PDP | LDN

Prepared on behalf of

Kier Group PLC

2204_247TottenhamCourtRd

PLANNING CONDITION 9

TCR-PDP-ZZ-ZZ-RP-A-03-702 | 21.07.2023

Planning Condition 9

Executive Summary

This report has been prepared in support of an application attached to Planning Permission 2023/1155/P listed below:

- Planning condition 9

The wording of Condition 9 of the Planning Permission is as set out below.

“9 Noise standards

Prior to commencement of installation of any plant equipment, full details (including plans, elevations, manufacturer specifications and sections) of the proposed plant equipment and enclosure shall be submitted to and approved in writing by the Local Planning Authority. The details shall include the external noise level emitted from plant/ machinery/ equipment and mitigation measures as appropriate. The measures shall ensure that the external noise level emitted from plant, machinery/ equipment will be lower than the typical background noise level by at least 10dBA, by 15dBA where the source is tonal, as assessed according to BS4142:2014 at the nearest and/or most affected noise sensitive premises, with all machinery operating together at maximum capacity. Approved details shall be implemented prior to occupation of the development and thereafter be permanently retained.

Reason: To safeguard the amenities of neighbouring noise sensitive receptors in accordance with the requirements of policies A1 and A4 of the London Borough of Camden Local Plan 2017.”

As recommended by the Condition 9, an Acoustic Report, prepared by Clarke Saunders and detailed plans have been prepared to support the discharge of this condition. This assessment has shown that noise emissions under normal operation are expected to comply with the requirements of the condition during both daytime and night-time scenarios.

This report sets out a selection of relevant technical information.

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PREPARED: Thursday, 20 July 2023

THE FITZROVIA, 247 TOTTENHAM COURT ROAD; CONDITION 9 ACOUSTIC REPORT

clarke saunders

CONTENTS

LIST OF ATTACHMENTS

Project Ref:	AS12439	**Title:**	THE FITZROVIA, 247 TOTTENHAM COURT ROAD
Report Ref:	12439.230712.R1.1	**Title:**	CONDITION 9 ACOUSTIC REPORT
Client Name:	Kier Construction		
Project Manager:	Matt Sugden		
Report Author:	Matt Sugden		
Clarke Saunders Acoustics Winchester SO22 5BE	This report has been prepared in response to the instructions of our client. It is not intended for and should not be relied upon by any other party or for any other purpose.		

1.0 EXECUTIVE SUMMARY

1.1 The Fitzrovia development at 247 Tottenham Court Road, London involves mechanical services plant to be located externally on the roof to provide the necessary ventilation, heating and cooling of the building interiors.

1.2 An assessment has been undertaken of predicted noise emissions from the specified plant that would be expected to operate under normal conditions, as required under Condition 9 of the Camden planning consent ref. 2023/1155/P.

1.3 This assessment has shown that noise emissions are expected to comply with the requirements of the condition during both daytime and night-time scenarios.

1.4 Although outside the scope of the condition, noise emissions from emergency plant has also been assessed and mitigation specified to ensure control to reasonable levels.

2.0 INTRODUCTION

2.1 The Fitzrovia development at 247 Tottenham Court Road, London is subject to a number of planning conditions as set by Camden Council.

2.2 Condition 9 is concerned with the effect of noise emissions from building services plant on nearby receptors. The condition is as follows;

> *Prior to commencement of installation of any plant equipment, full details (including plans, elevations, manufacturer specifications and sections) of the proposed plant equipment and enclosure shall be submitted to and approved in writing by the Local Planning Authority. The details shall include the external noise level emitted from plant/ machinery/ equipment and mitigation measures as appropriate. The measures shall ensure that the external noise level emitted from plant, machinery/ equipment will be lower than the typical background noise level by at least 10dBA, by 15dBA where the source is tonal, as assessed according to BS4142:2014 at the nearest and/or most affected noise sensitive premises, with all machinery operating together at maximum capacity. Approved details shall be implemented prior to occupation of the development and thereafter be permanently retained.*
>
> *Reason: To safeguard the amenities of neighbouring noise sensitive receptors in accordance with the requirements of policies A1 and A4 of the London Borough of Camden Local Plan 2017.*

2.3 This report describes the approach taken to control noise from installed plant and details the desktop assessment undertaken to validate the plant acoustic design and subsequent noise control specifications.

2.4 Please refer to Appendix A for clarification of acoustic terminology used in this report.

Clarke Saunders AS12439.230712.R1.1 | 20/07/23

3.0 OVERVIEW OF BUILDING SERVICES STRATEGY

3.1 The building comprises three below-ground and six above-ground storeys of commercial, office and residential uses. Building services plant is distributed within the building generally as described below.

3.2 ROOF

3.2.1 Office ventilation air handling units (AHU-01 / 02), WC extract fans (EX-01 / 02), and air conditioning condensers are distributed across the western side of the roof. The eastern side of the roof, i.e. toward Morwell Street, provides terraces for use by building occupants.

3.2.2 Emergency plant comprising a generator and smoke fans are also on the roof. These will not run under normal conditions, save for scheduled routine testing.

3.2.3 Plant is generally arranged around and between the north and south cores of the commercial building.

3.3 GROUND FLOOR

3.3.1 Heat recovery units (HRU-01 / 02) serving the coffee shop and landlord areas will vent via louvres at high level in the Morwell Street and Bayley Street facades.

3.3.2 An air handling unit (AHU-03) serving basement and ground floor areas will vent via louvres at high level in the Morwell Street facade.

3.3.3 Smaller fans (EX-03 to 06) will extract air from back of house spaces and plantrooms at ground and basement level, exhausting via louvres at high level in the Morwell Street façade.

3.4 RESIDENTIAL APARTMENTS

3.4.1 Apartments are to be ventilated by means of individual mechanical ventilation / heat recovery units (MVHR). These will vent locally via louvres in the Morwell Street and Tottenham Court Road facades.

4.0 NEAREST AFFECTED RECEPTORS

4.1 Sensitive receptors have been identified facing the site on Morwell Street. The majority of premises on Morwell Street are commercial, although some three storey terraced dwellings are evident at its northern end.

4.2 Apartments are located at greeter distance above commercial units on Bayley Street and opposite the site on Tottenham Court Road.

5.0 PLANT NOISE LIMITS (CONDITION 9)

5.1 A review of previous environmental noise monitoring undertaken in the vicinity of the site was compiled by others in 2020[1]. Further monitoring has since been undertaken by Clarke Saunders Associates (CSA) at the site in order to investigate the post-Covid noise climate.It was found that the background noise climate had not changed to a significant extent.

5.2 The key findings of background noise level measurements, $L_{A90,T}$, during daytime and night-time periods are summarised below.

RECEPTOR	MORWELL / BAYLEY STREET	TOTTENHAM COURT ROAD
Typical lowest $L_{A90,T}$ Daytime 07:00h – 23:00h	48dB	51dB
Typical lowest $L_{A90,T}$ Night-time 23:00h – 07:00h	46dB	46dB

* T = 5min

5.3 Noise emissions limits determined from these levels in accordance with Condition 9 are set out below.

RECEPTOR	MORWELL / BAYLEY STREET	TOTTENHAM COURT ROAD
Non-tonal / Tonal $L_{Aeq,1h}$ Daytime 07:00h – 23:00h	38 / 33 dB	41 / 36dB
Non-tonal / Tonal $L_{Aeq,15min}$ Night-time 23:00h – 07:00h	36 / 31dB	36 / 31dB

6.0 BASIS OF ASSESSMENT

6.1 The assessment has been based upon manufacturer's plant noise data as provided to Kier by the mechanical services subcontractors. These are summarised in Appendix B.

6.2 Calculations have been undertaken using the manufacturer's stated sound power or sound pressure levels.

6.3 Allowance has been made for acoustic shielding provided by screens located around the plant.

6.4 Ducted connections to fans, air handling units, HRU and MVHR equipment are to be fitted with attenuators, as shown in Appendix B.

6.5 Specialist modelling software CadnaA has been used to determine overall noise emissions from key rooftop plant. The software uses algorithms based on formulae given in ISO 9613-2:1996 *Acoustics - Attenuation of sound during propagation outdoors -- Part 2: General method of calculation*. The calculation method assumes that receptors are subject to downwind acoustic propagation at a wind speed of 1.5m/s.

6.6 For the daytime case (07:00h to 23:00h), the model is based on all plant operating at full duty.

[1] AECOM Noise Assessment, dated July 2020

7.0 COMPUTER MODEL OUTPUT – ROOFTOP PLANT

7.1 Figure AS12439/NM9.1 shows plant noise emissions as façade-incident levels calculated for daytime operation, i.e. all plant at full duty.

7.2 Values shown in octagons represent the highest predicted level at the façade. Values shown alongside the crosshairs represent noise levels on the roof terrace.

7.3 Noise emissions are not expected to be audibly tonal when perceived at receptor locations.

7.4 The figures show that the noise emissions criteria set by Condition 9 are expected to be achieved at receptors on Morwell Street and at the facades of apartments within the development during daytime periods.

7.5 Plant operation will reduce at night, with many items switching off entirely or running in a 'setback' condition. Noise emissions would be expected to decrease by at least 3dB, i.e. to 26dB to 27dB L_{Aeq} at residential facades. Night-time noise emissions criteria would also be satisfied.

8.0 MVHR & ANCILLIARY VENTILATION PLANT

8.1 Atmospheric noise emissions from plant venting via the facades will be controlled by in-duct attenuators as shown in Appendix B.

8.2 MVHR attenuator selections are determined on the basis of limiting noise levels so as to not exceed 40dB(A) at 2m. Noise levels at the nearest sensitive receptors would not be expected to exceed 30dB(A) as a result. Compliance with Condition 9 would, therefore, be expected during daytime and night-time periods.

8.3 Attenuator selections for ancillary fans and HRU are determined on the basis of limiting noise levels so as to not exceed 33dB(A) at the nearest sensitive receptors. Although these plant items would be expected to operate during daytime periods only, this level of protection would be sufficient to satisfy Condition 9 should they also operate at night.

9.0 EMERGENCY PLANT

9.1 An emergency generator and 3no. smoke fans are located at roof level to serve the offices and residential areas. A fourth smoke fan will be located at basement level in parallel with AHU03. These will operate during emergency situations and during scheduled testing.

9.2 The acoustic specification applied to the generator enclosure and attenuators fitted to the fans will ensure that noise emissions from during operation will be controlled to limit increases in background noise at nearby receptors to 10dB or less.

10.0 CONCLUSION

10.1 This report has been prepared in response to Condition 9 of Camden's planning consent for the Fitzrovia development at 247 Tottenham Court Road, London.

10.2 Extensive and rigorous calculation of noise emissions from building services has enabled development of acoustic performance specifications for plant items and sound attenuators on the basis of limits set by Camden.

