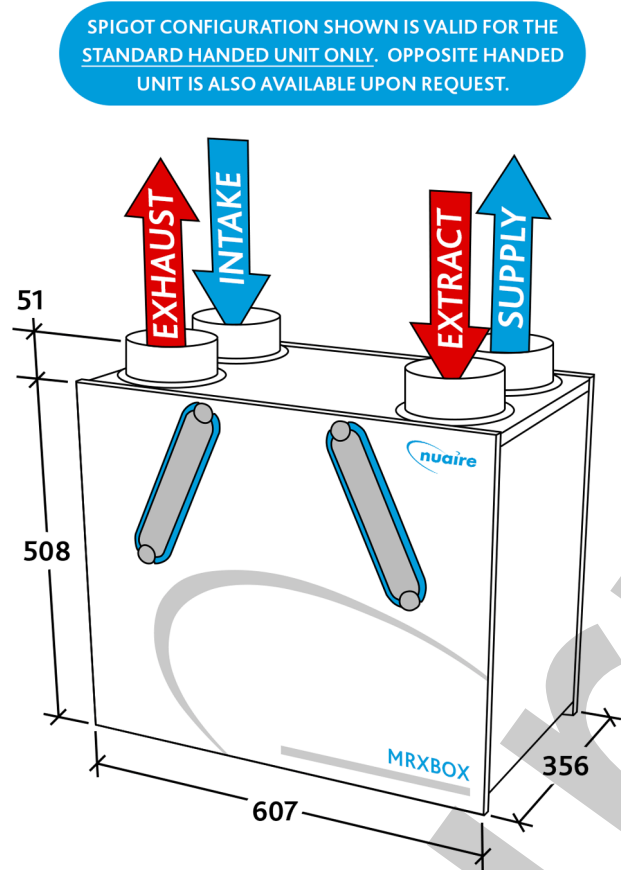
The unit shall be fully insulated providing excellent thermal and acoustic characteristics and shall be complete with a multi plate counter flow high efficiency heat exchanger block, with a thermal efficiency of up to 95%. The heat exchanger shall be protected by filters on fresh air inlet and system extract. The heat exchanger and filters shall be accessible via the front access panel, enabling quick and easy maintenance.
The unit shall have low energy, high efficiency EC fan/motor assemblies with sealed for life bearings, the impellers shall be backward curved centrifugal type. The motors shall be suitable for an ambient temperature of 40°C.
The unit shall be supplied complete with a condensate drip tray and 21.5mm drain connection.
The unit shall be suitable for 125mm circular ducting.
The breakout noise level and power requirements shall be as detailed by the unit manufacturer and in accordance with the ventilation equipment schedule.
The unit shall be offered with a five year warranty. The product warranty applies to the UK mainland and in accordance with Clause 14 of our Conditions of Sale. Customers purchasing from outside of the UK should contact Nuaire International Sales office for further details.



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 11 Nov 2022 16:03 using software version 5.7.4437.0

Fan Dimensions



Length: Width: Height:
356 607 507
Spigot size: 125
Duct size: 125
Drawing is for dimensional purposes only. Dimensions in mm.
Please see selected ancillaries section for additional dimensions for any requested additional ancillaries.

SAP Appendix Q Test Results

Application	Specific Fan Power (W/l/s)	Heat Exchange Efficiency %
Kitchen + 1 wet room	0.55	90%
Kitchen + 2 wet rooms	0.65	89%
Kitchen + 3 wet rooms	0.8	87%
Kitchen + 4 wet rooms	1.01	86%
Kitchen + 5 wet rooms	1.26	86%



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 11 Nov 2022 16:03 using software version 5.7.4437.0

Project: 20/01070/RES

VICTORIA RIVERSIDE
Location: VRS 1429 Typical 2 bed MROH 55@158 220X90

Technical Data

MRXBOX-ECO - Wall Mounted Multi Room Xbox
Fan Code: **MRXBOXAB-ECO2B-SW**
Installation Manual Links: 671795

Required duty: 55 l/s at 158 Pa
Actual duty: 68 l/s at 246 Pa
Actual at required flow: 55 l/s at 334 Pa

When speed controlled to required duty (80.43%):
Motor Input Power: 0.081 kW
Specific Fan Power: 1.5 W/(l/s)
Velocity at required duty: 4.482 m/s

At full speed:
Motor Input Power: 0.156 kW
Specific Fan Power: 2.3 W/(l/s)

Maximum Fan Speed: 3,300 RPM
Electrical Supply: 230V, 1 Phase, 50 Hz
Motor current (flc): 1.2 A

Max. operating temp: 50°C
Weight: 20 kg
Starting currents are nominal.

Sound Data

Acoustic performance to ISO 13347 and AMCA 300.
Noise calculated speed controlled to required duty (80.43%)

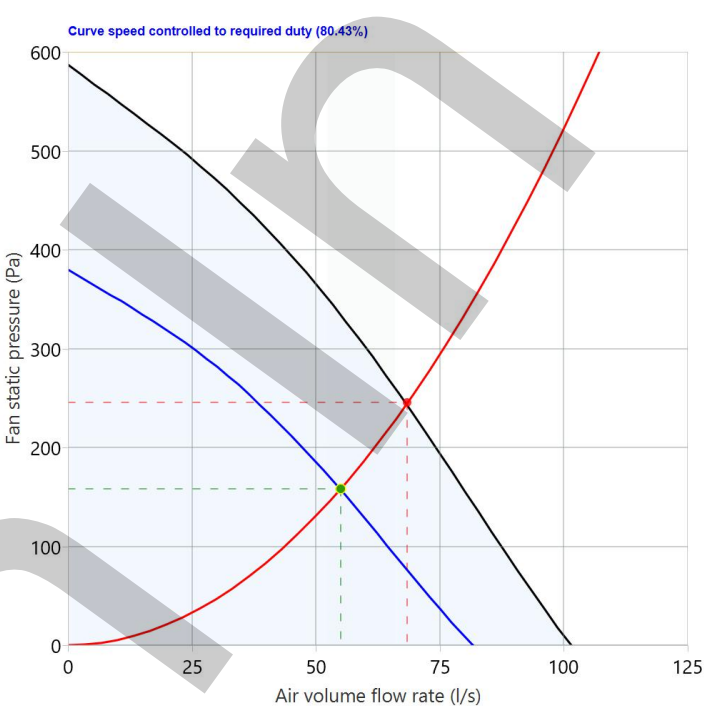
Sound Power Levels re 1 pWatts (Hz):

Hz	63	125	250	500	1k	2k	4k	8k	dBA
Breakout	58	58	56	57	48	44	31	22	38
Open Inlet (Intake & Extract)	45	49	59	55	48	44	31	24	
Open Outlet (Supply & Exhaust)	55	63	66	69	66	63	54	44	

dBA is hemi-spherical at 3 metres. For spherical deduct 3 dBA.

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.

Performance Chart



Additional Notes

Specification

The unit shall be fully insulated providing excellent thermal and acoustic characteristics and shall be complete with a multi plate counter flow high efficiency heat exchanger block, with a thermal efficiency of up to 95%. The heat exchanger shall be protected by filters on fresh air inlet and system extract. The heat exchanger and filters shall be accessible via the front access panel, enabling quick and easy maintenance.

The unit shall have low energy, high efficiency EC fan/motor assemblies with sealed for life bearings, the impellers shall be backward curved centrifugal type. The motors shall be suitable for an ambient temperature of 40°C.

The unit shall be supplied complete with a condensate drip tray and 21.5mm drain connection.

The unit shall be suitable for 125mm circular ducting.

The breakout noise level and power requirements shall be as detailed by the unit manufacturer and in accordance with the ventilation equipment schedule.

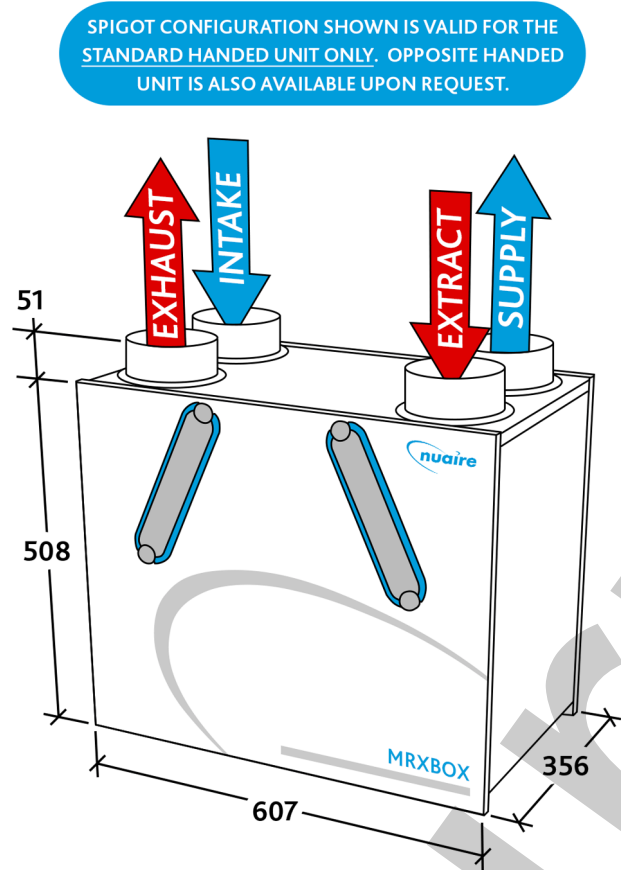
The unit shall be offered with a five year warranty. The product warranty applies to the UK mainland and in accordance with Clause 14 of our Conditions of Sale. Customers purchasing from outside of the UK should contact Nuaire International Sales office for further details.



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 11 Nov 2022 16:03 using software version 5.7.4437.0

Fan Dimensions



Length: Width: Height:
356 607 507
Spigot size: 125
Duct size: 125
Drawing is for dimensional purposes only. Dimensions in mm.
Please see selected ancillaries section for additional dimensions for any requested additional ancillaries.

SAP Appendix Q Test Results

Application	Specific Fan Power (W/l/s)	Heat Exchange Efficiency %
Kitchen + 1 wet room	0.55	90%
Kitchen + 2 wet rooms	0.65	89%
Kitchen + 3 wet rooms	0.8	87%
Kitchen + 4 wet rooms	1.01	86%
Kitchen + 5 wet rooms	1.26	86%



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 11 Nov 2022 16:03 using software version 5.7.4437.0

Project: 20/01070/RES

VICTORIA RIVERSIDE
Location: VRS 1440 Typical 2 bed 2 storey LR 28@74 204X60

Technical Data

MRXBOX-ECO - Wall Mounted Multi Room Xbox
Fan Code: MRXBOXAB-ECO2B
Installation Manual Links: 671795

Required duty: 28 l/s at 74 Pa
Actual duty: 58 l/s at 312 Pa
Actual at required flow: 28 l/s at 479 Pa

When speed controlled to required duty (48.55%):
Motor Input Power: 0.018 kW
Specific Fan Power: 0.6 W/(l/s)
Velocity at required duty: 2.282 m/s

At full speed:
Motor Input Power: 0.156 kW
Specific Fan Power: 2.7 W/(l/s)

Maximum Fan Speed: 3,300 RPM
Electrical Supply: 230V, 1 Phase, 50 Hz
Motor current (flc): 1.2 A

Max. operating temp: 50°C
Weight: 20 kg
Starting currents are nominal.

Sound Data

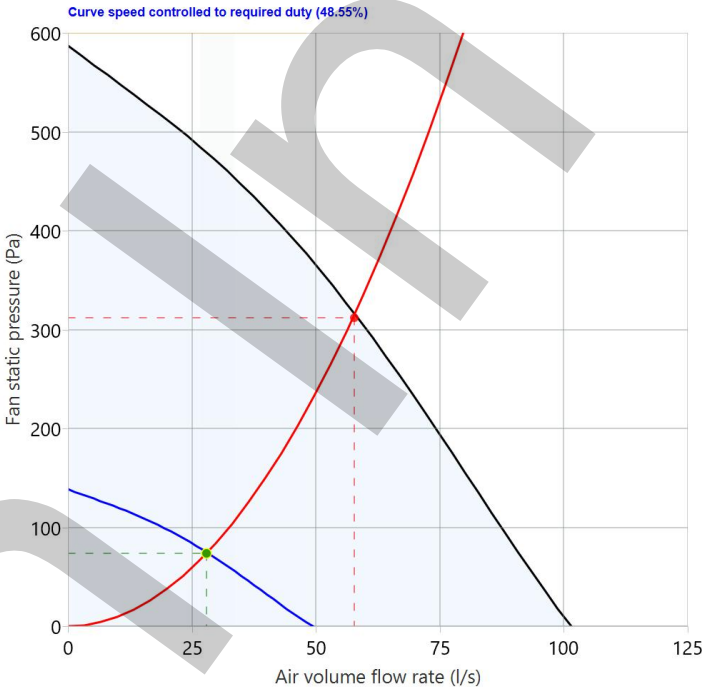
Acoustic performance to ISO 13347 and AMCA 300.
Noise calculated speed controlled to required duty (48.55%)

Sound Power Levels re 1 pWatts (Hz):									
Hz	63	125	250	500	1k	2k	4k	8k	dBA
Breakout	43	48	46	46	37	32	17	<16	27
Open Inlet (Intake & Extract)	40	39	49	44	37	31	<16	<16	
Open Outlet (Supply & Exhaust)	48	54	55	58	53	50	39	27	

dBA is hemi-spherical at 3 metres. For spherical deduct 3 dBA.

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.

Performance Chart



Additional Notes

Specification

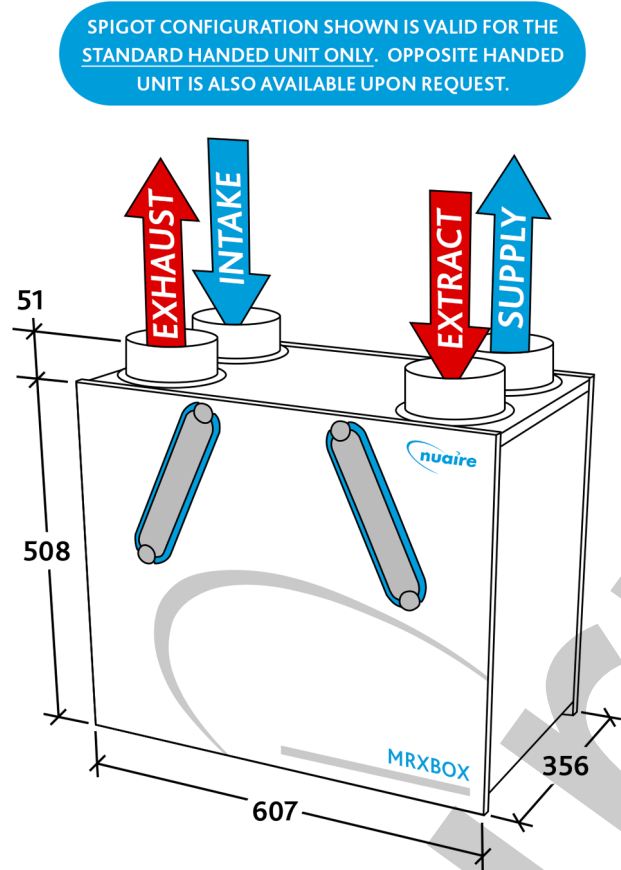
The unit shall be fully insulated providing excellent thermal and acoustic characteristics and shall be complete with a multi plate counter flow high efficiency heat exchanger block, with a thermal efficiency of up to 95%. The heat exchanger shall be protected by filters on fresh air inlet and system extract. The heat exchanger and filters shall be accessible via the front access panel, enabling quick and easy maintenance.
The unit shall have low energy, high efficiency EC fan/motor assemblies with sealed for life bearings, the impellers shall be backward curved centrifugal type. The motors shall be suitable for an ambient temperature of 40°C.
The unit shall be supplied complete with a condensate drip tray and 21.5mm drain connection.
The unit shall be suitable for 125mm circular ducting.
The breakout noise level and power requirements shall be as detailed by the unit manufacturer and in accordance with the ventilation equipment schedule.
The unit shall be offered with a five year warranty. The product warranty applies to the UK mainland and in accordance with Clause 14 of our Conditions of Sale. Customers purchasing from outside of the UK should contact Nuaire International Sales office for further details.



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 11 Nov 2022 16:03 using software version 5.7.4437.0

Fan Dimensions



Length: Width: Height:
356 607 507
Spigot size: 125
Duct size: 125
Drawing is for dimensional purposes only. Dimensions in mm.
Please see selected ancillaries section for additional dimensions for any requested additional ancillaries.

SAP Appendix Q Test Results

Application	Specific Fan Power (W/l/s)	Heat Exchange Efficiency %
Kitchen + 1 wet room	0.55	90%
Kitchen + 2 wet rooms	0.65	89%
Kitchen + 3 wet rooms	0.8	87%
Kitchen + 4 wet rooms	1.01	86%
Kitchen + 5 wet rooms	1.26	86%



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 11 Nov 2022 16:03 using software version 5.7.4437.0

Project: 20/01070/RES

VICTORIA RIVERSIDE
Location: VRS 1440 Typical 2 bed 2 storey HR 35@111 204X60

Technical Data

MRXBOX-ECO - Wall Mounted Multi Room Xbox
Fan Code: MRXBOXAB-ECO2B
Installation Manual Links: 671795

Required duty: 35 l/s at 111 Pa
Actual duty: 58 l/s at 308 Pa
Actual at required flow: 35 l/s at 447 Pa

When speed controlled to required duty (59.86%):
Motor Input Power: 0.033 kW
Specific Fan Power: 1.0 W/(l/s)
Velocity at required duty: 2.852 m/s

At full speed:
Motor Input Power: 0.156 kW
Specific Fan Power: 2.7 W/(l/s)
Maximum Fan Speed: 3,300 RPM
Electrical Supply: 230V, 1 Phase, 50 Hz
Motor current (flc): 1.2 A

Max. operating temp: 50°C
Weight: 20 kg
Starting currents are nominal.

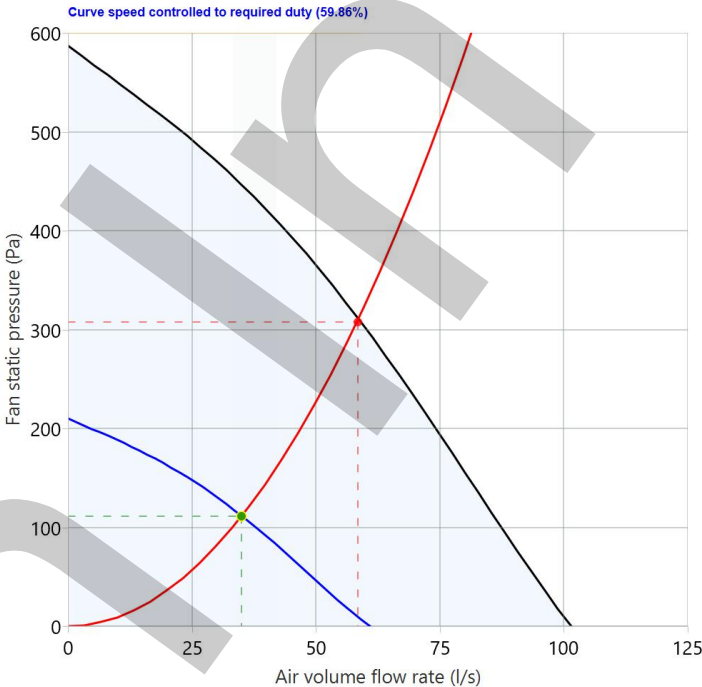
Sound Data

Acoustic performance to ISO 13347 and AMCA 300.
Noise calculated speed controlled to required duty (59.86%)

Sound Power Levels re 1 pWatts (Hz):									
Hz	63	125	250	500	1k	2k	4k	8k	dBA
Breakout	48	54	51	51	42	38	25	<16	32
Open Inlet (Intake & Extract)	41	42	55	49	42	37	23	<16	
Open Outlet (Supply & Exhaust)	52	59	60	63	59	56	46	35	

dBA is hemi-spherical at 3 metres. For spherical deduct 3 dBA.
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.

Performance Chart



Additional Notes

Specification

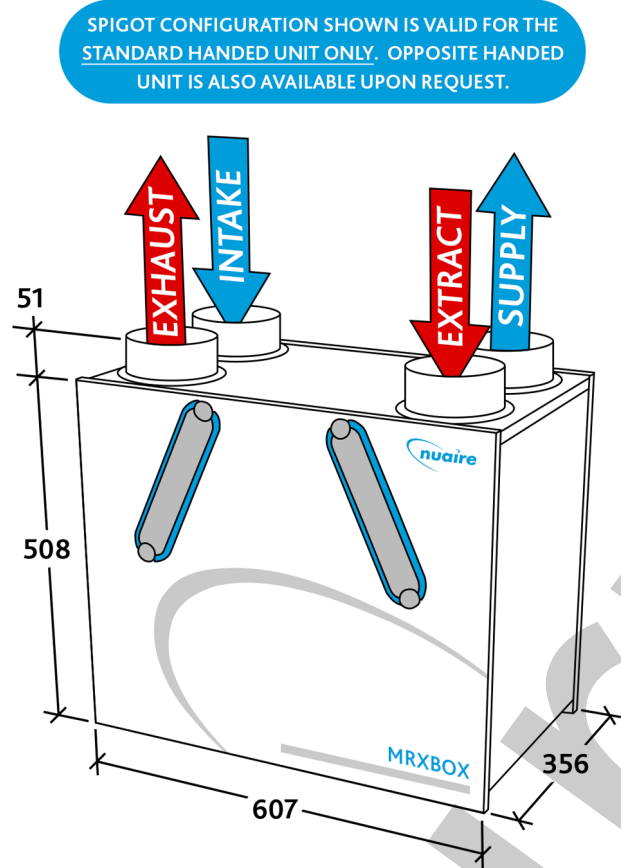
The unit shall be fully insulated providing excellent thermal and acoustic characteristics and shall be complete with a multi plate counter flow high efficiency heat exchanger block, with a thermal efficiency of up to 95%. The heat exchanger shall be protected by filters on fresh air inlet and system extract. The heat exchanger and filters shall be accessible via the front access panel, enabling quick and easy maintenance.
The unit shall have low energy, high efficiency EC fan/motor assemblies with sealed for life bearings, the impellers shall be backward curved centrifugal type. The motors shall be suitable for an ambient temperature of 40°C.
The unit shall be supplied complete with a condensate drip tray and 21.5mm drain connection.
The unit shall be suitable for 125mm circular ducting.
The breakout noise level and power requirements shall be as detailed by the unit manufacturer and in accordance with the ventilation equipment schedule.
The unit shall be offered with a five year warranty. The product warranty applies to the UK mainland and in accordance with Clause 14 of our Conditions of Sale. Customers purchasing from outside of the UK should contact Nuaire International Sales office for further details.



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 11 Nov 2022 16:03 using software version 5.7.4437.0

Fan Dimensions



Length: Width: Height:
356 607 507
Spigot size: 125
Duct size: 125
Drawing is for dimensional purposes only. Dimensions in mm.
Please see selected ancillaries section for additional dimensions for any requested additional ancillaries.

