



325-331 LONG LANE, UXBRIDGE UB10 9JU

BS4142 PLANT NOISE ASSESSMENT

29 September 2023

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1.0 INTRODUCTION

Aran Acoustics in collaboration with Airtight Building Solutions Ltd have been appointed to carry out a noise impact assessment for the proposed car servicing and valet area to the rear of 325-331 Long Lane, Uxbridge.

A noise survey and assessment has been requested to ensure that noise levels from the operational use does not cause undue disturbance to nearby noise sensitive locations.

The purpose of this assessment is to determine the existing noise levels at the nearest noise sensitive location and establish the maximum permissible noise levels from the plant.

Such to establish suitable plant noise levels an assessment has been carried out to BS 4142: 2014 '*Method for rating and assessing industrial and commercial sound*'. This assessment has been benchmarked against an environmental noise survey carried out on 17 July 2023.

This report therefore describes the noise survey and its results. Figure 4.1 contains a graphical representation of the noise measurements taken on site. Section 5.0 provides the maximum permissible noise levels for the proposed plant. Section 6.0 provides an assessment of plant noise levels based on the proposed location.

2.0 SITE DESCRIPTION

The site is located at 325-331 Long Lane in Uxbridge. The site contains an existing car sales garage and parking area to the rear.

Proposals include the erection of a car repair garage and valeting area to the rear of site as shown on the site plans in Appendix A. The repair garage is to be fully enclosed.

The nearest noise sensitive receptors to the proposed location of garage and valeting area are the rear windows of the residential flats located in Magnolia Court to the south of site.

A subjective assessment on site determined that the predominant noise sources in the area to impact nearby noise sensitive receptors is noise from road traffic on surrounding roads along with plant servicing adjacent commercial units.

Figure 2.1 below shows a location map and aerial photo of the site and surrounding area.

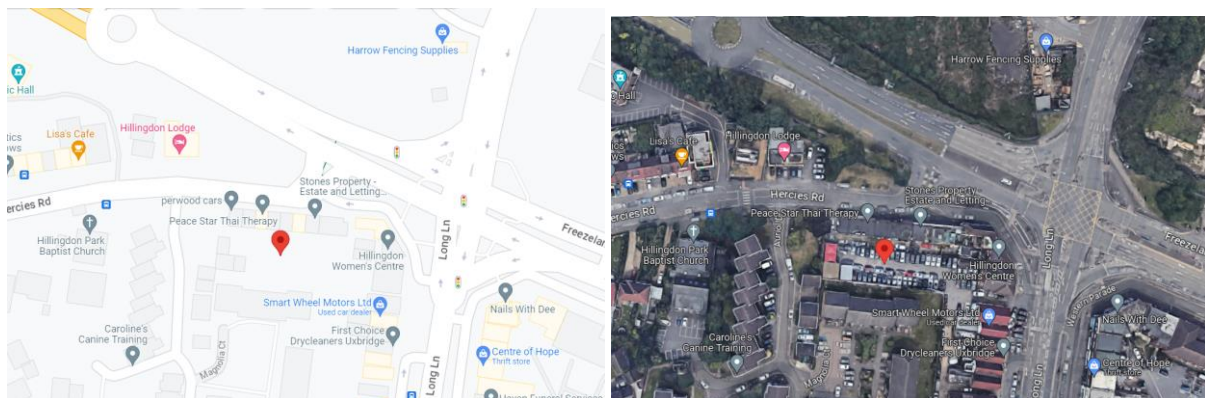


Table 2.1 – Location map and aerial photo of the site*

**Imagery courtesy of Google Maps*

3.0 ENVIRONMENTAL NOISE SURVEY

An attended background noise survey was carried out at the site on Monday 17 July 2023 between 13:00 – 17:00 hours.

A single noise monitor was placed next to the boundary wall to the rear gardens of the adjacent residential flats. The microphone was extended approximately 2m above ground level. Noise levels measured at the microphone location are considered representative of the existing environmental noise levels to impact nearby noise sensitive receptors.

A site plan showing the microphone location is provided in Appendix A. Site photos of the microphone position are provided in Appendix B.

3.1 Measurement Equipment

The following measurement equipment was used, which complies with the performance specifications for a Class 1 device in accordance with BS EN 61672-1, BS EN 61260 and BS EN 60942.