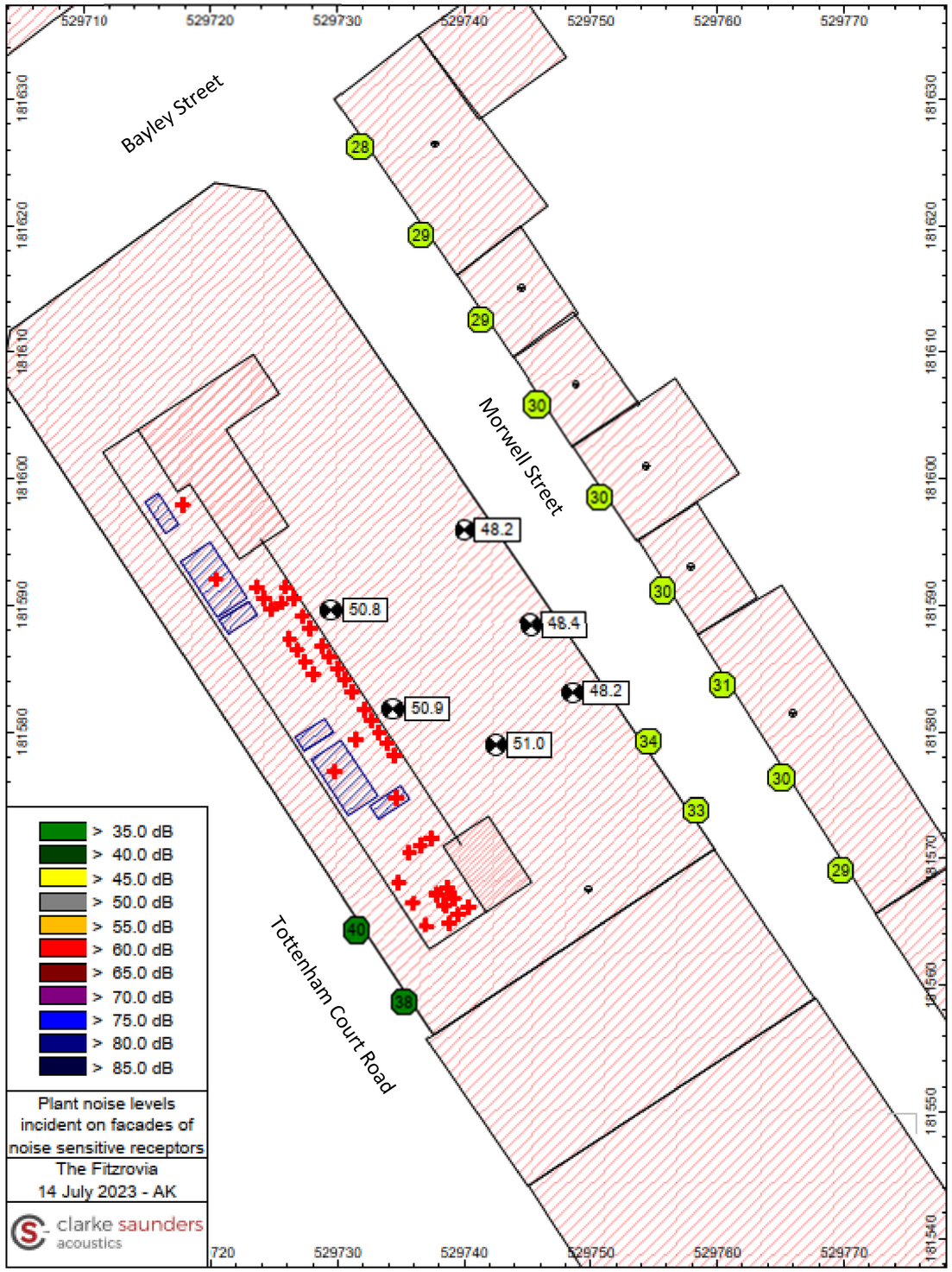
10.3 A computer model has been created to allow assessment of overall noise emissions at each of the identified receptor locations.

10.4 The model shows that the limits set under Condition 9 are expected to be met under daytime and night-time operational scenarios.

Matt Sugden

Matt Sugden MIOA
CLARKE SAUNDERS ASSOCIATES

Rooftop Plant Noise Emissions, dB L_{Aeq}



Acoustic Terminology

The human impact of sounds is dependent upon many complex interrelated factors such as 'loudness', its frequency (or pitch) and variation in level. In order to have some objective measure of the annoyance, scales have been derived to allow for these subjective factors.

Sound Vibrations propagating through a medium (air, water, etc.) that are detectable by the auditory system.

Noise Sound that is unwanted by or disturbing to the perceiver.

Frequency The rate per second of vibration constituting a wave, measured in Hertz (Hz), where 1Hz = 1 vibration cycle per second. The human hearing can generally detect sound having frequencies in the range 20Hz to 20kHz. Frequency corresponds to the perception of 'pitch', with low frequencies producing low 'notes' and higher frequencies producing high 'notes'.

dB(A): Human hearing is more susceptible to mid-frequency sounds than those at high and low frequencies. To take account of this in measurements and predictions, the 'A' weighting scale is used so that the level of sound corresponds roughly to the level as it is typically discerned by humans. The measured or calculated 'A' weighted sound level is designated as dB(A) or L_A.

L_{eq}: A notional steady sound level which, over a stated period of time, would contain the same amount of acoustical energy as the actual, fluctuating sound measured over that period (e.g. 8 hour, 1 hour, etc).

The concept of L_{eq} (equivalent continuous sound level) has primarily been used in assessing noise from industry, although its use is becoming more widespread in defining many other types of sounds, such as from amplified music and environmental sources such as aircraft and construction.

Because L_{eq} is effectively a summation of a number of events, it does not in itself limit the magnitude of any individual event, and this is frequently used in conjunction with an absolute sound limit.

Octave Band Frequencies

In order to determine the way in which the energy of sound is distributed across the frequency range, the International Standards Organisation has agreed on "preferred" bands of frequency for sound measurement and analysis. The widest and most commonly used band for frequency measurement and analysis is the Octave Band. In these bands, the upper frequency limit is twice the lower frequency limit, with the band being described by its "centre frequency" which is the average (geometric mean) of the upper and lower limits, e.g. 250 Hz octave band extends from 176 Hz to 353 Hz. The most commonly used octave bands are:

Octave Band Centre Frequency Hz	63	125	250	500	1000	2000	4000	8000

APPENDIX A

ACOUSTIC TERMINOLOGY AND HUMAN RESPONSE TO BROADBAND SOUND

Human Perception of Broadband Noise

Because of the logarithmic nature of the decibel scale, it should be borne in mind that sound levels in dB(A) do not have a simple linear relationship. For example, 100dB(A) sound level is not twice as loud as 50dB(A). It has been found experimentally that changes in the average level of fluctuating sound, such as from traffic, need to be of the order of 3dB before becoming definitely perceptible to the human ear. Data from other experiments have indicated that a change in sound level of 10dB is perceived by the average listener as a doubling or halving of loudness. Using this information, a guide to the subjective interpretation of changes in environmental sound level can be given.

INTERPRETATION

Change in Sound Level dB	Subjective Impression	Human Response
0 to 2	Imperceptible change in loudness	Marginal
3 to 5	Perceptible change in loudness	Noticeable
6 to 10	Up to a doubling or halving of loudness	Significant
11 to 15	More than a doubling or halving of loudness	Substantial
16 to 20	Up to a quadrupling or quartering of loudness	Substantial
21 or more	More than a quadrupling or quartering of loudness	Very Substantial

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APPENDIX A: ACOUSTIC TERMINOLOGY AND HUMAN RESPONSE TO BROADBAND SOUND

AS12439
APPENDIX B
SCHEDULES

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AS12439 THE FITZROVIA

PLANT NOISE SCHEDULE

Ref:	AS12439/PNS1	Revision:	*0*	Date:	12 July 2023	Engineer	MS

Plant Reference/Location	Description	Octave Band Mid Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
MP Air-Handling AHU-01 North Core	In-duct Intake Lw	83	77	80	75	64	61	59	55
	In-duct Exhaust Lw	84	81	91	86	89	84	79	75
	Breakout Lw	63	60	56	42	42	38	31	27
MP Air-Handling AHU-02 South Core	In-duct Intake Lw	75	78	84	69	64	58	57	52
	In-duct Exhaust Lw	80	82	80	80	82	77	71	65
	Breakout Lw	59	63	57	44	43	40	31	29
MP Air-Handling AHU-03 Basement	In-duct Intake Lw	68	68	76	67	62	58	51	49
	In-duct Exhaust Lw	80	83	80	79	79	75	68	61
	Breakout Lw	56	64	48	36	36	30	21	14
Woods EC Twin Fan 350 EX-01 North Core	In-duct Exhaust LwA	67	71	73	69	63	62	62	48
	Breakout LwA	58	60	60	41	29	28	28	<20
Woods EC Twin Fan 350 EX-02 South Core	In-duct Exhaust LwA	70	74	77	73	68	67	67	55
	Breakout LwA	61	63	64	45	34	33	33	<20
Woods EC Twin Fan 200 EX-03 / EX-04	In-duct Exhaust LwA	49	52	52	53	53	52	46	40
	Breakout LwA	40	41	39	25	<20	<20	<20	<20
Woods EC Twin Fan 250 EX-05	In-duct Exhaust LwA	62	66	64	64	64	62	60	52
	Breakout LwA	53	55	51	36	30	28	26	<20
Woods EC Twin Fan 200 EX-06	In-duct Exhaust LwA	52	55	56	57	57	56	50	46
	Breakout LwA	43	44	43	29	213	22	<20	<20
Vent Axia Lo-Carbon Sentinel Plus B MVHR Apt Type 1	In-duct Intake Lw	55	62	52	45	32	24	20	25
	In-duct Exhaust Lw	62	65	58	56	46	37	25	25

Notes:

Lw – sound power level, dB re. 12pW
LwA – A-weighted sound power level
Lp – sound pressure re. 20 µPa

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AS12439 THE FITZROVIA

PLANT NOISE SCHEDULE

Ref:	AS12439/PNS1	Revision:	*0*	Date:	12 July 2023	Engineer	MS

Plant Reference/Location	Description	Octave Band Mid Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
Vent Axia Lo-Carbon Kinetic Plus E MVHR Apt Type 2	In-duct Intake Lw	65	59	65	45	50	40	29	26
	In-duct Exhaust Lw	71	70	74	62	57	51	41	36
Vent Axia Lo-Carbon Sentinel Plus B MVHR Apt Type 3	In-duct Intake Lw	63	62	60	51	39	32	23	25
	In-duct Exhaust Lw	68	68	73	62	53	48	34	28
Vent Axia Lo-Carbon Kinetic Plus E MVHR Apt Type 4	In-duct Intake Lw	64	59	65	56	49	39	28	26
	In-duct Exhaust Lw	71	70	73	62	56	50	42	35
Vent Axia Lo-Carbon Kinetic Plus E MVHR Apt Type 5	In-duct Intake Lw	64	59	64	56	49	39	28	26
	In-duct Exhaust Lw	70	70	73	62	56	50	41	34
Mitsubishi QAHV-N560YA-HPB(-BS) DHW Air Source Heat Pump	Lp at 1m	70	58	59	56	52	48	44	38
Mitsubishi RYYQ-U7Y1B Office Condenser	Lp at 1m	64	66	62	57	54	51	54	44
Mitsubishi PUZ-M250YKA.UK AHU Condenser	Lp @ 1m	71	62	61	60	57	53	49	43
Mitsubishi PUMY-P140YKM5 Cafe Condenser	Lp @ 1m	59	60	51	52	47	42	37	31
Daikin REYQ8U Reception Condenser	Lp @ 1m	62	64	58	55	50	45	44	36
Aquarea WH-UXZ12KE8 Domestic Air Source Heat Pump	LwA	52							