SAP Appendix Q Test Results

Application	Specific Fan Power (W/l/s)	Heat Exchange Efficiency %
Kitchen + 1 wet room	0.55	90%
Kitchen + 2 wet rooms	0.65	89%
Kitchen + 3 wet rooms	0.8	87%
Kitchen + 4 wet rooms	1.01	86%
Kitchen + 5 wet rooms	1.26	86%



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 11 Nov 2022 16:03 using software version 5.7.4437.0

Project: 20/01070/RES

VICTORIA RIVERSIDE
Location: VRS 1440 Typical 2 bed 2 storey MROH 55@99 220X90

Technical Data

MRXBOX-ECO - Wall Mounted Multi Room Xbox
Fan Code: **MRXBOXAB-ECO2B-SW**
Installation Manual Links: 671795

Required duty: 55 l/s at 99 Pa
Actual duty: 76 l/s at 188 Pa
Actual at required flow: 55 l/s at 334 Pa

When speed controlled to required duty (72.45%):
Motor Input Power: 0.059 kW
Specific Fan Power: 1.1 W/(l/s)
Velocity at required duty: 4.482 m/s

At full speed:
Motor Input Power: 0.156 kW
Specific Fan Power: 2.1 W/(l/s)

Maximum Fan Speed: 3,300 RPM
Electrical Supply: 230V, 1 Phase, 50 Hz
Motor current (flc): 1.2 A

Max. operating temp: 50°C
Weight: 20 kg
Starting currents are nominal.

Sound Data

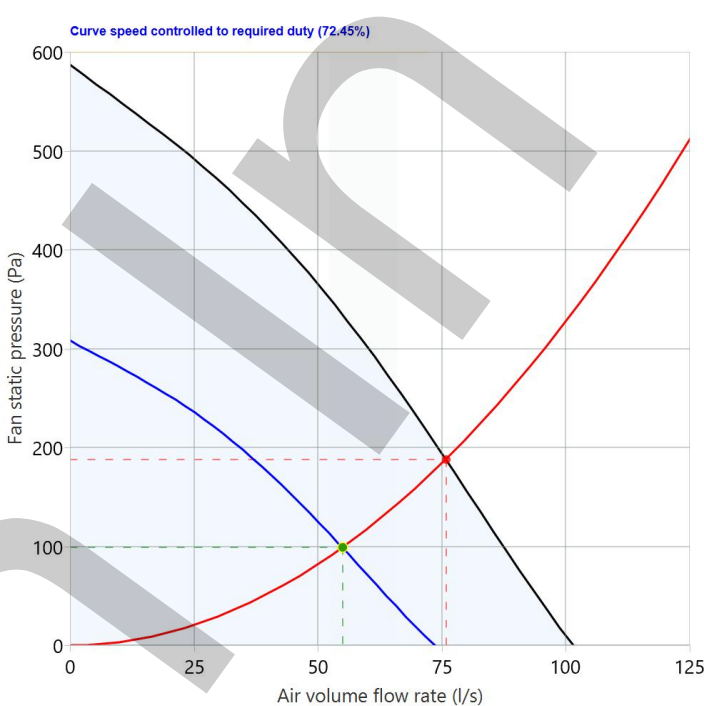
Acoustic performance to ISO 13347 and AMCA 300.
Noise calculated speed controlled to required duty (72.45%)

Sound Power Levels re 1 pWatts (Hz):

Hz	63	125	250	500	1k	2k	4k	8k	dBA
Breakout	52	56	53	53	45	41	28	17	35
Open Inlet (Intake & Extract)	43	45	57	51	45	40	27	18	
Open Outlet (Supply & Exhaust)	54	62	63	66	62	59	50	40	

dBA is hemi-spherical at 3 metres. For spherical deduct 3 dBA.
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.

Performance Chart



Additional Notes

Specification

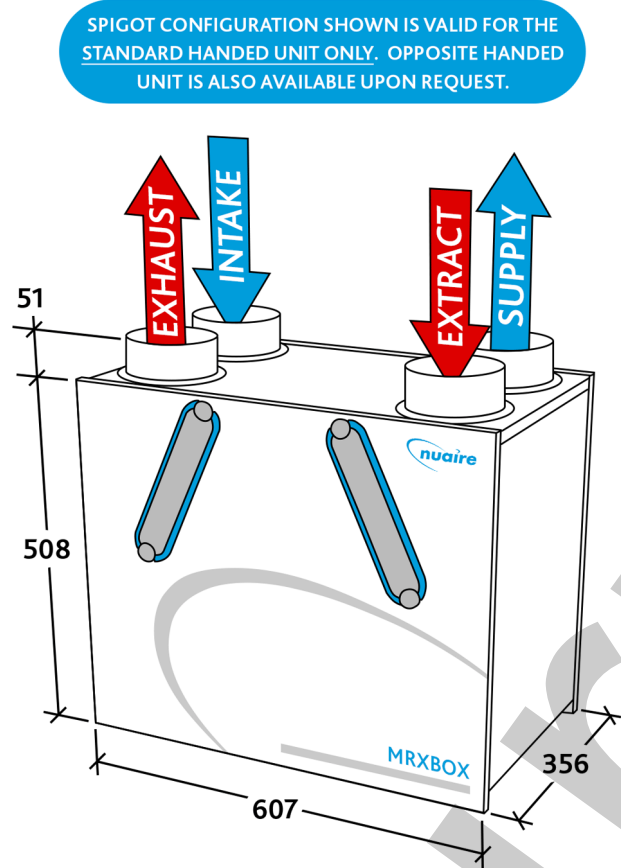
The unit shall be fully insulated providing excellent thermal and acoustic characteristics and shall be complete with a multi plate counter flow high efficiency heat exchanger block, with a thermal efficiency of up to 95%. The heat exchanger shall be protected by filters on fresh air inlet and system extract. The heat exchanger and filters shall be accessible via the front access panel, enabling quick and easy maintenance.
The unit shall have low energy, high efficiency EC fan/motor assemblies with sealed for life bearings, the impellers shall be backward curved centrifugal type. The motors shall be suitable for an ambient temperature of 40°C.
The unit shall be supplied complete with a condensate drip tray and 21.5mm drain connection.
The unit shall be suitable for 125mm circular ducting.
The breakout noise level and power requirements shall be as detailed by the unit manufacturer and in accordance with the ventilation equipment schedule.
The unit shall be offered with a five year warranty. The product warranty applies to the UK mainland and in accordance with Clause 14 of our Conditions of Sale. Customers purchasing from outside of the UK should contact Nuaire International Sales office for further details.



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 11 Nov 2022 16:03 using software version 5.7.4437.0

Fan Dimensions



Length: Width: Height:
356 607 507
Spigot size: 125
Duct size: 125
Drawing is for dimensional purposes only. Dimensions in mm.
Please see selected ancillaries section for additional dimensions for any requested additional ancillaries.

SAP Appendix Q Test Results

Application	Specific Fan Power (W/l/s)	Heat Exchange Efficiency %
Kitchen + 1 wet room	0.55	90%
Kitchen + 2 wet rooms	0.65	89%
Kitchen + 3 wet rooms	0.8	87%
Kitchen + 4 wet rooms	1.01	86%
Kitchen + 5 wet rooms	1.26	86%



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 11 Nov 2022 16:03 using software version 5.7.4437.0

Project: 20/01070/RES

VICTORIA RIVERSIDE
Location: VRS 1434 Typical 3 bed LR 26@75 204X60

Technical Data

MRXBOX-ECO - Wall Mounted Multi Room Xbox
Fan Code: MRXBOXAB-ECO2B
Installation Manual Links: 671795

Required duty: 26 l/s at 75 Pa
Actual duty: 55 l/s at 337 Pa
Actual at required flow: 26 l/s at 487 Pa

When speed controlled to required duty (47.36%):
Motor Input Power: 0.017 kW
Specific Fan Power: 0.6 W/(l/s)
Velocity at required duty: 2.119 m/s

At full speed:
Motor Input Power: 0.156 kW
Specific Fan Power: 2.8 W/(l/s)

Maximum Fan Speed: 3,300 RPM
Electrical Supply: 230V, 1 Phase, 50 Hz
Motor current (flc): 1.2 A

Max. operating temp: 50°C
Weight: 20 kg
Starting currents are nominal.

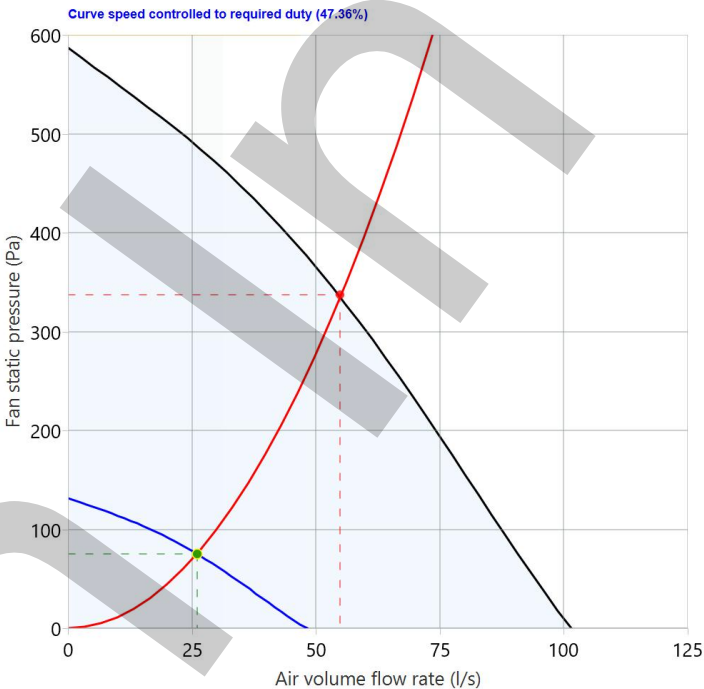
Sound Data

Acoustic performance to ISO 13347 and AMCA 300.
Noise calculated speed controlled to required duty (47.36%)

Sound Power Levels re 1 pWatts (Hz):									
Hz	63	125	250	500	1k	2k	4k	8k	dBA
Breakout	42	48	46	45	36	31	16	<16	27
Open Inlet (Intake & Extract)	40	39	49	43	36	31	<16	<16	
Open Outlet (Supply & Exhaust)	47	53	55	57	52	49	38	26	

dBA is hemi-spherical at 3 metres. For spherical deduct 3 dBA.
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.

Performance Chart



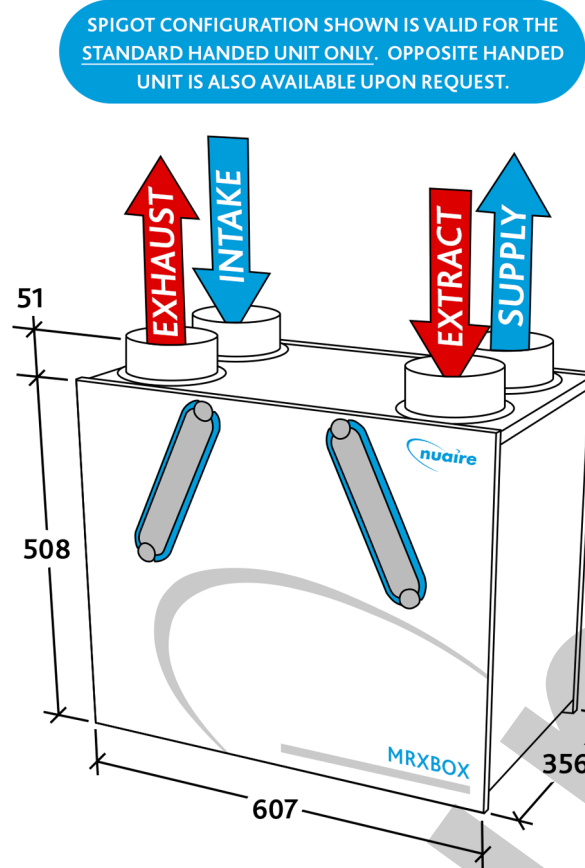
Additional Notes

Specification

The unit shall be fully insulated providing excellent thermal and acoustic characteristics and shall be complete with a multi plate counter flow high efficiency heat exchanger block, with a thermal efficiency of up to 95%. The heat exchanger shall be protected by filters on fresh air inlet and system extract. The heat exchanger and filters shall be accessible via the front access panel, enabling quick and easy maintenance.
The unit shall have low energy, high efficiency EC fan/motor assemblies with sealed for life bearings, the impellers shall be backward curved centrifugal type. The motors shall be suitable for an ambient temperature of 40°C.
The unit shall be supplied complete with a condensate drip tray and 21.5mm drain connection.
The unit shall be suitable for 125mm circular ducting.
The breakout noise level and power requirements shall be as detailed by the unit manufacturer and in accordance with the ventilation equipment schedule.
The unit shall be offered with a five year warranty. The product warranty applies to the UK mainland and in accordance with Clause 14 of our Conditions of Sale. Customers purchasing from outside of the UK should contact Nuaire International Sales office for further details.

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 11 Nov 2022 16:03 using software version 5.7.4437.0

Fan Dimensions



Length: Width: Height:
356 607 507
Spigot size: 125
Duct size: 125
Drawing is for dimensional purposes only. Dimensions in mm.
Please see selected ancillaries section for additional dimensions for any requested additional ancillaries.

SAP Appendix Q Test Results

Application	Specific Fan Power (W/l/s)	Heat Exchange Efficiency %
Kitchen + 1 wet room	0.55	90%
Kitchen + 2 wet rooms	0.65	89%
Kitchen + 3 wet rooms	0.8	87%
Kitchen + 4 wet rooms	1.01	86%
Kitchen + 5 wet rooms	1.26	86%



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 11 Nov 2022 16:03 using software version 5.7.4437.0

Project: 20/01070/RES

VICTORIA RIVERSIDE
Location: VRS 1434 Typical 3 bed HR 37@123 204X60

Technical Data

MRXBOX-ECO - Wall Mounted Multi Room Xbox
Fan Code: MRXBOXAB-ECO2B
Installation Manual Links: 671795

Required duty: 37 l/s at 123 Pa
Actual duty: 59 l/s at 313 Pa
Actual at required flow: 37 l/s at 437 Pa

When speed controlled to required duty (62.85%):
Motor Input Power: 0.039 kW
Specific Fan Power: 1.0 W/(l/s)
Velocity at required duty: 3.015 m/s

At full speed:
Motor Input Power: 0.156 kW
Specific Fan Power: 2.6 W/(l/s)
Maximum Fan Speed: 3,300 RPM
Electrical Supply: 230V, 1 Phase, 50 Hz
Motor current (flc): 1.2 A

Max. operating temp: 50°C
Weight: 20 kg
Starting currents are nominal.

Sound Data

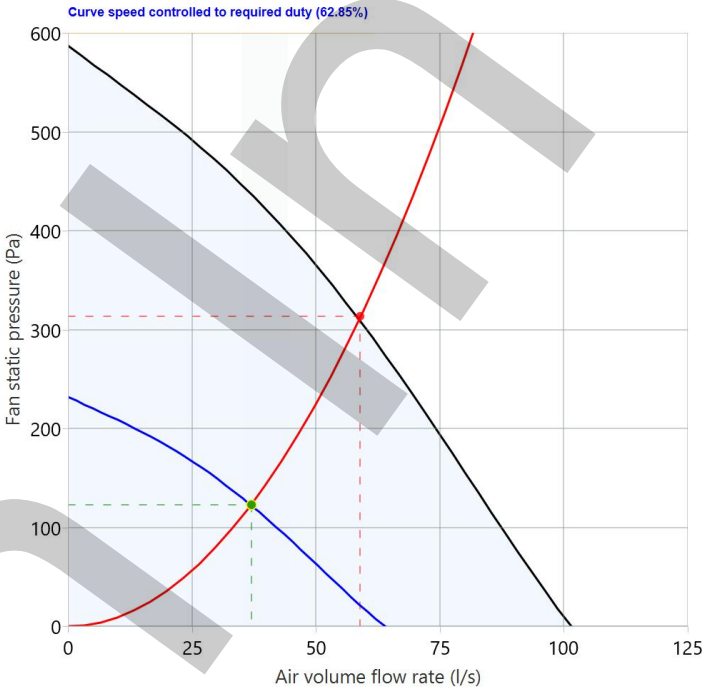
Acoustic performance to ISO 13347 and AMCA 300.
Noise calculated speed controlled to required duty (62.85%)

Sound Power Levels re 1 pWatts (Hz):									
Hz	63	125	250	500	1k	2k	4k	8k	dBA
Breakout	49	55	52	52	43	39	26	<16	33
Open Inlet (Intake & Extract)	42	43	56	50	43	39	25	<16	
Open Outlet (Supply & Exhaust)	53	61	61	65	60	58	48	38	

dBA is hemi-spherical at 3 metres. For spherical deduct 3 dBA.

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.

Performance Chart



Additional Notes

Specification

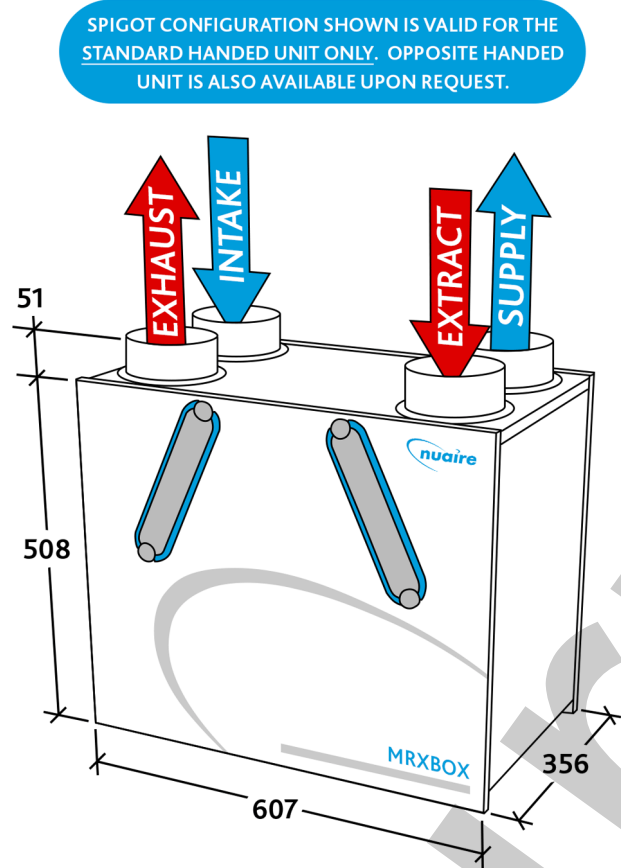
The unit shall be fully insulated providing excellent thermal and acoustic characteristics and shall be complete with a multi plate counter flow high efficiency heat exchanger block, with a thermal efficiency of up to 95%. The heat exchanger shall be protected by filters on fresh air inlet and system extract. The heat exchanger and filters shall be accessible via the front access panel, enabling quick and easy maintenance.
The unit shall have low energy, high efficiency EC fan/motor assemblies with sealed for life bearings, the impellers shall be backward curved centrifugal type. The motors shall be suitable for an ambient temperature of 40°C.
The unit shall be supplied complete with a condensate drip tray and 21.5mm drain connection.
The unit shall be suitable for 125mm circular ducting.
The breakout noise level and power requirements shall be as detailed by the unit manufacturer and in accordance with the ventilation equipment schedule.
The unit shall be offered with a five year warranty. The product warranty applies to the UK mainland and in accordance with Clause 14 of our Conditions of Sale. Customers purchasing from outside of the UK should contact Nuaire International Sales office for further details.



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 11 Nov 2022 16:03 using software version 5.7.4437.0

Fan Dimensions



Length: Width: Height:
356 607 507
Spigot size: 125
Duct size: 125
Drawing is for dimensional purposes only. Dimensions in mm.
Please see selected ancillaries section for additional dimensions for any requested additional ancillaries.

SAP Appendix Q Test Results

Application	Specific Fan Power (W/l/s)	Heat Exchange Efficiency %
Kitchen + 1 wet room	0.55	90%
Kitchen + 2 wet rooms	0.65	89%
Kitchen + 3 wet rooms	0.8	87%
Kitchen + 4 wet rooms	1.01	86%
Kitchen + 5 wet rooms	1.26	86%



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 11 Nov 2022 16:03 using software version 5.7.4437.0

Project: 20/01070/RES

VICTORIA RIVERSIDE
Location: VRS 1434 Typical 3 bed MROH 55@124 220X90

Technical Data

MRXBOX-ECO - Wall Mounted Multi Room Xbox
Fan Code: **MRXBOXAB-ECO2B-SW**
Installation Manual Links: 671795

Required duty: 55 l/s at 124 Pa
Actual duty: 72 l/s at 216 Pa
Actual at required flow: 55 l/s at 334 Pa

When speed controlled to required duty (76.03%):
Motor Input Power: 0.069 kW
Specific Fan Power: 1.2 W/(l/s)
Velocity at required duty: 4.482 m/s

At full speed:
Motor Input Power: 0.156 kW
Specific Fan Power: 2.2 W/(l/s)

Maximum Fan Speed: 3,300 RPM
Electrical Supply: 230V, 1 Phase, 50 Hz
Motor current (flc): 1.2 A

Max. operating temp: 50°C
Weight: 20 kg
Starting currents are nominal.

Sound Data

Acoustic performance to ISO 13347 and AMCA 300.
Noise calculated speed controlled to required duty (76.03%)

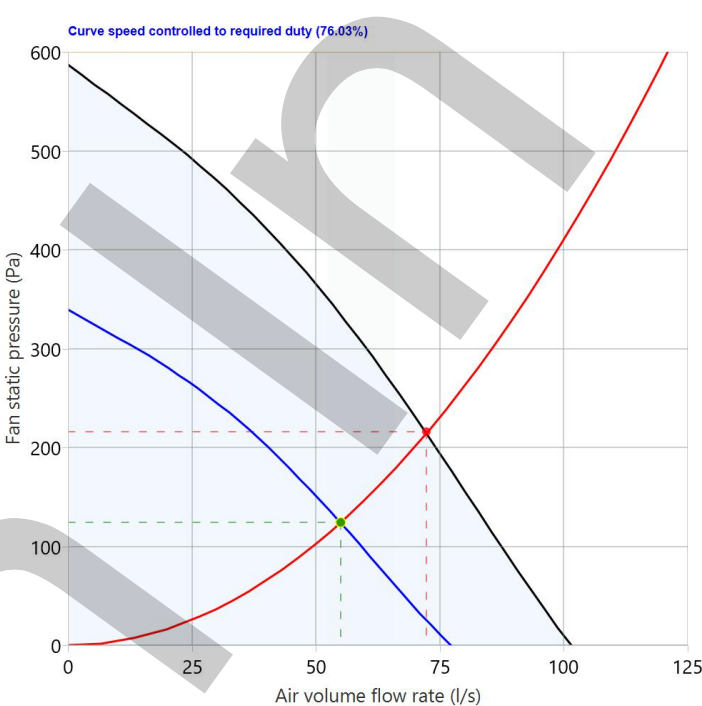
Sound Power Levels re 1 pWatts (Hz):

Hz	63	125	250	500	1k	2k	4k	8k	dBA
Breakout	54	58	54	55	46	42	30	20	36
Open Inlet (Intake & Extract)	44	47	58	53	46	42	29	21	
Open Outlet (Supply & Exhaust)	55	63	64	68	64	61	52	42	

dBA is hemi-spherical at 3 metres. For spherical deduct 3 dBA.

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.

Performance Chart



Additional Notes

Specification

The unit shall be fully insulated providing excellent thermal and acoustic characteristics and shall be complete with a multi plate counter flow high efficiency heat exchanger block, with a thermal efficiency of up to 95%. The heat exchanger shall be protected by filters on fresh air inlet and system extract. The heat exchanger and filters shall be accessible via the front access panel, enabling quick and easy maintenance.

The unit shall have low energy, high efficiency EC fan/motor assemblies with sealed for life bearings, the impellers shall be backward curved centrifugal type. The motors shall be suitable for an ambient temperature of 40°C.

The unit shall be supplied complete with a condensate drip tray and 21.5mm drain connection.

The unit shall be suitable for 125mm circular ducting.

The breakout noise level and power requirements shall be as detailed by the unit manufacturer and in accordance with the ventilation equipment schedule.

