

Assessment of kitchen plant noise

Balance
42-43 Lower Marsh
South Bank
London
SE1 7RG



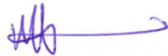

On Behalf of Rolfe Judd
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Project Ref: 7480 | Rev: 2 | Date: 18th March 2021

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Document Control Sheet

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Date: 12th March 2021
Project Ref: 7480
Report Title: Assessment of kitchen plant noise

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Revision	Date	Description
1	15-3-21	Silencer performance updated as per NIOCO silencer schedule Ref 21010254A dated 12 th February 2021
	18-3-21	IL's in Table at 2.2 up dated

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1 Executive Summary

Planning permission is being sort from Lambeth Council for the installation on kitchen ventilation equipment at Balance, 42-43 Lower Marsh, South Bank, London SE1 7RG (planning reference 20/04125/DET) and an *noise assessment* is required by the local authority to accompany this application.

This report provides the details of the kitchen supply and extract fans, their proposed location on the rear 2nd floor roof and the resultant sound levels at the nearest neighbours.

Lambeth Council routinely require that noise from these fans *“as measured in accordance with BS4142:2014, shall not exceed 5dB less than the background noise level $L_{90B(A)}$ 15 minutes, when measured outside the window of the nearest noise sensitive or residential premises.”*

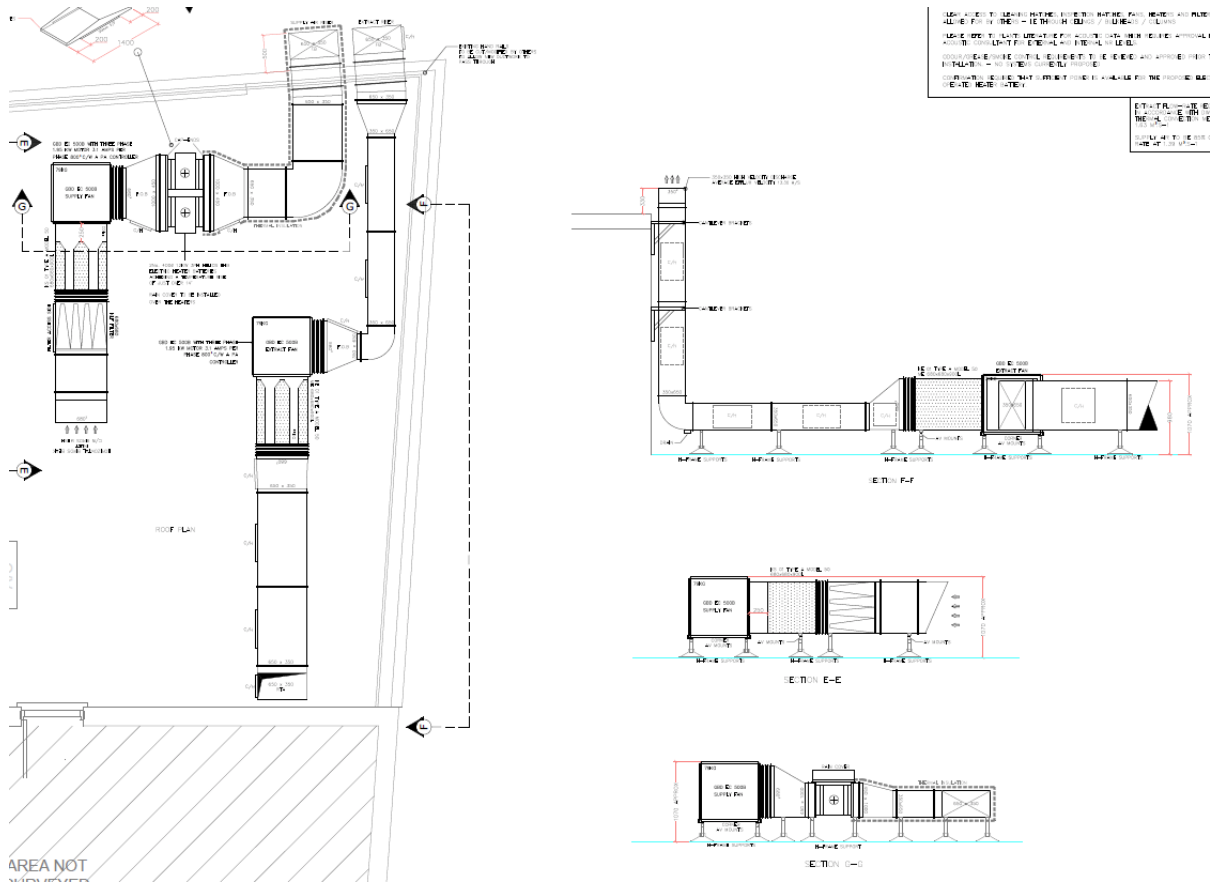
This report shows that with the proposed fans both fitted with atmospheric silencers the rated level of noise, at the nearest residential neighbour’s window will meet and better Lambeth Council’s noise criteria.