Notes:

Lw – sound power level, dB re. 12pW
LwA – A-weighted sound power level
Lp – sound pressure re. 20 µPa

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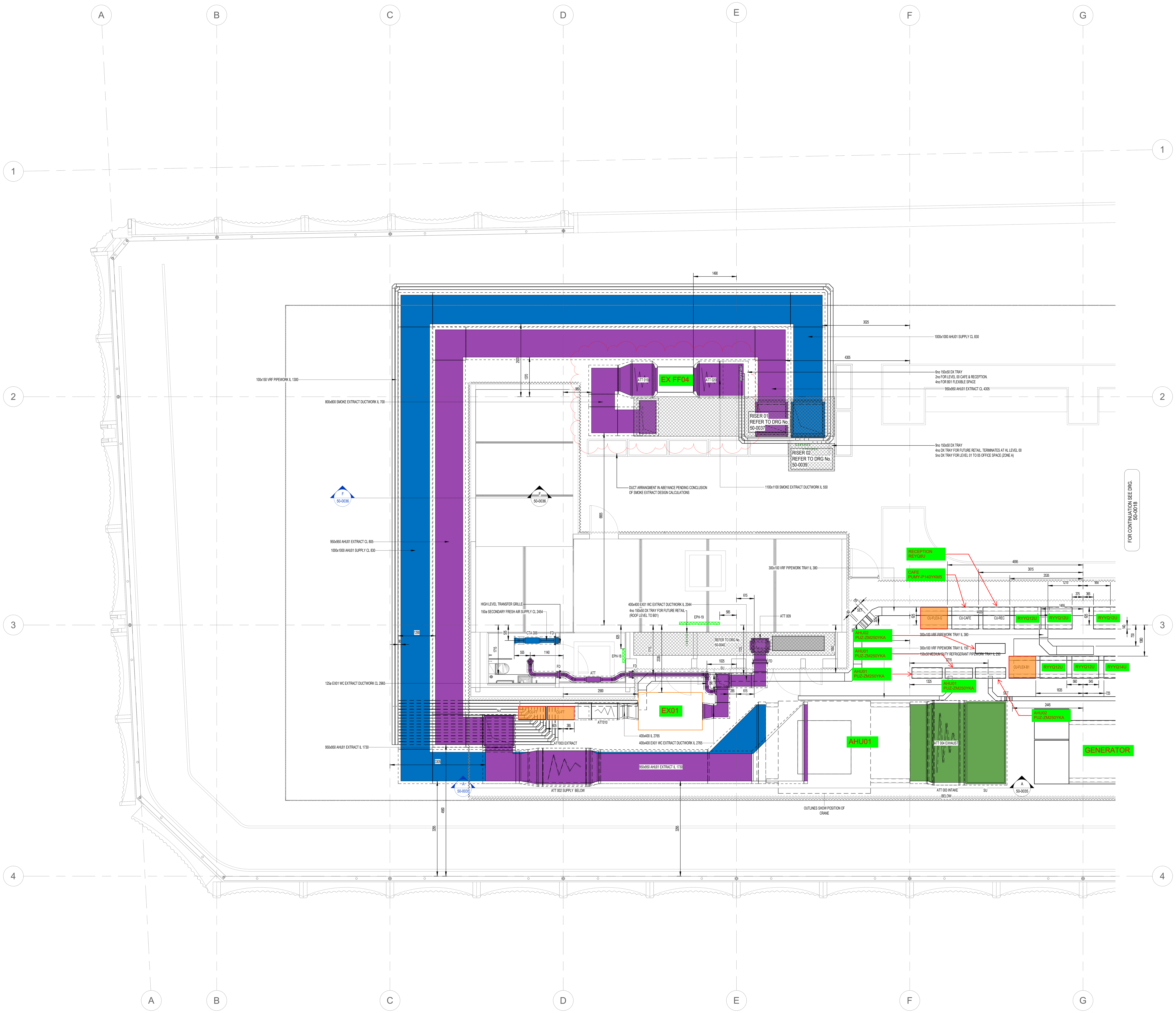
ATMOSPHERIC SILENCER SCHEDULE

AS12439 THE FITZROVIA

Ref:	AS12439/SS-2.0		Attenuator Insertion Loss, dB							
Silencer Ref.	Description		Octave Band Mid Frequency (Hz)							
			63	125	250	500	1k	2k	4k	8k
ATT001	AHU01 Intake		6	9	14	17	23	13	10	7
ATT004	AHU01 Exhaust		5	10	16	25	34	34	29	22
ATT005	AHU02 Intake		6	9	14	17	23	13	10	7
ATT008	AHU02 Exhaust		6	9	14	17	23	13	10	7
ATT010	EX01 Exhaust		4	7	14	22	29	22	19	11
ATT012	EX02 Exhaust		3	7	13	26	37	30	26	16
ATT013	AHU03 Intake		6	9	14	17	23	13	10	7
ATT016	AHU03 Exhaust		6	9	14	17	23	13	10	7
ATT018	EX05 Exhaust		3	7	13	26	37	30	26	16
ATT021	HRU-1 Intake		2	4	8	16	32	29	26	15
ATT024	HRU-1 Exhaust		2	4	8	16	32	29	26	15
ATT025	HRU-2 Intake		1	2	6	16	23	19	17	12
ATT024	HRU-2 Exhaust		1	2	6	16	23	19	17	12
ATT030	EX03 Exhaust		1	3	7	19	28	23	20	15
ATT032	EX04 Exhaust		1	3	7	19	28	23	20	15
-	MVHR Intake		2	5	11	24	46	42	36	22
-	MVHR Exhaust		2	5	11	24	46	42	36	22

Notes:

ROOF PLANT NOISE LEVELS PLAN



KEY PLAN

Zone 1

Zone 2

North

MECHANICAL SERVICES NOTES:

1. THIS DRAWING MUST NOT BE USED FOR CONSTRUCTION OR INSTALLATION PURPOSES UNLESS EXPRESSLY STATED.
2. DO NOT SCALE OFF THIS DRAWING. ALWAYS WORK TO NOTED DIMENSIONS.
3. ALL DIMENSIONS MUST BE VERIFIED ON SITE BEFORE COMPLETING SHOP DRAWINGS OR SETTING OUT THE WORKS.
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5. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL ARCHITECTURAL AND STRUCTURAL ENGINEER'S DRAWINGS AND ASSOCIATED KIER MECHANICAL & ELECTRICAL DRAWINGS.
6. REFER TO EQUIPMENT SCHEDULES FOR DETAILS.
7. FOR STANDARD SYMBOLS AND ABBREVIATIONS PLEASE REFER TO DRAWING No. TCR-KME-XX-XX-DR-ME-50-SCM67
8. REFER TO ARCHITECTS DETAILS FOR SETTING OUT DIMENSIONS OF EQUIPMENT AND DEVICES.
9. EXTERNAL LOUVRES/GRILLES AND ASSOCIATED INSULATED PLENUM BOX BY OTHERS.
10. ALL DUCTWORK SHALL BE INSULATED.
11. CEILING ACCESS PANELS TO BE PROVIDED IN LOCATIONS INDICATED.
TYPE A = 600x600mm
TYPE B = 600x300mm

NO OTHER RESIDUAL RISKS IDENTIFIED;
KME H&S PLAN APPLIES

FUTURE CONDENSER (NOT UNSTALLED AS PART OF THIS PHASE)

Rev	Date	Description	Orig	Chkd
01	12/05/23	FIRST ISSUE	MM	RG

Drg Status: PRELIMINARY

KIER

Mechanical & Electrical

Centenary House, 10 Winchester Road, Basingstoke, Hampshire, RG21 8UQ
Tel: 01256 666001
kier.co.uk

Client: Core/M&G

Project: 247 Tottenham Court Road

Title: Level 06
Plant Area Mechanical Services Layout
Sheet 1 of 2

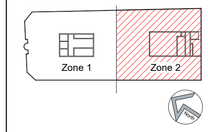
Originator: MM | Checked: RG | Approved: AB

Scale: 1:50 | Sheet size: A0 | Discipline: Mechanical

Drg No: TCR-KME-XX-06-DR-ME-50-0017 | Rev: 01

ROOF PLANT NOISE LEVELS PLANS

KEY PLAN



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6. REFER TO EQUIPMENT SCHEDULES FOR DETAILS.

7. FOR STANDARD SYMBOLS AND ABBREVIATIONS PLEASE REFER TO DRAWING No. TCR-KME-XX-XX-DR-ME-50-SCM07

8. REFER TO ARCHITECTS DETAILS FOR SETTING OUT DIMENSIONS OF EQUIPMENT AND DEVICES.

9. EXTERNAL LOUVRES/GRILLES AND ASSOCIATED INSULATED PLENUM BOX BY OTHERS.

10. ALL DUCTWORK SHALL BE INSULATED.

11. CEILING ACCESS PANELS TO BE PROVIDED IN LOCATIONS INDICATED.
TYPE A = 600x600mm
TYPE B = 600x300mm

NO OTHER RESIDUAL RISKS IDENTIFIED;
KME H&S PLAN APPLIES

EXISTING EQUIPMENT TO BE DEMOLISHED

Rev	Date	Description	Org	Chkd
01	12/05/23	FIRST ISSUE	MM	RG

Drg Status:
PRELIMINARY

KIER

Mechanical & Electrical
Centenary House, 10 Winchester Road, Basingstoke, Hampshire, RG21 8UQ
Tel: 01256 666001
kier.co.uk

