



Azymuth Acoustics UK

Professional Acoustic Services

Noise Verification Report Ref: AA0461

Faulkner House

Manchester,

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On behalf of

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1.0 Introduction

This report sets out the results of noise verification measurements for the extract fan that has been installed at Faulkner House and addresses the pre-planning condition from the local planning authority (Manchester city council) namely:

a) Externally mounted ancillary 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 5dB (LAeq) below the typical background (LA90) level at the nearest noise sensitive location. Prior to commencement of the use hereby approved the scheme shall be submitted to and approved in writing by the City Council as local planning authority in order to secure a reduction in the level of noise emanating from the site. The scheme shall be implemented in full before the use commences or as otherwise agreed in writing by the City Council as local planning authority.

b) Prior to the operation of the scheme a verification report shall be submitted to and approved in writing by the City Council as local planning authority to validate that the work undertaken throughout the development conforms to the recommendations and requirements in the approved acoustic report. The report shall also undertake post completion testing to confirm that the noise criteria have been met. Any instances of nonconformity with the recommendations in the report shall be detailed along with any measures required to ensure compliance with the agreed noise criteria.

In response Azymuth Acoustics has carried out a noise assessment for Faulkner House at the pre-completion stage of the project. The noise verification presents the operational noise levels measured on the 24th January 2023 and a baseline noise survey carried out on the 18th and 25th of January 2023.

Azymuth Acoustics visited the site now that the extract and intake is operational (on 24th January 2023) and we have adjusted the standard kitchen extract noise spectrum to reflect the measured values from the site visit.

2.0 Baseline Assessment

2.1 Description of Baseline Noise Assessment

This environmental noise assessment is intended to provide information relating to potential noise levels affecting the site, in order to support the planning application for the kitchen. In particular, the baseline survey covers the following details:

- The results of a baseline noise survey undertaken in the vicinity of the proposed premises carried out on the 18th and 25th of January 2023
- Reasonable assessment criteria for the analysis of survey results

Measurement positions during the survey Azymuth Acoustics measured the baseline noise at 2 separate positions (shown in the figure below) in addition to the nearfield source measurement labelled S.



Figure 1 Shows the measurement positions 1-2-S and the site of the kitchen being outlined in green.



2.2 Results of Baseline Noise Survey

The following table summarises the results of the baseline noise measurements undertaken at the proposed site in terms of the average daytime (15:39 to 17:30 hours), evening (20:55 to 23:00) and night-time (after 23:00) statistical noise levels.

Pos	Period	L _{AFMax}	L _{Aeq}	L _{A10}	L _{A50}	L _{A90}
1	Day (15:39 - 17:30)	74.1	65.5	67.3	64.5	61.1
1	Evening (20:55-23:00)	NA	64	NA	NA	NA
1	Night (after 2300)	NA	65.6	NA	NA	NA
2	Day (15:39 - 17:30)	68.2	66.5	68.4	63.9	58.5
2	Evening (20:55-23:00)	NA	65	NA	NA	NA

Table 1 - Summary results from the baseline noise surveys carried out by AAUK

2.3 Description of Baseline Noise Climate

At the times of the noise measurements the noise climate was dominated by the road traffic noise coming from primarily New York Street and some of the side streets nearby such as Faulkner Street as well as more distant traffic on Portland Street.

Azymuth has also identified some loud extract fans in the area which were clearly audible. The precise locations of these off-site fans are unknown but bank house which facilitates multiple businesses could have roof extract which would be audible. In addition the nearby Piccadilly Plaza multi-storey car park is also likely to have fairly large extract fans.

3.0 Plant Noise (Verification) Measurements

3.1 Plant Noise Measurement Procedures

A site visit was carried out by Azymuth Acoustics on 25th January 2023 for the purpose of recording the noise levels at fixed position located at the top of a scissor lift so that the microphone was nominally 4m away from the kitchen extract plant and having a clear line of sight. The noise measurements were taken to establish an accurate representation of the kitchen extract fan noise levels present at site.

The instrumentation used for the noise survey consisted of a NTi XL2-TA type 1 precision sound level meter. The equipment was calibrated before and after the noise measurements. The sound level meter measured at A-weighted (fast response) noise levels as well as octave bands noise levels for all measurement records.

A single noise measurements position was measured and this is indicated in Figure 1 being labelled "S" Table 2 below summarises the measured noise levels for each position measured.