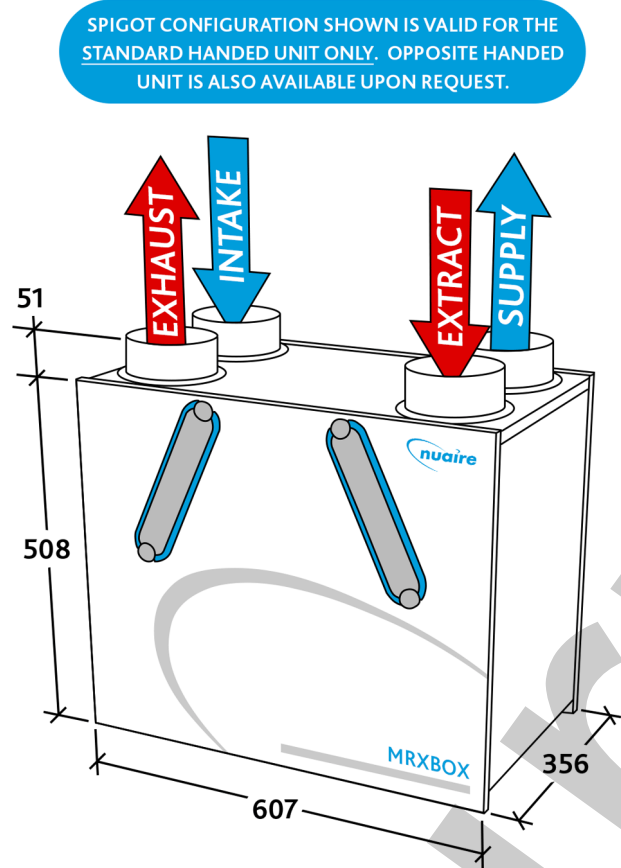
The unit shall be offered with a five year warranty. The product warranty applies to the UK mainland and in accordance with Clause 14 of our Conditions of Sale. Customers purchasing from outside of the UK should contact Nuaire International Sales office for further details.



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 11 Nov 2022 16:03 using software version 5.7.4437.0

Fan Dimensions



Length: Width: Height:
356 607 507
Spigot size: 125
Duct size: 125
Drawing is for dimensional purposes only. Dimensions in mm.
Please see selected ancillaries section for additional dimensions for any requested additional ancillaries.

SAP Appendix Q Test Results

Application	Specific Fan Power (W/l/s)	Heat Exchange Efficiency %
Kitchen + 1 wet room	0.55	90%
Kitchen + 2 wet rooms	0.65	89%
Kitchen + 3 wet rooms	0.8	87%
Kitchen + 4 wet rooms	1.01	86%
Kitchen + 5 wet rooms	1.26	86%



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 11 Nov 2022 16:03 using software version 5.7.4437.0

Project: 20/01070/RES

VICTORIA RIVERSIDE
Location: VRS 1434 typical 3 bed HROH 100@338 220X90

Technical Data

MRXBOX-ECO - Wall Mounted Multi Room Xbox
Fan Code: MRXBOXAB-ECO5

Required duty: 100 l/s at 338 Pa
Actual duty: 109 l/s at 401 Pa
Actual at required flow: 100 l/s at 465 Pa

When speed controlled to required duty (91.7%):

Motor Input Power: 0.245 kW
Specific Fan Power: 2.5 W/(l/s)
Velocity at required duty: 5.659 m/s

At full speed:

Motor Input Power: 0.318 kW
Specific Fan Power: 2.9 W/(l/s)

Maximum Fan Speed: 4,120 RPM
Electrical Supply: 230V, 1 Phase, 50 Hz
Nominal Motor Rating: 0.34 kW
Motor current (flc): 2.8 A
Motor starting current (sc): 2.8 A

Max. operating temp: 40°C
Weight: 25 kg
Starting currents are nominal.

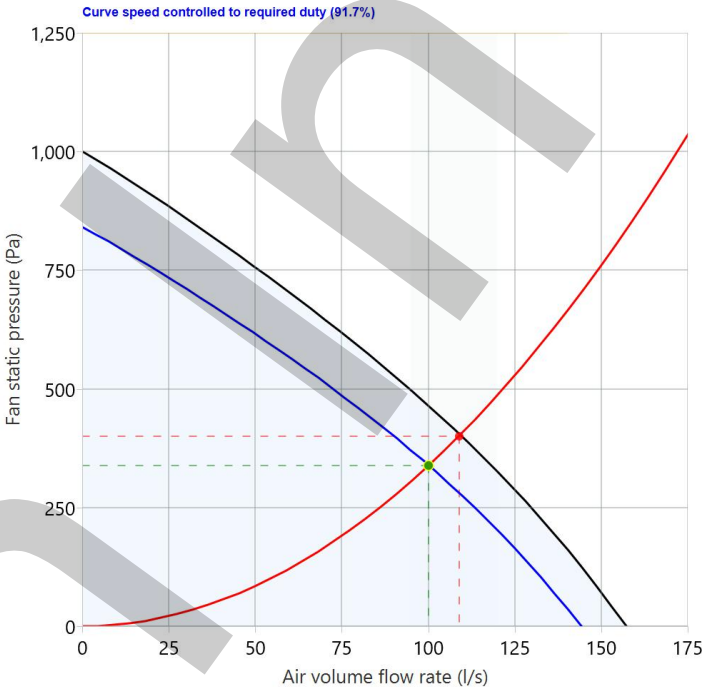
Sound Data

Acoustic performance to ISO 13347 and AMCA 300.
Noise calculated speed controlled to required duty (91.7%)

Sound Power Levels re 1 pWatts (Hz):									
Hz	63	125	250	500	1k	2k	4k	8k	dBA
Breakout	70	57	60	60	49	48	41	29	41
Open Inlet (Intake & Extract)	61	61	61	59	53	45	35	31	
Open Outlet (Supply & Exhaust)	69	68	69	74	67	63	55	48	

dBA is hemi-spherical at 3 metres. For spherical deduct 3 dBA.
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.

Performance Chart



Additional Notes

Specification

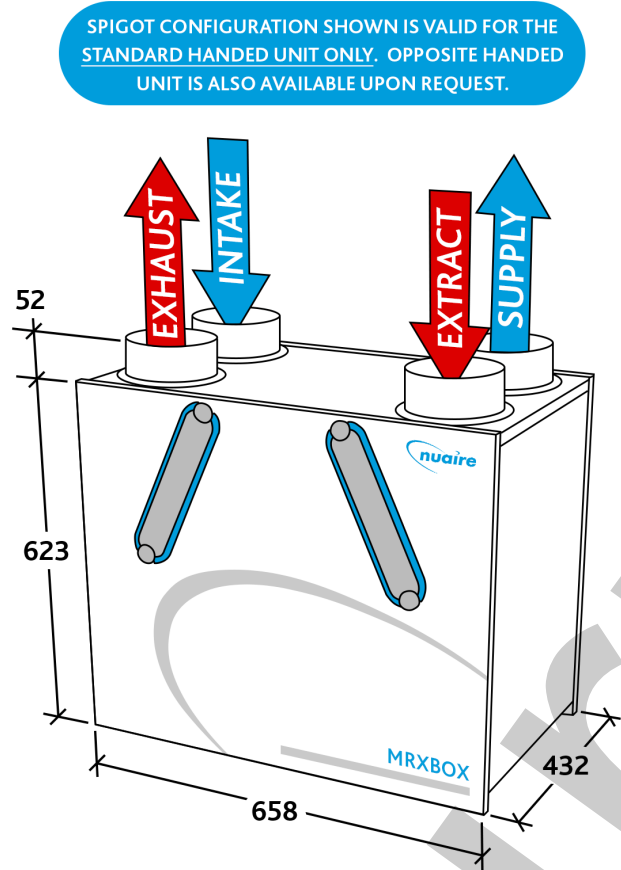
The unit shall be fully insulated providing excellent thermal and acoustic characteristics and shall be complete with a multi plate counter flow high efficiency heat exchanger block, with a thermal efficiency of up to 95%. The heat exchanger shall be protected by filters on fresh air inlet and system extract. The heat exchanger and filters shall be accessible via the front access panel, enabling quick and easy maintenance.
The unit shall have low energy, high efficiency EC fan/motor assemblies with sealed for life bearings, the impellers shall be backward curved centrifugal type. The motors shall be suitable for an ambient temperature of 40°C.
The unit shall be supplied complete with a condensate drip tray and 21.5mm drain connection.
The unit shall be suitable for 150mm circular ducting.
The breakout noise level and power requirements shall be as detailed by the unit manufacturer and in accordance with the ventilation equipment schedule.
The unit shall be offered with a five year warranty. The product warranty applies to the UK mainland and in accordance with Clause 14 of our Conditions of Sale. Customers purchasing from outside of the UK should contact Nuaire International Sales office for further details.



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 11 Nov 2022 16:03 using software version 5.7.4437.0

Fan Dimensions



Length: Width: Height:
432 658 623
Spigot size: 150
Duct size: 150
Drawing is for dimensional purposes only. Dimensions in mm.
Please see selected ancillaries section for additional dimensions for any requested additional ancillaries.

SAP Appendix Q Test Results

Application	Specific Fan Power (W/l/s)	Heat Exchange Efficiency %
Kitchen + 1 wet room	0.63	90%
Kitchen + 2 wet rooms	0.61	89%
Kitchen + 3 wet rooms	0.68	88%
Kitchen + 4 wet rooms	0.79	87%
Kitchen + 5 wet rooms	0.91	86%
Kitchen + 6 wet rooms	1.09	85%
Kitchen + 7 wet rooms	1.27	85%



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 11 Nov 2022 16:03 using software version 5.7.4437.0

Project: 20/01070/RES

VICTORIA RIVERSIDE
Location: VRS 1445 Typical 3 bed 2 storey LR 41@81 204X60

Technical Data

MRXBOX-ECO - Wall Mounted Multi Room Xbox
Fan Code: MRXBOXAB-ECO2B
Installation Manual Links: 671795

Required duty: 41 l/s at 81 Pa
Actual duty: 70 l/s at 232 Pa
Actual at required flow: 41 l/s at 416 Pa

When speed controlled to required duty (58.93%):
Motor Input Power: 0.032 kW
Specific Fan Power: 0.8 W/(l/s)
Velocity at required duty: 3.341 m/s

At full speed:
Motor Input Power: 0.156 kW
Specific Fan Power: 2.2 W/(l/s)

Maximum Fan Speed: 3,300 RPM
Electrical Supply: 230V, 1 Phase, 50 Hz
Motor current (flc): 1.2 A

Max. operating temp: 50°C
Weight: 20 kg
Starting currents are nominal.

Sound Data

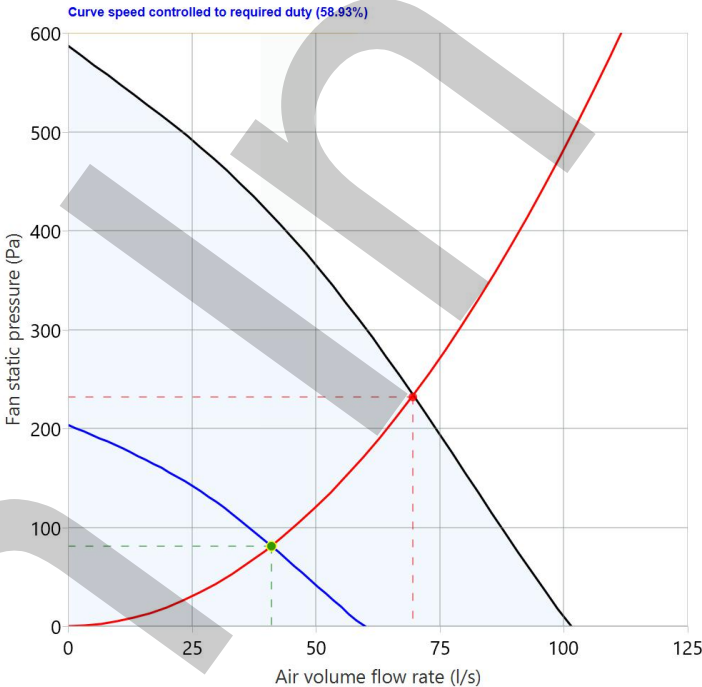
Acoustic performance to ISO 13347 and AMCA 300.
Noise calculated speed controlled to required duty (58.93%)

Sound Power Levels re 1 pWatts (Hz):									
Hz	63	125	250	500	1k	2k	4k	8k	dBA
Breakout	46	52	49	49	41	36	23	<16	31
Open Inlet (Intake & Extract)	41	41	53	47	41	36	21	<16	
Open Outlet (Supply & Exhaust)	51	58	59	62	57	54	44	33	

dBA is hemi-spherical at 3 metres. For spherical deduct 3 dBA.

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.

Performance Chart



Additional Notes

Specification

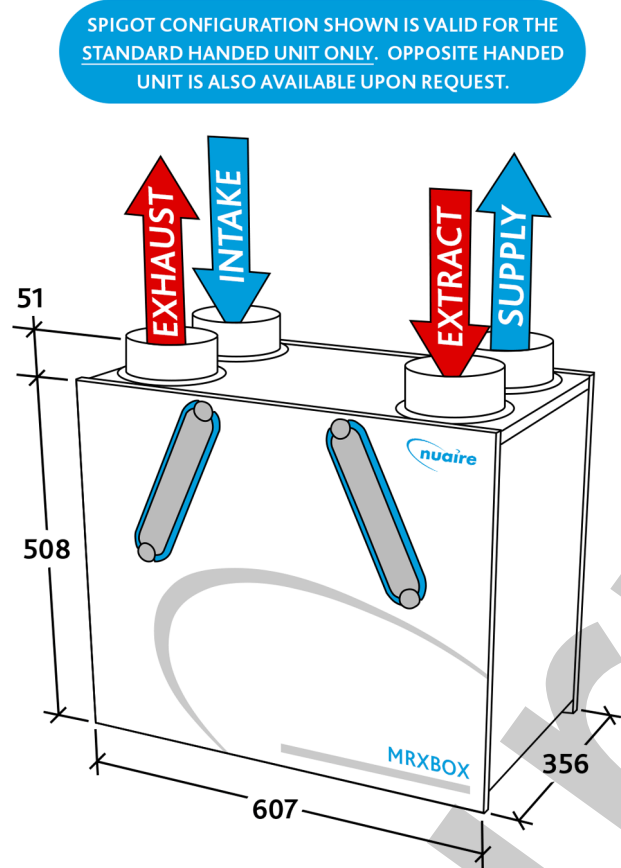
The unit shall be fully insulated providing excellent thermal and acoustic characteristics and shall be complete with a multi plate counter flow high efficiency heat exchanger block, with a thermal efficiency of up to 95%. The heat exchanger shall be protected by filters on fresh air inlet and system extract. The heat exchanger and filters shall be accessible via the front access panel, enabling quick and easy maintenance.
The unit shall have low energy, high efficiency EC fan/motor assemblies with sealed for life bearings, the impellers shall be backward curved centrifugal type. The motors shall be suitable for an ambient temperature of 40°C.
The unit shall be supplied complete with a condensate drip tray and 21.5mm drain connection.
The unit shall be suitable for 125mm circular ducting.
The breakout noise level and power requirements shall be as detailed by the unit manufacturer and in accordance with the ventilation equipment schedule.
The unit shall be offered with a five year warranty. The product warranty applies to the UK mainland and in accordance with Clause 14 of our Conditions of Sale. Customers purchasing from outside of the UK should contact Nuaire International Sales office for further details.



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 11 Nov 2022 16:03 using software version 5.7.4437.0

Fan Dimensions



Length: Width: Height:
356 607 507
Spigot size: 125
Duct size: 125
Drawing is for dimensional purposes only. Dimensions in mm.
Please see selected ancillaries section for additional dimensions for any requested additional ancillaries.

SAP Appendix Q Test Results

Application	Specific Fan Power (W/l/s)	Heat Exchange Efficiency %
Kitchen + 1 wet room	0.55	90%
Kitchen + 2 wet rooms	0.65	89%
Kitchen + 3 wet rooms	0.8	87%
Kitchen + 4 wet rooms	1.01	86%
Kitchen + 5 wet rooms	1.26	86%



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 11 Nov 2022 16:03 using software version 5.7.4437.0

Project: 20/01070/RES

VICTORIA RIVERSIDE
Location: VRS 1445 Typical 3 bed 2 storey HR 43@88 204X60

Technical Data

MRXBOX-ECO - Wall Mounted Multi Room Xbox
Fan Code: MRXBOXAB-ECO2B
Installation Manual Links: 671795

Required duty: 43 l/s at 90 Pa
Actual duty: 70 l/s at 234 Pa
Actual at required flow: 43 l/s at 405 Pa

When speed controlled to required duty (61.81%):
Motor Input Power: 0.037 kW
Specific Fan Power: 0.9 W/(l/s)
Velocity at required duty: 3.504 m/s

At full speed:
Motor Input Power: 0.156 kW
Specific Fan Power: 2.2 W/(l/s)
Maximum Fan Speed: 3,300 RPM
Electrical Supply: 230V, 1 Phase, 50 Hz
Motor current (flc): 1.2 A

Max. operating temp: 50°C
Weight: 20 kg
Starting currents are nominal.

Sound Data

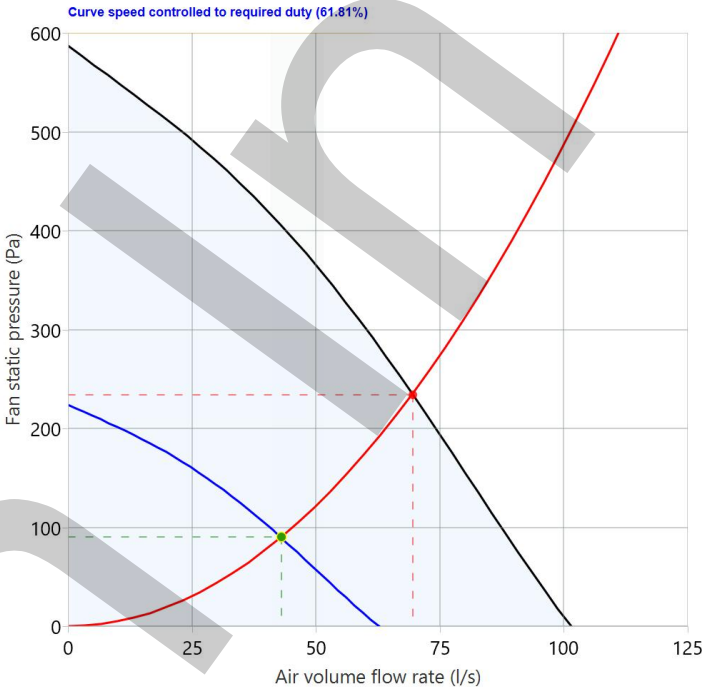
Acoustic performance to ISO 13347 and AMCA 300.
Noise calculated speed controlled to required duty (61.81%)

Sound Power Levels re 1 pWatts (Hz):									
Hz	63	125	250	500	1k	2k	4k	8k	dBA
Breakout	48	54	51	51	42	38	25	<16	32
Open Inlet (Intake & Extract)	41	42	55	49	42	37	23	<16	
Open Outlet (Supply & Exhaust)	52	59	60	63	59	56	46	35	

dBA is hemi-spherical at 3 metres. For spherical deduct 3 dBA.

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.

Performance Chart



Additional Notes

Specification

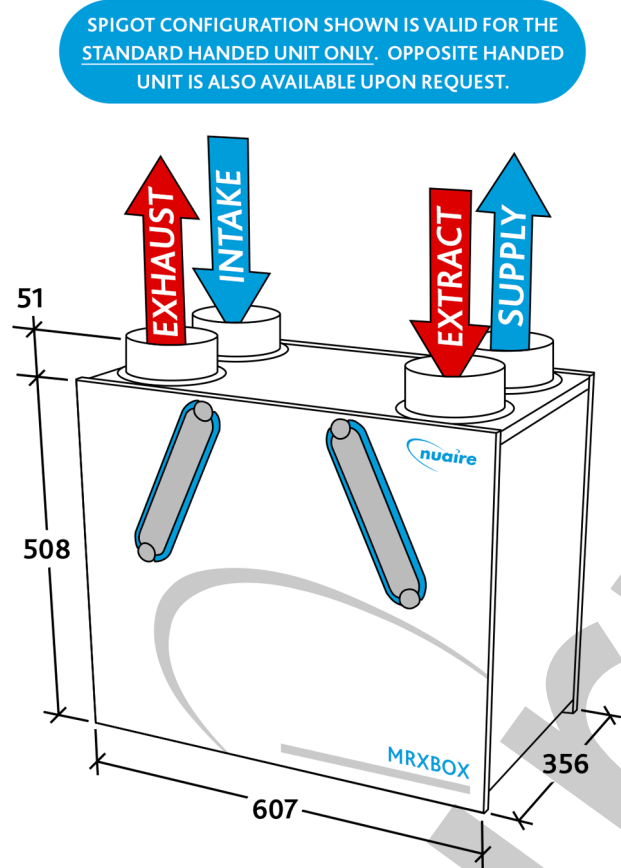
The unit shall be fully insulated providing excellent thermal and acoustic characteristics and shall be complete with a multi plate counter flow high efficiency heat exchanger block, with a thermal efficiency of up to 95%. The heat exchanger shall be protected by filters on fresh air inlet and system extract. The heat exchanger and filters shall be accessible via the front access panel, enabling quick and easy maintenance.
The unit shall have low energy, high efficiency EC fan/motor assemblies with sealed for life bearings, the impellers shall be backward curved centrifugal type. The motors shall be suitable for an ambient temperature of 40°C.
The unit shall be supplied complete with a condensate drip tray and 21.5mm drain connection.
The unit shall be suitable for 125mm circular ducting.
The breakout noise level and power requirements shall be as detailed by the unit manufacturer and in accordance with the ventilation equipment schedule.
The unit shall be offered with a five year warranty. The product warranty applies to the UK mainland and in accordance with Clause 14 of our Conditions of Sale. Customers purchasing from outside of the UK should contact Nuaire International Sales office for further details.



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 11 Nov 2022 16:03 using software version 5.7.4437.0

Fan Dimensions



Length: Width: Height:
356 607 507
Spigot size: 125
Duct size: 125
Drawing is for dimensional purposes only. Dimensions in mm.
Please see selected ancillaries section for additional dimensions for any requested additional ancillaries.

SAP Appendix Q Test Results

Application	Specific Fan Power (W/l/s)	Heat Exchange Efficiency %
Kitchen + 1 wet room	0.55	90%
Kitchen + 2 wet rooms	0.65	89%
Kitchen + 3 wet rooms	0.8	87%
Kitchen + 4 wet rooms	1.01	86%
Kitchen + 5 wet rooms	1.26	86%



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 11 Nov 2022 16:03 using software version 5.7.4437.0

Project: 20/01070/RES

VICTORIA RIVERSIDE
Location: VRS 1426 Typical 3 bed 3 storey LR 37@75 204x60

Technical Data

MRXBOX-ECO - Wall Mounted Multi Room Xbox
Fan Code: MRXBOXAB-ECO2B
Installation Manual Links: 671795

Required duty: 37 l/s at 75 Pa
Actual duty: 68 l/s at 252 Pa
Actual at required flow: 37 l/s at 437 Pa

When speed controlled to required duty (54.74%):
Motor Input Power: 0.026 kW
Specific Fan Power: 0.7 W/(l/s)
Velocity at required duty: 3.015 m/s

At full speed:
Motor Input Power: 0.156 kW
Specific Fan Power: 2.3 W/(l/s)

Maximum Fan Speed: 3,300 RPM
Electrical Supply: 230V, 1 Phase, 50 Hz
Motor current (flc): 1.2 A

Max. operating temp: 50°C
Weight: 20 kg
Starting currents are nominal.