Client:
Core/M&G

Project:
247 Tottenham Court Road

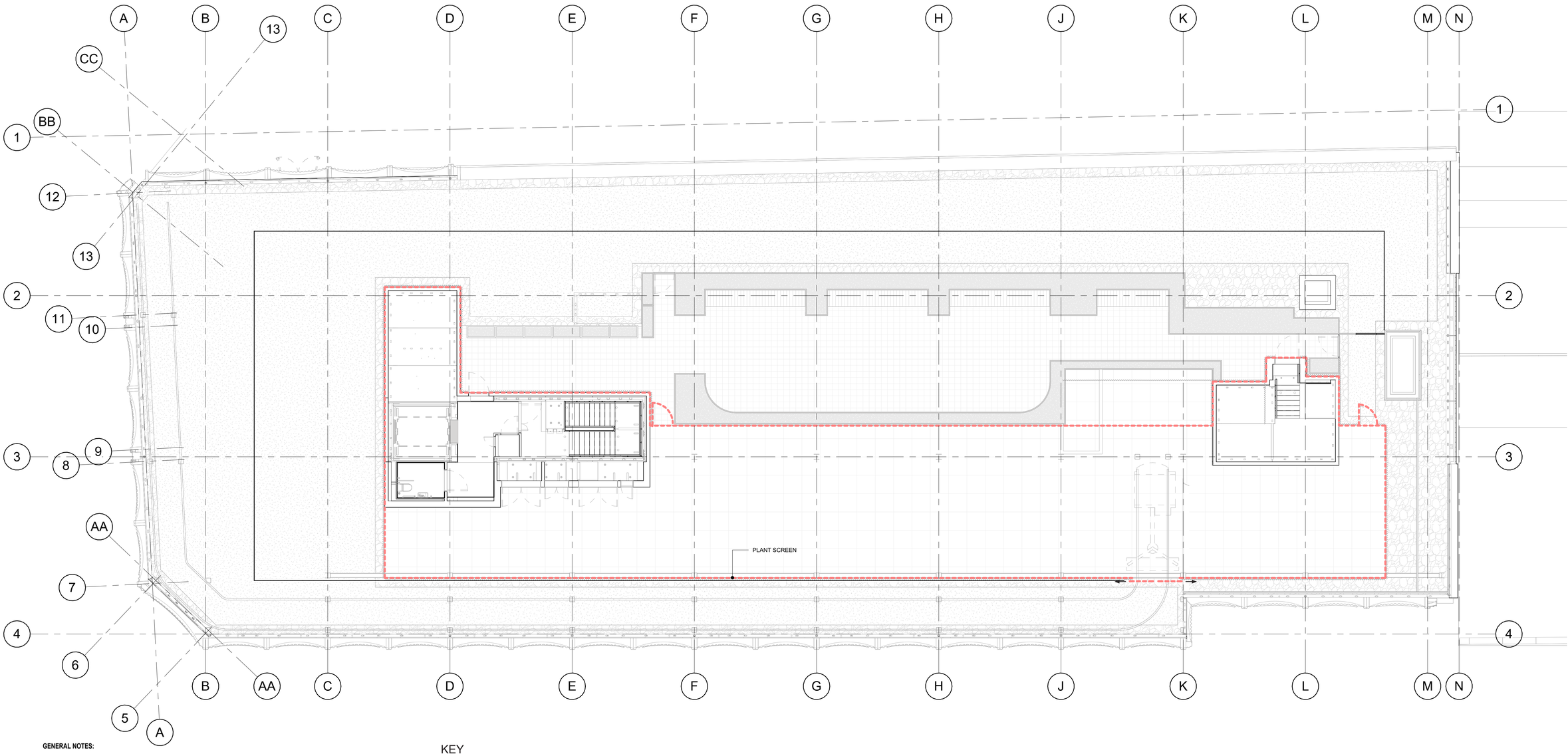
Title:
Level 06
Plant Area Mechanical Services Layout
Sheet 2 of 2

Originator:	Checked:	Approved:
MM	RG	AB

Scale:	Sheet size:	Discipline:
1:50	A0	Mechanical

Drg No:	Rev:
TCR-KME-XX-06-DR-ME-50-0018	01

‘PROPOSED DRAWING’ ROOFTOP PLANT ENCLOSURE PLAN



GENERAL NOTES:

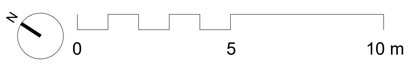
ALL DIMENSIONS TO BE CHECKED ON SITE PRIOR TO COMMENCEMENT OF ANY WORKS, AND/OR PREPARATION OF ANY SHOP DRAWINGS. SIZES OF AND DIMENSIONS TO ANY STRUCTURAL ELEMENTS ARE INDICATIVE ONLY. SEE STRUCTURAL ENGINEERS DRAWINGS FOR ACTUAL SIZES / DIMENSIONS. SIZES OF AND DIMENSIONS OF ANY SERVICE ELEMENTS ARE INDICATIVE ONLY. SEE SERVICE ENGINEERS DRAWINGS FOR ACTUAL SIZES AND DIMENSIONS. THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS DRAWINGS, SPECIFICATIONS AND OTHER CONSULTANTS' INFORMATION.

DO NOT SCALE FROM THIS DRAWING

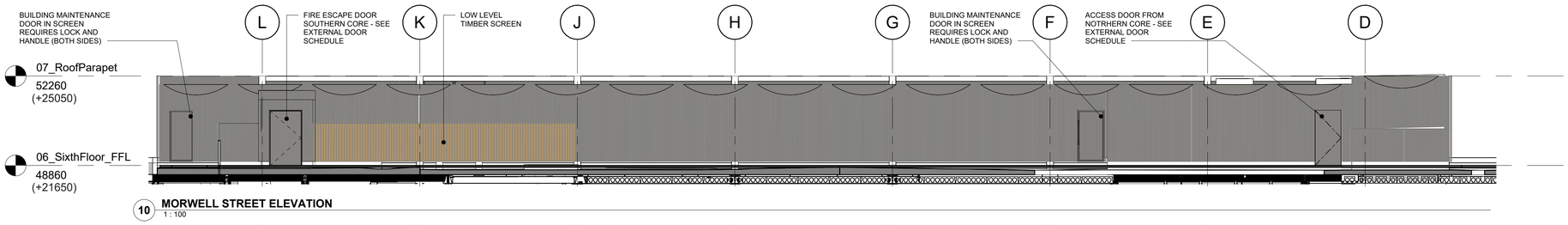
KEY

EXTENT OF PLANT ENCLOSURE

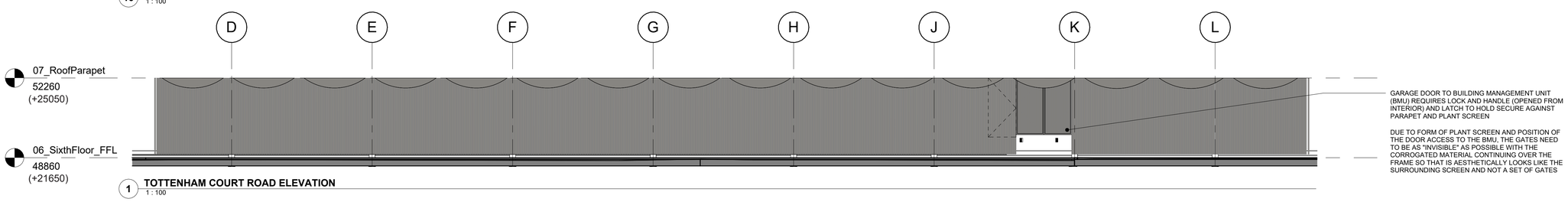
1:100 @ A1
1:200 @ A3



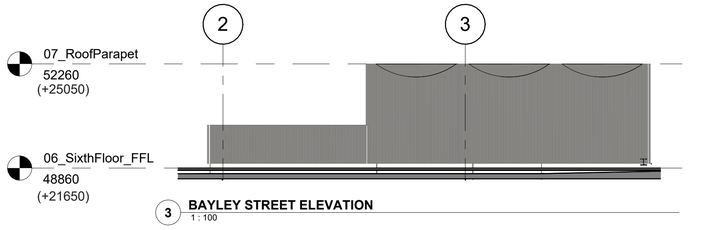
‘PROPOSED DRAWING’ ROOFTOP PLANT ENCLOSURE ELEVATIONS



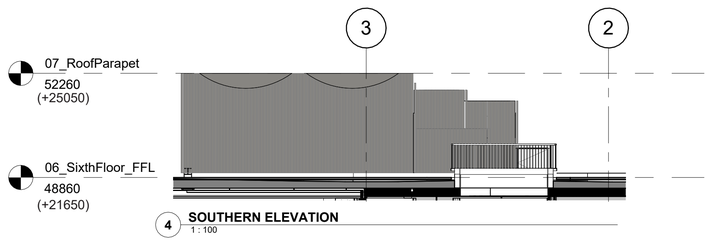
10 **MORWELL STREET ELEVATION**
1 : 100



1 **TOTTENHAM COURT ROAD ELEVATION**
1 : 100

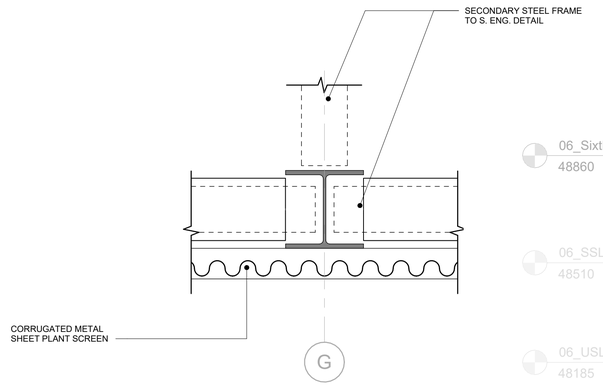


3 **BAYLEY STREET ELEVATION**
1 : 100

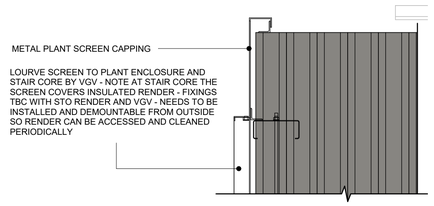


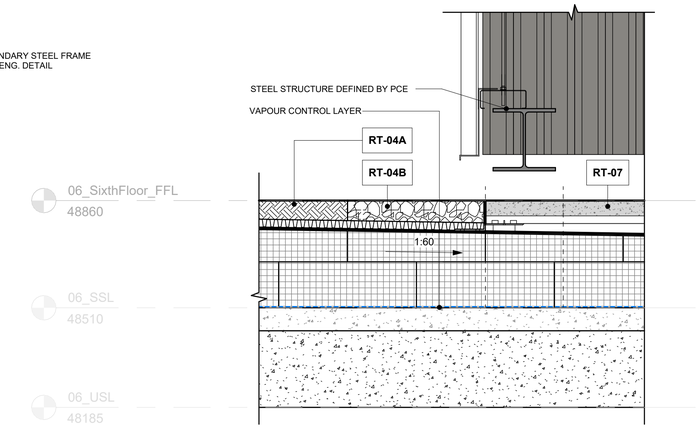
4 **SOUTHERN ELEVATION**
1 : 100

1:200 @ A3
1:100 @ A1



7 **06_PLANT SCREEN DETAIL PLAN**
1 : 10





2 **06_OFFICE_PLANT SCREEN DETAIL SECTION**
1 : 10

1:20 @ A3
1:10 @ A1

AIR HANDLING UNIT

AHU01

AIR-HANDLING

AIR HANDLING | ACOUSTIC CONTROL | REFURBISHMENT | UV AIR STERILISATION | REFRIGERATION | CONTROLS

TECHNICAL SPECIFICATION

Version:Pollard Select
Version Date: 01/01/2020

ACCESS SECTION

Air Flow: 6.176 m³/s | Length: 550 mm

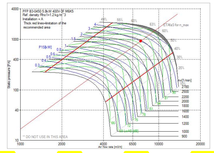
ACCESSORIES
Standard Bulkhead Light
Pressure Test Port

ACCESS
Door Type: Hinged door | Dimensions (mm): 500 X 1275 mm | Reinforced Floor: None
Drain Pan: Na | Drain Pan Material: None

SUPPLY FAN ARRAY

GENERAL
Fan Type: EC
Wheel Type: Backward Curve
Quantity: 3
Static Efficiency: 63%
Duty % Per Fan: Single Fan
Impellor Diam: 450 mm
VSD: Inbuilt
Drive Type: DirectDrive
Poles:
FLC: 8.9 A
Volts/Ph/Hz: 400/3/50 Hz

OUTPUT
Airflow Volume: 6.176 m³/s
Outlet Velocity: 9.610 m/s
Static Efficiency: 63%
Ext Static Pressure: 400 Pa
Unit Static Pressure: 926 Pa
Fan Total Pressure: 981 Pa
Fan Speed: 2173 rpm
Motor Speed: 2173 rpm
Abs Power: 3.02 kW
Power: 5.8 kW