Lambeth Council’s requirements, relating to noise, can therefore be seen to be delivered.

2 Proposed kitchen ventilation equipment

2.1 Location

The proposed kitchen supply and extract fans will be mounted on the 2nd floor roof and the layout is shown on MFD Ductwork Installation Ltd’s drawing No. BWL-3 A, a copy is included at the rear of this report and an extract shown below;



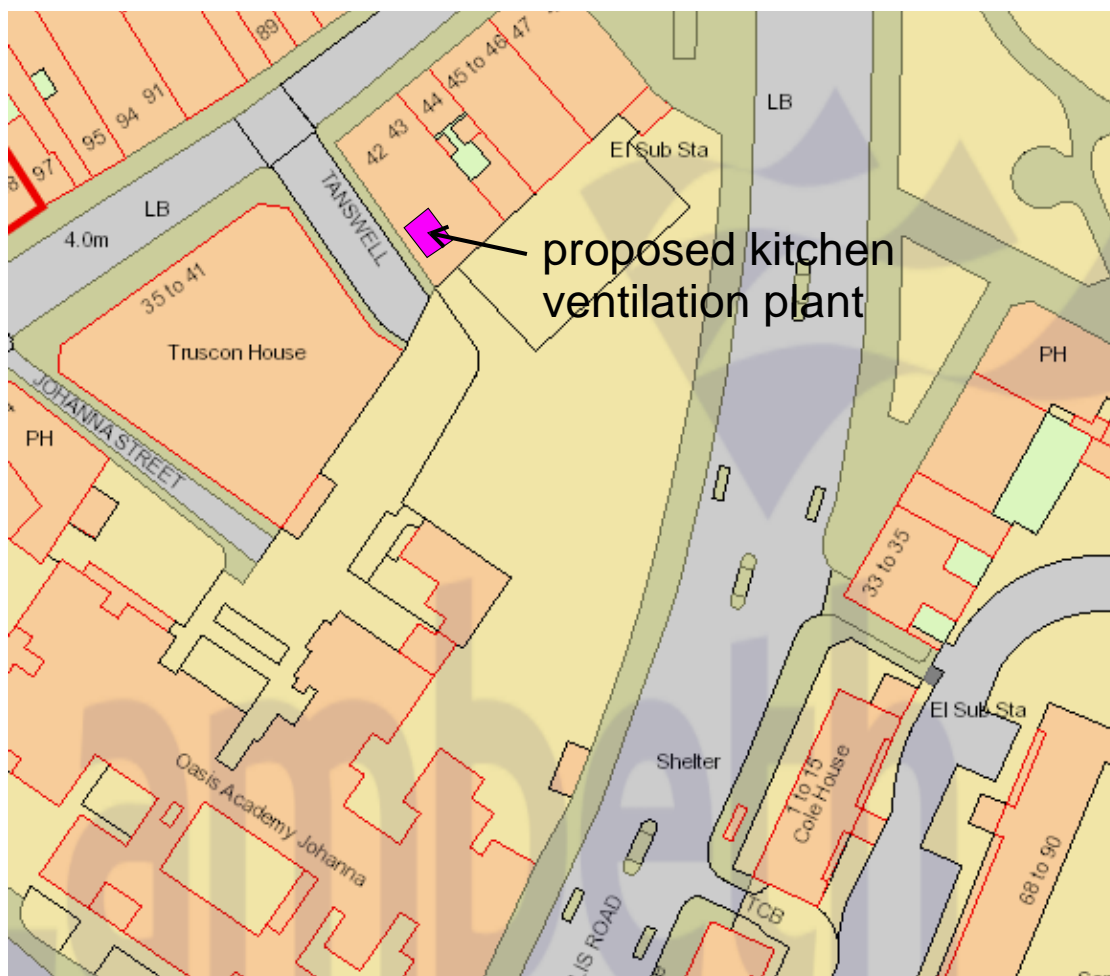
2.2 Fans

The fans will have the following manufacturer’s noise ratings;