A BS 4142 assessment was then carried following the results gained from our measurements and Soundplan using predicted and recorded noise levels to assist the process.

3.2 Results of Noise Verification Measurements

The following table summarises the results of the noise measurements carried out positions S) and 2) in the vicinity of Faulkner House on 24th January 2023.

	Kitchen fan condition	Octave Band Centre Frequency (Hz)								dBA
		63	125	250	500	1000	2000	4000	8000	
S) on top of scissor lift facing kitchen extract grilles	ON	72.8	72.2	69.2	66.0	66.7	60.1	53.6	43.8	69.9
	OFF	72.9	79.3	69.9	65.9	67.6	60.1	54.3	44.9	71.1
2) at pavement level on Faulkner St	ON	73.0	70.2	67.5	65.4	65.5	59.4	54.0	47.2	68.9
	OFF	77.5	81.2	71.3	67.5	68.1	60.9	55.7	48.7	72.3

Table 2- Summary of measured noise levels around Faulkner House.

These noise measurements have been used to calculate the Sound Power Level for the Kitchen Extract system. The following table sets out the sound power level for the kitchen extract that was calculated by Azymuth Acoustics to be used as an accurate sound power spectrum for the kitchen extract fan which was previously assumed from a generic kitchen extract fan.

The sound from the Faulkner House extract system is continuous and based on the octave band noise levels and a subjective assessment of the character of the sound it would best be described as non-tonal and non-intermittent in nature. Therefore, it is not deemed appropriate to add penalties in BS4142.

	Octave Band Centre Frequency (Hz)								LwA
	63	125	250	500	1000	2000	4000	8000	
Calculated Kitchen Extract Sound Power Level	89.0	88.6	85.7	66.4	83.2	61.1	70.1	60.2	84.7

Table 3 - Octave band sound power level for the Faulkner House extract system

This octave band sound power spectrum has been fed into the SoundPlan model described below.

4.0 SoundPlan Noise Model

A SoundPlan noise model has been developed for the pre-planning stage noise assessment and this computer-based noise model has been updated to take account of the commissioning noise measurements set out above. All other noise model information remains valid from the previous assessment.

The Graphic below shows the output from the SoundPlan model in terms of the sound propagation in the vicinity of the Faulkner House site and the overall dBA levels at (single point) receiver locations placed where AAUK actually carried out the noise measurements (i.e., allowing the noise model to be “calibrated” against the noise measurements carried out on site).



Figure 1 - Grid noise map output from the SoundPlan noise model

The sound levels at the single point receivers located at Receiver S and Receiver 2 are carried over into the BS4142 and BS8233 noise assessments set out below.

5.0 BS4142 and BS8233 Assessment

The following table updates the BS 4142 noise assessment for the hotel receptors located at the Mercure Manchester Piccadilly Hotel (approx. 45m to the north east of the Faulkner House site). This receptor is deemed to be the nearest noise sensitive receptor. This assessment relies on the baseline noise data from the baseline measurements as a worst case on the basis.



Location	Results	Values	Commentary
Mercure Manchester Piccadilly Hotel	Noise level @ 1m from the atmosphere connection	$L_{Aeq} = 77\text{dBA}$	Measured extract fan as reported above
	Residual Sound Level	$L_{Aeq, 5\text{mins}} = 65$	Average taken from evening (up to 2300h) measurements
	Background Sound Level	$L_{A90, 5\text{mins}} = 58$	Average background sound level from evening (up to 2300h) measurements
	Estimated Sound Level @ 45 metres from source	$L_{Aeq} = 46\text{dB}$	Taken from the SoundPlan calculations based upon source data
	Acoustic feature correction	+ 0 dB	The sound is purely speculative at present, and as such the required correction cannot be determined. It is assumed the sound will not be tonal nor impulsive
	Rating Level	$(46 + 0) = 46\text{ dB}$	As above
	Background Sound Level	$L_{A90, 5\text{mins}} = 58\text{dB}$	
	Excess of rating over background sound level	$(46 - 58)\text{ dB} = -12\text{dB}$	As per clause 11 of BS4142
	Assessment indicates no adverse impact		The excess of the rating level over the background sound level is showing a negative result. This indicates that there will be no adverse noise impact.