ACOUSTIC DATA

FREQUENCY	63 Hz	125 Hz	250 Hz	500 Hz	1k Hz	2k Hz	4k Hz	8k Hz
SWL Inside Inlet Duct (dB)	85	80	84	79	71	73	74	71
SWL Inside Outlet Duct (dB)	80	77	87	82	82	80	75	71

FAN NOTES
This fan cannot be controlled with a variable frequency drive

ACCESSORIES
Inlet guard
Door Guard
IP65 Isolator fitted and wired to motor
Standard Bulkhead Light
Pressure Test Port

ACCESS
Door Type: Hinged door | Dimensions (mm): 550 X 1275 mm | Reinforced Floor: None
Drain Pan: Na | Drain Pan Material: None

AHU01

AIR-HANDLING

AIR HANDLING | ACOUSTIC CONTROL | REFURBISHMENT | UV AIR STERILISATION | REFRIGERATION | CONTROLS

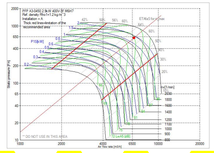
TECHNICAL SPECIFICATION

Version:Pollard Select
Version Date: 01/01/2020

EXHAUST FAN ARRAY

GENERAL
Fan Type: EC
Wheel Type: Backward Curve
Quantity: 3
Duty % Per Fan: Single Fan
Impellor Diam: 450 mm
VSD: Inbuilt
Drive Type: DirectDrive
Poles:
FLC: 4.5 A
Volts/Ph/Hz: 400/3/50 Hz

OUTPUT
Airflow Volume: 5.571 m³/s
Outlet Velocity: 8.440 m/s
Static Efficiency: 62%
Ext Static Pressure: 325 Pa
Unit Static Pressure: 617 Pa
Fan Total Pressure: 660 Pa
Fan Speed: 1751 rpm
Motor Speed: 1751 rpm
Abs Power: 1.83 kW
Power: 2.9 kW



ACOUSTIC DATA

FREQUENCY	63 Hz	125 Hz	250 Hz	500 Hz	1k Hz	2k Hz	4k Hz	8k Hz
SWL Inside Inlet Duct (dB)	76	78	86	77	73	70	65	61
SWL Inside Outlet Duct (dB)	79	76	86	81	81	79	74	70

FAN NOTES
This fan cannot be controlled with a variable frequency drive

ACCESSORIES
Inlet guard
Door Guard
IP65 Isolator fitted and wired to motor
Standard Bulkhead Light
Pressure Test Port

ACCESS
Door Type: Hinged door | Dimensions (mm): 550 X 1275 mm | Reinforced Floor: None
Drain Pan: Na | Drain Pan Material: None

OUTLET SECTION

Airflow: 5.571 m³/s | Pressure Drop: 4 Pa | Class: Side Seals
Air Velocity: 2.670 m/s | Location: Internal | Material: Galvanised Steel
Depth: 165 mm | Blades: Opposed | Dimensions: 1900 x 1100 mm

ACCESS
Door Type: Removable panel | Dimensions (mm): 225 X 1275 mm | Reinforced Floor: None
Drain Pan: Na | Drain Pan Material: None

AHU ACOUSTIC DATA SUPPLY SECTION

Description:	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	Overall dB(A)
Outlet Sound Power (dB)	83	80	90	85	85	83	76	71	90
Inlet Sound Power (dB)	83	77	80	75	64	61	59	55	76
Case breakout sound Pressure (dB)	63	60	56	42	42	38	31	27	50

AHU01

AIR-HANDLING

AIR HANDLING | ACOUSTIC CONTROL | REFURBISHMENT | UV AIR STERILISATION | REFRIGERATION | CONTROLS

TECHNICAL SPECIFICATION

Version:Pollard Select
Version Date: 01/01/2020

AHU ACOUSTIC DATA EXHAUST SECTION

Description:	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	Overall dB(A)
Outlet Sound Power (dB)	84	81	91	86	86	84	79	75	91
Inlet Sound Power (dB)	75	77	85	76	71	64	58	53	79
Case breakout sound Pressure (dB)	58	59	56	42	42	38	31	27	50

SPECIFIC FAN POWER

SUPPLY
Filter Condition: Clean | Motor Efficiency: 100% | Absorbed Power (Supply): 7.77 kW
Air Volume: 6.176 m³/s | Drive Efficiency: 100% | Absorbed Power (Exhaust): 5.1 kW
Inverter Efficiency: 100% | AHU SFP: 2.08 kW/m³/s | Motor Efficiency Class: 100%

AHU02

AIR-HANDLING

AIR HANDLING | ACOUSTIC CONTROL | REFURBISHMENT | UV AIR STERILISATION | REFRIGERATION | CONTROLS

TECHNICAL SPECIFICATION

Version:Pollard Select
Version Date: 01/01/2020

ACCESS SECTION

Air Flow: **5.498 m³/s** Length: **550 mm**

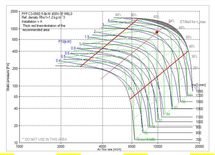
ACCESSORIES
Standard Bulkhead Light
Pressure Test Port

ACCESS
Door Type: **Hinged door** Dimensions (mm): **550 X 1275 mm** Reinforced Floor: **None**
Drain Pan: **Na** Drain Pan Material: **None**

SUPPLY FAN ARRAY

GENERAL
Fan Type: **EC**
Wheel Type: **Backward Curve**
Quantity: **2**
Duty % Per Fan: **Single Fan**
Impellor Diam: **560 mm**
VSD: **Inbuilt**
Drive Type: **DirectDrive**
Poles:
FLC: **8.4 A**
Volts/Ph/Hz: **400/3/50 Hz**

OUTPUT
Airflow Volume: **5.498 m³/s**
Outlet Velocity: **8.600 m/s**
Static Efficiency: **64%**
Ext Static Pressure: **425 Pa**
Unit Static Pressure: **858 Pa**
Fan Total Pressure: **902 Pa**
Fan Speed: **1554 rpm**
Motor Speed: **1554 rpm**
Abs Power: **3.70 kW**
Power: **5.6 kW**



ACOUSTIC DATA

FREQUENCY	63 Hz	125 Hz	250 Hz	500 Hz	1k Hz	2k Hz	4k Hz	8k Hz
SWL Inside Inlet Duct (dB)	79	83	90	75	73	72	74	70
SWL Inside Outlet Duct (dB)	83	85	88	85	85	84	77	75

FAN NOTES
This fan cannot be controlled with a variable frequency drive

ACCESSORIES
Inlet guard
Door Guard
IP65 Isolator fitted and wired to motor
Standard Bulkhead Light
Pressure Test Port

ACCESS
Door Type: **Hinged door** Dimensions (mm): **550 X 1275 mm** Reinforced Floor: **None**
Drain Pan: **Na** Drain Pan Material: **None**

AHU02

AIR-HANDLING

AIR HANDLING | ACOUSTIC CONTROL | REFURBISHMENT | UV AIR STERILISATION | REFRIGERATION | CONTROLS

TECHNICAL SPECIFICATION

Version:Pollard Select
Version Date: 01/01/2020

ACCESS
Door Type: **Hinged door** Dimensions (mm): **550 X 1275 mm** Reinforced Floor: **None**
Drain Pan: **Na** Drain Pan Material: **None**

PANEL FILTER

GENERAL
Class / Type: **ISO 16890 ePM10 55% / (M5 EN779)/ Panel**
Length: **50 mm**
Withdrawal: **Front**

PRESSURE DROP
Clean PD: **42.1 Pa**
Dirty PD: **92.1 Pa**
Mean PD: **67.1 Pa**

QUANTITY & SIZE
Size 1: **6qty x 595 x 594 x 44 mm**
Size 2: **2qty x 289 x 594 x 44 mm**
Size 3: **None**

ACCESSORIES
2" Compact Differential Pressure Gauge 250Pa

PLENUM SECTION
Air Flow: **4.954 m³/s** Length: **200 mm**

ACCESSORIES
Pressure Test Port

ACCESS SECTION
Air Flow: **4.954 m³/s** Length: **550 mm**

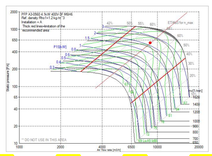
ACCESSORIES
Standard Bulkhead Light
Pressure Test Port

ACCESS
Door Type: **Hinged door** Dimensions (mm): **550 X 1275 mm** Reinforced Floor: **None**
Drain Pan: **Na** Drain Pan Material: **None**

EXHAUST FAN ARRAY

GENERAL
Fan Type: **EC**
Wheel Type: **Backward Curve**
Quantity: **2**
Duty % Per Fan: **Single Fan**
Impellor Diam: **560 mm**
VSD: **Inbuilt**
Drive Type: **DirectDrive**
Poles:
FLC: **6.3 A**
Volts/Ph/Hz: **400/3/50 Hz**

OUTPUT
Airflow Volume: **4.954 m³/s**
Outlet Velocity: **6.890 m/s**
Static Efficiency: **64%**
Ext Static Pressure: **325 Pa**
Unit Static Pressure: **574 Pa**
Fan Total Pressure: **602 Pa**
Fan Speed: **1276 rpm**
Motor Speed: **1276 rpm**
Abs Power: **2.23 kW**
Power: **4.1 kW**



ACOUSTIC DATA

FREQUENCY	63 Hz	125 Hz	250 Hz	500 Hz	1k Hz	2k Hz	4k Hz	8k Hz
SWL Inside Inlet Duct (dB)	75	80	77	72	71	67	64	59
SWL Inside Outlet Duct (dB)	77	79	77	77	79	74	68	62

30/01/2022 : The Fitzrovia, 247 Tottenham Court Road

AIR HANDLING | ACOUSTIC CONTROL | REFURBISHMENT | UV AIR STERILISATION | REFRIGERATION | CONTROLS

salesteam@mansfieldpollard.co.uk www.mansfieldpollard.co.uk tel: 01274 774050

AHU02

AIR-HANDLING

AIR HANDLING | ACOUSTIC CONTROL | REFURBISHMENT | UV AIR STERILISATION | REFRIGERATION | CONTROLS

TECHNICAL SPECIFICATION

Version:Pollard Select
Version Date: 01/01/2020

FAN NOTES
This fan cannot be controlled with a variable frequency drive

ACCESSORIES
Inlet guard
Door Guard
IP65 Isolator fitted and wired to motor
Standard Bulkhead Light
Pressure Test Port

ACCESS
Door Type: **Hinged door** Dimensions (mm): **550 X 1275 mm** Reinforced Floor: **None**
Drain Pan: **Na** Drain Pan Material: **None**

OUTLET SECTION
Airflow: **4.954 m³/s** Pressure Drop: **4 Pa** Class: **Side Seals**
Air Velocity: **2.910 m/s** Location: **Internal** Material: **Galvanised Steel**
Depth: **165 mm** Blades: **Opposed** Dimensions: **1700 x 1000 mm**

ACCESS
Door Type: **Removable panel** Dimensions (mm): **225 X 1275 mm** Reinforced Floor: **None**
Drain Pan: **Na** Drain Pan Material: **None**

AHU ACOUSTIC DATA SUPPLY SECTION

Description:	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	Overall dB(A)
Outlet Sound Power (dB)	84	86	89	86	86	85	76	73	91
Inlet Sound Power (dB)	75	78	84	69	64	58	57	52	76
Case breakout sound Pressure (dB)	59	63	57	44	43	40	31	29	52