- Kitchen extract fan Giga Box GBD EC 500 B rated at 77 dB L_{WA} & 41 dBA at 3m (casing break-out),
- Kitchen supply fan Giga Box GBDEC 500 B rated at 776dB L_{WA} & 40 dBA at 4m (casing break-out),
- Full data shown in Appendix 1
- Both fans will be fitted with 900mm long atmospheric side silencers offering the following dynamic attenuation losses as per Nioco’s silencer schedule (copy included at rear of this report);

Noise Control Item	octave band centre frequency Hz					
	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz
kit ext' 0.9m long	6	10	14	23	15	9
Kit supply 0.9m long	4	7	12	21	13	9

The map below shows the location of these fans and the nearest overlooking residential windows on the 2nd floor at 44 Lower Marsh, the view of the plant from the windows at the back of No. 44 will be screened by the corner of the upper floors of 42-43 Lower Marsh;

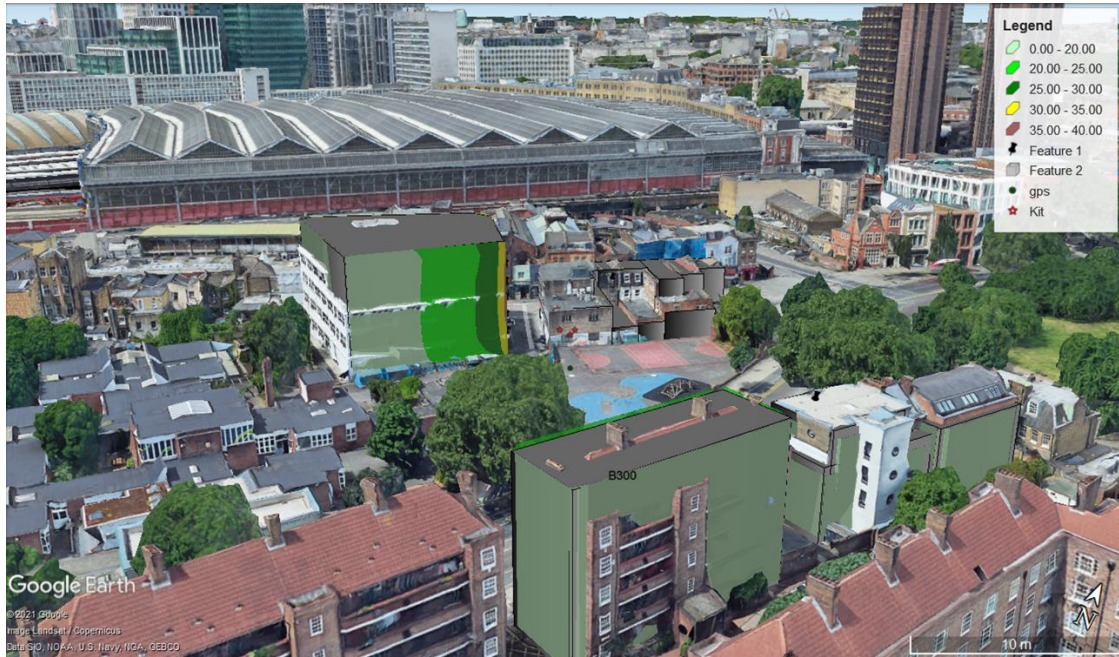


Truscon House on the opposite side of Tanswell is an office building and there are also flats on the opposite side of Baylis Road, to the east some 65m plus away from the proposed ventilation plant.

2.3 Fan noise levels at nearest sensitive windows

Fan noise levels have been predicted using iNoise 3-D noise modelling software, implementing the calculation procedures set out in ISO 9613-2:1996 (Acoustics - Attenuation of sound during propagation outdoors - Part 2: General method of calculation) including ISO/TR 17534-3:2015 (Acoustics - Software for the calculation of sound outdoors).