Table 4 - BS4142 noise assessment for the residential receptors at the Mercure Manchester Piccadilly Hotel



6.0 Summary / Conclusions

Azymuth Acoustics have carried out a noise verification survey for the kitchen extract system located at ground floor of Faulkner House. The results of the verification survey confirm that the noise level at 5m from kitchen extract system is ≤ 60 dBA.

The resulting sound level at the nearest noise sensitive receptor is 46 dBA and this is 12 dB below the typical background noise level at this location, ie fully compliant with the local authority requirements.



Appendix A – Full Results of Noise Surveys

Pos	Time	Octave Band Centre Frequency (Hz)									dBA
		63	125	250	500	1000	2000	4000	8000	16000	
1	20:52	67.7	64.7	60.9	59.8	58.6	54.0	46.2	37.6	27.0	62.6
1	20:55	67.8	65.7	62.5	60.3	59.3	56.1	48.7	40.5	28.7	63.7
1	21:00	71.0	72.2	69.2	68.4	66.0	61.1	54.9	47.0	39.0	70.4
1	21:05	71.9	73.5	69.8	68.7	67.2	61.9	54.6	44.6	34.0	71.2
1	21:10	71.6	71.1	67.4	64.9	64.0	58.4	50.8	43.1	37.5	67.9
1	21:15	68.5	68.4	64.0	62.1	61.1	55.5	49.1	42.8	34.8	65.0
1	21:20	64.6	64.0	59.7	58.5	59.1	52.3	49.1	41.5	26.3	62.2
2	21:20	68.2	66.2	63.6	62.0	60.5	56.7	48.5	40.3	29.2	64.8
2	21:25	66.9	64.7	60.8	60.8	59.4	54.5	46.1	35.4	26.2	63.2
2	21:30	65.6	65.1	60.9	60.5	60.5	54.4	45.3	35.8	22.1	63.6
2	21:35	74.8	70.7	66.0	63.6	60.6	56.2	49.9	41.0	31.0	65.8
2	21:40	66.0	64.7	61.7	60.5	58.7	53.8	45.1	37.2	23.8	62.8
2	21:45	67.2	64.6	61.7	60.6	59.3	54.0	48.4	46.6	42.1	63.3
2	21:50	65.1	65.2	62.0	61.7	61.0	56.2	47.0	34.3	21.6	64.6
1	21:51	65.6	64.6	61.6	59.0	57.9	52.9	45.6	39.4	32.5	62.0
1	21:55	66.3	62.5	58.0	56.9	57.1	51.1	42.5	33.4	25.1	60.3
1	22:00	63.1	61.7	57.7	56.8	56.5	51.2	41.5	30.7	21.5	60.0
1	22:05	63.9	61.8	57.9	56.8	55.0	54.7	55.2	53.7	47.8	62.2
1	22:10	66.7	63.8	58.9	58.8	58.0	53.6	42.2	33.9	23.2	61.8
1	22:12	66.8	67.9	65.3	62.6	60.4	55.6	49.9	44.4	36.1	65.1
1	22:15	66.0	67.0	64.1	61.2	60.9	54.4	46.4	38.7	23.4	64.4
1	22:16	68.0	68.3	64.9	61.4	58.6	54.4	48.7	51.5	44.7	64.1
1	22:20	66.9	66.4	63.4	61.4	60.7	55.9	49.1	41.1	32.3	64.6
1	22:25	66.3	64.5	62.6	61.4	58.4	54.7	46.8	34.6	21.3	63.3
2	22:27	80.2	72.6	65.9	64.2	64.6	59.4	50.6	41.8	35.1	68.2
2	22:30	66.5	67.0	64.6	63.2	63.8	57.6	47.6	36.5	22.2	66.8
2	22:35	66.6	68.0	65.7	64.2	63.9	57.1	48.7	39.3	24.7	67.1
2	22:40	67.8	67.4	65.2	62.9	62.9	56.3	47.9	37.3	23.0	66.2
2	22:45	66.9	67.2	65.1	63.2	63.4	56.4	47.7	37.4	31.4	66.4
2	22:50	66.4	66.8	64.5	62.5	62.0	56.1	47.7	38.7	22.9	65.5
2	22:55	68.9	66.5	64.8	62.8	62.4	56.9	48.4	39.0	25.1	66.0
2	23:00	68.8	66.9	64.6	62.8	62.4	56.7	48.7	40.4	27.4	65.9
2	23:05	62.1	62.9	59.8	58.2	57.4	51.9	47.7	44.7	39.2	61.3
1	23:05	65.2	65.6	62.3	61.1	58.3	53.2	47.4	41.2	35.0	63.0
1	23:10	68.9	66.5	63.6	61.5	61.2	54.7	47.5	39.7	34.7	64.6
1	23:15	66.4	67.1	64.3	62.3	63.5	55.9	47.2	38.9	22.5	66.1
1	23:20	68.9	67.2	64.7	63.1	64.3	58.6	61.5	42.3	34.9	68.4
1	23:25	66.0	66.9	63.7	62.3	63.7	57.2	47.9	37.3	24.7	66.4
1	23:30	65.6	66.6	64.4	62.7	63.6	57.7	47.9	38.1	27.1	66.6
1	23:35	66.2	66.1	64.0	61.9	61.7	55.5	48.4	40.0	31.8	65.1
1	23:40	67.3	65.8	64.9	62.2	60.8	55.3	49.4	43.5	36.5	64.9
1	23:45	67.8	65.9	64.7	62.4	61.3	56.9	49.5	39.6	25.7	65.4
1	22:50	71.7	66.5	65.9	63.4	62.3	58.3	52.2	42.0	27.5	66.6