Sound Data

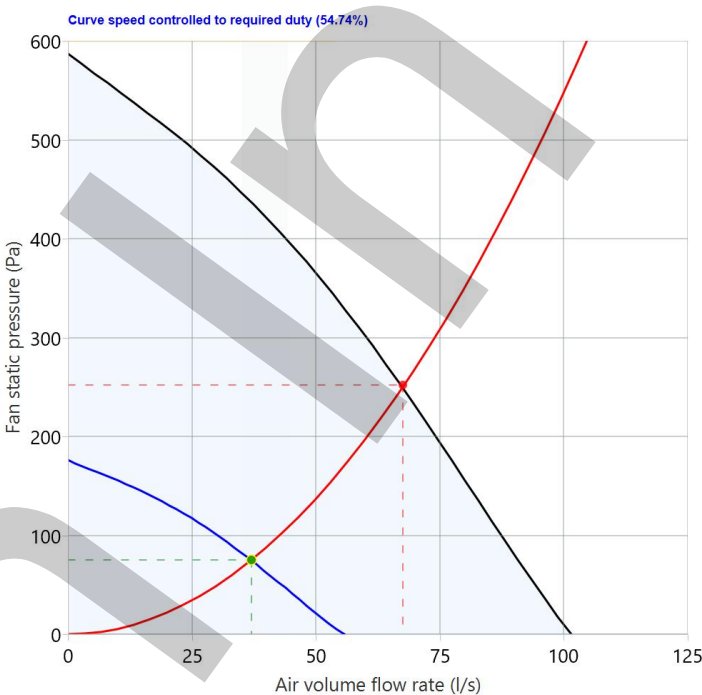
Acoustic performance to ISO 13347 and AMCA 300.
Noise calculated speed controlled to required duty (54.74%)

Sound Power Levels re 1 pWatts (Hz):									
Hz	63	125	250	500	1k	2k	4k	8k	dBA
Breakout	45	51	48	48	39	35	20	<16	29
Open Inlet (Intake & Extract)	40	40	52	46	39	34	19	<16	
Open Outlet (Supply & Exhaust)	50	56	57	60	55	52	42	31	

dBA is hemi-spherical at 3 metres. For spherical deduct 3 dBA.

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.

Performance Chart



Additional Notes

Specification

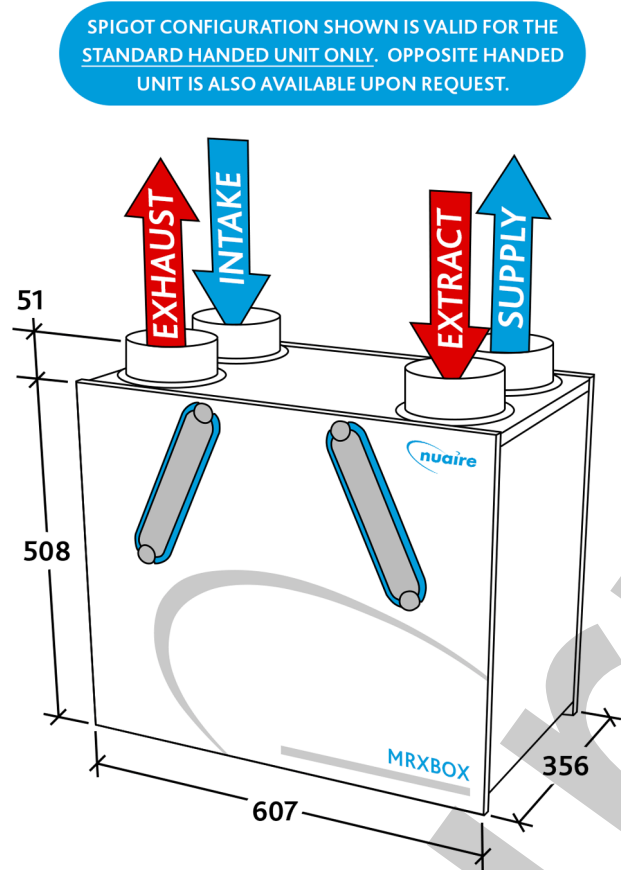
The unit shall be fully insulated providing excellent thermal and acoustic characteristics and shall be complete with a multi plate counter flow high efficiency heat exchanger block, with a thermal efficiency of up to 95%. The heat exchanger shall be protected by filters on fresh air inlet and system extract. The heat exchanger and filters shall be accessible via the front access panel, enabling quick and easy maintenance.
The unit shall have low energy, high efficiency EC fan/motor assemblies with sealed for life bearings, the impellers shall be backward curved centrifugal type. The motors shall be suitable for an ambient temperature of 40°C.
The unit shall be supplied complete with a condensate drip tray and 21.5mm drain connection.
The unit shall be suitable for 125mm circular ducting.
The breakout noise level and power requirements shall be as detailed by the unit manufacturer and in accordance with the ventilation equipment schedule.
The unit shall be offered with a five year warranty. The product warranty applies to the UK mainland and in accordance with Clause 14 of our Conditions of Sale. Customers purchasing from outside of the UK should contact Nuaire International Sales office for further details.



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 11 Nov 2022 16:03 using software version 5.7.4437.0

Fan Dimensions



Length: Width: Height:
356 607 507
Spigot size: 125
Duct size: 125
Drawing is for dimensional purposes only. Dimensions in mm.
Please see selected ancillaries section for additional dimensions for any requested additional ancillaries.

SAP Appendix Q Test Results

Application	Specific Fan Power (W/l/s)	Heat Exchange Efficiency %
Kitchen + 1 wet room	0.55	90%
Kitchen + 2 wet rooms	0.65	89%
Kitchen + 3 wet rooms	0.8	87%
Kitchen + 4 wet rooms	1.01	86%
Kitchen + 5 wet rooms	1.26	86%



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 11 Nov 2022 16:03 using software version 5.7.4437.0

Project: 20/01070/RES

VICTORIA RIVERSIDE
Location: VRS 1426 Typical 3 bed 3 storey HR 49@147 204X60

Technical Data

MRXBOX-ECO - Wall Mounted Multi Room Xbox
Fan Code: MRXBOXAB-ECO2B
Installation Manual Links: 671795

Required duty: 49 l/s at 147 Pa
Actual duty: 66 l/s at 262 Pa
Actual at required flow: 49 l/s at 371 Pa

When speed controlled to required duty (74.69%):
Motor Input Power: 0.065 kW
Specific Fan Power: 1.3 W/(l/s)
Velocity at required duty: 3.993 m/s

At full speed:
Motor Input Power: 0.156 kW
Specific Fan Power: 2.4 W/(l/s)
Maximum Fan Speed: 3,300 RPM
Electrical Supply: 230V, 1 Phase, 50 Hz
Motor current (flc): 1.2 A

Max. operating temp: 50°C
Weight: 20 kg
Starting currents are nominal.

Sound Data

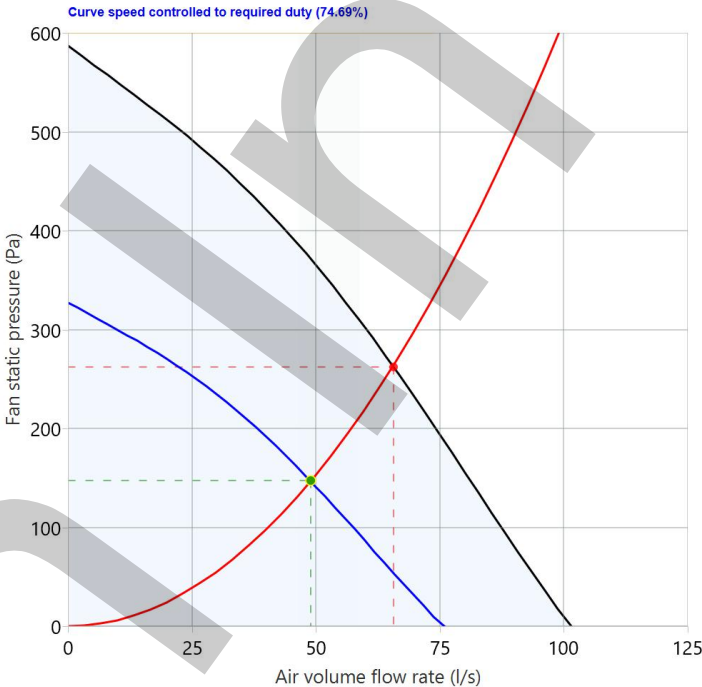
Acoustic performance to ISO 13347 and AMCA 300.
Noise calculated speed controlled to required duty (74.69%)

Sound Power Levels re 1 pWatts (Hz):									
Hz	63	125	250	500	1k	2k	4k	8k	dBA
Breakout	55	58	55	55	47	43	30	20	37
Open Inlet (Intake & Extract)	44	47	59	54	47	43	29	22	
Open Outlet (Supply & Exhaust)	55	63	64	68	64	62	52	43	

dBA is hemi-spherical at 3 metres. For spherical deduct 3 dBA.

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.

Performance Chart



Additional Notes

Specification

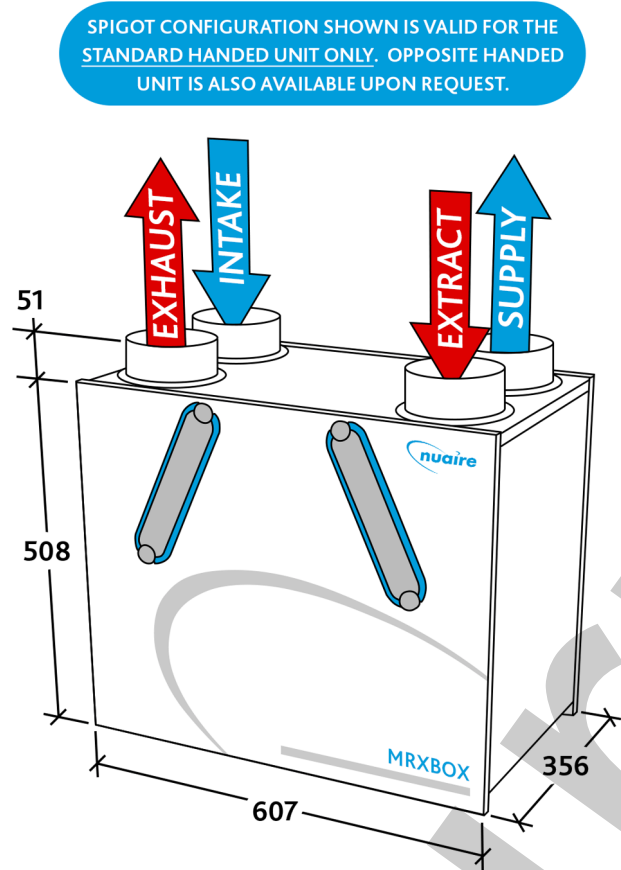
The unit shall be fully insulated providing excellent thermal and acoustic characteristics and shall be complete with a multi plate counter flow high efficiency heat exchanger block, with a thermal efficiency of up to 95%. The heat exchanger shall be protected by filters on fresh air inlet and system extract. The heat exchanger and filters shall be accessible via the front access panel, enabling quick and easy maintenance.
The unit shall have low energy, high efficiency EC fan/motor assemblies with sealed for life bearings, the impellers shall be backward curved centrifugal type. The motors shall be suitable for an ambient temperature of 40°C.
The unit shall be supplied complete with a condensate drip tray and 21.5mm drain connection.
The unit shall be suitable for 125mm circular ducting.
The breakout noise level and power requirements shall be as detailed by the unit manufacturer and in accordance with the ventilation equipment schedule.
The unit shall be offered with a five year warranty. The product warranty applies to the UK mainland and in accordance with Clause 14 of our Conditions of Sale. Customers purchasing from outside of the UK should contact Nuaire International Sales office for further details.



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 11 Nov 2022 16:03 using software version 5.7.4437.0

Fan Dimensions



Length: Width: Height:
356 607 507
Spigot size: 125
Duct size: 125
Drawing is for dimensional purposes only. Dimensions in mm.
Please see selected ancillaries section for additional dimensions for any requested additional ancillaries.

SAP Appendix Q Test Results

Application	Specific Fan Power (W/l/s)	Heat Exchange Efficiency %
Kitchen + 1 wet room	0.55	90%
Kitchen + 2 wet rooms	0.65	89%
Kitchen + 3 wet rooms	0.8	87%
Kitchen + 4 wet rooms	1.01	86%
Kitchen + 5 wet rooms	1.26	86%

Technical Submittal

To: CR Construction (UK) Company Ltd Copy: BFL Team	Contract Title: Victoria Riverside – Manchester Contract Number: 4015
Issue Date: 04/12/23	Technical Submittal No: 4015-TS-069 REV - 1
Technical Submittal for : Elta Fans Landlord MEV and HRU units's Documents: • MEV and HRU technical information sheets attached	
Confirmation required by (date): 18/12/23 Print Name: Morgan Glennon Signature: M.Glennon	
Client Reply: Status: Date: Print Name: Signature:	



Technical Data - Fan Model SH150-1LC (7.6 speed)

Location: MNEV.A-01

Designation:

Performance - Required

Air Flow : 0.09 m³/s
Static Pressure : 150 Pa
Selection Pressure: 150 Pa
Installation Type: n/a
Air Density: 1.204 kg/m³
- Atmos. Temp: 20 °C
- Altitude: 0 m
- Humidity: 0.0 %

Actual

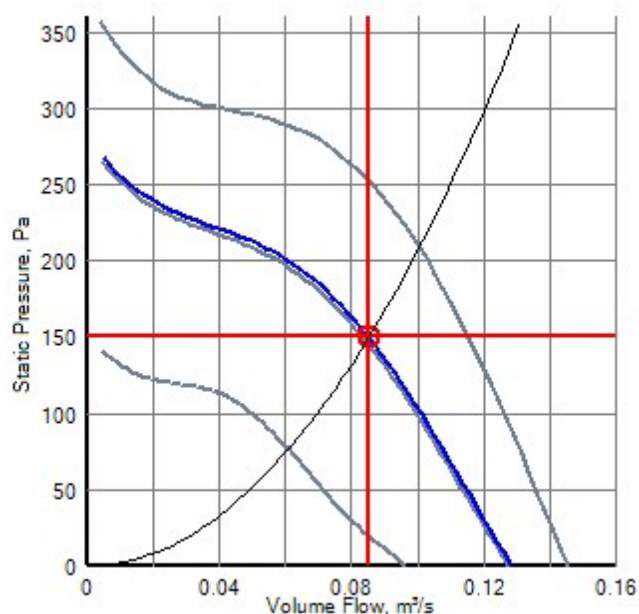
Air Flow: 0.09 m³/s
Static Pressure: 150 Pa
Total Pressure: 164 Pa

Fan Data

Catalogue Code: SH150-1LC (7.6 speed)
Description: Low Profile Box
Diameter: 150 mm
Impeller Type: Mixed Flow
Blade Material: -
Speed: 3784 r/min @50 Hz
Power, Abs: -
Input Power: 0.03 kW
Efficiency Total: -
SFP: 0.39
Fan Weight: 5.7 kg

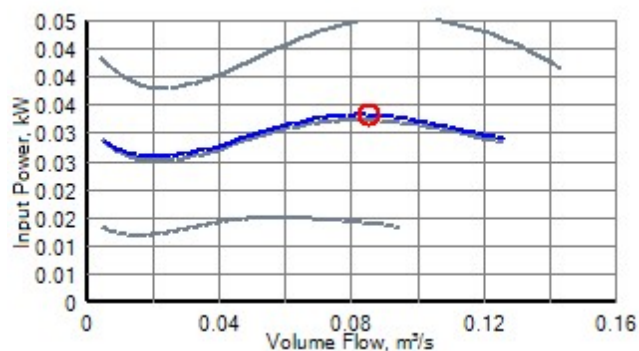
Peak: -

Static: -



Motor Data (at STP)

Motor Type:
Electrical Supply: 230V 1ph 50Hz
Motor Frame:
Motor Power: 0.04kW
FLC/Start: 0.33A / -
Motor Speed: 2 pole
Motor Efficiency: -



Sound Data

Spectrum (Hz):	63	125	250	500	1K	2K	4K	8K	dBW	dB(A) @ 3m
Inlet (dB):	47	48	55	62	59	61	58	57	67	46
Outlet (dB):	51	48	56	63	59	61	60	57	68	47
Breakout (dB):	28	29	36	49	49	50	51	49	57	36

Sound levels are quoted as in-duct values. dB(A) values are average spherical free-field for comparative use only.



Represented by:
ELTA FANS LTD (BUILDING SERVICES)
 Tel: +44 (0)1384 275800 Fax: +44 (0)1384 275810 email: sales@eltafans.co.uk
 46 Third Avenue, Pensnett Trading Estate, Kingswinford, West Midlands DY6 7US, UK
 Version 5.26.11 Copyright © 2010-23 Elta Group

Technical Data - Fan Model SH150-1LC (7.6 speed)

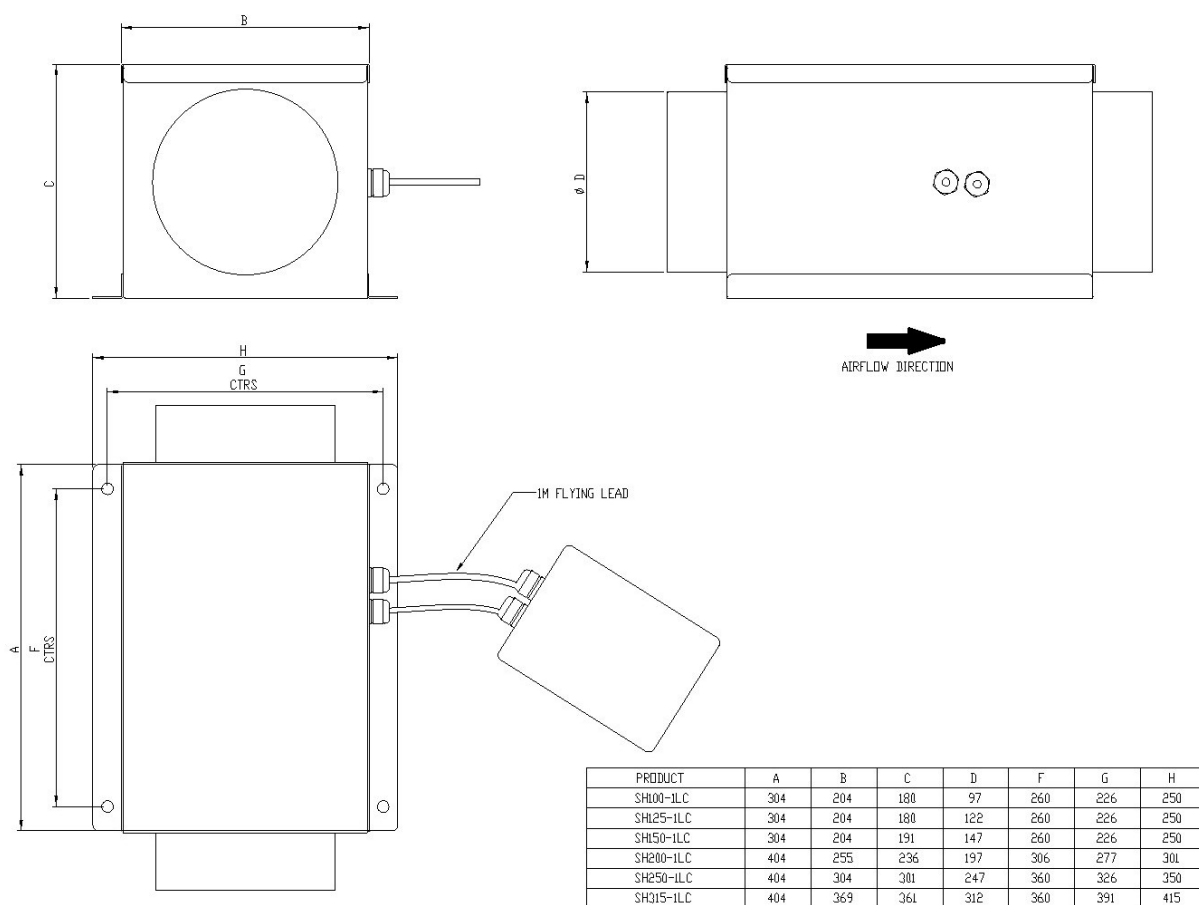
Location: MNEV.A-01

Designation:

Energy Related Product Data

Typology:	NRVU, UVU	Drive Type:	Variable-Speed
HRS Type:	None	Thermal Efficiency:	n/a%
Nom. Flow Rate:	0.09 m³/s	Effective Input Power:	0.05 kW
SFP int:	575.31 W/(m³/s)	Face Velocity:	5.09 m/s
Nom. Ext. Pressure:	247 Pa	Casing Sound Power:	46 dB(A)
Internal Pressure:	n/a	Int. Pressure (non-vent):	n/a
Static Efficiency:	53.7%	Max. External Leakage:	2%
Energy Performance of Filters:	n/a		
Visual Filter Warning Details:	n/a		
Disassembly Instructions:	http://www.eltafans.com		

Drawing for Fan Model SH150-1LC





Represented by:
ELTA FANS LTD (BUILDING SERVICES)
Tel: +44 (0)1384 275800 Fax: +44 (0)1384 275810 email: sales@eltafans.co.uk
46 Third Avenue, Pensnett Trading Estate, Kingswinford, West Midlands DY6 7US, UK
Version 5.26.11 Copyright © 2010-23 Elta Group

Technical Data - Fan Model SLC450-1EC (8.8 speed)

Location: MNEV.A-02

Designation:

Performance - Required

Air Flow : 0.88 m³/s
Static Pressure : 150 Pa
Selection Pressure: 150 Pa
Installation Type: n/a
Air Density: 1.204 kg/m³
- Atmos. Temp: 20 °C
- Altitude: 0 m
- Humidity: 0.0 %

Actual

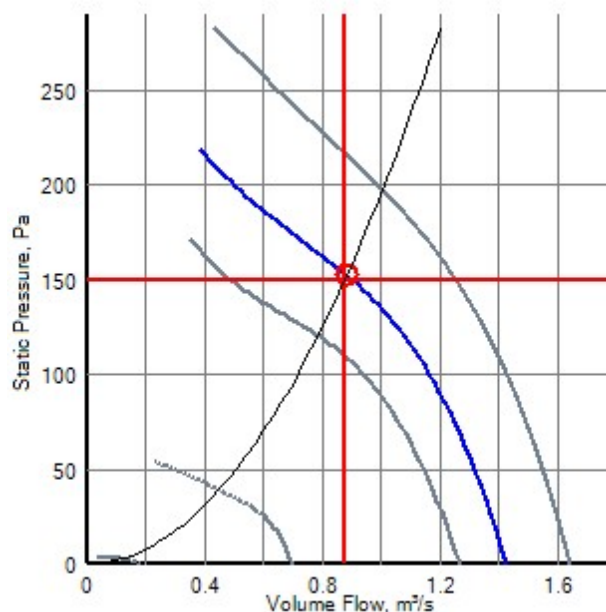
Air Flow: 0.88 m³/s
Static Pressure: 152 Pa
Total Pressure: 171 Pa

Fan Data

Catalogue Code: SLC450-1EC (8.8 speed)
Description: Axial Duct
Diameter: 450 mm
Impeller Type: Axial
Blade Material: -
Speed: 1588 r/min @50 Hz
Power, Abs: 0.23 kW
Input Power: 0.31 kW
Efficiency Total: 65.3%
SFP: 0.35
Fan Weight: 30.0 kg

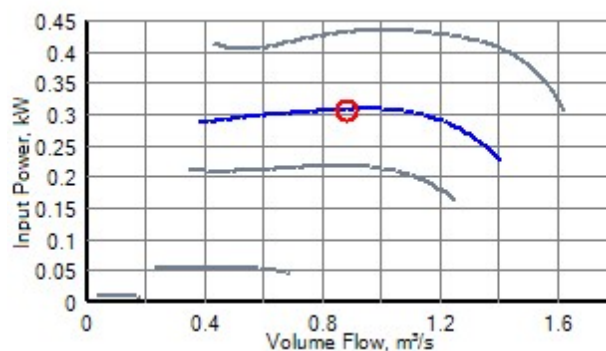
Peak: 0.34 kW

Static: 58.2%



Motor Data (at STP)

Motor Type:
Electrical Supply: 230V 1ph 50Hz
Motor Frame: 80
Motor Power: 0.55kW
FLC/Start (DOL): 8.10A / 8.10A
Motor Speed: 4 pole
Motor Efficiency: 77.4%



Sound Data

Spectrum (Hz):	63	125	250	500	1K	2K	4K	8K	dBW	dB(A) @ 3m
Inlet (dB):	80	78	74	73	70	69	65	65	84	56
Outlet (dB):	81	78	74	72	70	70	66	66	84	56

Sound levels are quoted as in-duct values. dB(A) values are average spherical free-field for comparative use only.