The image below shows predicted fan noise levels on the facades of the adjacent buildings;



The plan view below shows fan noise levels at a height of 4m;



The table below details the predicted new ventilation fan noise levels at 1m from the neighbours' facades;

Location	Height m	Fan Noise dB LAeq
31 Baylis Rd	1.5	25
32 Baylis Rd	1.5	25
33 Baylis Rd	7.5	26
34 Baylis Rd	7.5	26
35 Baylis Rd	10.5	27
Coles House 1st to 5th	1.5	24
Coles House 1st to 5th	4.5	25
Coles House 1st to 5th	7.5	25
Coles House 1st to 5th	10.5	26
Coles House 1st to 5th	13.5	26
44 Lower Marsh	8	35
Truscon House 1st to 5th	13.5	41
Truscon House 1st to 5th	10.5	41
Truscon House 1st to 5th	7.5	41
Truscon House 1st to 5th	4.5	39
Truscon House 1st to 5th	1.5	37

This shows the highest noise levels will be outside the office building across Tanswell, at 40 dB LAeq and the residential window level will be 35 dB LAeq outside the rear 2nd floor flat windows at 44 Lower Marsh.

3 Background sound levels

Acoustic Associates SW Ltd were instructed to provide this noise assessment in February 2021, during the 3rd National Covid-19 Lock-down with London at its quietest.

On-site measurement is likely to reveal unrepresentative low background levels, particularly across the evenings.

An acoustic survey was carried out for the planning application¹ for the new hotel on the other side of Lower Marsh and the application included an Acoustic Survey², undertaken in June 2018. This shows the background sound levels, at the rear, ranging from 60 dB LA90 during the day dropping to 52 dB LA90 in the small hours of the night.

The proposed operational hours for Balance's new plant is 7am to 11pm.

Assuming a background sound level of 52 dB LA90 in the hour from 10 to 11pm outside the rear windows of Balance's closest residential neighbour, at 44 Lower Marsh, will therefore be robust.

¹<https://planning.lambeth.gov.uk/online-applications/applicationDetails.do?activeTab=documents&keyVal=PLSQ0UBOHSK00>

²https://planning.lambeth.gov.uk/online-applications/files/B1B4E71B856F12C76ED9FFA99E8F30CF/pdf/19_00244_DET-_REDACTED__NOISE_SURVEY-2233792.pdf

4 BS4142:2014 & conclusion

Lambeth Council's noise criteria is that as measured in accordance with BS4142:2014³, shall not exceed 5dB less than the background noise level $L_{90B(A) 15 \text{ minutes}}$, when measured outside the window of the nearest noise sensitive or residential premises."

