

PEAK acoustics

Noise Assessment Report

Rev. 0 01/07/2019

Noise Impact Assessment

Project Reference Number: PA855

Report Reference Number: NM1503191NR

Assessment Standards: BS4142:2014

Client: Tom Lewis

Site: Carhartt WIP, 59 – 61 Oldham Street, Manchester, M1 1JR

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Project Information

Peak Acoustics have been commissioned to undertake the assessment detailed within this report. Below is a summary of pre-commencement requirements and comments as communicated to Peak Acoustics by involved parties, this information forms the basis of the assessment and report.

Client Contact	Tom Lewis
Client Requirement	A Condenser unit has been installed at Carhartt WIP, 59-61 Oldham Street, Manchester M1 1JR. A Noise Assessment is required to accompany the retrospective planning application in order to identify and assess the potential for adverse noise impacts upon nearby residential Noise Sensitive Receptors (NSRs).
Site details as communicated by client.	Times of operation are during opening hours which run from 10:00 – 18:00 on Monday – Saturday, and 12:00 – 17:00 Sunday.
Selected Methodology	BS4142:2014 – *Methods for rating and assessing industrial and commercial sound* is a recognised standard for assessing the noise impact of fixed plant machinery via relation of noise emissions to current background noise levels.

Assessment Summary

A Noise Assessment is required to accompany the retrospective planning application for a newly installed condenser unit, in order to identify and assess the potential for adverse noise impacts upon nearby residential Noise Sensitive Receptors (NSRs).

Environmental noise levels were measured on site during two attended periods to gain the lowest background noise levels representative of the nearest Noise Sensitive Receptor. These were between 09:00 and 10:00, the hour before the store opens; and 18:00 – 19:00, the hour just after the store closes. The representative daytime background level measured was 62.3 dB $L_{A90,1hour}$.

Initial calculations to determine the noise impact has demonstrated that noise levels produced by the condenser unit are predicted to be 5 dB below the background noise level at the nearest NSR during operational hours, resulting in an indication of a low impact at the NSR location when assessed in accordance with BS4142:2014. Therefore, no additional mitigation measures are deemed necessary.

1. Proposed Noise Source

1.1 A condenser unit has been installed at Carhartt WIP, 59-61 Oldham Street, Manchester M1 1JR.

1.2 Manufacturer's noise data for the proposed unit (1 x Toshiba RAV-SM2804AT8-E) is shown in **Appendix H**.

2. Subjective Impressions

2.1 The residual noise climate at the NSR location is dominated by road traffic noise from Oldham Street whereby sources including engine noise and brake pad noise from passing cars and buses were dominant. Other dominant noise sources were heavy foot flow of pedestrians and talking, shouting and laughing were also noted.

2.2 Secondary noise sources were noted as intermittent distant traffic and distant sirens and music.

3. Site & NSR Location

3.1 The nearest NSR has been identified as the neighbouring residential dwelling, 75 Richmond Road, as shown in Figure 1 below. The location of the condenser unit is shown in Figure 2 on Page 7.

Figure 1: Site Plan



Background Measurement Location (attended near front façade)

Carhartt Store (Ground Level)

Figure 2: Proposed Plant Location



Plant Location

4. Measurement Equipment

4.1 Measurements were undertaken using a calibrated class 1 sound level meter. Full equipment details can be found in **Appendix B**.

4.2 The calibrator reference level was 114.0dB. Full calibration details can be found in **Appendix D**.

5. Weather Conditions

5.1 Wind speeds of 4 – 5 m/s SSW and temperatures of 11 °C – 14 °C were recorded on site. Meteorological conditions are detailed in **Appendix C**.

6. Measurement Procedure

6.1 Noise measurements were undertaken during two attended periods between 09:00 – 10:00 and 18:00 – 19:00 on 4th June 2019.

6.2 The microphone was placed approximately 1.6m from ground level and 1m away from the nearest façade as shown in **Figure 1**, at a position deemed to be representative of the noise climate at the Noise Sensitive Receptor.

6.3 Measurements of L_{A90} were logged in 30 second intervals. Measured noise levels are shown in **Appendix F**.

7. Background Sound Level

7.1 As the condenser unit will only operate during the opening times of the store, the assessment will consider daytime criteria only.