AHU ACOUSTIC DATA EXHAUST SECTION

Description:	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	Overall dB(A)
Outlet Sound Power (dB)	80	82	80	80	82	77	71	65	85
Inlet Sound Power (dB)	72	77	74	69	67	59	55	49	72
Case breakout sound Pressure (dB)	54	59	45	36	38	31	23	17	45

SPECIFIC FAN POWER

SUPPLY
Filter Condition: **Clean** Motor Efficiency: **100%** Absorbed Power (Supply): **6.24 kW**
Air Volume: **5.498 m³/s** Drive Efficiency: **100%** Absorbed Power (Exhaust): **4.08 kW**
Inverter Efficiency: **100%** AHU SFP: **1.88 kW/m³/s** Motor Efficiency Class: **100%**

30/01/2022 : The Fitzrovia, 247 Tottenham Court Road

AIR HANDLING | ACOUSTIC CONTROL | REFURBISHMENT | UV AIR STERILISATION | REFRIGERATION | CONTROLS

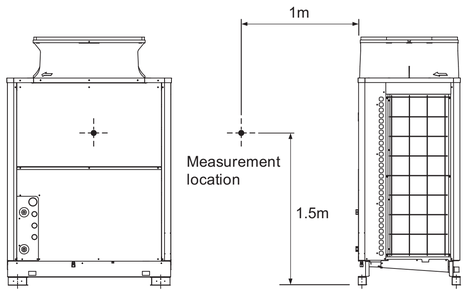
salesteam@mansfieldpollard.co.uk www.mansfieldpollard.co.uk tel: 01274 774050

2. Product Data

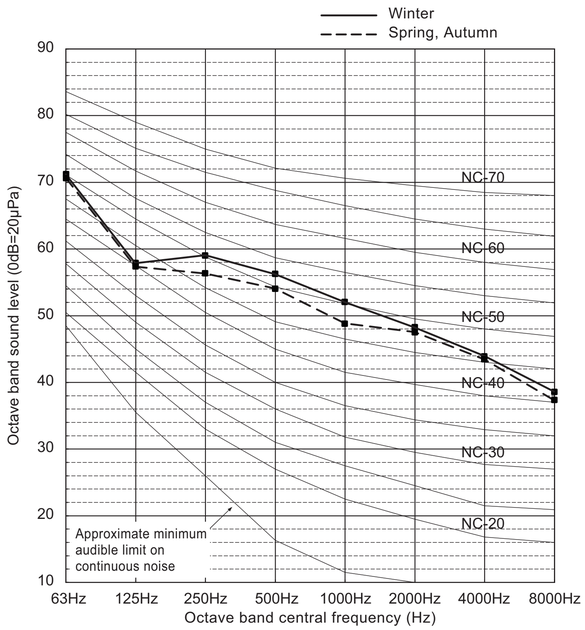
2-2. Sound pressure levels

Measurement condition

QAHV-N560YA-HPB(-BS)



Sound Pressure Level: 56.0 / 58.0 dB (Spring, Autumn/Winter)
Opetation condition… Spring, Autumn: Outdoor temp.: 16°CDB/12°CWB, Inlet water temp.: 17°C, Outlet water temp.: 65°C
Winter: Outdoor temp.: 7°CDB/6°CWB, Inlet water temp.: 9°C, Outlet water temp.: 65°C



Aquarea T-CAP

For retrofit and new builds, install the T-CAP heat pump keeping Total Capacity even at extremely cold ambient.

			Aquarea T-CAP All in One K Generation Single phase / Three phase. Heating and Cooling [1]				Aquarea T-CAP Bi-bloc K Generation Single phase / Three phase. Heating and Cooling			
			Single phase (power to indoor)		Three phase (power to indoor)		Single phase (power to indoor)		Three phase (power to indoor)	
Kit 3 kW electric heater			—	—	—	—	KIT-WXC09K3E5	—	KIT-WXC09K3E8	—
Kit 6 kW electric heater			KIT-AXC09KE5	KIT-AXC12KE5	—	—	KIT-WXC09K6E5	KIT-WXC12K6E5	—	—
Kit 9 kW electric heater			—	—	KIT-AXC09KE8	KIT-AXC12KE8	—	—	KIT-WXC09K9E8	KIT-WXC12K9E8
Heating capacity / COP (A +7 °C, W 35 °C)		kW / COP	9,00/5,03	12,10/4,84	9,00/5,03	12,10/4,84	9,00/5,03	12,10/4,84	9,00/5,03	12,10/4,84
Heating capacity / COP (A +7 °C, W 55 °C)		kW / COP	—/—	—/—	—/—	—/—	—/—	—/—	—/—	—/—
Heating capacity / COP (A +2 °C, W 35 °C)		kW / COP	—/—	—/—	—/—	—/—	—/—	—/—	—/—	—/—
Heating capacity / COP (A +2 °C, W 55 °C)		kW / COP	—/—	—/—	—/—	—/—	—/—	—/—	—/—	—/—
Heating capacity / COP (A -7 °C, W 35 °C)		kW / COP	—/—	—/—	—/—	—/—	—/—	—/—	—/—	—/—
Heating capacity / COP (A -7 °C, W 55 °C)		kW / COP	9,00/3,69	12,00/3,44	9,00/3,69	12,00/3,44	9,00/3,69	12,00/3,44	9,00/3,69	12,00/3,44
Cooling capacity / EER (A 35 °C, W 7 °C)		kW / EER	8,80/3,11	10,70/2,68	8,80/3,11	10,70/2,68	8,80/3,11	10,70/2,68	8,80/3,11	10,70/2,68
Cooling capacity / EER (A 35 °C, W 18 °C)		kW / EER	—/—	—/—	—/—	—/—	—/—	—/—	—/—	—/—
Heating average climate (W 35 °C / W 55 °C)	Seasonal energy efficiency	SCOP (η_s %)	4,96/3,57(195/140)	4,96/3,57(195/140)	4,96/3,57(195/140)	4,96/3,57(195/140	4,96/3,57(195/140)	4,96/3,57(195/140)	4,96/3,57(195/140)	4,96/3,57(195/140)
	Energy class [2]	A+++ to D	A+++/A++	A+++/A++	A+++/A++	A+++/A++	A+++/A++	A+++/A++	A+++/A++	A+++/A++
Heating warm climate (W 35 °C / W 55 °C)	Seasonal energy efficiency	SCOP (η_s %)	6,47/4,34(256/171)	6,47/4,34(256/171)	6,47/4,34(256/171)	6,47/4,34(256/171	6,47/4,34(256/171)	6,47/4,34(256/171)	6,47/4,34(256/171)	6,47/4,34(256/171)
	Energy class [2]	A+++ to D	A+++/A+++	A+++/A+++	A+++/A+++	A+++/A+++	A+++/A+++	A+++/A+++	A+++/A+++	A+++/A+++
Heating cold climate (W 35 °C / W 55 °C)	Seasonal energy efficiency	SCOP (η_s %)	4,31/3,26(169/127)	4,31/3,26(169/127)	4,31/3,26(169/127)	4,31/3,26(169/127	4,31/3,26(169/127)	4,31/3,26(169/127)	4,31/3,26(169/127)	4,31/3,26(169/127)
	Energy class [2]	A+++ to D	A++/A++	A++/A++	A++/A++	A++/A++	A++/A++	A++/A++	A++/A++	A++/A++
Indoor unit 3 kW electric heater			—	—	—	—	WH-SXC09K3E5	—	WH-SXC09K3E8	—
Indoor unit 6 kW electric heater			WH-ADC0912K6E5	WH-ADC0912K6E5	—	—	WH-SXC09K6E5	WH-SXC12K6E5	—	—
Indoor unit 9 kW electric heater			—	—	WH-ADC0912K9E8***	WH-ADC0912K9E8***	—	—	WH-SXC09K9E8	WH-SXC12K9E8
Sound pressure	Heat / Cool	dB(A)	33/33	33/33	33/33	33/33	33/33	33/33	33/33	33/33
Dimension	H x W x D	mm	1642 x 599 x 602	1642 x 599 x 602	1642 x 599 x 602	1642 x 599 x 602	892 x 500 x 340	892 x 500 x 340	892 x 500 x 340	892 x 500 x 340
Net weight		kg	101	101	—	—	43	43	43	44
Water volume		L	185	185	185	185				
Maximum DHW temperature		°C	65	65	65	65				
Material inside tank			Stainless steel	Stainless steel	Stainless steel	Stainless steel				
Tapping profile according EN16147			L	L	L	L				
DHW tank ERP efficiency average / warm / cold [3]		A+ to F	A/A/A	A/A/A	A/A/A	A/A/A				
DHW tank ERP average climate η / COPdHW		ηwh %/COPdHW	112/2,80	112/2,80	112/2,80	112/2,80				
DHW tank ERP warm climate η / COPdHW		ηwh %/COPdHW	132/3,30	132/3,30	132/3,30	132/3,30				
DHW tank ERP cold climate η / COPdHW		ηwh %/COPdHW	88/2,20	88/2,20	88/2,20	88/2,20				
Outdoor unit			WH-UXZ09KE5	WH-UXZ12KE5	WH-UXZ09KE8	WH-UXZ12KE8	WH-UXZ09KE5	WH-UXZ12KE5	WH-UXZ09KE8	WH-UXZ12KE8
Sound power [4]	Heat	dB(A)	51	52	51	52	51	52	51	52
Dimension / Net weight	H x W x D	mm / kg	1340 x 900 x 320/88	1340 x 900 x 320/88	1340 x 900 x 320/—	1340 x 900 x 320/—	1340 x 900 x 320/88	1340 x 900 x 320/88	1340 x 900 x 320/88	1340 x 900 x 320/88
Refrigerant (R32) / CO_2 Eq.		kg / T	2,20/1,485	2,20/1,485	2,20/1,485	2,20/1,485	2,20/1,485	2,20/1,485	2,20/1,485	2,20/1,485
Piping diameter	Liquid / Gas	Inch (mm)	1/4(6,35)/1/2(12,70)	1/4(6,35)/1/2(12,70)	1/4(6,35)/1/2(12,70)	1/4(6,35)/1/2(12,70)	1/4(6,35)/1/2(12,70)	1/4(6,35)/1/2(12,70)	1/4(6,35)/1/2(12,70)	1/4(6,35)/1/2(12,70)
Pipe length range / Elevation difference (in / out)		m / m	3~30/20	3~30/20	3~30/20	3~30/20	3~30/20	3~30/20	3~30/20	3~30/20
Operating range - outdoor ambient	Heat	°C	-28~+35	-28~+35	-28~+35	-28~+35	-28~+35	-28~+35	-28~+35	-28~+35
	Cool	°C	+10~+43	+10~+43	+10~+43	+10~+43	+10~+43	+10~+43	+10~+43	+10~+43
Water outlet	Heat / Cool	°C	20~60/5~20	20~60/5~20	20~60/5~20	20~60/5~20	20~60/5~20	20~60/5~20	20~60/5~20	20~60/5~20

Tentative data

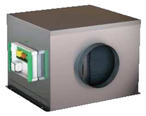
1) Kits available with Electrical Anode models. 2) Scale from A+++ to D. 3) Scale from A+ to F. 4) Sound power in accordance to 811/2013, 813/2013 and EN12102-1:2017 at +7 °C. 4) Check local regulations.* EER and COP calculation is based in accordance to EN14511. ** This product is designed to comply with the European Water Quality Directive 98/83/EC amended by 2015/1787/EU. The lifespan of the product is not guaranteed in the case of the use of groundwater, such as spring water or well water, the use of tap water when salt or other impurities are contained, nor in areas of acidic water quality. Maintenance and warranty costs related to these cases are the customer's responsibility. *** Available Autumn 23. **** Tentative data.