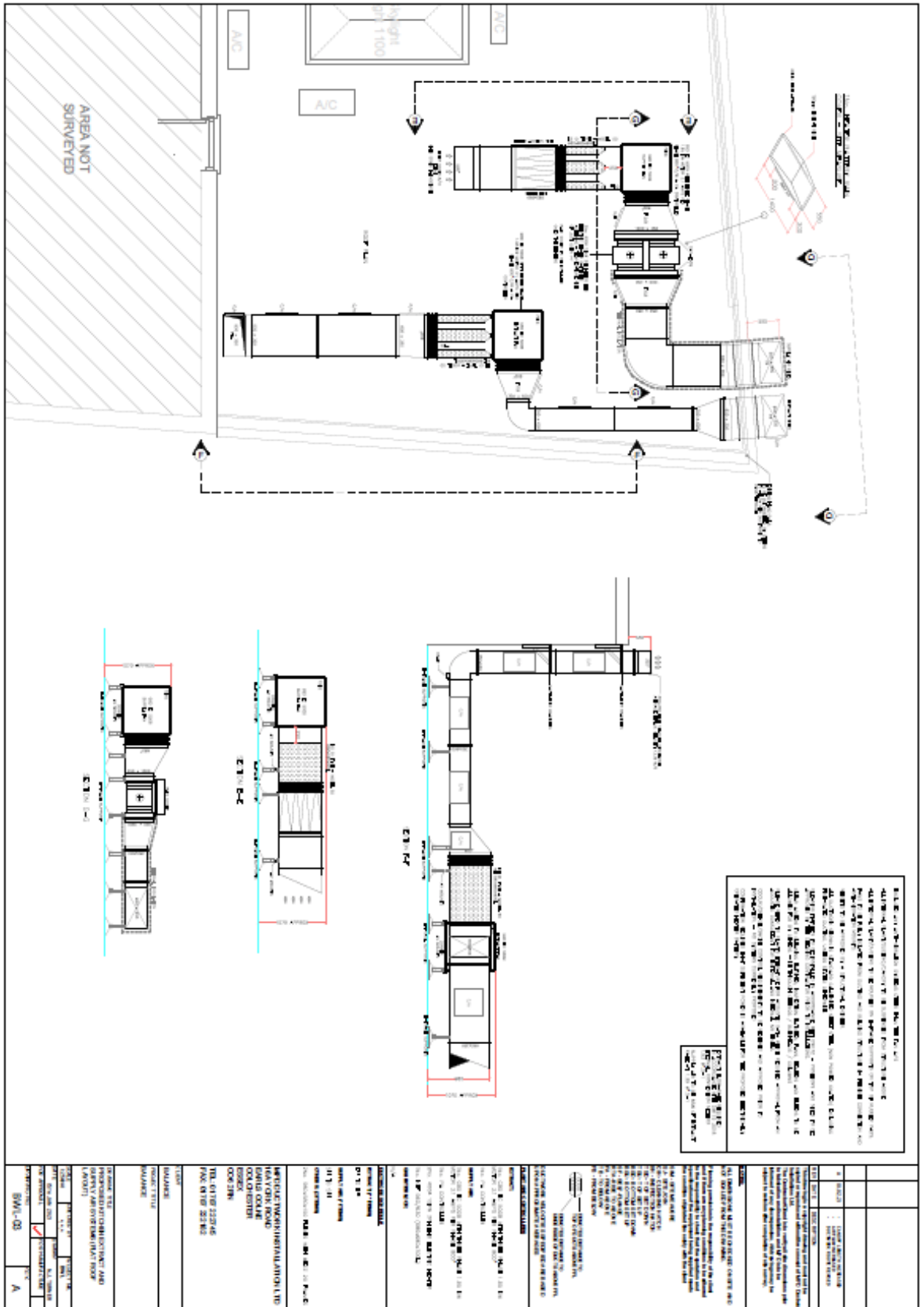
BS4142 requires that the plant noise (L_{Aeq}) is given penalties if it contains tonality, impulsivity, intermittency or has other noticeable characteristics to give *rated level* ($L_{A,r}$). It is this *rated level* that must be at least 5 dB below background sound level, giving a new plant noise criterion of $52 - 5 = 47$ dB $L_{A,r}$.

The proposed fans will run continuously without any tonality or impulsivity and will create no more than 35 dB L_{Aeq} at the nearest residential window, some 17 dB below the late evening background sound level. On this basis no character penalties are required to be added to the L_{Aeq} level to give the *rated level*, namely 34 dB $L_{A,r}$.

The *rated level* of noise from the proposed new plant will meet and significantly better Lambeth Council's noise requirements.

³ BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound

Appendix 1 – MFD Ductwork Installation Ltd's dr'g No. BWL-3 A



Kitchen extract fan



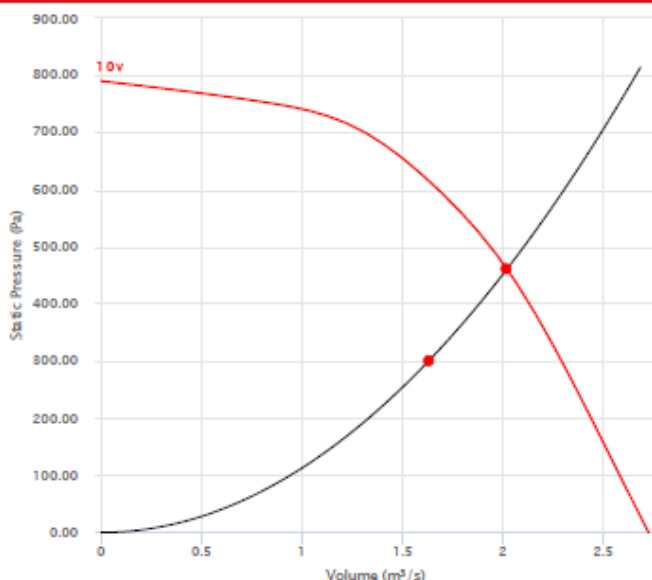
Project Name:
Client: Engineer:
Quote Number: Date: 11/02/2021
Item Reference: Item Quantity: 1