Technical Data - Fan Model SLC450-1EC (8.8 speed)

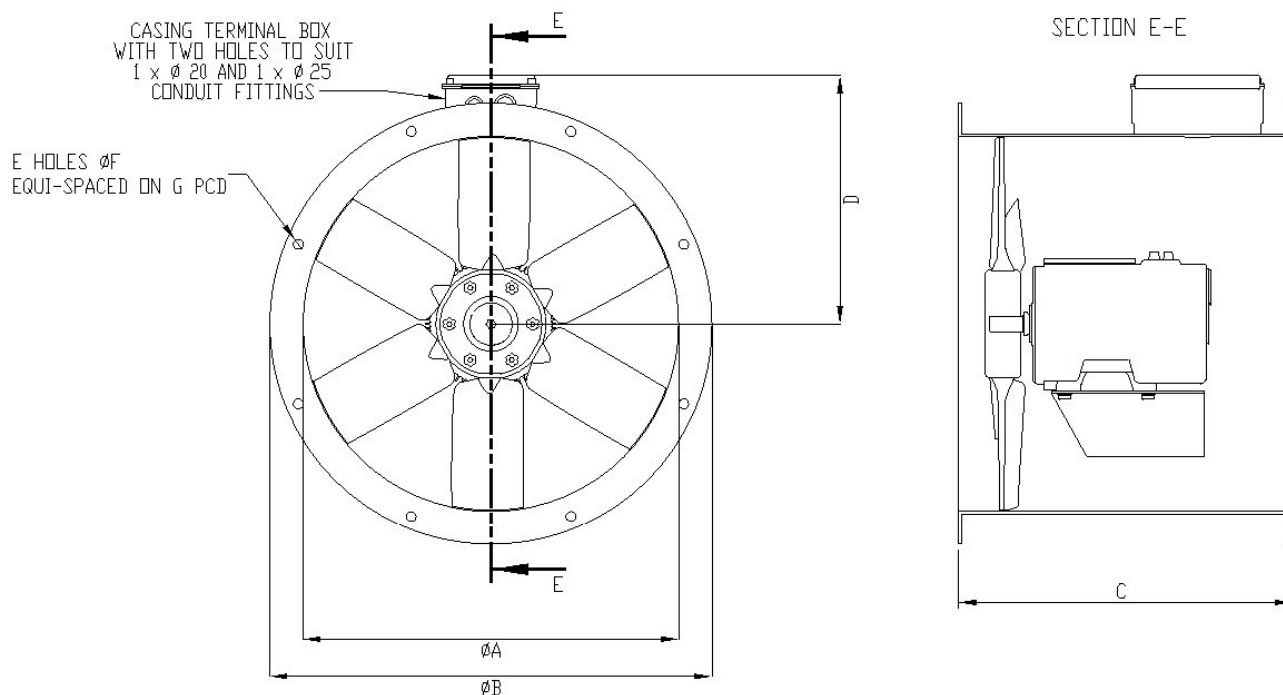
Location: MNEV.A-02

Designation:

Energy Related Product Data

Overall Efficiency:	59.7%	At Maximum Efficiency Point	Input Power:	0.22 kW
Measurement Category:	D		Air Flow:	0.98 m³/s
Efficiency Category:	Total		Pressure:	116 Pa
FMEG:	70 (Integrated)		Speed:	1410 r/min
Specific Ratio:	1			

Drawing for Fan Model SLC450-1EC



PRODUCT CODE	FAN DIA. A	B	C	D	E	F	G
SLC315-1EC	315	375	400	229	8	10	355
SLC355-1EC	355	425	400	250	8	10	395
SLC400-1EC	400	475	400	272	8	12	450
SLC450-1EC	450	530	400	298	8	12	500
SLC500-1EC	500	585	400	323	12	12	560
SLC560-1EC	560	645	400	353	12	12	620
SLC630-1EC	630	715	400	388	12	12	690
SLC710-1EC	710	795	450	428	16	12	770



Technical Data - Fan Model SH250-1LC (7.9 speed)

Location: MNEV.B-01

Designation:

Performance - Required

Air Flow : 0.31 m³/s
 Static Pressure : 175 Pa
 Selection Pressure: 175 Pa
 Installation Type: n/a
 Air Density: 1.204 kg/m³
 - Atmos. Temp: 20 °C
 - Altitude: 0 m
 - Humidity: 0.0 %

Actual

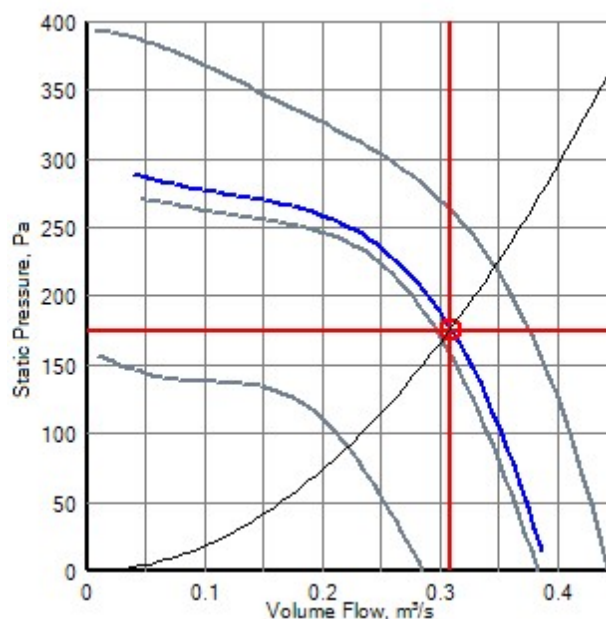
Air Flow: 0.31 m³/s
 Static Pressure: 176 Pa
 Total Pressure: 200 Pa

Fan Data

Catalogue Code: SH250-1LC (7.9 speed)
 Description: Low Profile Box
 Diameter: 250 mm
 Impeller Type: Mixed Flow
 Blade Material: -
 Speed: 2528 r/min @50 Hz
 Power, Abs: -
 Input Power: 0.12 kW
 Efficiency Total: -
 SFP: 0.38
 Fan Weight: 9.3 kg

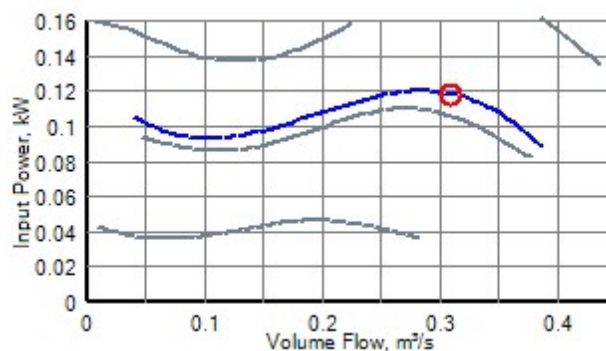
Peak: -

Static: -



Motor Data (at STP)

Motor Type:
 Electrical Supply: 230V 1ph 50Hz
 Motor Frame:
 Motor Power: 0.15kW
 FLC/Start: 1.00A / -
 Motor Speed: 2 pole
 Motor Efficiency: -



Sound Data

Spectrum (Hz):	63	125	250	500	1K	2K	4K	8K	dBW	dB(A) @ 3m
Inlet (dB):	57	57	64	67	67	66	65	61	73	52
Outlet (dB):	57	58	70	67	67	67	66	63	75	53
Breakout (dB):	36	37	47	54	55	53	50	49	60	39

Sound levels are quoted as in-duct values. dB(A) values are average spherical free-field for comparative use only.



Represented by:
ELTA FANS LTD (BUILDING SERVICES)
 Tel: +44 (0)1384 275800 Fax: +44 (0)1384 275810 email: sales@eltafans.co.uk
 46 Third Avenue, Pensnett Trading Estate, Kingswinford, West Midlands DY6 7US, UK
 Version 5.26.11 Copyright © 2010-23 Elta Group

Technical Data - Fan Model SH250-1LC (7.9 speed)

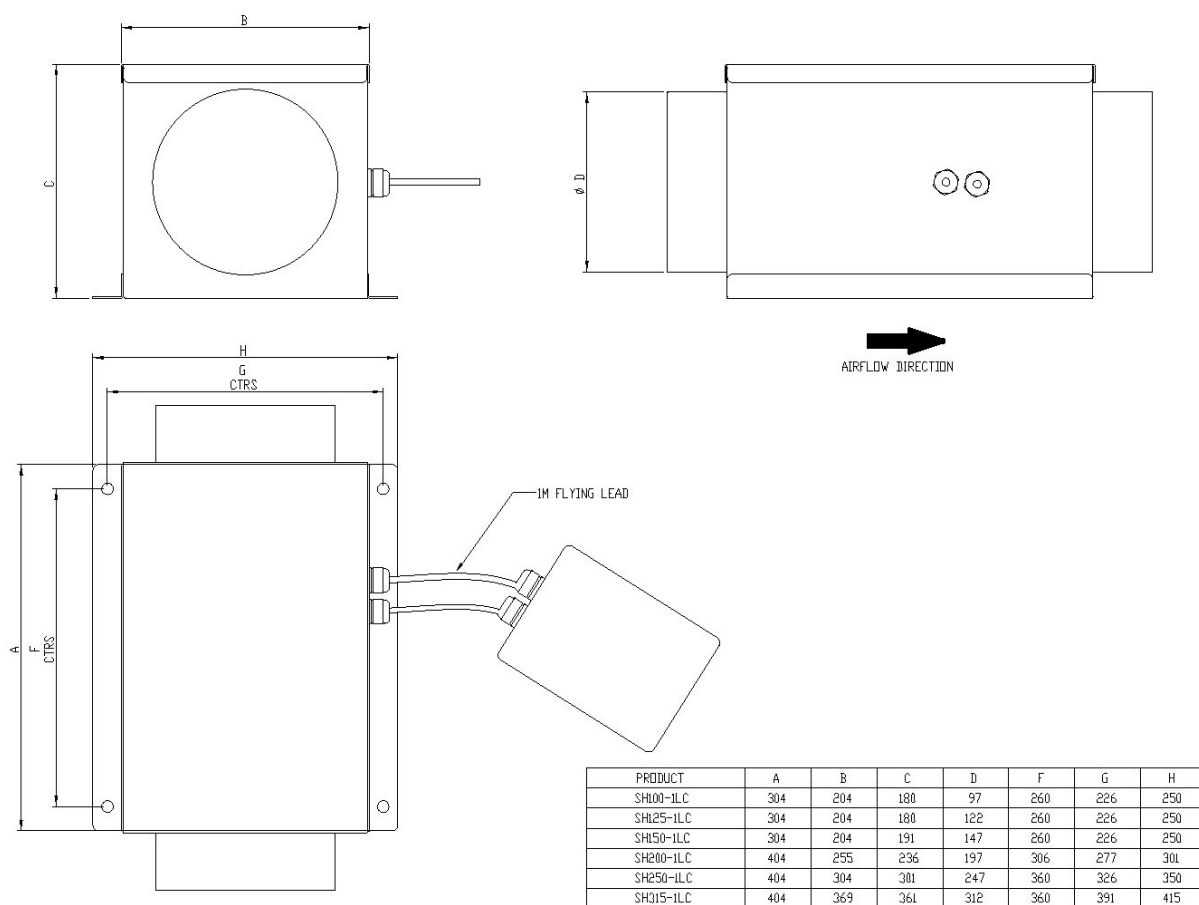
Location: MNEV.B-01

Designation:

Energy Related Product Data

Typology:	NRVU, UVU	Drive Type:	Variable-Speed
HRS Type:	None	Thermal Efficiency:	n/a%
Nom. Flow Rate:	0.28 m³/s	Effective Input Power:	0.18 kW
SFP int:	619.54 W/(m³/s)	Face Velocity:	5.7 m/s
Nom. Ext. Pressure:	283 Pa	Casing Sound Power:	52 dB(A)
Internal Pressure:	n/a	Int. Pressure (non-vent):	n/a
Static Efficiency:	56.9%	Max. External Leakage:	2%
Energy Performance of Filters:	n/a		
Visual Filter Warning Details:	n/a		
Disassembly Instructions:	http://www.eltafans.com		

Drawing for Fan Model SH250-1LC





Represented by:
ELTA FANS LTD (BUILDING SERVICES)
 Tel: +44 (0)1384 275800 Fax: +44 (0)1384 275810 email: sales@eltafans.co.uk
 46 Third Avenue, Pensnett Trading Estate, Kingswinford, West Midlands DY6 7US, UK
 Version 5.26.11 Copyright © 2010-23 Elta Group

Technical Data - Fan Model SH315-1LC (5.9 speed)

Location: MNEV.C-01

Designation:

Performance - Required

Air Flow : 0.43 m³/s
 Static Pressure : 150 Pa
 Selection Pressure: 150 Pa
 Installation Type: n/a
 Air Density: 1.204 kg/m³
 - Atmos. Temp: 20 °C
 - Altitude: 0 m
 - Humidity: 0.0 %

Actual

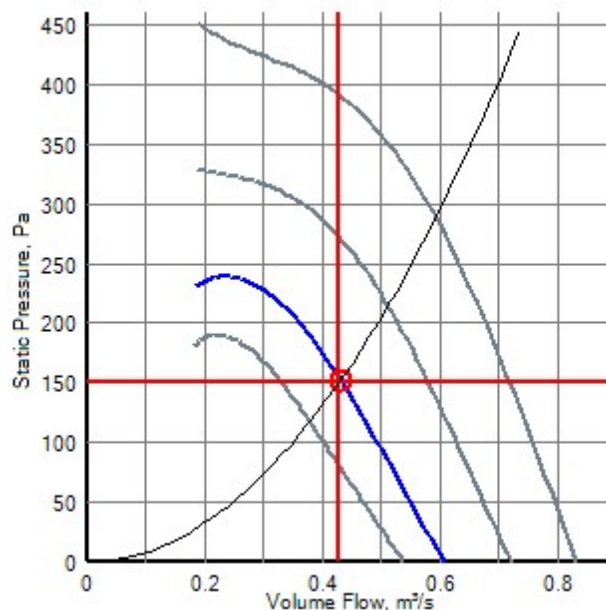
Air Flow: 0.43 m³/s
 Static Pressure: 153 Pa
 Total Pressure: 171 Pa

Fan Data

Catalogue Code: SH315-1LC (5.9 speed)
 Description: Low Profile Box
 Diameter: 315 mm
 Impeller Type: Mixed Flow
 Blade Material: -
 Speed: 1770 r/min @50 Hz
 Power, Abs: -
 Input Power: 0.16 kW
 Efficiency Total: -
 SFP: 0.38
 Fan Weight: 18.8 kg

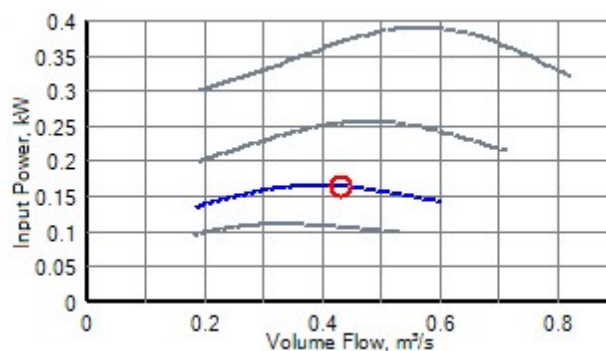
Peak: -

Static: -



Motor Data (at STP)

Motor Type:
 Electrical Supply: 230V 1ph 50Hz
 Motor Frame:
 Motor Power: 0.31kW
 FLC/Start: 2.50A / -
 Motor Speed: 2 pole
 Motor Efficiency: -



Sound Data

Spectrum (Hz):	63	125	250	500	1K	2K	4K	8K	dBW	dB(A) @ 3m
Inlet (dB):	77	85	77	70	69	64	60	53	86	54
Outlet (dB):	78	84	77	70	68	66	59	53	86	54
Breakout (dB):	64	74	74	74	72	66	56	48	80	55

Sound levels are quoted as in-duct values. dB(A) values are average spherical free-field for comparative use only.



Represented by:
ELTA FANS LTD (BUILDING SERVICES)
 Tel: +44 (0)1384 275800 Fax: +44 (0)1384 275810 email: sales@eltafans.co.uk
 46 Third Avenue, Pensnett Trading Estate, Kingswinford, West Midlands DY6 7US, UK
 Version 5.26.11 Copyright © 2010-23 Elta Group

Technical Data - Fan Model SH315-1LC (5.9 speed)

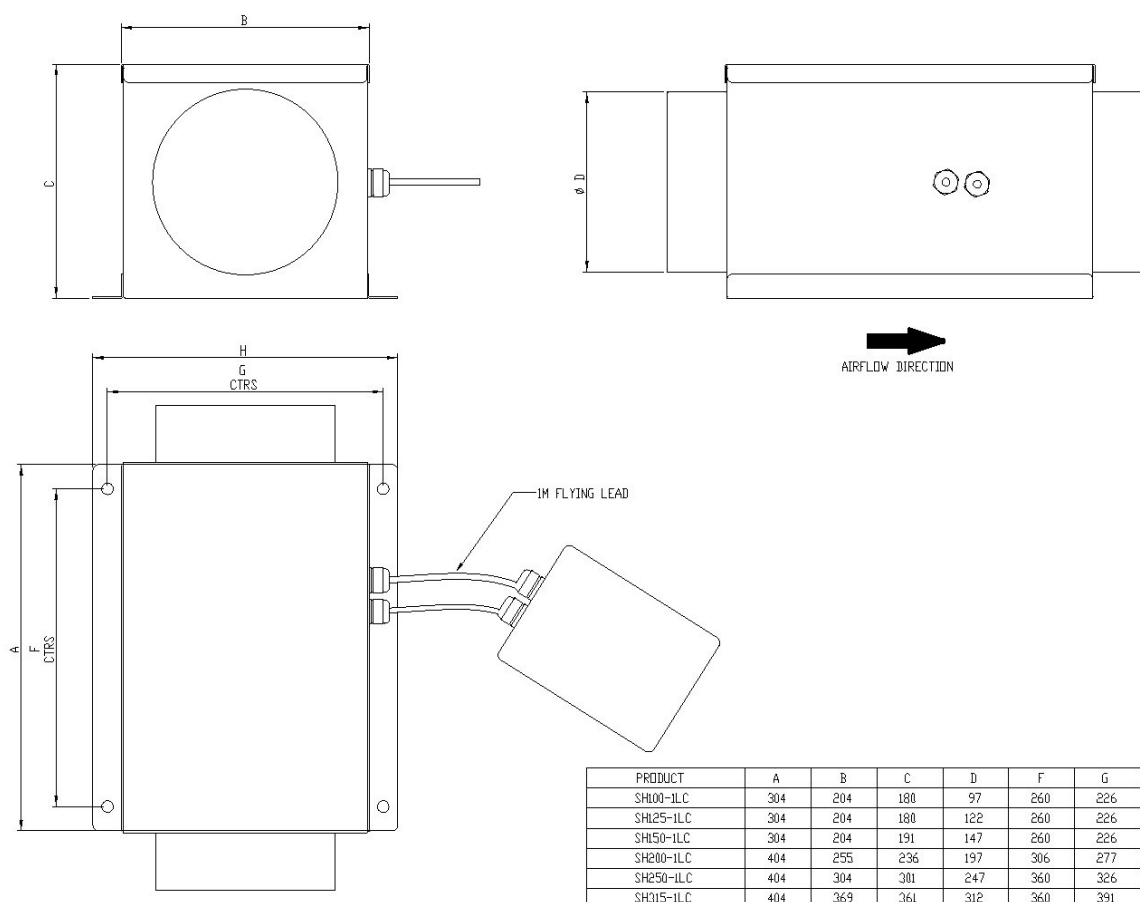
Location: MNEV.C-01

Designation:

Energy Related Product Data

Typology:	NRVU, UVU	Drive Type:	Variable-Speed
HRS Type:	None	Thermal Efficiency:	n/a%
Nom. Flow Rate:	0.5 m³/s	Effective Input Power:	0.38 kW
SFP int:	773.88 W/(m³/s)	Face Velocity:	5.47 m/s
Nom. Ext. Pressure:	360 Pa	Casing Sound Power:	54 dB(A)
Internal Pressure:	n/a	Int. Pressure (non-vent):	n/a
Static Efficiency:	55.9%	Max. External Leakage:	2%
Energy Performance of Filters:	n/a		
Visual Filter Warning Details:	n/a		
Disassembly Instructions:	http://www.eltafans.com		

Drawing for Fan Model SH315-1LC





Represented by:
ELTA FANS LTD (BUILDING SERVICES)
 Tel: +44 (0)1384 275800 Fax: +44 (0)1384 275810 email: sales@eltafans.co.uk
 46 Third Avenue, Pensnett Trading Estate, Kingswinford, West Midlands DY6 7US, UK
 Version 5.26.11 Copyright © 2010-23 Elta Group

Technical Data - Fan Model SH200-1LC (5.5 speed)

Location: MNEV.C-02

Designation:

Warning: Static Pressure above 90% of Maximum Pressure;
 Care should be taken if you choose this selection.

Performance - Required

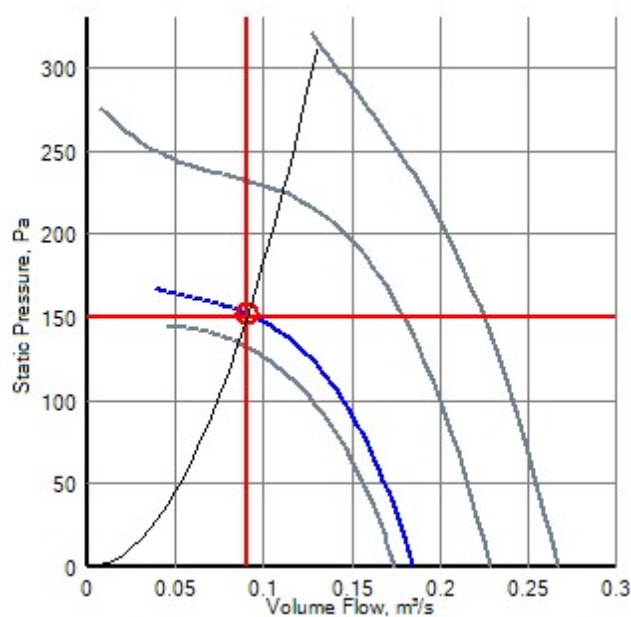
Air Flow : 0.09 m³/s
 Static Pressure : 150 Pa
 Selection Pressure: 150 Pa
 Installation Type: n/a
 Air Density: 1.204 kg/m³
 - Atmos. Temp: 20 °C
 - Altitude: 0 m
 - Humidity: 0.0 %

Actual

Air Flow: 0.09 m³/s
 Static Pressure: 152 Pa
 Total Pressure: 157 Pa

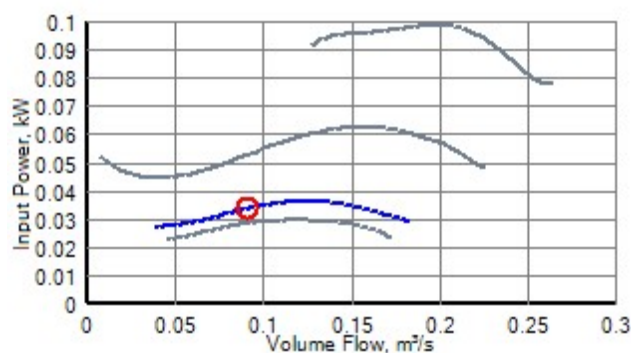
Fan Data

Catalogue Code: SH200-1LC (5.5 speed)
 Description: Low Profile Box
 Diameter: 200 mm
 Impeller Type: Mixed Flow
 Blade Material: -
 Speed: 2365 r/min @50 Hz
 Power, Abs: -
 Input Power: 0.03 kW
 Efficiency Total: -
 SFP: 0.37
 Fan Weight: 9.0 kg



Motor Data (at STP)

Motor Type:
 Electrical Supply: 230V 1ph 50Hz
 Motor Frame:
 Motor Power: 0.08kW
 FLC/Start: 0.70A / -
 Motor Speed: 2 pole
 Motor Efficiency: -



Sound Data

Spectrum (Hz):	63	125	250	500	1K	2K	4K	8K	dBW	dB(A) @ 3m
Inlet (dB):	48	48	56	56	59	60	56	53	65	44
Outlet (dB):	49	49	58	59	58	60	57	53	66	44
Breakout (dB):	27	26	40	46	44	43	39	38	50	29

Sound levels are quoted as in-duct values. dB(A) values are average spherical free-field for comparative use only.