Name	Serial Number	Last Calibrated	Calibration Due
Norsonic Precision Sound Analyser Type 140	1404768	Nov 2022	Nov 2024
Norsonic Type 1209 Pre-amplifier	31313	Nov 2022	Nov 2024
Norsonic Type 1225 Microphone	157320	Nov 2022	Nov 2024
Rion Type NC-74 Acoustic Calibrator	35168026	Nov 2022	Nov 2023

Table 3.1 – Measurement equipment used on site

The meter was calibrated before and after testing - no deviations were found. The meter was set to measure consecutive 'A' weighted 15-minute samples.

3.2 Weather Conditions

The weather remained dry for the duration of the survey. Wind speed remained below 5 m/s. The temperature was approximately 26 °C.

The weather conditions were seen as suitable for environmental noise surveying in accordance with BS 7445-1:2003 '*Description and measurement of environmental noise*'.

4.0 SURVEY RESULTS

The noise levels measured during the survey period are shown in Figure 4.1 below. The full set of acoustic data measured on site is available upon request.

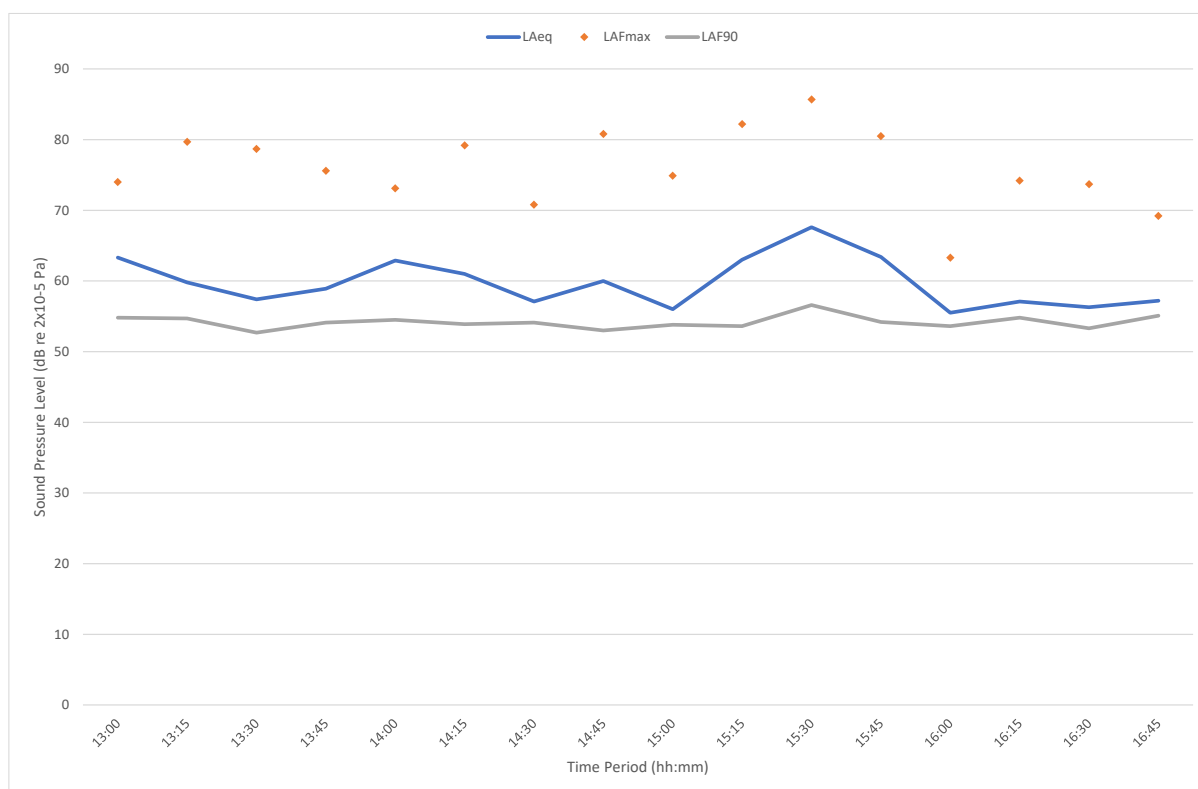


Figure 4.1 – Measured noise levels

Analysis of the measured noise levels shows that the background noise level remained relatively consistent throughout the survey.

The following table provides a summary of the noise levels measured on site at the fixed microphone position during the survey period including the equivalent continuous A-weighted sound pressure level; $L_{Aeq,T}$ and representative background noise level; $L_{A90,T}$.

Time Period	Average Noise Level L_{Aeq} , dB	Representative Background L_{A90} , dB
Day (13:00 – 17:00 hours)	61	55

Table 4.1 - Summary of measured noise levels

5.0 ASSESSMENT CRITERIA

Section 4.0 above provides a summary of measured noise levels on site. The following section provides a summary of guidance documentation relevant to this development.