GBD EC 500 B (CENT) GigaBox centrifugal box fan EC technology



Acoustic ventilation box with intake and extract spigots, with flexible connectors to reduce vibration transmission and variable applicable side panels to suit to structural conditions. Simple positioning by standard crane hooks. Self-supporting frame construction made from hollow aluminium profiles. Lined with 20 mm thick double-walled side panels made from galvanised sheet steel, sound and thermally insulated with flame-retardant mineral wool. Free-running backward curved centrifugal impeller from aluminium, direct driven. Energy efficient with low noise development. Dynamically balanced with the motor to DIN ISO 1940 PL1 - class 6.3 Energy-saving, speed controllable EC-external rotor motor with highest efficiency, protection to IP 54. With ball bearings, maintenance-free and interference-free. Integrated electronic temperature monitoring for EC motor and electronics. Stepless speed control with potentiometer or stepless speed control with universal control system EUR-EC. Electrical connection via standard terminal box (IP 54), which is mounted with a permanently attached cable.

Performance Chart



Product

Ref.No.	5813
Model Code	GBD EC 500 B (CENT)
Fan Size	500 mm
Maximum airflow temp.	50 °C
Weight	79.0 kg

Performance

Requested Duty	1.63 m³/s @ 300 Pa (Static)
Actual Duty	2.02 m³/s @ 461 Pa (Static)
Fan Nominal Speed	1500 rpm
Specific Fan Power	0.66 W/l/s
Output Power	1.95 kW

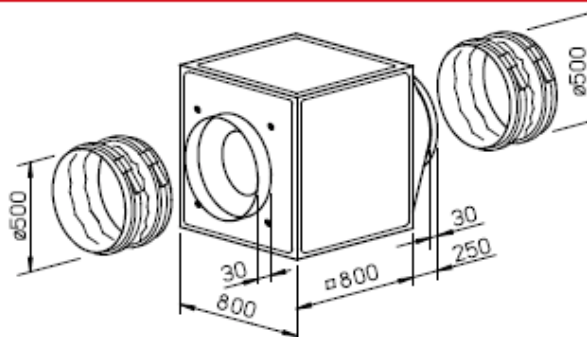
Motor

Rating	1.95 kW
Motor Input Power	1.84 kWh
Electrical Supply	400v/3Ph/50Hz
Full Load Current	3.1 A

Sound

Sound Pressure Level	41 dB(A) at 3m								
Spectrum	Hz	Total	125	250	500	1k	2k	4k	8k
LwA Intake	dB(A)	74	53	65	67	69	68	63	56
LwA Extract	dB(A)	77	57	68	71	72	70	66	59
LwA Breakout	dB(A)	62	51	60	53	52	48	45	38

Dimension and Drawing



*This drawing shows dimensions that should be used as a guide only and are subject to change. Certified drawings are available on request.