Represented by:
ELTA FANS LTD (BUILDING SERVICES)
 Tel: +44 (0)1384 275800 Fax: +44 (0)1384 275810 email: sales@eltafans.co.uk
 46 Third Avenue, Pensnett Trading Estate, Kingswinford, West Midlands DY6 7US, UK
 Version 5.26.11 Copyright © 2010-23 Elta Group

Technical Data - Fan Model SH200-1LC (5.5 speed)

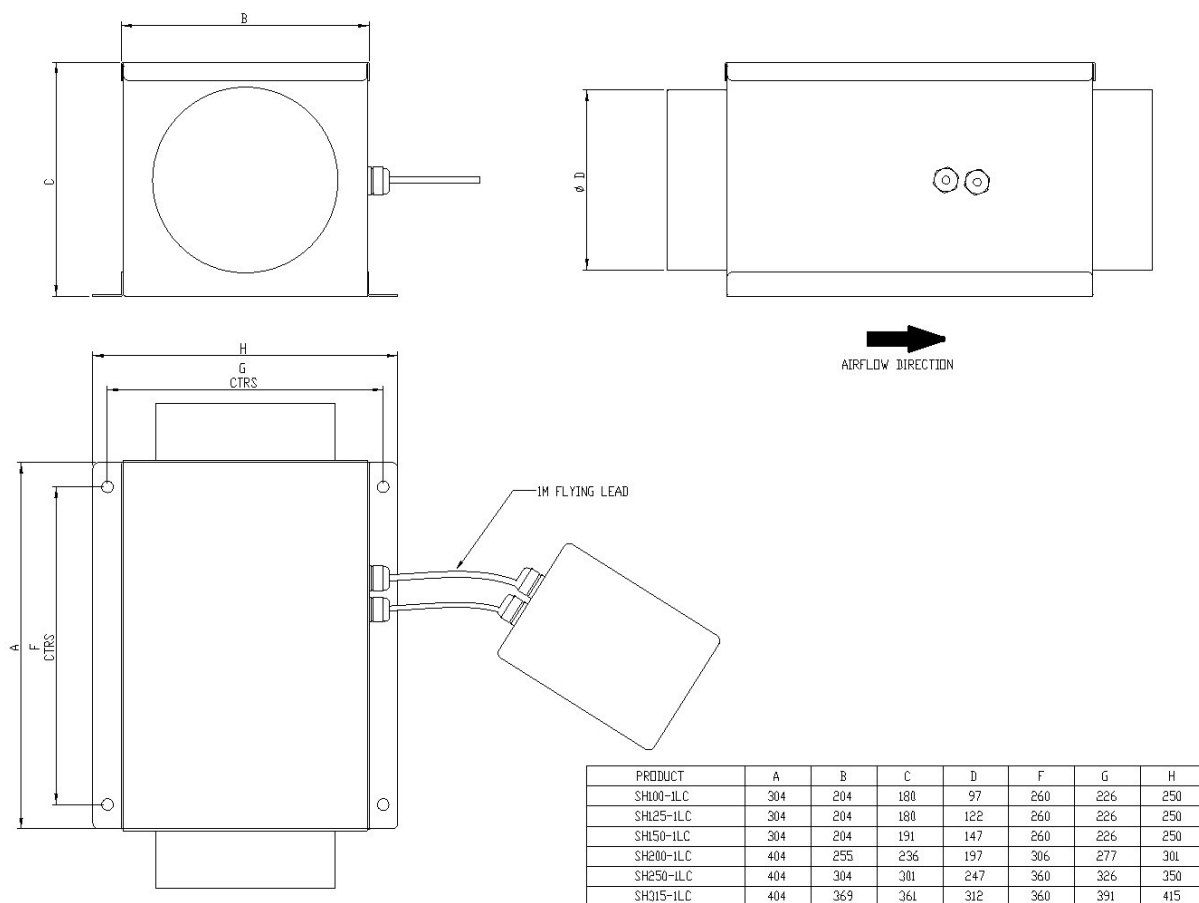
Location: MNEV.C-02

Designation:

Energy Related Product Data

Typology:	NRVU, UVU	Drive Type:	Variable-Speed
HRS Type:	None	Thermal Efficiency:	n/a%
Nom. Flow Rate:	0.18 m³/s	Effective Input Power:	0.1 kW
SFP int:	593.05 W/(m³/s)	Face Velocity:	5.71 m/s
Nom. Ext. Pressure:	271 Pa	Casing Sound Power:	44 dB(A)
Internal Pressure:	n/a	Int. Pressure (non-vent):	n/a
Static Efficiency:	56.8%	Max. External Leakage:	2%
Energy Performance of Filters:	n/a		
Visual Filter Warning Details:	n/a		
Disassembly Instructions:	http://www.eltafans.com		

Drawing for Fan Model SH200-1LC



Technical Data - Fan Model QD100TBB

Location: MNEV.C-03

Designation:

Performance - Required

Air Flow : 0.02 m³/s
 Static Pressure : 5 Pa
 Selection Pressure: 5 Pa
 Installation Type: n/a
 Air Density: 1.204 kg/m³
 - Atmos. Temp: 20 °C
 - Altitude: 0 m
 - Humidity: 0.0 %

Actual

Air Flow: 0.02 m³/s
 Static Pressure: 8 Pa
 Total Pressure: 11 Pa

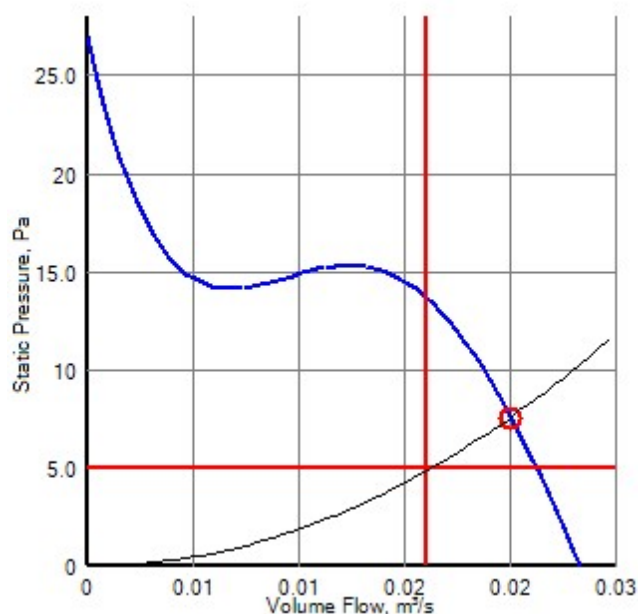
25% additional capacity available

Fan Data

Catalogue Code: QD100TBB
 Description: Residential Axial
 Diameter: 100 mm
 Impeller Type: Axial
 Blade Material: -
 Speed: 2410 r/min @50 Hz
 Power, Abs: -
 Input Power: 0.01 kW
 Efficiency Total: -
 SFP: 0.50
 Fan Weight: 0.8 kg

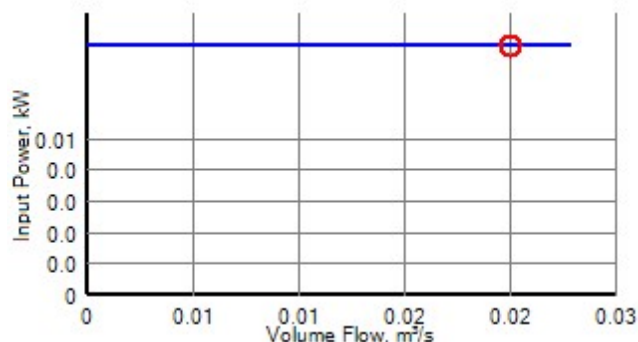
Peak: -

Static: -



Motor Data (at STP)

Motor Type:
 Electrical Supply: 230V 1ph 50Hz
 Motor Frame:
 Motor Power: 0.01kW
 FLC/Start: -A / -
 Motor Speed: 2 pole
 Motor Efficiency: -



Sound Data

Spectrum (Hz):	63	125	250	500	1K	2K	4K	8K	dBW	dB(A) @ 3m
Inlet (dB):	42	47	44	44	41	40	34	24	52	26
Outlet (dB):	43	47	44	44	43	41	33	23	52	27

Sound levels are quoted as in-duct values. dB(A) values are average spherical free-field for comparative use only.



Represented by:
ELTA FANS LTD (BUILDING SERVICES)
Tel: +44 (0)1384 275800 Fax: +44 (0)1384 275810 email: sales@eltafans.co.uk
46 Third Avenue, Pensnett Trading Estate, Kingswinford, West Midlands DY6 7US, UK
Version 5.26.11 Copyright © 2010-23 Elta Group

Technical Data - Fan Model QD100TBB

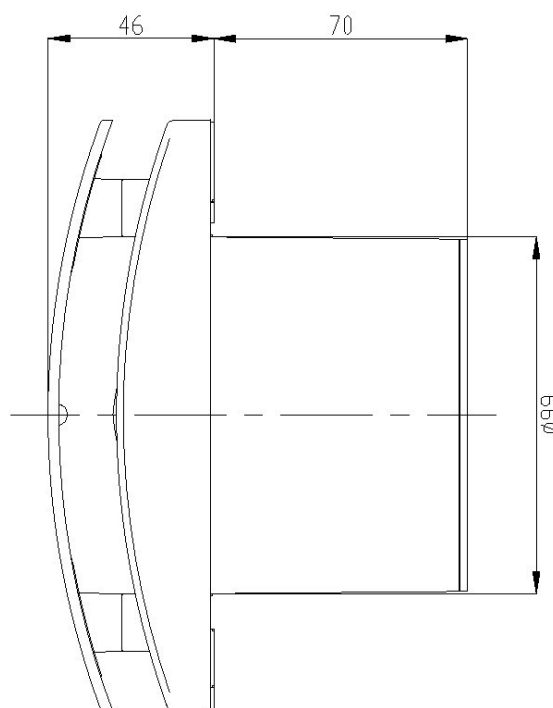
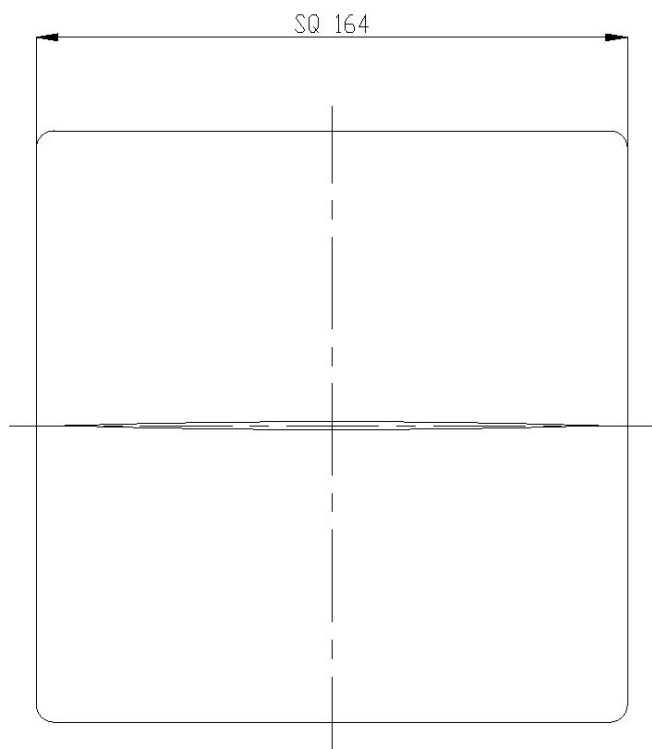
Location: MNEV.C-03

Designation:

Energy Related Product Data

SEC Class:	E	SEC (avg/warm/cold):	-10.5/-2.8/-23.8 kWh/(m ² a)
Typology:	RVU, UVU	Drive Type:	n/a
HRS Type:	None	Thermal Efficiency:	n/a%
Max. Flow Rate:	83 m ³ /h	Electric Power Input:	8.3 W
Ref. Flow Rate:	0.02305 m ³ /s	Ref. Pressure Difference:	10 Pa
SPI:	0.1 W/(m ³ /h)	Sound Power:	26 dB(A)
Mixing Rate:	n/a	Control Factor:	1
Max. Internal Leakage:	n/a	Max. External Leakage:	n/a
Air Tightness:	n/a	Airflow Sensitivity:	n/a
AEC:	1.3 kWh/a	AHS (Avg/Warm/Cold):	13.9/6.3/27.3 kWh/a
Visual Filter Warning Details:	n/a		
Installation instructions:	n/a		
Disassembly Instructions:	http://www.eltafans.com		

Drawing for Fan Model QD100TBB





Represented by:
ELTA FANS LTD (BUILDING SERVICES)
Tel: +44 (0)1384 275800 Fax: +44 (0)1384 275810 email: sales@eltafans.co.uk
46 Third Avenue, Pensnett Trading Estate, Kingswinford, West Midlands DY6 7US, UK
Version 5.26.11 Copyright © 2010-23 Elta Group

Technical Data - HRH30

Location:	HRU.A-01	Designation:	
Category:	Air Handling Units		
Sub Category :	-		
Sub Type:	-		
Description:	Heat recovery unit with controls and Modbus. See data sheet for detail.		

Technical Data - HRH20

Location:	HRU.A-02	Designation:	
Category:	Air Handling Units		
Sub Category :	-		
Sub Type:	-		
Description:	Heat recovery unit with controls and Modbus. See data sheet for detail.		

Technical Data - HRH10

Location:	HRU.B-01	Designation:	
Category:	Air Handling Units		
Sub Category :	-		
Sub Type:	-		
Description:	Heat recovery unit with controls and Modbus. See data sheet for detail.		

Technical Data - HRH20

Location:	HRU.C-01	Designation:	
Category:	Air Handling Units		
Sub Category :	-		
Sub Type:	-		
Description:	Heat recovery unit with controls and Modbus. See data sheet for detail.		

Technical Submittal

To: CR Construction (UK) Company Ltd Copy: BFL Team	Contract Title: Victoria Riverside – Manchester Contract Number: 4015
Issue Date: 22/04/24	Technical Submittal No: 4015-TS-069 REV - 1
Technical Submittal for : Elta Fans Landlord MEV and HRU units's Documents: • MEV and HRU technical information sheets attached Revised Tech Sub to suit revised fan location	
Confirmation required by (date): 29/04/24 Print Name: Morgan Glennon Signature: M.Glennon	

Client Reply: Status: Date: Print Name: Signature:

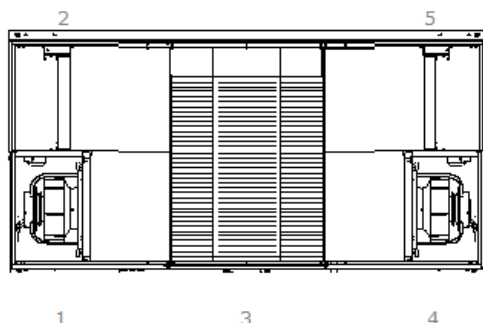
Date: 22-04-2024



Offer N°: 0030-23
Reference: Victotria Riverside

Customer:
Ref. Unit: HRU.A-01

UNIT TYPE: HRH 40							
Supply air flow		2196	m³/h	Supply external static pressure		180 Pa	
Return air flow		2196	m³/h	Return external static pressure		175 Pa	
Total efficiency of heat recovery		84	%				
Outside air - Winter	-5.0	C°	90.0 %	Return air - Winter	20.0	C°	50.0 %
Outside Air - Summer	30.0	C°	50.0 %	Return air - Summer	26.0	C°	50.0 %



Version
Configuration

Horizontal
A

Length mm 2150
Width mm 1840
Height mm 590
Total weight Kg 360

Dimensions do not include dampers, flexible flanges or round duct adaptors

Max absorbed power	2000.0	W	Max absorbed current	3.5	A
Power supply 400 V 3+N ph 50/60 Hz					

Heat recovery unit made from selfsupporting sandwich panels (RAL 9002 precoated steel metal outer skin and galvanized steel sheet metal inner skin); 25 mm thickness unflammmable mineral wool thermal and acoustic insulation. F7 compact filter on fresh air side, M5 compact filter on return side, replaceable from hinged access door, common with fan sections, composed of plug-fan, direct driven by EC motor. High efficiency counterflow heat recovery with on/off bypass for freecooling freeheating. Plug-and-play unit with electronic control on board and remote control panel.

Selected accessories

DPS	Differential pressure sensor	LMFARQU082
PSTD	Differential pressure switch on filters	LMFAPSD001

Date: 22-04-2024

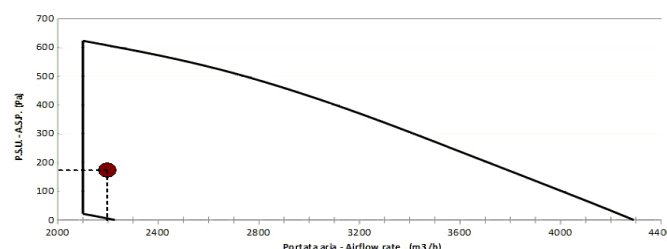
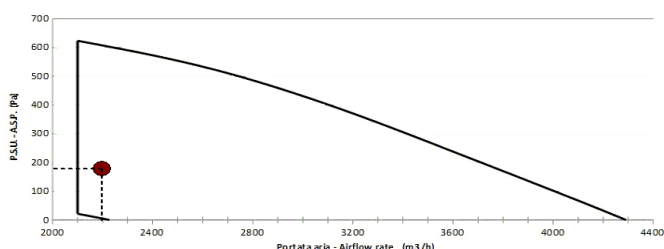
Offer N°: 0030-23
Reference: Victotria Riverside

Customer:
Ref. Unit: HRU.A-01

UNIT TYPE: HRH 40

4	Supply fan
Airflow	2196 m³/h
External static pressure	180 Pa
Input power	0.44 kW
Max current	1.75 A
Static efficiency	53.1 %
Sound power	70.4 dB(A)

1	Return fan
Airflow	2196 m³/h
External static pressure	175 Pa
Input power	0.41 kW
Max current	1.75 A
Static efficiency	53.1 %
Sound power	69.8 dB(A)



Noise level at 3 m

SWL (dB) octave band (Hz)							
63	125	250	500	1000	2000	4000	8000
67	70	68	67	64	65	59	52
Sound pressure - SPL supply		53	dB(A)				
Sound pressure - SPL return		44	dB(A)				
Sound pressure - SPL outside		36	dB(A)				



2	Fresh air filter
Filtration class	F7
Clean filter pressure drop	47 Pa

5	Return air filter
Filtration class	M5
Clean filter pressure drop	34 Pa

Compliance to EU 1253/2014 - ECODESIGN

Typology	NRVU;BVU reference unit
Thermal efficiency of heat recovery [%]	76.8
SFPint / SFPint limit 2018 [W/(m³/s)]	1056 / 1076
Reference Air flow [m³/s]	0.917
Reference Static Pressure [Pa]	340

ECODESIGN	Ecodesign 2016/2018
Typology	NRVU;BVU
Efficiency 1253/2014 (EN 308)	77.73 %
SFP Int limit 2018	1150.40 W/(m³/s)
SFPint	730.01 W/(m³/s)
Input power - Supply	0.44 kW
Input power - Return	0.41 kW
Static efficiency of fan [%] - ...	53.12 %
Static efficiency of fan [%] - ...	53.14 %
SFP	
SFPv W/(m³/s)	1393
SFPv Class	SFP4

Date: 22-04-2024



Offer N°: 0030-23
Reference: Victotria Riverside

Customer:
Ref. Unit: HRU.A-01

UNIT TYPE: HRH 40

Heating

Cooling

3 Plate heat recovery unit					
Fresh air temperature in	-5	°C	Fresh air temperature in	30	°C
Fresh relative humidity in	90	%	Fresh relative humidity in	50	%
Fresh air temperature out	16	°C	Fresh air temperature out	26.9	°C
Fresh relative humidity out	21	%	Fresh relative humidity out	60	%
Exhaust air temperature in	20	°C	Exhaust air temperature in	26	°C
Exhaust relative humidity in	50	%	Exhaust relative humidity in	50	%
Exhaust air temperature out	4.7	°C	Exhaust air temperature out	29.1	°C
Exhaust air humidity out	96	%	Exhaust air humidity out	42	%
Wet efficiency	84	%	Wet efficiency	77.7	%
Dry efficiency	77.6	%	Dry efficiency	77.7	%

ACCESSORIES	DESCRIPTION	CODE		Quantity	
DPS	Differential pressure sensor	LMFARQU082		1	
PSTD	Differential pressure switch on filters	LMFAPSD001		2	

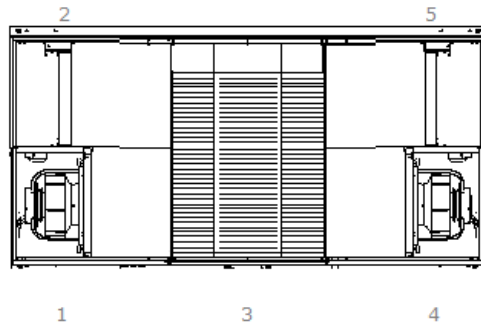
Date: 22-04-2024



Offer N°: 0030-23
Reference: Victotria Riverside

Customer:
Ref. Unit: HRU.A-02

UNIT TYPE: HRH 15					
Supply air flow	144	m³/h	Supply external static pressure	146	Pa
Return air flow	144	m³/h	Return external static pressure	145	Pa
Total efficiency of heat recovery		94.6 %			
Outside air - Winter	-5.0	C°	90.0 %	Return air - Winter	20.0 C° 50.0 %
Outside Air - Summer	30.0	C°	50.0 %	Return air - Summer	26.0 C° 50.0 %



Version Configuration Horizontal A

Length mm 1850
Width mm 1030
Height mm 455
Total weight Kg 175

Dimensions do not include dampers, flexible flanges or round duct adaptors

Max absorbed power	920.0	W	Max absorbed current	6.0	A
Power supply 230 V 1 ph 50/60 Hz					

Heat recovery unit made from selfsupporting sandwich panels (RAL 9002 precoated steel metal outer skin and galvanized steel sheet metal inner skin); 25 mm thickness unflammmable mineral wool thermal and acoustic insulation. F7 compact filter on fresh air side, M5 compact filter on return side, replaceable from hinged access door, common with fan sections, composed of plug-fan, direct driven by EC motor. High efficiency counterflow heat recovery with on/off bypass for freecooling freeheating. Plug-and-play unit with electronic control on board and remote control panel.