Table A1 – Baseline noise survey 18th January 2023



Pos	Time	LAFmax	LAeq	LAF10	LAF50	LAF90
1	15:39	60.9	59.2	59.9	59.1	58.3
1	15:40	74.8	64.6	67.1	63.3	60.2
1	15:45	80	65.7	67.9	65.5	60.1
1	15:50	75.8	65.7	68.4	64.5	60.5
1	15:55	71.2	66	68.5	65.3	62.3
1	16:00	71.4	65.3	67.3	65.1	61.6
1	16:05	72.9	65.4	67.4	64.8	61.9
1	16:10	75	66.1	68.9	65.3	60.4
1	16:15	78.3	66.6	68.4	66.1	62.1
1	16:19	74	66.7	69.8	64.7	62.1
1	16:20	78.3	66.7	69	66	62.3
1	16:25	86.4	66.3	68.3	65.4	61.7
1	16:30	64.2	62.9	63.8	62.8	61.2
2	16:37	84	66.7	69.4	65.6	60.2
2	16:40	77.3	64.8	67.6	62.9	59.6
2	16:45	79.2	64.3	67.2	63.5	64.3
2	16:50	67.6	65.5	66.6	65.4	62.8
2	16:50	72.7	66.5	69.1	66.1	60
2	16:55	76.6	65.9	69.3	63.5	55.5
2	17:00	88.6	65.4	68.1	63.2	56.7
2	17:05	91.8	67.6	70	65.9	58.5
2	17:10	75.1	65.8	69.3	64.5	56.5
2	17:15	79.9	68.4	71.6	65.2	56.1
2	17:20	78.2	65.5	68.3	62.9	58
2	17:25	86.3	70.9	74.7	64.8	57.6
2	17:30	59.4	57.1	58	57.3	54.6