7.2 The background sound level measured during the attended periods on site are shown below. The results are also shown in **Appendix F**.

Table 1: Measured Background Sound Levels

Time period	Background LA_{90}, dB
09:00 – 10:00	62.3
18:00 – 19:00	62.6

*The lowest background sound level measured will be used for the assessment.

8. Specific Sound Level

8.1 The specific sound level is the A-weighted equivalent noise level at the NSR location over the reference time period.

8.2 The specific sound level is calculated as 48.5 dB $L_{Aeq, T}$ Calculations are shown in **Appendix E**.

9. Rating Level

9.1 The specific sound level may be corrected for certain characteristics that make a sound more noticeable at the NSR location.

9.2 As the background noise level was 62.3 dB, 14dB higher than the Specific Noise Level, noise emissions are considered unlikely to be perceptible at the NSR location. Therefore, no penalties have been applied.

9.3 The resultant sound Rating Level is tabulated below:

Table 2: Sound Rating Level

Specific Sound Level, dB L_{As}	Penalty, dB	Rating Level, dB L_{Ar}
48.5	0	48.5

10. Rating Level vs Background Sound Level

10.1 The Rating Level is to be compared to the background sound level to determine the resultant noise impact in accordance with BS4142:2014.

A Sound Rating Level at or below the background noise level is indicative of a *Low Impact depending on the context*;

A Sound Rating Level that exceeds the background noise level by around + 5dB is likely an *indication of Adverse Impact, depending on the context*;

A Sound Rating Level that exceeds the background noise level by around + 10dB is likely an *indication of Significant Adverse Impact, depending on the context*;

10.2 The resulting noise impact is tabulated below:

Table 3: Noise Impact

Rating, dB L_{Ar}	Background, dB L_{A90}	Difference, dB	Impact
48.5	62	-13.8	*Low Impact*

10.3 The Rating Level of the installed condenser unit is below above the representative background noise level by 13.8 dB, which indicates a *Low Impact* in accordance with BS4142:2014.

10.4 No significant contextual factors have been identified which would alter the initial estimation of the noise impact indicated by the relationship of the Rating Level against the Background Sound Level.

10.5 Therefore, no mitigation for reducing the noise impact is deemed necessary.

11. Conclusion

11.1 A noise impact assessment has been conducted for the operation of a condenser unit at Carhartt WIP, 59-61 Oldham Street, Manchester M1 1JR.

11.2 Noise levels generated by the unit are 14 dB below the corresponding existing background noise level at the nearest NSR, indicative of a *Low Impact* when assessed using BS4142:2014.

11.3 It is considered that noise generated by operation of the condenser unit would be unlikely to give rise to adverse noise impacts upon nearby residents, and mitigation measures are not deemed necessary.

12. Uncertainty

12.1 The monitoring equipment is subject to a 1dB error margin, however calibration before and after measurements allows the drift within the margin to be monitored and thus demonstrates that minimal drift occurred throughout the measurements.

12.2 Uncertainty can arise when predicting noise levels using manufacturer data, however this is an acceptable method in accordance to BS 4142:2104. Uncertainty in this regard has been offset by assuming within the calculations that the unit is operating at maximum capacity all of the time; this is representative of a worst-case scenario. In practice, the condenser unit is likely to operate at different fan speeds due to change in temperature for much of the time.

12.3 Uncertainty is offset by assessing noise levels to the lowest representative background noise level. Periods whereby background noise levels are higher would result in a decreased noise impact.

Appendix A - Measurement Details					
Measurement	Kit	Start Date	Start Time	End Date	End Time
M1	A1	04/06/19	09:00	04/06/19	10:00
M2	A1	04/06/19	18:00	04/06/19	19:00

Appendix B - Equipment Details					
Kit	Equipment	Make	Model	Class	Serial Number
A1	Sound Meter	Svantek	958	1	34525
A1	Pre-Amp	Svantek	SV12L	1	41651
A1	Calibrator	Svantek	SV31	1	90273

Appendix C - Meteorology Details						
Measurement Date	Temp C	Wind Speed m/s	Wind Direction	Humidity %	Precipitation mm	Cloud Cover (Oktas)
04th June (Start of Surveys)	11	4 – 5	SSW	84	0	8/8
04th June (End of Surveys)	14	4 – 5	SW	62	0	8/8