Selected accessories

DPS	Differential pressure sensor	LMFARQU082
PSTD	Differential pressure switch on filters	LMFAPSD001

Date: 22-04-2024

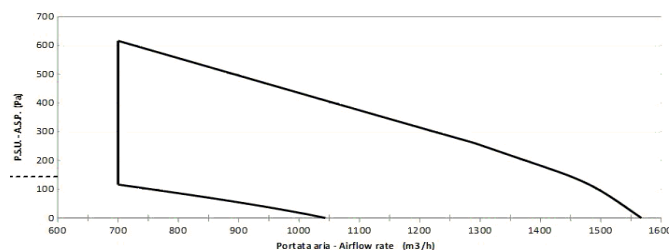
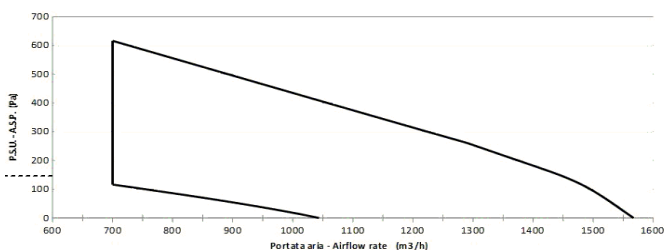
Offer N°: 0030-23
Reference: Victotria Riverside

Customer:
Ref. Unit: HRU.A-02

UNIT TYPE: HRH 15

4	Supply fan
Airflow	144 m³/h
External static pressure	146 Pa
Input power	0.04 kW
Max current	3.00 A
Static efficiency	15.3 %
Sound power	58.8 dB(A)

1	Return fan
Airflow	144 m³/h
External static pressure	145 Pa
Input power	0.04 kW
Max current	3.00 A
Static efficiency	15.3 %
Sound power	58.7 dB(A)



Noise level at 3 m

SWL (dB) octave band (Hz)							
63	125	250	500	1000	2000	4000	8000
68	66	59	57	53	48	43	34
Sound pressure - SPL supply		41	dB(A)				
Sound pressure - SPL return		33	dB(A)				
Sound pressure - SPL outside		24	dB(A)				



2	Fresh air filter
Filtration class	F7
Clean filter pressure drop	3 Pa

5	Return air filter
Filtration class	M5
Clean filter pressure drop	3 Pa

Compliance to EU 1253/2014 - ECODESIGN

Typology	NRVU;BVU reference unit
Thermal efficiency of heat recovery [%]	77.6
SFPint / SFPint limit 2018 [W/(m³/s)]	1189 / 1191
Reference Air flow [m³/s]	0.314
Reference Static Pressure [Pa]	360

ECODESIGN	Ecodesign 2016/2018
Typology	NRVU;BVU
Efficiency 1253/2014 (EN 308)	93.15 %
SFP Int limit 2018	1698.50 W/(m³/s)
SFPint	315.85 W/(m³/s)
Input power - Supply	0.04 kW
Input power - Return	0.04 kW
Static efficiency of fan [%] - ...	15.29 %
Static efficiency of fan [%] - ...	15.26 %
SFP	
SFPv W/(m³/s)	2000
SFPv Class	SFP5

Date: 22-04-2024



Offer N°: 0030-23
Reference: Victotria Riverside

Customer:
Ref. Unit: HRU.A-02

UNIT TYPE: HRH 15

Heating

Cooling

3 Plate heat recovery unit					
Fresh air temperature in	-5	°C	Fresh air temperature in	30	°C
Fresh relative humidity in	90	%	Fresh relative humidity in	50	%
Fresh air temperature out	18.6	°C	Fresh air temperature out	26.3	°C
Fresh relative humidity out	18	%	Fresh relative humidity out	62	%
Exhaust air temperature in	20	°C	Exhaust air temperature in	26	°C
Exhaust relative humidity in	50	%	Exhaust relative humidity in	50	%
Exhaust air temperature out	3.2	°C	Exhaust air temperature out	29.7	°C
Exhaust air humidity out	96	%	Exhaust air humidity out	40	%
Wet efficiency	94.6	%	Wet efficiency	93.2	%
Dry efficiency	93	%	Dry efficiency	93.2	%

ACCESSORIES	DESCRIPTION	CODE		Quantity	
DPS	Differential pressure sensor	LMFARQU082		1	
PSTD	Differential pressure switch on filters	LMFAPSD001		2	

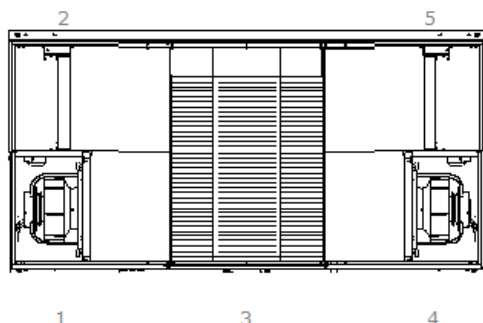
Date: 22-04-2024



Offer N°: 0030-23
Reference: Victotria Riverside

Customer:
Ref. Unit: HRU.C-01

UNIT TYPE: HRH 05							
Supply air flow		216	m³/h	Supply external static pressure		147 Pa	
Return air flow		288	m³/h	Return external static pressure		146 Pa	
Total efficiency of heat recovery			94.3 %				
Outside air - Winter		-5.0	C°	90.0 %	Return air - Winter		20.0 C° 50.0 %
Outside Air - Summer		30.0	C°	50.0 %	Return air - Summer		26.0 C° 50.0 %



Version
Configuration

Horizontal
A

Length mm 1350
Width mm 680
Height mm 330
Total weight Kg 85

Dimensions do not include dampers, flexible flanges or round duct adaptors

Max absorbed power	340.0	W	Max absorbed current	2.8	A
Power supply 230 V 1 ph 50/60 Hz					

Heat recovery unit made from selfsupporting sandwich panels (RAL 9002 precoated steel metal outer skin and galvanized steel sheet metal inner skin); 25 mm thickness unflammmable mineral wool thermal and acoustic insulation. F7 compact filter on fresh air side, M5 compact filter on return side, replaceable from hinged access door, common with fan sections, composed of plug-fan, direct driven by EC motor. High efficiency counterflow heat recovery with on/off bypass for freecooling freeheating. Plug-and-play unit with electronic control on board and remote control panel.

Selected accessories

PSTD	Differential pressure switch on filters	LMFAPSD001
DPS	Differential pressure sensor	LMFARQU082

Date: 22-04-2024

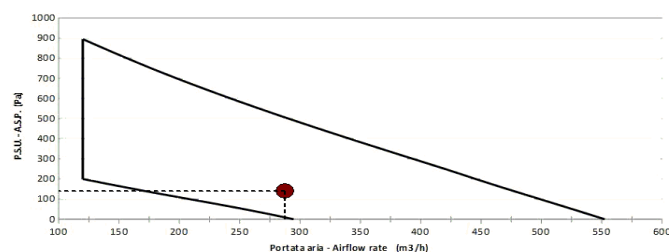
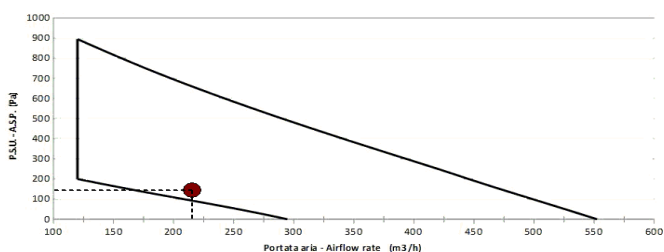
Offer N°: 0030-23
Reference: Victotria Riverside

Customer:
Ref. Unit: HRU.C-01

UNIT TYPE: HRH 05

4	Supply fan
Airflow	216 m³/h
External static pressure	147 Pa
Input power	0.05 kW
Max current	1.40 A
Static efficiency	38.2 %
Sound power	64.5 dB(A)

1	Return fan
Airflow	288 m³/h
External static pressure	146 Pa
Input power	0.06 kW
Max current	1.40 A
Static efficiency	42.5 %
Sound power	64 dB(A)



Noise level at 3 m

SWL (dB) octave band (Hz)							
63	125	250	500	1000	2000	4000	8000
55	56	60	62	61	57	51	46
Sound pressure - SPL supply		47	dB(A)				
Sound pressure - SPL return		38	dB(A)				
Sound pressure - SPL outside		30	dB(A)				



2	Fresh air filter
Filtration class	F7
Clean filter pressure drop	29 Pa

5	Return air filter
Filtration class	M5
Clean filter pressure drop	29 Pa

Compliance to EU 1253/2014 - ECODESIGN

Typology	NRVU;BVU reference unit
Thermal efficiency of heat recovery [%]	81.2
SFPint / SFPint limit 2018 [W/(m³/s)]	1291 / 1330
Reference Air flow [m³/s]	0.106
Reference Static Pressure [Pa]	340

ECODESIGN	Ecodesign 2016/2018
Typology	NRVU;BVU
Efficiency 1253/2014 (EN 308)	86.05 %
SFP Int limit 2018	1481.00 W/(m³/s)
SFPint	780.40 W/(m³/s)
Input power - Supply	0.05 kW
Input power - Return	0.06 kW
Static efficiency of fan [%] - ...	38.25 %
Static efficiency of fan [%] - ...	42.48 %
SFP	
SFPv W/(m³/s)	1833
SFPv Class	SFP4

Date: 22-04-2024



Offer N°: 0030-23
Reference: Victotria Riverside

Customer:
Ref. Unit: HRU.C-01

UNIT TYPE: HRH 05

Heating

Cooling

3 Plate heat recovery unit					
Fresh air temperature in	-5	°C	Fresh air temperature in	30	°C
Fresh relative humidity in	90	%	Fresh relative humidity in	50	%
Fresh air temperature out	18.6	°C	Fresh air temperature out	26.2	°C
Fresh relative humidity out	18	%	Fresh relative humidity out	62	%
Exhaust air temperature in	20	°C	Exhaust air temperature in	26	°C
Exhaust relative humidity in	50	%	Exhaust relative humidity in	50	%
Exhaust air temperature out	6.4	°C	Exhaust air temperature out	28.8	°C
Exhaust air humidity out	95	%	Exhaust air humidity out	42	%
Wet efficiency	94.3	%	Wet efficiency	94.1	%
Dry efficiency	94.1	%	Dry efficiency	94.1	%

ACCESSORIES	DESCRIPTION	CODE	Quantity
PSTD	Differential pressure switch on filters	LMFAPSD001	2
DPS	Differential pressure sensor	LMFARQU082	1

Attenuator Schedule

Victoria Riverside Landlord Areas

Schedule Date
21/10/2024
Caice Reference
127611/OA00001

Notes

1. All products shall be supplied by Caice or equal and approved, as per their file reference #ProjectNumber#, contact #SalesPersonContactDetails#.
2. The Contractor shall order the attenuators scheduled below, and shall send finalised drawings and equipment noise levels to the attenuator supplier to check the selections prior to manufacture.
3. The attenuator supplier shall then undertake acoustic calculations to ensure that the attenuators achieve the specified noise criteria, based upon the finalised information.
4. A Technical Submittal comprising acoustic calculations and a finalised schedule of attenuators shall then be issued to the Consultant for final approval.
5. If an alternative attenuator supplier is proposed then the Contractor shall allow for them to undertake witnessed tests to prove their claimed insertion loss performance in a UKAS accredited BS EN ISO 7235: 2009 test facility, for two sample units. This shall be undertaken prior to order.
6. Pressure losses are stated in accordance with ISO 7235, which is based on laminar airflow conditions. The system designer shall make allowance for increased attenuator pressure losses where turbulent airflow conditions exist on the attenuator entry or exit.
7. Unless stated otherwise all attenuators shall be constructed as follows: Galvanised sheet steel casings with 30mm profile flanges that are fully compliant with DW/TM1 at a high pressure rating (+2000/-750Pa). Profile flanges shall be compatible with Doby, Mez & Metu flanging systems. Elements shall be installed in the vertical plane, with side elements provided as standard, and all elements shall have aerodynamic inlet and outlet fairings. Element facings shall be constructed from expanded galvanised steel mesh with fibre glass tissue bonded to the inner face. Mineral wool infill shall be overpacked to minimise voids due to settlement. Attenuator ends shall be protectively wrapped, and all attenuators shall be delivered to site on pallets and individually labelled.

Product Reference	Product Description	Product Code	Dimensions (mm)			Insertion Loss (dB)								Air Volume (m³/s)	Pressure Loss (Pa)	Quantity	Features
			Width	Height	Length	63	125	250	500	1k	2k	4k	8k				
ATT 01	MNEV.B.01 Room Side	Rectangular LG01H/3C/L/S	400	150	900	2	4	6	13	24	33	30	22	0.31	40	1	Rectangular attenuator & Horizontal elements
ATT 02	MNEV.B.01 Atmosphere	Rectangular LG01H/3C/L/S	400	150	600	2	3	4	8	16	24	26	19	0.31	30	1	Rectangular attenuator & Horizontal elements
ATT 03	MNEV.C.02 Atmosphere	Circular CG01U/2K/L	200	dia	600	1	3	7	14	29	20	16	15	0.09	5	1	Circular attenuator, Un-podded, 40mm long spigots & Medium pressure rating (+1000/-750Pa)
ATT 04	MNEV.C.02 Room Side	Circular CG01U/2K/L	200	dia	600	1	3	7	14	29	20	16	15	0.09	5	1	Circular attenuator, Un-podded, 40mm long spigots & Medium pressure rating (+1000/-750Pa)
ATT 05	MNEV.C.01 Atmosphere	Rectangular LG01H/3C/L/S	400	200	600	1	3	4	8	19	25	20	15	0.43	30	1	Rectangular attenuator & Horizontal elements
ATT 06	MNEV.C.01 Room Side	Rectangular LG01H/3C/L/S	400	200	900	2	3	7	13	27	33	24	18	0.43	40	1	Rectangular attenuator & Horizontal elements
ATT 07	MNEV.A.01 Atmosphere	Rectangular LG01H/3C/L/S	250	150	600	2	3	4	8	16	24	26	19	0.13	30	1	Rectangular attenuator & Horizontal elements
ATT 08	MNEV.A.01 Room Side	Rectangular LG01H/3C/L/S	250	150	600	2	3	4	8	16	24	26	19	0.13	30	1	Rectangular attenuator & Horizontal elements
ATT 09	MNEV.A.02 Atmosphere	Rectangular LG01H/3C/L/S	700	250	900	1	3	5	9	23	19	14	13	0.88	30	1	Rectangular attenuator & Horizontal elements
ATT 10	MNEV.A.02 Room Side	Rectangular LG01H/3C/L/S	700	250	900	1	3	5	9	23	19	14	13	0.88	30	1	Rectangular attenuator & Horizontal elements
ATT 11	HRU.A.01 Atmosphere	Rectangular LG01H/3C/L/S	600	200	600	1	3	4	8	19	25	20	15	0.55	30	1	Rectangular attenuator & Horizontal elements

ATT 12	HRU.A.01 Room side	Rectangular LG01H/3C/L/S	600	200	600	1	3	4	8	19	25	20	15	0.55	30	1	Rectangular attenuator & Horizontal elements
ATT 13	HRU.A.01 Atmosphere	Rectangular LG01H/3C/L/S	600	200	600	1	3	4	8	19	25	20	15	0.55	30	1	Rectangular attenuator & Horizontal elements
ATT 14	HRU.A.01 Room side	Rectangular LG01H/3C/L/S	600	200	600	1	3	4	8	19	25	20	15	0.55	30	1	Rectangular attenuator & Horizontal elements
ATT 15	HRU.A.02 Atmosphere	Rectangular LG01H/3C/L/S	400	150	600	2	3	4	8	16	24	26	19	0.24	30	1	Rectangular attenuator & Horizontal elements
ATT 16	HRU.A.02 Room Side	Rectangular LG01H/3C/L/S	400	150	1200	3	5	9	18	32	42	34	25	0.24	30	1	Rectangular attenuator & Horizontal elements
ATT 17	HRU.A.02 Atmosphere	Rectangular LG01V/3C/L/S	150	150	600	3	5	9	14	26	42	40	32	0.04	30	1	Rectangular attenuator
ATT 18	HRU.A.02 Room Side	Rectangular LG01V/3C/L/S	150	150	1200	4	7	16	29	46	55	48	37	0.04	30	1	Rectangular attenuator
ATT 19	HRU.C.01 Atmosphere	Circular CG01U/2K/L	250	dia	600	1	2	5	11	26	16	13	13	0.05	0	1	Circular attenuator, Un-podded, 40mm long spigots & Medium pressure rating (+1000/-750Pa)
ATT 20	HRU.C.01 Room Side	Circular CG01U/2K/L	250	dia	1200	1	4	9	23	44	25	18	17	0.05	0	1	Circular attenuator, Un-podded, 40mm long spigots & Medium pressure rating (+1000/-750Pa)
ATT 21	HRU.C.01 Atmosphere	Rectangular LG01V/3C/L/S	250	250	600	3	5	8	16	26	36	32	24	0.07	30	1	Rectangular attenuator
ATT 22	HRU.C.01 Room Side	Rectangular LG01H/3C/L/S	250	250	1200	2	4	10	19	36	33	22	17	0.07	30	1	Rectangular attenuator & Horizontal elements



Technical Submittal

To: CR Construction (UK) Company Ltd Copy: BFL Team	Contract Title: Victoria Riverside – Manchester Contract Number: 4015
Issue Date: 30/09/2024	Technical Submittal No: 4015-TS-078 REV - 1
Technical Submittal for : Car Park Smoke Ventilation System <u>Documents:</u> Interactive Special Projects Technical Submission Impulse Fans Data Sheet Control Panel Fireman’s Override Switch CO2 Detector	
Confirmation required by (date): 04/10/2024	
Print Name: Adam Penketh	

Client Reply:

Status: **Date:**

Print Name: **Signature:**

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 02 Aug 2024 12:47 using software version 5.8.4590.0

Project: 24/15391/COM

VICTORIA RIVERSIDE

Location: 50 N Induction fan

Technical Data

SVTC - Low Depth Car Park Induction Fans

Fan Code: **SVTC-50T8**

Installation Manual Links: 671635

Required duty: 1.5 m³/s at 400 Pa

Actual duty:

Actual at required flow:

At full speed:

Maximum Fan Speed: 4 / 8 pole, 1,430 / 705 RPM

Electrical Supply: 400V, 3 Phase, 50 Hz

Nominal Motor Rating: 1.2 / 0.3 kW

Motor current (flc): 3.21 / 1.37 A

Motor starting current (sc): 16 / 4.11 A

Max. operating temp: 300°C for 2 hours

Weight: 100 kg

Starting currents are nominal.

Thrust Full/Low Speed: 50 / 12 Newtons

Protection Class: IP55

Insulation: H



0086-CPR-741804 2797-CPR-672476 EN 12101-3:2015
Powered smoke and heat exhaust ventilators for use in
Construction Works. Application Classes, uninsulated,
smoke reservoir, dual purpose.
Class F300 - 300°C / 120 mins. Motor rating Class F / H.

Sound Data

Acoustic performance to ISO 13347 and AMCA 300.

Noise calculated speed controlled to required duty (100%)

Sound Power Levels re 1 pWatts (Hz):

Hz	63	125	250	500	1k	2k	4k	8k	dBA
Breakout	79	95	89	89	87	83	80	72	74
Breakout (low speed)	74	78	75	79	73	70	59	51	61

dBA is hemi-spherical at 3 metres. For spherical deduct 3 dBA.

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.

Additional Notes

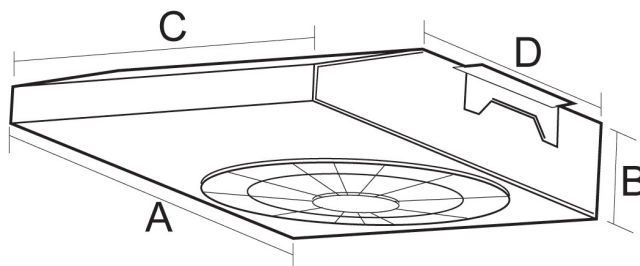
Specification

The SVTC unit comprising of centrifugal impeller, motor and all assembled components, shall be certified for high temperature operation at 300°C for 2 hours, the range shall have been type tested to EN12101-3.

For day to day operation the units shall be either two speed or driven by inverter, please refer to I&M for connection details, providing environmental ventilation at low speed and when required operating at high speed removing high CO levels. The unit is designed for a one off emergency mode use at temperatures up to 300°C.

Inlet guards are provided for safety purposes and to prevent debris being pulled through the fan. The car park induction units shall be the SVTC type and the main exhaust units shall be the high temperature AXUS type all as manufactured by Nuaire.

Fan Dimensions



A	B	C	D	kg
1265	230	790	710	100.0
Length:	Width:	Height:		
1270	790	230		

Drawing is for dimensional purposes only. Dimensions in mm.

Please see selected ancillaries section for additional dimensions for any requested additional ancillaries.

Technical Submittal

To: CR Construction (UK) Company Ltd Copy: BFL Team	Contract Title: Victoria Riverside – Manchester Contract Number: 4015
Issue Date: 28/02/24	Technical Submittal No: 4015-TS-052 REV - 2
Technical Submittal for : Smoke Ventilation Control <u>Documents:</u> • Technical Submission of systems in Line with updated fire strategy	
Confirmation required by (date): 08/03/24 Print Name: Morgan Glennon Signature: Morgan Glennon	

Client Reply: Status: Date: Print Name: Signature:	
---	--

Cased Axials HT JM Aerofoil

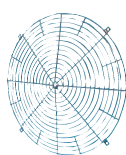
CE Certified



Accessories & Controllers



Damper



Guard



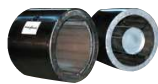
Bellmouth



Flange



Mounting Feet



Silencer



Spring AV's



Flexible
Connector



Controls
Inverter

Casings

HT JM Aerofoil fans are available in long cased form, complete with an externally mounted pre-wired electrical terminal box. Casings are spun from sheet steel with integral pre-drilled and radiused inlet flanges. The galvanised finish gives a high resistance to corrosion and is ideal for external as well as internal use.

Product Code

- HT - denotes high temperature fan
- 63 - denotes the fan impeller diameter in centimetres
- JM - denotes axial fan family
- 20 - denotes impeller hub diameter in centimetres
- 4 - denotes a nominal 4 pole speed
- 6 - denotes the number of blades
- 36 - denotes the pitch angle for the required duty

Control Options

Fans are tested in compliance with high temperature test standard directive 89/106/EEC to EN 12101-3, and are fully CE marked accordingly.

Fan motors are sized to run the fans continuously at normal ambient temperatures (-40°C to 50°C), as well as operating at their emergency high temperature category (once off usage).

400°C for 2 hours available, enquire for more information.

Note: During emergency use the inverter should be overridden and the fan run at full speed.

Product Features

Features

- 355 - 1000 mm diameter
- Air flow up to 21 m³/s
- Static pressures up to 1000 Pa
- IP55 motor rating
- Fans tested to ISO5801 and BS848
- High energy efficiency
- Low installed noise levels
- Motor protection IP55
- Larger sizes available please enquire for more information

Electrical Supply

380-420V/50Hz/3φ

Temperature Range

-40°C to 50°C as standard.
300 for 2 hours - one off emergency operation only. High temperature test standard: EN 12101-3.

Sizes

355, 400, 450, 500, 560, 630, 710, 800, 900 and 1000 mm.

Impellers

A unique high efficiency aerofoil section blade with a smoothed hub and clamp plate for adjustable pitch angle availability. The impellers are die cast to offer thin aerofoil sections for low generation of noise. Every cast aluminium component is X-ray examined using Real Time Radiography inspection prior to assembly. The maximum pitch angles shown allow for speed control by frequency inverter.

Motors

HT JM Aerofoil fans utilise a totally enclosed squirrel cage motor. The grades of motor insulation has been selected to meet the specific requirements for each of the H.T. Categories. These motors are suitable for inverter speed control down to 20% of full speed and where appropriate incorporate IE2 efficiency grade motors.

Please contact:

01204 579002

for further information.