Table A2 – Base line noise survey 25th January 2023



Pos	Fan ON/off	Octave Band Centre Frequency (Hz)									dBA
		63	125	250	500	1000	2000	4000	8000	16000	
Roof level	on	70.4	69.2	67.7	65.7	65.9	58.3	50.6	39.5	26.4	68.9
Roof level	on	71.0	71.2	69.1	65.8	66.6	59.7	53.0	42.2	31.7	69.7
Roof level	on	72.4	71.0	69.1	65.8	66.9	60.2	53.6	43.8	31.0	70.0
Roof level	on	73.1	71.4	68.4	65.1	67.6	61.1	55.2	45.6	31.2	70.3
Roof level	on	71.4	71.1	69.3	66.0	66.1	60.1	53.7	43.2	33.5	69.6
Roof level	on	72.5	71.3	69.8	66.5	67.4	60.0	54.0	45.7	32.5	70.4
Roof level	on	75.0	73.6	70.9	67.3	69.3	63.1	57.1	46.7	32.5	72.3
Roof level	off	72.4	78.8	70.2	66.1	67.7	60.0	53.7	43.8	28.2	71.1
Roof level	off	71.7	79.7	69.9	66.1	66.5	59.7	54.5	45.1	30.1	70.7
Roof level	off	75.4	79.6	70.1	66.2	66.8	60.6	55.6	47.2	34.2	71.0
Roof level	off	73.1	79.1	69.3	65.8	68.5	60.7	54.4	45.0	30.7	71.5
Roof level	off	72.0	79.3	70.0	65.5	68.3	59.5	53.3	43.4	28.9	71.3
Roof level	on	75.0	72.5	69.2	66.0	67.0	61.7	57.4	50.0	42.1	70.5
Roof level	on	72.1	72.4	69.5	65.7	65.6	59.3	51.9	41.9	29.2	69.3
Roof level	on	71.9	72.3	69.4	65.7	65.5	59.5	52.2	42.6	29.3	69.2
Roof level	on	78.5	73.3	69.4	66.3	66.7	60.6	53.5	44.4	30.9	70.2
Roof level	on	74.3	73.0	69.1	66.2	67.0	61.0	54.2	44.8	34.7	70.3
Roof level	on	71.8	73.3	69.4	67.4	66.7	59.6	52.9	43.6	32.1	70.2
Roof level	on	75.4	73.0	68.7	65.8	66.2	59.2	52.2	41.1	26.6	69.5
2	on	72.1	70.6	66.5	64.7	65.7	58.5	51.2	43.4	32.7	68.6
2	on	77.2	70.8	67.5	65.8	65.9	59.2	54.0	46.9	35.3	69.2
2	on	73.7	71.0	67.5	65.4	66.0	59.2	53.0	44.9	32.8	69.1
2	on	72.2	71.0	68.4	66.3	66.0	59.0	53.0	44.8	32.0	69.4
2	on	71.7	70.4	68.4	65.2	65.8	58.4	51.4	43.7	34.4	68.9
2	on	70.9	67.5	66.4	65.1	63.4	62.1	61.4	59.4	61.7	69.6
2	off	72.7	81.1	69.7	65.6	66.1	59.1	53.4	44.4	28.6	70.6
2	off	76.9	81.6	70.0	66.5	67.6	61.1	55.2	50.2	42.9	71.8
2	off	75.7	81.6	70.1	66.5	67.2	60.1	54.8	45.9	31.4	71.5
2	off	78.5	81.4	70.5	66.4	68.8	60.8	55.6	53.2	35.7	72.3
2	off	78.5	81.8	70.5	66.1	68.1	59.5	54.2	45.3	32.9	71.9
2	off	77.7	81.6	71.3	67.3	67.6	60.5	56.6	48.8	37.6	72.1
2	off	82.3	79.6	77.1	73.9	71.3	65.4	60.1	53.4	42.9	76.1

Table A3 - Near-field noise measurements with kitchen extract on/off 24th January 2023

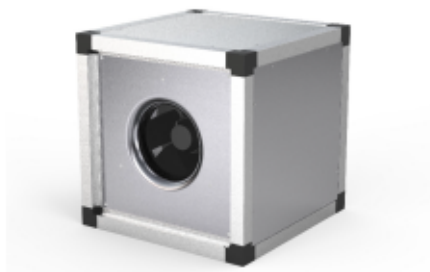
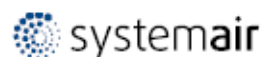
[illegible]



MUB 042 500D4 Multibox

Article Number: 235396

Variant : 400V 3~ 50Hz - 90° air flow



Description

- High efficient motor
- Speed-controllable via frequency converter
- Integral cold conductor (PTC)
- Low sound level
- Flexible airflow direction due to removable panels
- Installation in any mounting position
- Easy to maintain and reliable

The MUB fan are equipped with high efficient motors. The MUB fans have an impeller with backward curved blades, manufactured from aluminum. Speed control is only possible by using a frequency converter. Motor protection is done by cold conductors (PTC), which have to be connected to an external motor protection device. The casing consists of an aluminum frame with fiberglass reinforced plastic.

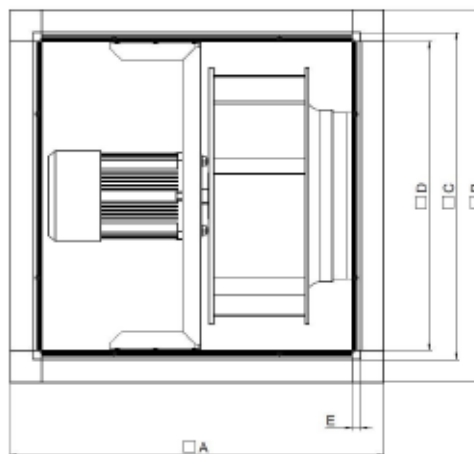
Find more details in our online catalogue