Appendix D - Calibration Details					
Measurement	Calibrator Ref Level (dB)	Level Before (dB)	Deviation Before (dB)	Level After (dB)	Deviation After (dB)
M1	114.0	114.0	0.0	113.7	0.3
M2	114.0	113.9	0.1	114.5	-0.5

Appendix E – BS4142:2014 Calculations

Specific & Rating Level Calculations:

						BS 4142 Corrections				
Source	Sound Pressure Level	r1	r2	Level at NSR	Tonal'y	Impuls'y	Inter'y	Lr	BG	Difference
	LpA dB	*m*	*m*	*dB*	*dB*	dB	dB	LAr	*dB*	*dB*
Toshiba RAV-SM2804AT8-E	58	1	3	48.5	0	0	0	48.5	62.3	-13.8
							Total:	48.5	62.3	-13.8

$$SSL = L_p + (20 * LOG(\frac{r1}{r2})$$

SSL = Specific Sound Level

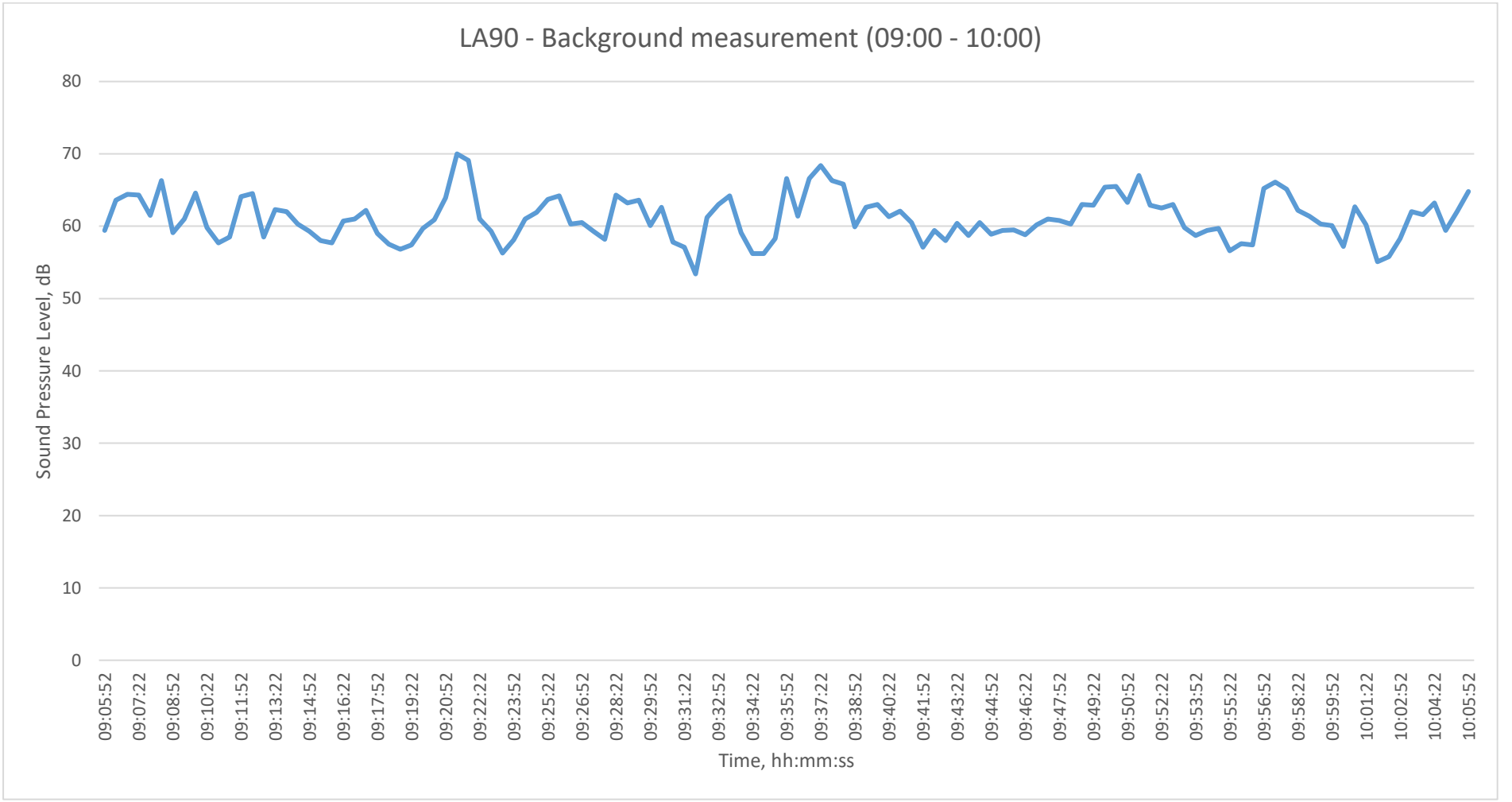
L_p = Sound Pressure Level

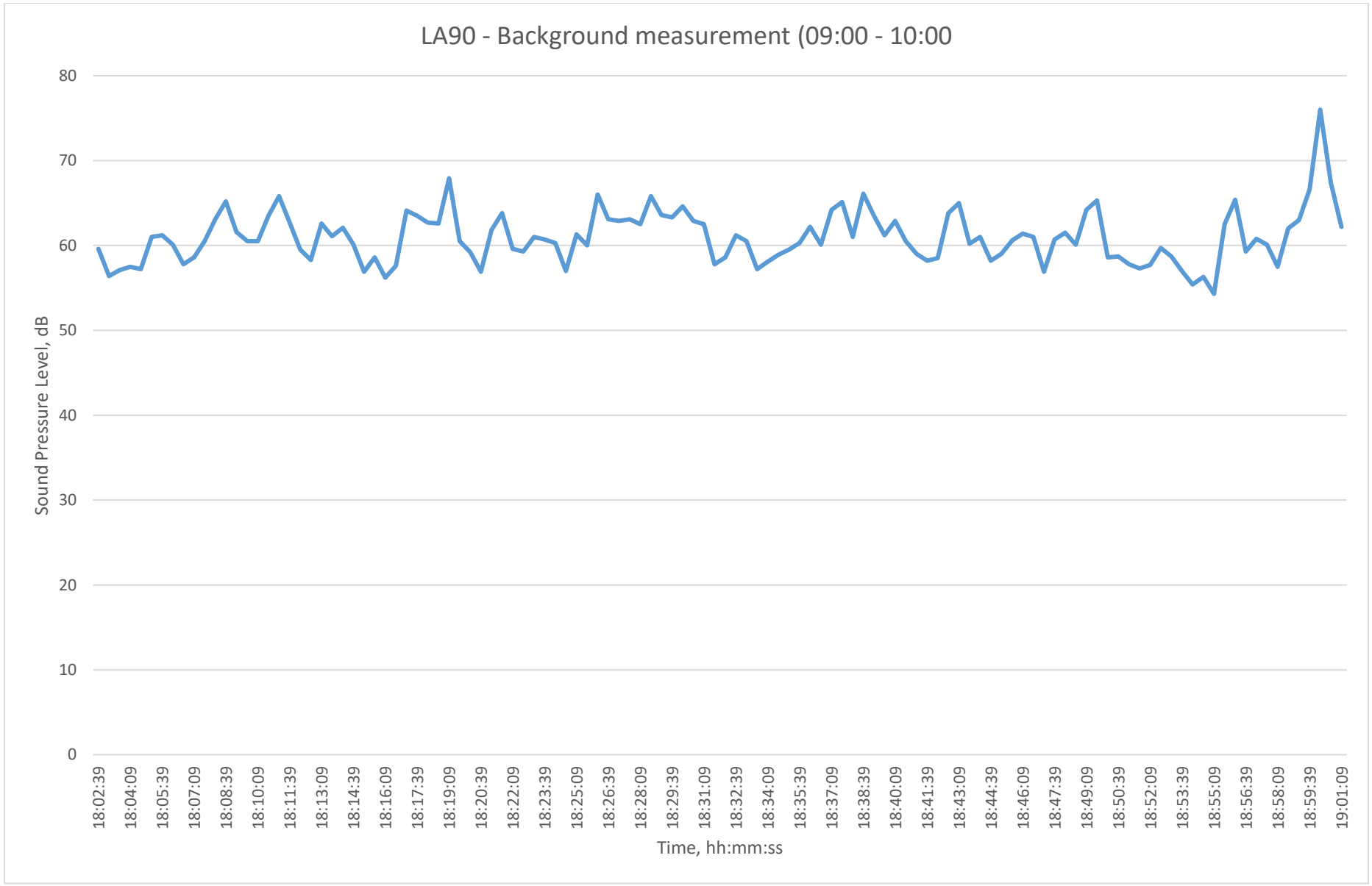
r1 = Distance from Source

r2 = Distance from NSR

Appendix F – Background Sound Level Measurements

Measured Background Noise Levels, 4th June 2019




LA90 - Background measurement (09:00 - 10:00
Sound Pressure Level, dB
80
70
60
50
40
30
20
10
0
18:02:39
18:04:09
18:05:39
18:07:09
18:08:39
18:10:09
18:11:39
18:13:09
18:14:39
18:16:09
18:17:39
18:19:09
18:20:39
18:22:09
18:23:39
18:25:09
18:26:39
18:28:09
18:29:39
18:31:09
18:32:39
18:34:09
18:35:39
18:37:09
18:38:39
18:40:09
18:41:39
18:43:09
18:44:39
18:46:09
18:47:39
18:49:09
18:50:39
18:52:09
18:53:39
18:55:09
18:56:39
18:58:09
18:59:39
19:01:09
Time, hh:mm:ss

Appendix G – Plans and Technical Data sheets

Toshiba RAV-SM2804AT8-E

	HVAC systems						Indoor Spec						Outdoor Spec				
Location	Manufacturer	Indoor Model	Ref	Outdoor Model	Ref	Duty	Pipe sizes	Style	Dim's H/W/D	Weight	Phase	Fuse	Pipe sizes	Dim's H/W/D	Weight	Phase	Fuse
Sales Floor	Toshiba	2No RAV-SM1404UTP-E	AC1-2	RAV-SM2804AT8-E	CU1	25kw	5/8" x 3/8"	Cassette	350/840/840	24kg	1	6amp	1-1/8" x 1/2"	1540x900x320	134kg	3	20amp
Sales Floor	Toshiba	VN-1000HE	HRU1	N/A	N/A	1000M3/h	250 Dia	Void	1189x1189x400	70kg	1	10amp	N/A	N/A	N/A	N/A	N/A