Kitchen

Kitchen Supply fan



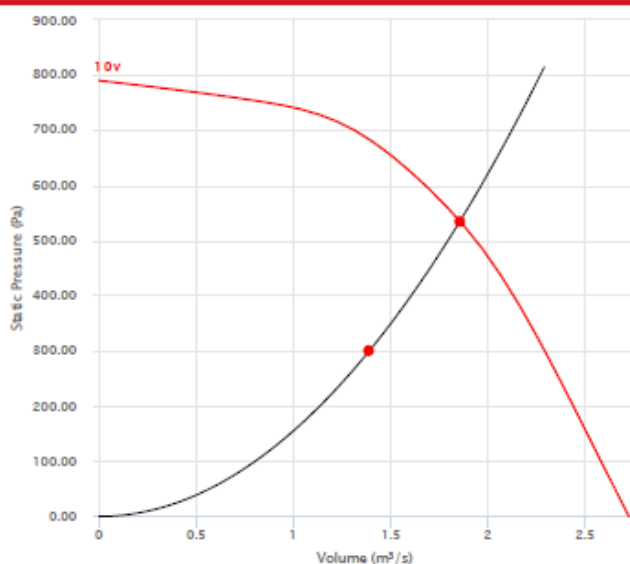
Project Name:
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Acoustic ventilation box with intake and extract spigots, with flexible connectors to reduce vibration transmission and variable applicable side panels to suit to structural conditions. Simple positioning by standard crane hooks. self-supporting frame construction made from hollow aluminium profiles. Lined with 20 mm thick double-walled side panels made from galvanised sheet steel, sound and thermally insulated with flame-retardant mineral wool. Free-running backward curved centrifugal impeller from aluminium, direct driven. Energy efficient with low noise development. Dynamically balanced with the motor to DIN ISO 1940 Pt.1 - class 6.3 Energy-saving, speed controllable EC-external rotor motor with highest efficiency, protection to IP 54. With ball bearings, maintenance-free and interference-free. Integrated electronic temperature monitoring for EC motor and electronics. Stepless speed control with potentiometer or stepless speed control with universal control system EUR-EC. Electrical connection via standard terminal box (IP 54), which is mounted with a permanently attached cable.

Performance Chart



Product

Ref.No.	5813
Model Code	GBD EC 500 B (CENT)
Fan Size	500 mm
Maximum airflow temp.	50 °C
Weight	79.0 kg

Performance

Requested Duty	1.39 m³/s @ 300 Pa (Static)
Actual Duty	1.86 m³/s @ 535 Pa (Static)
Fan Nominal Speed	1500 rpm
Specific Fan Power	0.66 W/l/s
Output Power	1.95 kW

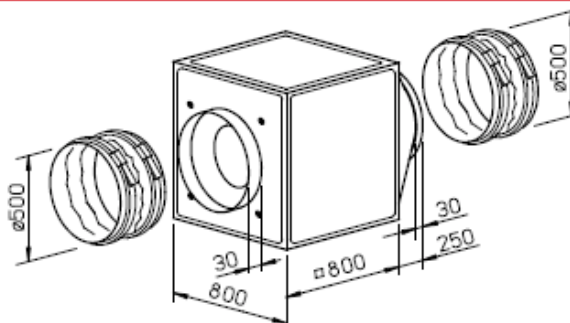
Motor

Rating	1.95 kW
Motor Input Power	1.90 kWh
Electrical Supply	400w/3Ph/50Hz
Full Load Current	3.1 A

Sound

Sound Pressure Level	40 dB(A) at 3m								
Spectrum	Hz	Total	125	250	500	1k	2k	4k	8k
LwA Intake	dB(A)	73	52	64	66	68	67	62	55
LwA Extract	dB(A)	76	56	67	70	71	69	65	58
LwA Breakout	dB(A)	61	50	59	52	51	47	44	37

Dimension and Drawing



*This drawing shows dimensions that should be used as a guide only and are subject to change. Certified drawings are available on request.

NOICO silencer insertion losses

Tel: 01256 766207 Email: sales@noico.co.uk Page 1 of 1																			
INSERTION LOSS SCHEDULE Project Balance																			
Date: 12 February 2021 Ref: 2101025-4A																			
Item	Location	Type	Model	Dimensions mm			Wt Kg	Noise Criteria	Vol. m ³ /s	PD Pa	Qty	Insertion Loss (Hz)							
				W	H	L1						63	125	250	500	1K	2K	4K	8K
1	Extract KE01 OUTLET	A	50/900 ME	680	680	900	41		1.63	8	1	3	6	9.5	14	23	15	9	6.3
2	Supply KS01 INTLET 250MM PLENUM - 650 ACTIVE SPLITTER	A	50/900	680	680	900	30		1.39	6	1	2	4	7	12	21	13	9	7

Type A: Rectangular attenuator. Flanged.
 Type B: Rectangular attenuator. Spigot ends.
 Type C: Vertical Band attenuator.
 Type D: Horizontal Bend attenuator.
 Type E: Cylindrical attenuator with stepped inserts.
 Type F: Cylindrical attenuator with spigot connections.
 Type G: Louvre.
 Type H: Horizontal splitters.
 Type I: Stepped spigots.
 Type J: Plenum section.

CODES:
 ME: Melinex wrapped intll.
 CRP: Chlorinated rubber paint (internal surfaces only)