Technical parameters

Nominal data	
Voltage (nominal)	400 V
Frequency	50 Hz
Phase(s)	3~
Input power	1,454 W
Input current	3.01 A
Impeller speed	1,454 rpm
Air flow	max 2,214 m³/s
Temperature of transported air	max 40 °C
Max temperature of transported air, when speed controlled	40 °C
Protection/Classification	
Enclosure class, motor	IP55
Insulation class	F
Data according to ErP	
ErP ready	ErP 2016, ErP 2018
Dimensions and weights	
Weight	64.5 kg
Others	
Motor type	AC

Dimension

MUB 042	□A	□B	□C	□D	E
400/450/500	690	690	590	548	21

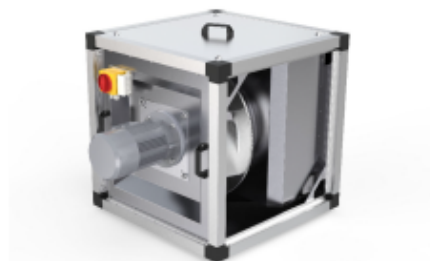
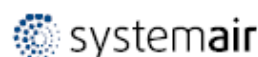




MUB/T-S 062 560D4

Article Number: 235448

Variant : 400V 3~ 50Hz



Description

- Inline airflow direction
- Up to 120°C medium temperature, continuous operation
- use, e.g. for kitchen exhaust air
- Pre-mounted Isolator is standard
- Low sound level
- High efficient motors
- Integral cold conductor (PTC)
- Easy to maintain and reliable
- Motor outside the air stream

All MUB/T-S fans have new optimized and high efficient HD impellers with backward curved blades, manufactured from aluminium. The fans are equipped with IEC standard motors outside the air stream. Optimum motor protection by cold conductors (PTC) to be connected to an external motor protection device. The casing consists...

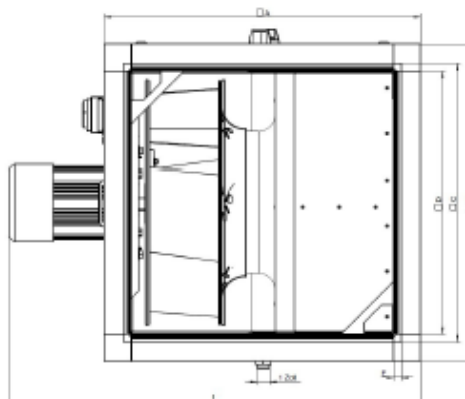
Find more details in our online catalogue

Technical parameters

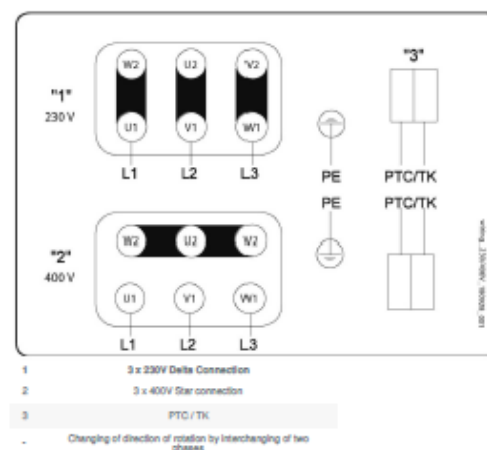
Nominal data	
Voltage (nominal)	400 V
Frequency	50 Hz
Phase(s)	3~
Input power	3,093 W
Input current	5,47 A
Impeller speed	1,453 rpm
Air flow	max 3.575 m³/s
Temperature of transported air	max 120 °C
Max temperature of transported air, when speed controlled	120 °C
Protection/Classification	
Enclosure class, motor	IP55
Insulation class	F
Dimensions and weights	
Weight	108.5 kg
Others	
Motor type	AC

Dimension

MUB/T-S	αA	αB	αC	αD	E	I
062	820	820	720	670	21	1070
560D4 IE3						



Wiring





Attenuators

t: 01384 275800
f: 01384 275810
e: bs@eltafans.co.uk
visit: eltaselect.com



AXIAL



MIXED FLOW



CENTRIFUGAL



ROOF



BIFURCATED



DE-STRATIFICATION



ATEX



SMOKE



CIRCULATING



WINDOW / WALL



HEAT RECOVERY



ATTENUATORS

CONTROLS