Unit 3 | Harcourt Street | Walkden
Worsley | Manchester M28 3GN

www.interactive.uk.com



INTERACTIVE
SPECIAL PROJECTS

The new standard in intelligent smoke control



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 14 Sep 2022 15:38 using software version 5.7.4408.0

Project: 22/18892/COM

VICTORIA RIVERSIDE

Location: Tower A

Technical Data

Smoke Long Case Run & Standby. Class H 300°C/2hr, 6.6 kW 4P 400V 3ph 50Hz TEAO IP55. Aluminium impeller. Galvanised steel case.

Fan Code: **AXT90DG*4HA7-2EM**

Installation Manual Links: 671156

Required duty: 7.5 m³/s at 300 Pa @ 40°C
Actual duty: 7.532 m³/s at 303 Pa @ 40°C
Actual at required flow: 7.5 m³/s at 308 Pa @ 40°C
Actual duty: 7.532 m³/s at 323 Pa @ 20°C
Actual at required flow: 7.5 m³/s at 329 Pa @ 20°C

At full speed:

Absorbed power: 6.08 kW @ 40°C
Maximum Absorbed power: 6.511 kW @ 40°C
Motor Input Power: 6.778 kW @ 40°C
Specific Fan Power: 0.9 W/(l/s) @ 40°C
Fan Total Efficiency: 47% @ 40°C
Absorbed power: 6.495 kW @ 20°C
Maximum Absorbed power: 6.955 kW @ 20°C
Motor Input Power: 7.241 kW @ 20°C
Specific Fan Power: 1.0 W/(l/s) @ 20°C

Maximum Fan Speed: 4 pole, 1,465 RPM
Electrical Supply: 400V, 3 Phase, 50 Hz
Motor Rating: 6.6 kW
Motor current (flc): 12.6 A
Motor starting current (sc): 86 A (DOL) 28.67 A (SD)
Overload setting: 13.86 A
Motor Efficiency: IE3 / Premium Efficiency
Starting currents are nominal. D.O.L. is recommended.
Blade angle: 27 °
Max. Operating Temp: 300°C for 2 hours



2797-CPR-672476 EN12101-3-2015 Powered smoke and heat exhaust ventilators for use in Construction Works. Application Classes - uninsulated, smoke reservoir, dual purpose. Class F300 - 300°C / 120 min. Motor rating class F / H.

Sound Data

Noise calculated speed controlled to required duty (100%)

Sound Power Levels re 1 pWatts (Hz):

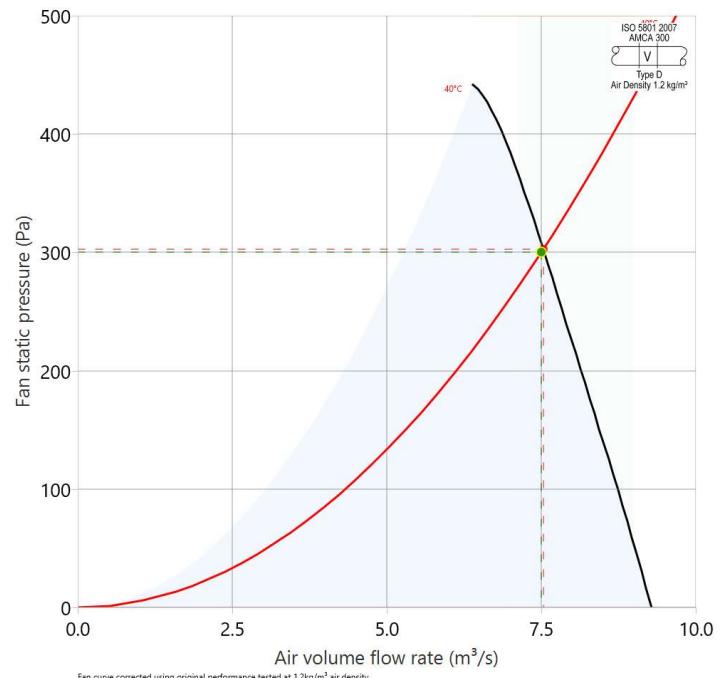
Hz	63	125	250	500	1k	2k	4k	8k	dBA
Induct Inlet	103	112	109	103	98	90	85	78	
Induct Outlet	107	113	110	104	99	90	85	79	
Open Inlet	96	109	108	103	98	90	85	78	
Open Outlet	100	111	109	104	99	90	85	79	
Breakout	83	91	95	79	71	72	67	54	66

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.

Performance Chart



Additional Notes

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: 61
Overall efficiency: 59.7 %
Measurement category: D
Efficiency category: Total
Variable speed drive: None
Input power at best point: 7.556 kW
Volume flow at best point: 8.66 m³/s
Pressure at best point: 521 Pa
Speed: 1,465 RPM
Specific ratio: 1.005156

Selected Ancillaries

1 x CMB90 Mounting bracket (pair)
1 x CFCH90 Hi-temp flexible connector
1 x CMF90 Matching flange
1 x NAV49 Anti-vibration mounting kit

CMB90 - Mounting bracket (pair)

Weight: 10.0 kg

CFCH90 - Hi-temp flexible connector

Weight: 2.0 kg

CMF90 - Matching flange

Weight: 3.3 kg

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 14 Sep 2022 15:38 using software version 5.7.4408.0

Specification

900mm diameter two-stage run & standby long cased circular axial flow fan manufactured from pre-galvanised mild steel. The case is fitted with integral vanes. Fan incorporates inlet and outlet flanges with pre-drilled bolt holes and an external 300/2hr terminal box. Impeller manufactured from aluminium mounted in a aluminium hub as standard. The motor is 400V three phase, single speed, totally enclosed air over, protected to IP55, foot mounted, class H insulated, with drain holes. Motor efficiency is IE3. Motor efficiency stated is based on the IEC rated output for the motor. Day to day operation up to ambient temperature of 60°C and once off at 300°C for 2 hours. D.O.L starting is recommended.

NOTE: This unit cannot be inverter speed controlled.

NOTE: Unit diameters 630mm and greater are delivered in two.

CMB90

The mounting brackets are manufactured from heavy gauge galvanised steel and supplied in pairs.

CFCH90

Circular flexible connector without flanges. Flexible duct material is flameproof and resistance to heat up to 400°C, chemicals, ozone, oil and grease. The material is airtight, waterproof and tested to BS476 Part 7. Supplied complete with fixing straps.

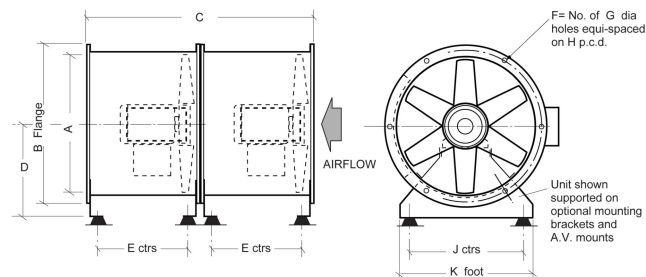
CMF90

The matching flanges are manufactured from galvanised steel and are supplied individually.

NAV49

Spring type anti-vibration mountings, supplied as a set of 4.

Fan Dimensions



A	B	C	D	E	F	G	H	J
900	1005	1480	600	660	16	15	970	610

K kg

750 317.36

Length: Width: Height:

740 1005 1005

Drawing is for dimensional purposes only. Dimensions in mm.

Please see selected ancillaries section for additional dimensions for any requested additional ancillaries.



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 14 Sep 2022 15:38 using software version 5.7.4408.0

Project: 22/18892/COM

VICTORIA RIVERSIDE

Location: Tower B

Technical Data

Smoke Long Case Run & Standby. Class H 300°C/2hr, 5.5 kW 4P 400V 3ph 50Hz TEAO IP55. Aluminium impeller. Galvanised steel case.

Fan Code: **AXT90AA*43A7-2E**

Installation Manual Links: 671156

Required duty: 6 m³/s at 300 Pa @ 40°C
Actual duty: 6.067 m³/s at 307 Pa @ 40°C
Actual at required flow: 6 m³/s at 314 Pa @ 40°C
Actual duty: 6.067 m³/s at 328 Pa @ 20°C
Actual at required flow: 6 m³/s at 335 Pa @ 20°C

At full speed:

Absorbed power: 4.342 kW @ 40°C
Maximum Absorbed power: 4.408 kW @ 40°C
Motor Input Power: 4.84 kW @ 40°C
Specific Fan Power: 0.8 W/(l/s) @ 40°C
Fan Total Efficiency: 50% @ 40°C

Absorbed power: 4.638 kW @ 20°C
Maximum Absorbed power: 4.709 kW @ 20°C
Motor Input Power: 5.17 kW @ 20°C
Specific Fan Power: 0.9 W/(l/s) @ 20°C

Maximum Fan Speed: 4 pole, 1,465 RPM
Electrical Supply: 400V, 3 Phase, 50 Hz
Motor Rating: 5.5 kW
Motor current (flc): 10.4 A
Motor starting current (sc): 86 A (DOL) 28.67 A (SD)
Overload setting: 11.44 A
Motor Efficiency: IE3 / Premium Efficiency
Starting currents are nominal. D.O.L. is recommended.
Blade angle: 32.5 °
Max. Operating Temp: 300°C for 2 hours



2797-CPR-672476 EN12101-3-2015 Powered smoke and heat exhaust ventilators for use in Construction Works. Application Classes - uninsulated, smoke reservoir, dual purpose. Class F300 - 300°C / 120 min. Motor rating class F / H.

Sound Data

Noise calculated speed controlled to required duty (100%)

Sound Power Levels re 1 pWatts (Hz):

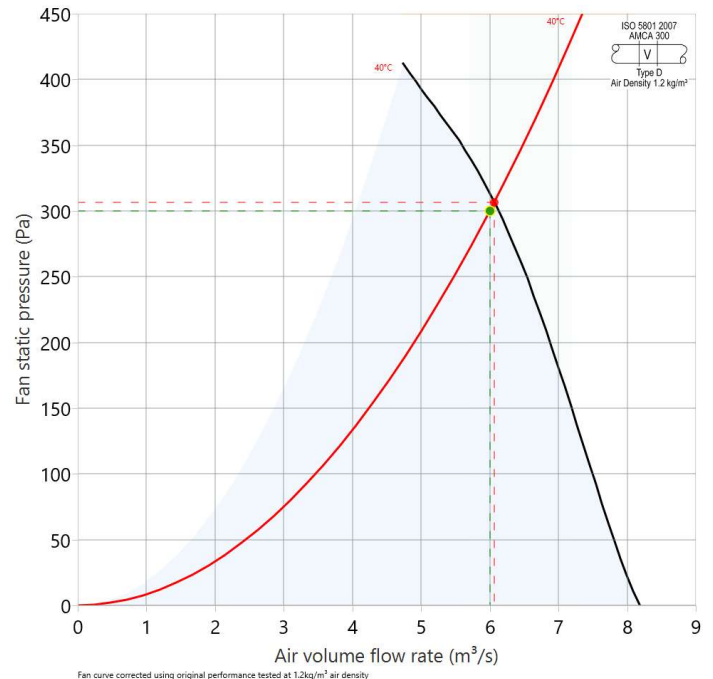
Hz	63	125	250	500	1k	2k	4k	8k	dBA
Induct Inlet	100	106	108	106	100	93	87	79	
Induct Outlet	103	108	113	109	104	97	89	81	
Open Inlet	93	104	107	105	100	93	87	79	
Open Outlet	96	106	112	109	104	97	89	81	
Breakout	80	85	96	83	75	78	70	55	68

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.

Performance Chart



Additional Notes

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:	62
Overall efficiency:	60.4 %
Measurement category:	D
Efficiency category:	Total
Variable speed drive:	None
Input power at best point:	5.158 kW
Volume flow at best point:	7.36 m³/s
Pressure at best point:	423 Pa
Speed:	1,465 RPM
Specific ratio:	1.004193

Selected Ancillaries

1 x CMF90	Matching flange
1 x CMB90	Mounting bracket (pair)
1 x CFCH90	Hi-temp flexible connector
1 x NAV49	Anti-vibration mounting kit

CMF90 - Matching flange

Weight: 3.3 kg

CMB90 - Mounting bracket (pair)

Weight: 10.0 kg

CFCH90 - Hi-temp flexible connector

Weight: 2.0 kg

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 14 Sep 2022 15:38 using software version 5.7.4408.0

Specification

900mm diameter two-stage run & standby long cased circular axial flow fan manufactured from pre-galvanised mild steel. The case is fitted with integral vanes. Fan incorporates inlet and outlet flanges with pre-drilled bolt holes and an external 300/2hr terminal box. Impeller manufactured from aluminium mounted in a aluminium hub as standard. The motor is 400V three phase, single speed, totally enclosed air over, protected to IP55, foot mounted, class H insulated, with drain holes. Motor efficiency is IE3. Motor efficiency stated is based on the IEC rated output for the motor. Day to day operation up to ambient temperature of 60°C and once off at 300°C for 2 hours. D.O.L starting is recommended.

NOTE: This unit cannot be inverter speed controlled.

NOTE: Unit diameters 630mm and greater are delivered in two.

CMF90

The matching flanges are manufactured from galvanised steel and are supplied individually.

CMB90

The mounting brackets are manufactured from heavy gauge galvanised steel and supplied in pairs.

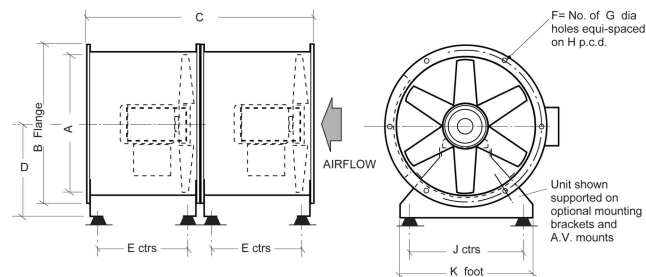
CFCH90

Circular flexible connector without flanges. Flexible duct material is flameproof and resistance to heat up to 400°C, chemicals, ozone, oil and grease. The material is airtight, waterproof and tested to BS476 Part 7. Supplied complete with fixing straps.

NAV49

Spring type anti-vibration mountings, supplied as a set of 4.

Fan Dimensions



A	B	C	D	E	F	G	H	J
900	1005	1480	600	660	16	15	970	610

K	kg
750	293.76

Length: 740 Width: 1005 Height: 1005

Drawing is for dimensional purposes only. Dimensions in mm.

Please see selected ancillaries section for additional dimensions for any requested additional ancillaries.



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 14 Sep 2022 15:38 using software version 5.7.4408.0

Project: 22/18892/COM

VICTORIA RIVERSIDE

Location: Tower C

Technical Data

Smoke Long Case Run & Standby. Class H 300°C/2hr, 5.5 kW 4P 400V 3ph 50Hz TEAO IP55. Aluminium impeller. Galvanised steel case.

Fan Code: **AXT90DG*4FA7-2E**

Installation Manual Links: 671156

Required duty: 6.5 m³/s at 300 Pa @ 40°C
Actual duty: 6.543 m³/s at 304 Pa @ 40°C
Actual at required flow: 6.5 m³/s at 310 Pa @ 40°C
Actual duty: 6.543 m³/s at 325 Pa @ 20°C
Actual at required flow: 6.5 m³/s at 331 Pa @ 20°C

At full speed:

Absorbed power: 4.903 kW @ 40°C
Maximum Absorbed power: 5.348 kW @ 40°C
Motor Input Power: 5.466 kW @ 40°C
Specific Fan Power: 0.8 W/(l/s) @ 40°C
Fan Total Efficiency: 48% @ 40°C

Absorbed power: 5.238 kW @ 20°C
Maximum Absorbed power: 5.712 kW @ 20°C
Motor Input Power: 5.839 kW @ 20°C
Specific Fan Power: 0.9 W/(l/s) @ 20°C

Maximum Fan Speed: 4 pole, 1,465 RPM
Electrical Supply: 400V, 3 Phase, 50 Hz
Motor Rating: 5.5 kW
Motor current (flc): 10.4 A
Motor starting current (sc): 86 A (DOL) 28.67 A (SD)
Overload setting: 11.44 A
Motor Efficiency: IE3 / Premium Efficiency
Starting currents are nominal. D.O.L. is recommended.
Blade angle: 24 °
Max. Operating Temp: 300°C for 2 hours



2797-CPR-672476 EN12101-3-2015 Powered smoke and heat exhaust ventilators for use in Construction Works. Application Classes - uninsulated, smoke reservoir, dual purpose. Class F300 - 300°C / 120 min. Motor rating class F / H.

Sound Data

Noise calculated speed controlled to required duty (100%)

Sound Power Levels re 1 pWatts (Hz):

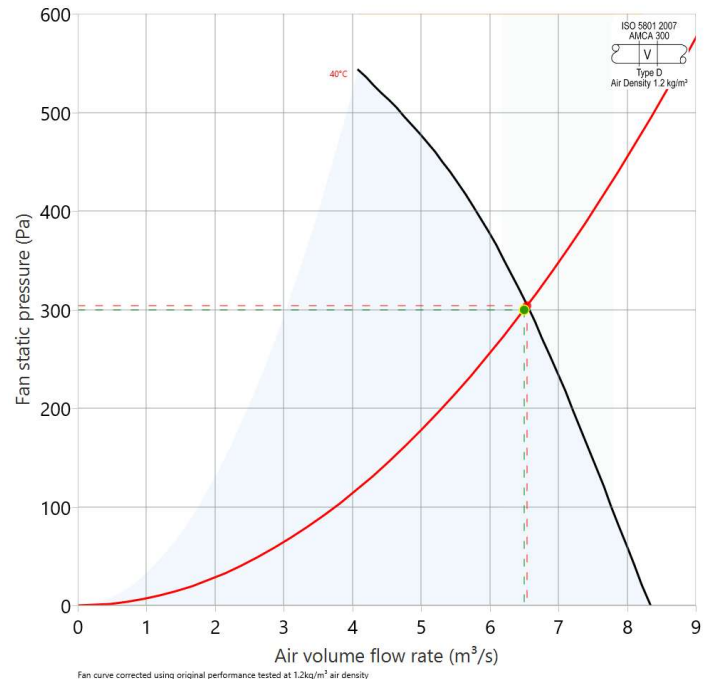
Hz	63	125	250	500	1k	2k	4k	8k	dBA
Induct Inlet	101	113	108	104	97	90	83	76	
Induct Outlet	105	115	109	105	98	90	83	77	
Open Inlet	95	111	107	103	97	90	83	76	
Open Outlet	98	112	108	104	98	90	83	77	
Breakout	81	92	94	80	70	72	65	52	65

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.

Performance Chart



Additional Notes

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: 61
Overall efficiency: 59.3 %
Measurement category: D
Efficiency category: Total
Variable speed drive: None
Input power at best point: 6.124 kW
Volume flow at best point: 7.40 m³/s
Pressure at best point: 491 Pa
Speed: 1,465 RPM
Specific ratio: 1.004859

Selected Ancillaries

1 x CMF90 Matching flange
1 x CMB90 Mounting bracket (pair)
1 x CFCH90 Hi-temp flexible connector
1 x NAV49 Anti-vibration mounting kit

CMF90 - Matching flange

Weight: 3.3 kg

CMB90 - Mounting bracket (pair)

Weight: 10.0 kg

CFCH90 - Hi-temp flexible connector

Weight: 2.0 kg

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 14 Sep 2022 15:38 using software version 5.7.4408.0

Specification

900mm diameter two-stage run & standby long cased circular axial flow fan manufactured from pre-galvanised mild steel. The case is fitted with integral vanes. Fan incorporates inlet and outlet flanges with pre-drilled bolt holes and an external 300/2hr terminal box. Impeller manufactured from aluminium mounted in a aluminium hub as standard. The motor is 400V three phase, single speed, totally enclosed air over, protected to IP55, foot mounted, class H insulated, with drain holes. Motor efficiency is IE3. Motor efficiency stated is based on the IEC rated output for the motor. Day to day operation up to ambient temperature of 60°C and once off at 300°C for 2 hours. D.O.L starting is recommended.

NOTE: This unit cannot be inverter speed controlled.

NOTE: Unit diameters 630mm and greater are delivered in two.

CMF90

The matching flanges are manufactured from galvanised steel and are supplied individually.

CMB90

The mounting brackets are manufactured from heavy gauge galvanised steel and supplied in pairs.

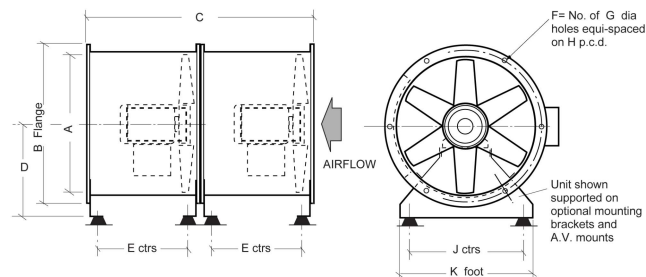
CFCH90

Circular flexible connector without flanges. Flexible duct material is flameproof and resistance to heat up to 400°C, chemicals, ozone, oil and grease. The material is airtight, waterproof and tested to BS476 Part 7. Supplied complete with fixing straps.

NAV49

Spring type anti-vibration mountings, supplied as a set of 4.

Fan Dimensions



A	B	C	D	E	F	G	H	J
900	1005	1480	600	660	16	15	970	610

K kg

750 317.36

Length: Width: Height:

740 1005 1005

Drawing is for dimensional purposes only. Dimensions in mm.

Please see selected ancillaries section for additional dimensions for any requested additional ancillaries.



ECO DESIGN TRANSFORMERS

TIER 2

Technical Specification for Three Phase Mineral Oil or Midel Fluid Filled

Rated power	1000kVA
Rated frequency	50Hz
Phases	3
Rated primary voltage	11.kV
Rated primary insulation level	12.kV
Power Frequency Test Voltage (r.m.s.)	28kV
Basic Impulse Level (BIL) (peak)	75kV
Off-circuit tapplings by switch (6 position)	±2½% & ±5% + 7.5%
Secondary voltage at no-load between phases	433V
Secondary voltage at no-load phase to neutral	250V
Rated secondary insulation level	1.1kV
Power Frequency Test Voltage (r.m.s.)	3kV
Vector group	Dyn11
No load loss (Maximum Loss - no positive tolerance)	693w
Load losses at 75°C (Maximum Loss - no positive tolerance)	7600w
Rated impedance at 75°C (subject to BS EN 60076 Tolerances)	4.75%
Sound Power Level	47dB(A)
Approximate Sound pressure Level at 0.3m	59dB(A)
Maximum Ambient Temperature for Operation	40°C
Daily Average Ambient Temperature for Operation	30°C
Yearly Average Ambient Temperature for Operation	20°C
Maximum Height of Operation	1000m
Class of insulation of HV and LV winding	A
Oil Temperature Rise (Free Breathing Non Conservator Type)	60°C
Winding temperature rise	65°C
Efficiency at Unity Power Factor (ref temp 75°C)	
125% Load	99.00%
100% Load	99.18%
75% Load	99.34%
50% Load	99.48%
25% Load	99.53%
Efficiency at 0.8 Power Factor (ref temp 75°C)	
125% Load	98.76%
100% Load	98.97%
75% Load	99.18%
50% Load	99.36%
25% Load	99.42%
Regulation at full load and Unity Power Factor (ref temp 75°C)	0.87%
Regulation at full load and 0.8 Power Factor (ref temp 75°C)	3.48%
No Load Current (% of HV Current)	TBA
Peak Value of Inrush Current	TBA
Ratio of Inrush to Rated Current	TBA
Half Value Time (seconds)	TBA
Time to return to Normal Rated Current (seconds)	TBA
Rated Percentage Impedance at 75°C (subject to BS EN 60076 Tolerances)	4.75%
Percentage Resistance at 75°C	0.7600%
Resistance in Ohms referred to LV at 75°C	0.001424916
Percentage Reactance at 75°C	4.69%
Reactance in Ohms referred to LV at 75°C	0.008790995