RAV Twin-Split Inverters 26

TOSHIBA Leading Innovation

DIGITAL INVERTER



RAV Twin-Split Digital Inverter - Compact Cassette and 4-Way Cassette

System Retail Price*	£2,321	£2,701	£3,076	£3,112	£3,549	£3,974	£5,018	£5,328
	Compact Cassette - Twin			4-Way Cassette - Twin				
Indoor Unit (ID) 1	RAV-SM304MUT-E	RAV-SM404MUT-E	RAV-SM564MUT-E	RAV-SM564UTP-E	RAV-SM804UTP-E	RAV-SM804UTP-E	RAV-SM1104UTP-E	RAV-SM1404UTP-E
Indoor Unit (ID) 2	RAV-SM304MUT-E	RAV-SM404MUT-E	RAV-SM564MUT-E	RAV-SM564UTP-E	RAV-SM804UTP-E	RAV-SM804UTP-E	RAV-SM1104UTP-E	RAV-SM1404UTP-E
Outdoor Unit (OD)	RAV-SM564ATP-E	RAV-SM804ATP-E	RAV-SM1104ATP-E	RAV-SM1104ATP-E	RAV-SM1404ATP-E	RAV-SM1603AT-E	RAV-SM2244AT8-E	RAV-SM2804AT8-E
Nominal Cooling Capacity, kW	5.0	6.7	10.0	10.0	12.0	14.0	20.0	23.0
Nominal Heating Capacity, kW	5.3	7.7	11.2	11.2	12.8	16.0	22.4	27.0
SEER/SCOP - Energy Rating	5.48/4.16 - A/A+	5.81/4.05 - A+/A+	5.04/4.17 - B/A+	5.72/4.28 - A+/A+	5.25/4.19 - A/A+	5.47/4.47 - A/A+	5.01/4.79 - B/A++	5.15/4.55 - A/A+
Sound Pressure ID - OD**, dB(A)	40/36/31 - 46/48	40/36/31 - 48/52	43/39/34 - 53/54	32/29/28 - 53/54	35/31/28 - 54/55	35/31/28 - 51/53	43/38/33 - 56/57	44/38/34 - 57/58
Dimensions - ID (H x W x D), mm	268 x 575 x 575	268 x 575 x 575	268 x 575 x 575	256 x 840 x 840	256 x 840 x 840	256 x 840 x 840	319 x 840 x 840	319 x 840 x 840
Dimensions - OD (H x W x D), mm	550 x 780 x 290	550 x 780 x 290	890 x 900 x 320	890 x 900 x 320	890 x 900 x 320	1340 x 900 x 320	1540 x 900 x 320	1540 x 900 x 320
Weight ID - OD, kg	16 - 33	17 - 44	17 - 68	20 - 68	20 - 68	20 - 99	24 - 134	24 - 134
Power Supply OD - ID cable***	16 A/1 ph - 3 core + earth	16 A/1 ph - 3 core + earth	20 A/1 ph - 3 core + earth	20 A/1 ph - 3 core + earth	32 A/1 ph - 3 core + earth	32 A/1 ph - 3 core + earth	16 A/3 ph - 3 core + earth	20 A/3 ph - 3 core + earth
R410A Pipe Sizes, Gas - Liquid, mm (inch)****	12.7 (1/2) - 6.4 (1/4)	15.9 (5/8) - 9.5 (3/8)	15.9 (5/8) - 9.5 (3/8)	15.9 (5/8) - 9.5 (3/8)	15.9 (5/8) - 9.5 (3/8)	15.9 (5/8) - 9.5 (3/8)	28.6 (1-1/8) - 12.7 (1/2)	28.6 (1-1/8) - 12.7 (1/2)
R410A Pipe Min./Max. Length - Height, m****	5/30 - 30	5/30 - 30	5/50 - 30	5/50 - 30	5/50 - 30	5/50 - 30	7.5/70 - 30	7.5/70 - 30
R410A Charge Length, m (kg) - Addition, g/m****	22 (1.1) - 20	22 (1.7) - 40	32 (2.8) - 40	32 (2.8) - 40	32 (2.8) - 40	32 (3.1) - 40	32 (5.9) - 80	32 (5.9) - 80

* RBC-AMT32E (£52) standard remote controller included in system price. Branch kit RBC-TWP101E (£162) is not included in the system price, alternative pipe connectors can be obtained locally
** Figures given for the Indoor Unit are at high/medium/low fan speeds, and for the Outdoor Unit for cooling/heating
*** Power cable from Header Indoor to Follower Indoor = 2 core + earth
**** Please refer to installation manual for piping distances for minimum/maximum piping lengths to branch joint and Indoor Unit separations

PEAK acoustics



Let us introduce ourselves

Peak Acoustics formed in 2011, we are a fully accredited specialist consultancy and testing organisation.

We are a diverse team of Acoustic Consultants, Specialist Engineers and Building Compliance Technicians, with a network spanning the UK. We are proud to offer our services nationally, with no job too big or small.

We provide Acoustic Consultancy, Building Compliance Testing and Energy Services.

Additional Services

We offer an extensive range of services in the sectors of Acoustic Consultancy, Building Compliance & Energy Efficiency. We are able to put together custom packages combining multiple services which saves both time and money for you.

Building Compliance

- **Sound Insulation Testing**
- **Air Tightness Testing**
- **Ventilation Testing**
- **Water Efficiency Calculations**
- **Sound Insulation Specification**

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- **SAP Calculations**
- **EPC's**
- **SBEM Calculations**
- **Energy Statements**
- **Sustainability Statements**
- **MEES Regulations**
- **Commercial EPC's**

Acoustic Consultancy

- **Noise Assessment for planning conditions**
- **Construction site noise monitoring**
- **Noise at work assessments**
- **Noise & Vibration Impact Assessments**

Peace of mind

We are accredited and registered by all the relevant major UK authorities to provide the services we offer. Peak Acoustics is UKAS accredited for sound insulation testing, ATTMA registered for Air Leakage Testing. and our Energy team are all Domestic On-Completion Energy Assessors.

OUR ADDED VALUE

We combine our detailed knowledge of building regulations with our technical understanding of building physics, acoustics and environmental sciences to maximise development quality. Our work ensures appropriate strategies and studies are prepared to demonstrate to demonstrate to local authorities how proposed developments will be of high quality and generate acceptable impact on the surrounding environment.

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