5.1 British Standard 4142

BS 4142:2014 describes a method of determining the level of noise of an industrial nature, together with the procedures for assessing whether the noise in question is likely to give rise to complaints from persons living in the vicinity. As such, an assessment to BS 4142 is typically called for within planning conditions.

The likelihood of complaints in response to a specific noise depends on various factors. BS 4142 assesses the likelihood of complaints by considering the margin by which the noise in question exceeds the background noise level. BS 4142 states that:

- a) Typically, the greater this difference, the greater the magnitude of the impact.
- b) A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.
- c) A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.
- d) The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

This standard also allows for an appropriate correction for the acoustic features present in the noise using a number of methods. A correction should be applied if one or more of the following features (see the list below), are present within the noise sources in question.

- The noise is of a tonal nature, i.e. it contains a distinguishable, discreet, continuous note such as whine, hiss, screech, hum;
- The noise is impulsive, i.e. it contains distinct impulses such as bangs, clicks, clatters, or thumps;
- The noise contains other characteristics that are neither tonal nor impulsive but is irregular enough to attract attention.

BS4142 states that 'where the initial estimate of the impact needs to be modified due to the context, take all pertinent factors into consideration including the following':

- The absolute level of sound. Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night.
- The character and level of the residual sound compared to the character and level of the specific sound.

It can be concluded from BS4142 guidance document that noise levels from plant and equipment associated with the development should not generally exceed the background noise level when measured at the nearest noise sensitive location. This is a positive indication of low noise impact.

6.0 TARGET PLANT NOISE LEVELS

It is understood that the proposed garage and valet area will operate in the day time only, i.e. between 09:00 – 18:00 hours. The garage is not intended as a fully functioning workshop but will be used to carry out light repairs.

Based on the garage and valet only operating during the day time period, Aran Acoustics suggests a design target of -5 dB below the existing background noise level. This is seen as a design target where noise impact would be 'low' in accordance with BS 4142 and complaints from nearby noise sensitive receptors deemed unlikely.

Due to the intermittent nature of the proposed operational activities it is considered a 6 dB acoustic correction is applied.

Based on the lowest background noise level during the proposed operating period and the suggested design targets including any tolerance or correction factors, the following table shows the maximum permissible noise level from the daily operations when measured at the window of the nearby noise sensitive receptors.

Timer Period	Representative Background, L_{A90}	Tolerance Factor	Correction Factor	Max Noise Level at Residential
Day (07:00 – 23:00 hours)	55 dBA	-5 dB	-6 dB	44 dBA

Table 6.1 - Plant Noise Level Target

7.0 PLANT NOISE LEVEL ASSESSMENT

In order to quantify the likely noise levels from the repair garage and valeting area it is necessary to define the various activities to be undertaken and the equipment used.

The repair garage is formed from 100mm insulated panels will contain an electric lift and compressor for air tools to remove wheels. A quiet compressor has been selected for this area and doors will remain closed when the compressor and air tools are in use. We have used data previously measured for a hand held air gun in our assessment.

The valeting area will use a jet wash and vacuum cleaner but not simultaneously. Hand towels are also used for cleaning. Measurements were carried out on site of noise levels from valeting. The following table provides a list of proposed plant and activities along with associated noise level.

Plant Description	Noise Level, dBA
Jet Washing at 5m	64
Vacuum Cleaning at 5m	61
Air Compressor at 1m	59
Air Impact Gun at 1m	72

Table 7.1 - Plant Schedule

The nearest noise sensitive receptors to the location of plant are the rear windows of the residential flats located in Magnolia Court. At distance, the units of plant are considered a point source and noise levels will decay at a rate of 6dB per doubling of distance. The boundary wall will act as a noise barrier for the valeting area therefore a barrier correction has been included in our calculations.

Calculations show that noise levels from the plant and operational activities when measured at the nearest noise sensitive receptors would be approximately 42 dBA. This does not exceed the noise level target in Table 6.1 therefore noise impact would be considered 'low' in accordance with BS4142.

Plant noise calculation sheets are provided in Appendix C. Manufacturers noise level data sheets are provided in Appendix D.

7.1 Noise Control Management Plan

While calculations show that the worst case noise levels from the daily operations will be low impact, management should take every opportunity to reduce the risk of noise impact on local residents through a noise control management plan.

Staff should be made fully aware of the type of work where instantaneous noise levels have the potential to cause disturbance to nearby noise sensitive properties and follow a procedure for mitigating these noise levels.