FlaktWoods Limited
Fan Selector - Technical Datasheet

EX-01

FläktGroup

Project	: The Fitzrovia - 277 Tottenham Court Road	**Project Code**	: BC-4030
Quotation	:	**Date**	: Thursday, February 23, 2023



Woods EC Box Fan
BC-4030-1

Woods EC Twin Fan 350
Toilet Extract Fan EX-01
(North Core)

PRODUCT

Model Code	Woods EC Twin Fan 350
Fan Diameter	350 mm
Installation	Type D

PERFORMANCE

Requested Duty	0.730 m³/s @ 230 Pa (Static)
Outlet Dynamic Pressure	35.2 Pa
Velocity	7.66 m/s

MOTOR

Motor Rating	0.450 kW [Integral Frame]
Full Load Current	2.9 A
Starting Current	2.9 A
Electrical Supply	220 - 240 Volts 50 Hz 1 Phase
Motor Winding	Standard
Motor Type	Class F Insulation

EFFICIENCY GRADES

Regulation 1253 - 2014	
UVU Efficiency	59.0% (ErP Compliant) ✓
Nominal Flow Rate	0.820 m³/s @ 320 Pa
Effective Input Power	0.446 kW
SFP value	0.41 W/l/s @ Actual Duty

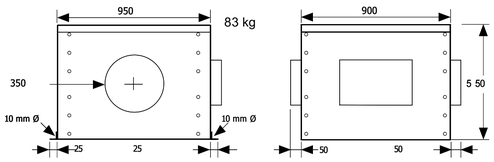
ENVIRONMENT

Air Density	1.2 kg/m³ / 20 ºC / 0 m / 40% RH
Smoke Venting	No Smoke Venting
Operating Environment	Normal

RUNNING COSTS

Power from mains	0.303 KWh
Energy Consumption	605.35 (2,000.00 h/Year)
Running Cost / Year	£151.34
CO2 per Year	212.82 kgCO2e

PRODUCT DIMENSIONS

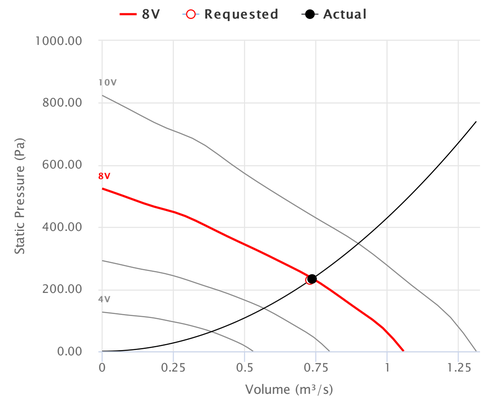


MECHANICAL

Operating Temperatures	0 ºC to 50 ºC
Weight	83kg

COMMENTS

FAN PERFORMANCE CURVE



ACOUSTICS

	Sound Spectrum (Hz)								Overall		Distance (3 m)
	63	125	250	500	1k	2k	4k	8k	Lw*	LwA*	LpA @ 3 m **
Inlet	62	66	68	64	58	57	57	43	72	66	46
Outlet	67	71	73	69	63	62	62	48	77	71	51
Breakout	58	60	60	41	29	28	28	<20	64	52	32

Sound Data At Requested Duty. * Lw dB re 10 $^{-12}$ W * Lw dB re 10 $^{-12}$ W

FAN & ACCESSORIES

Item Description	Part Number	Qty
Woods EC Twin Fan 350	EC350202	1
Clamps (2 Pieces) - DN 355	CP355000	2

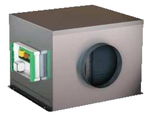
Axial Way
Colchester Essex CO4 5DZ
+44 (0) 1206 222 555
UK
E-mail:craig.weedall@flaktwoods.net

FlaktWoods Limited
Fan Selector - Technical Datasheet

EX-02

FläktGroup

Project	: The Fitzrovia - 277 Tottenham Court Road	**Project Code**	: BC-4030
Quotation	:	**Date**	: Thursday, February 23, 2023



Woods EC Box Fan
BC-4030-2

Woods EC Twin Fan 350
Toilet Extract Fan EX-02
(South Core)

PRODUCT

Model Code	Woods EC Twin Fan 350
Fan Diameter	350 mm
Installation	Type D

PERFORMANCE

Requested Duty	0.950 m³/s @ 230 Pa (Static)
Outlet Dynamic Pressure	59 Pa
Velocity	9.90 m/s

MOTOR

Motor Rating	0.450 kW [Integral Frame]
Full Load Current	2.9 A
Starting Current	2.9 A
Electrical Supply	220 - 240 Volts 50 Hz 1 Phase
Motor Winding	Standard
Motor Type	Class F Insulation

EFFICIENCY GRADES

Regulation 1253 - 2014	
UVU Efficiency	59.0% (ErP Compliant) ✓
Nominal Flow Rate	0.820 m³/s @ 320 Pa
Effective Input Power	0.446 kW
SFP value	0.48 W/l/s @ Actual Duty

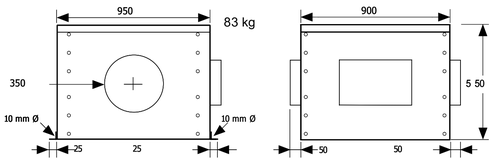
ENVIRONMENT

Air Density	1.2 kg/m³ / 20 ºC / 0 m / 40% RH
Smoke Venting	No Smoke Venting
Operating Environment	Normal

RUNNING COSTS

Power from mains	0.454 KWh
Energy Consumption	908.95 (2,000.00 h/Year)
Running Cost / Year	£227.24
CO2 per Year	319.55 kgCO2e

PRODUCT DIMENSIONS

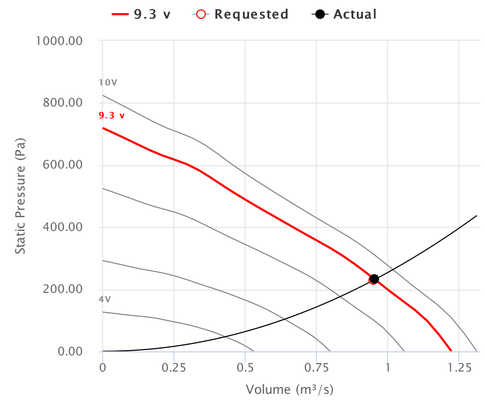


MECHANICAL

Operating Temperatures	0 ºC to 50 ºC
Weight	83kg

COMMENTS

FAN PERFORMANCE CURVE



ACOUSTICS

	Sound Spectrum (Hz)								Overall		Distance (3 m)
	63	125	250	500	1k	2k	4k	8k	Lw*	LwA*	LpA @ 3 m **
Inlet	65	69	72	68	63	62	62	50	76	70	50
Outlet	70	74	77	73	68	67	67	55	81	76	55
Breakout	61	63	64	45	34	33	33	<20	67	56	36

Sound Data At Requested Duty. * Lw dB re 10 $^{-12}$ W * Lw dB re 10 $^{-12}$ W

FAN & ACCESSORIES

Item Description	Part Number	Qty
Woods EC Twin Fan 350	EC350202	1
Clamps (2 Pieces) - DN 355	CP355000	2

Axial Way
Colchester Essex CO4 5DZ
+44 (0) 1206 222 555
UK
E-mail:craig.weedall@flaktwoods.net

2 Specifications

2-1 Technical Specifications					RYYQ8U	RYYQ10U	RYYQ12U	RYYQ14U	RYYQ16U	RYYQ18U	RYYQ20U
Fan	Quantity				1			2			
	External static pressure	Max.		Pa	78						
Fan motor	Quantity				1			2			
	Type				DC motor						
	Output			W	550			750			
Sound power level	Cooling	Nom.		dBA	78.0 (4)	79.1 (4)	83.4 (4)	80.9 (4)	85.6 (4)	83.8 (4)	87.9 (4)
	Heating	Nom.		dBA	62.7 (4)	64.8 (4)	64.9 (4)	68.3 (4)	68.6 (4)	66.3 (4)	67.0 (4)
Sound pressure level	Cooling	Nom.		dBA	57.0 (5)		61.0 (5)	60.0 (5)	63.0 (5)	62.0 (5)	65.0 (5)
Operation range	Cooling	Min.~Max.		°CDB	-5.0~43.0						
	Heating	Min.~Max.		°CWB	-20.0~15.5						
Refrigerant	Type				R-410A						
	GWP				2,087.5						
	Charge			TCO_2eq	12.3	12.5	13.2	21.5	21.7	24.4	24.6
				kg	5.9	6.0	6.3	10.3	10.4	11.7	11.8
Refrigerant oil	Type				Synthetic (ether) oil FVC68D						
Piping connections	Liquid	Type			Braze connection						
		OD		mm	9,52		12,7			15,9	
	Gas	Type			Braze connection						
		OD		mm	19.1	22.2	28.6				
	Total piping length	System	Actual	m	1,000 (6)						
Defrost method					Reversed cycle						
Safety devices	Item	01			High pressure switch						
		02			Fan driver overload protector						
		03			Inverter overload protector						
		04			PC board fuse						
		05			Leakage current detector						
PED	Category				Category II						
	Most critical part	Name			Accumulator						
		Ps*V		Bar*l	325			415		493	
Space cooling	A Condition (35°C - 27/19)	EERd			3.0	2.3	2.4	2.6	2.1	1.9	
		Pdc		kW	22.4	28.0	33.5	40.0	45.0	50.4	52.0
	B Condition (30°C - 27/19)	EERd			5.2	4.7	4.3	4.1	3.9	3.8	3.7
		Pdc		kW	16.5	20.6	24.7	29.5	33.2	37.1	38.3
	C Condition (25°C - 27/19)	EERd			9.5	8.3	7.7	7.8	7.7	7.5	7.3
		Pdc		kW	10.6	13.3	15.9	18.9	21.3	23.9	24.6
	D Condition (20°C - 27/19)	EERd			18.8	17.0	13.9	14.3	14.2	18.3	
		Pdc		kW	8.0	9.3	9.4	8.4	9.5	11.5	
Space cooling recommended combination 2	A Condition (35°C - 27/19)	EERd			2.6	2.4		2.6	2.1	1.9	
		Pdc		kW	22.4	28.0	33.5	40.0	45.0	50.4	52.0
	B Condition (30°C - 27/19)	EERd			4.9	4.7	4.0	4.1	3.8	3.7	3.6
		Pdc		kW	16.5	20.6	24.7	29.5	33.2	37.1	38.3
	C Condition (25°C - 27/19)	EERd			8.8	8.5	7.1	7.9	7.6	7.5	7.3
		Pdc		kW	10.6	13.3	15.9	18.9	21.3	23.9	24.6
	D Condition (20°C - 27/19)	EERd			15.1	17.2	13.1	14.0		18.1	18.9
		Pdc		kW	8.8	9.3	9.1	8.4	9.5	11.4	10.9
Space cooling recommended combination 3	A Condition (35°C - 27/19)	EERd			3.0	2.3	2.4	2.6	2.1	1.9	
		Pdc		kW	22.4	28.0	33.5	40.0	45.0	50.4	52.0
	B Condition (30°C - 27/19)	EERd			5.1	4.7	4.2	4.0	3.7		3.6
		Pdc		kW	16.5	20.6	24.7	29.5	33.2	37.1	38.3
	C Condition (25°C - 27/19)	EERd			9.6	8.4	7.7		7.4	7.6	7.3
		Pdc		kW	10.6	13.3	15.9	19.0	21.3	23.9	24.6
	D Condition (20°C - 27/19)	EERd			16.0	16.9	13.7	14.0	14.1	18.3	
		Pdc		kW	9.1	9.3	9.4	8.4	9.5	11.6	

4 SPECIFICATIONS

				PUZ-M200YKA.UK	PUZ-M250YKA.UK
OUTDOOR UNIT	Power supply (phase, cycle, voltage)			3 phase 50 Hz, 400 V	
		Max. current	A	22.5	
	External finish			Munsell 3Y 7.8/1.1	
	Refrigerant control			Linear Expansion Valve	
	Compressor			Hermetic	
		Model		AVB52FBAMT	
		Motor output	kW	3.8	
		Starter type		Inverter	
		Protection devices		HP switch Comp surface thermo Over current detection Thermal protector	
	Crankcase heater		W	—	
	Heat exchanger			Plate fin coil	
	Fan	Fan (drive) o No.		Propeller fan o 2	
		Fan motor output	kW	0.200 + 0.200	
		Airflow	m^3/min(CFM)	140 (4,940)	
	Defrost method			Reverse cycle	
	Sound pressure level	Cooling	dB	58	59
		Heating	dB	60	62
	Dimensions	W	mm (inch)	1,050 (41-5/16)	
		D	mm (inch)	330 + 40 (13+1-9/16)	
		H	mm (inch)	1,338 (52-11/16)	
	Weight		kg (lb)	129 (284)	138 (304)
	Refrigerant			R32	
		Charge	kg (lb)	5.6 (12.3)	6.8 (15.0)
		Oil (Model)	L	2.30 (FW68S)	
REFRIGERANT PIPING	Pipe size O.D.	Liquid	mm (inch)	9.52 (3/8)	12.7 (1/2)
		Gas	mm (inch)	25.4 (1)	25.4 (1)
	Connection method	Indoor side		Flared	
		Outdoor side		Flared & Brazing	
	Between the indoor & outdoor unit	Height difference		Maximum 30 m	
		Piping length		Maximum 70 m	

Air Conditioning | **Product Information**

Y Series Twin Fan
(12.5-22.4kW)
Mini VRF Heat Pump Outdoor Unit

R410A

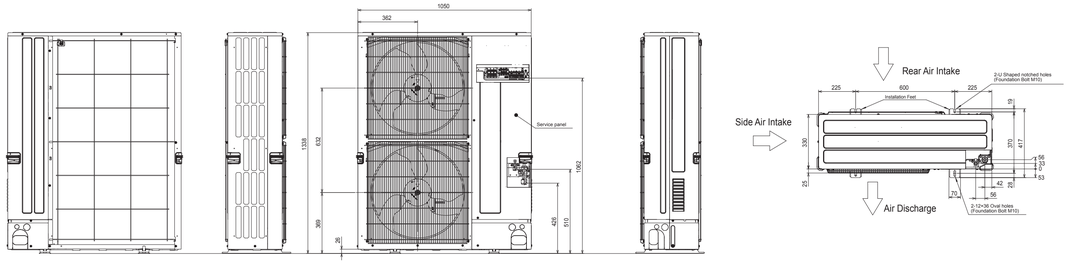
OUTDOOR UNITS		PUMY-P112VKM6	PUMY-P112YKM5 [3]	PUMY-P125VKM6	PUMY-P125YKM5 [3]	PUMY-P140VKM6	PUMY-P140YKM5 [3]	PUMY-P200YKM3 [3]
CAPACITY (kW)	Heating (nominal)	14.0	14.0	16.0	16.0	18.0	18.0	25.0
	Cooling (nominal)	12.5	12.5	14.0	14.0	15.5	15.5	22.4
	Heating (UK)	14.0	14.0	16.0	16.0	18.0	18.0	25.0
	Cooling (UK)	9.8	9.8	11.0	11.0	12.2	12.2	17.6
POWER INPUT (kW)	Heating (nominal)	3.49	3.49	4.06	4.06	4.63	4.63	5.85
	Cooling (nominal)	4.34	4.34	5.00	5.00	5.17	5.17	7.18
	Heating (UK)	4.48	4.48	5.22	5.22	5.95	5.95	7.52
	Cooling (UK)	2.08	2.08	2.39	2.39	2.47	2.47	3.43
COP / EER (nominal)		4.01 / 2.88	4.01 / 2.88	3.94 / 2.80	3.94 / 2.80	3.89 / 3.00	3.89 / 3.00	4.27 / 3.12
SCOP / SEER		-	-	-	-	-	-	-
MAX NO. OF CONNECTABLE INDOOR UNITS		9	9	10	10	12	12	12
MAX CONNECTABLE CAPACITY		50-130% OU Capacity	50-130% OU Capacity	50-130% OU Capacity	50-130% OU Capacity	50-130% OU Capacity	50-130% OU Capacity	50-130% OU Capacity
AIRFLOW (m^3/min)		110	110	110	110	110	110	141
PIPE SIZE mm (in)	Gas	15.88 (5/8")	15.88 (5/8")	15.88 (5/8")	15.88 (5/8")	15.88 (5/8")	15.88 (5/8")	19.05 (3/4")
	Liquid	9.52 (3/8")	9.52 (3/8")	9.52 (3/8")	9.52 (3/8")	9.52 (3/8")	9.52 (3/8")	9.52 (3/8")[2]
SOUND PRESSURE LEVEL (dBA)		49	49	50	50	51	51	57
SOUND POWER LEVEL (dBA)		69	69	70	70	71	71	76
WEIGHT (kg)		123	125	123	125	123	125	141
DIMENSIONS (mm)	Width	1050	1050	1050	1050	1050	1050	1050
	Depth	330+40	330+40	330+40	330+40	330+40	330+40	330+40
	Height	1338	1338	1338	1338	1338	1338	1338
ELECTRICAL SUPPLY		220-240v, 50Hz	380-415v, 50Hz	220-240v, 50Hz	380-415v, 50Hz	220-240v, 50Hz	380-415v, 50Hz	380-415v, 50Hz
PHASE		Single	Three	Single	Three	Single	Three	Three
STARTING CURRENT (A)		14	7	14	7	14	7	7
NOMINAL SYSTEM RUNNING CURRENT (A)	Heating / Cooling [MAX]	15.41 / 19.16 [29.5]	5.93 / 7.37 [13.0]	17.93 / 22.08 [29.5]	6.52 / 8.02 [13.0]	20.44 / 22.83 [29.5]	7.04 / 7.86 [13.0]	9.08 / 11.15 [19.0]
GUARANTEED OPERATING RANGE (ºC)	Heating / Cooling	-20~15 / -5~46	-20~15 / -5~46	-20~15 / -5~46	-20~15 / -5~46	-20~15 / -5~46	-20~15 / -5~46	-20~15 / -5~46
FUSE RATING (BS88) - HRC (A)		1 x 32	1 x 16	1 x 32	1 x 16	1 x 32	1 x 16	1 x 20
MAINS CABLE No. Cores		3	4 + earth	3	4 + earth	3	4 + earth	4 + earth
CHARGE REFRIGERANT (kg) / CO_2 EQUIVALENT (T) R410A (GWP 2088)		4.8 / 10.0	4.8 / 10.0	4.8 / 10.0	4.8 / 10.0	4.8 / 10.0	4.8 / 10.0	7.3 / 15.2
MAX ADDITIONAL REFRIGERANT (KG) / CO_2 EQUIVALENT (T) R410A (GWP 2088)		13.7 / 28.6	13.7 / 28.6	13.7 / 28.6	13.7 / 28.6	13.7 / 28.6	13.7 / 28.6	13.5 / 28.2

[3] Three Phase **Notes:** *1 12.7mm (1/2") if furthest length ≥ 60m.

PIPING RESTRICTIONS	PUMY-P112-140VKM6/YKM5	PUMY-P200YKM3
TOTAL PIPING LENGTH	300m max	150m max
FURTHEST PIPING LENGTH	150m max	80m max
FURTHEST PIPING LENGTH AFTER 1st BRANCH	30m max	30m max
BETWEEN INDOOR AND OUTDOOR UNITS - HEIGHT	50m max (40m max if outdoor installed below)	50m max (40m max if outdoor installed below)
BETWEEN INDOOR AND INDOOR UNITS - HEIGHT	15m max	15m max

PUMY-P112/125/140/200VKM5/YKM(5)(3) DIMENSIONS

REAR VIEW | SIDE VIEW | FRONT VIEW | SIDE VIEW | UPPER VIEW



DAIKIN

Outdoor details

Name	Model	CR	Cooling			Heating			Piping
			Tmp C	CC	Rq CC	Tmp H	HC	Rq HC	
		%	°C	kW	kW	°C (DBT/RH)	kW	kW	m
Out 3	REYQ8U	60.0	32.0	20.2	13.9	-4.0/100%	18.4	14.6	80.9

Name	Model	PS	MCA	MOP	RLA	FLA	WxHxD	Weight
			A	A	A	A	mm	kg
Out 3	REYQ8U	400V 3Nph	16.1	20.0	7.7	1.2	930 x 1,685 x 765	230.0
BS 1	BS6Q14AV1B	230V 1ph	0.6	15.0			580 x 298 x 430	28.0

Sound Data

Name	Model	Sound Power		Sound Pressure	
		Cooling	Heating	Cooling	Heating
		dBA	dBA	dBA	dBA
Out 3	REYQ8U	78	63	57	-

Seasonal Efficiency

Name	Model	$\eta_{s,h}$ heating	$\eta_{s,c}$ cooling	SCOP	SEER	CSPF
		%	%			
Out 3	REYQ8U	165.1	286.1	4.20	7.20	-

For more information go to: https://energylabel.daikin.eu/.

Refrigerant information

Name	Model	Refrigerant type	GWP	Base charge kg	Extra charge kg	TCO2 equivalent
Out 3	REYQ8U	R410A	2087.5	9.70	4.78	30.2

The system(s) contain fluorinated greenhouse gases.

The extra charge is calculated based on the pipe lengths specified. This may differ from the actual pipe lengths on site and therefore also from the real extra charge and the real TCO2 equivalent.

Out 3 - REYQ8U

Model	Quantity	Description
REYQ8U	1	REYQ-U (VRV IV)
BS6Q14AV1B	1	Branch selector unit
FXSQ20A	1	FXSQ-A - Concealed ceiling unit with medium ESP
FXSQ50A	2	FXSQ-A - Concealed ceiling unit with medium ESP
VAM250FC9	1	Heat reclaim ventilation
VAM800J8	1	
BRC1H52W	5	Remote controller (white)
KHFP26A100C	2	Pipe closing kit