The following points should be considered to reduce the likelihood of disturbance although this list is not exhaustive:

- Close doors to repair garage when compressor in operation
- Slamming of car doors, boots and bonnets should be avoided
- Car engines should be switched off when not in use
- Jet Washing and Vacuum Cleaning should be carried out under the Canopy area only
- Reducing the pressure of the Jet Wash pump can significantly reduce noise levels
- Replacing nozzle's on lances such that it does not intensify water in one area of the car
- When replacing older equipment, select new equipment that has reduced sound power levels through innovative or technical means.

8.0 SUMMARY AND CONCLUSION

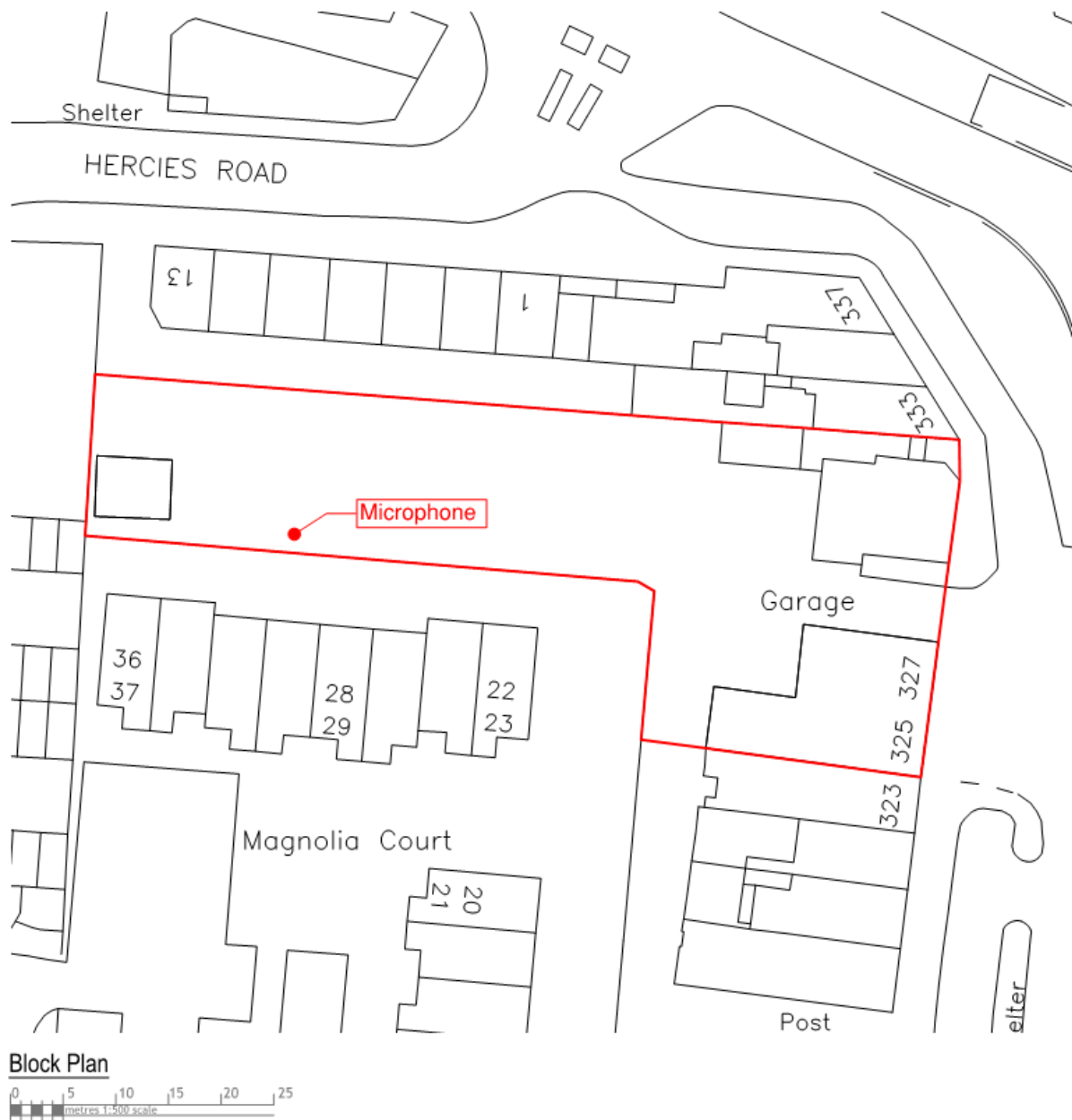
A noise survey was carried out at the proposed location for a repair garage and valeting area to the rear of 325-331 Long Lane, Uxbridge on 17 July 2023.

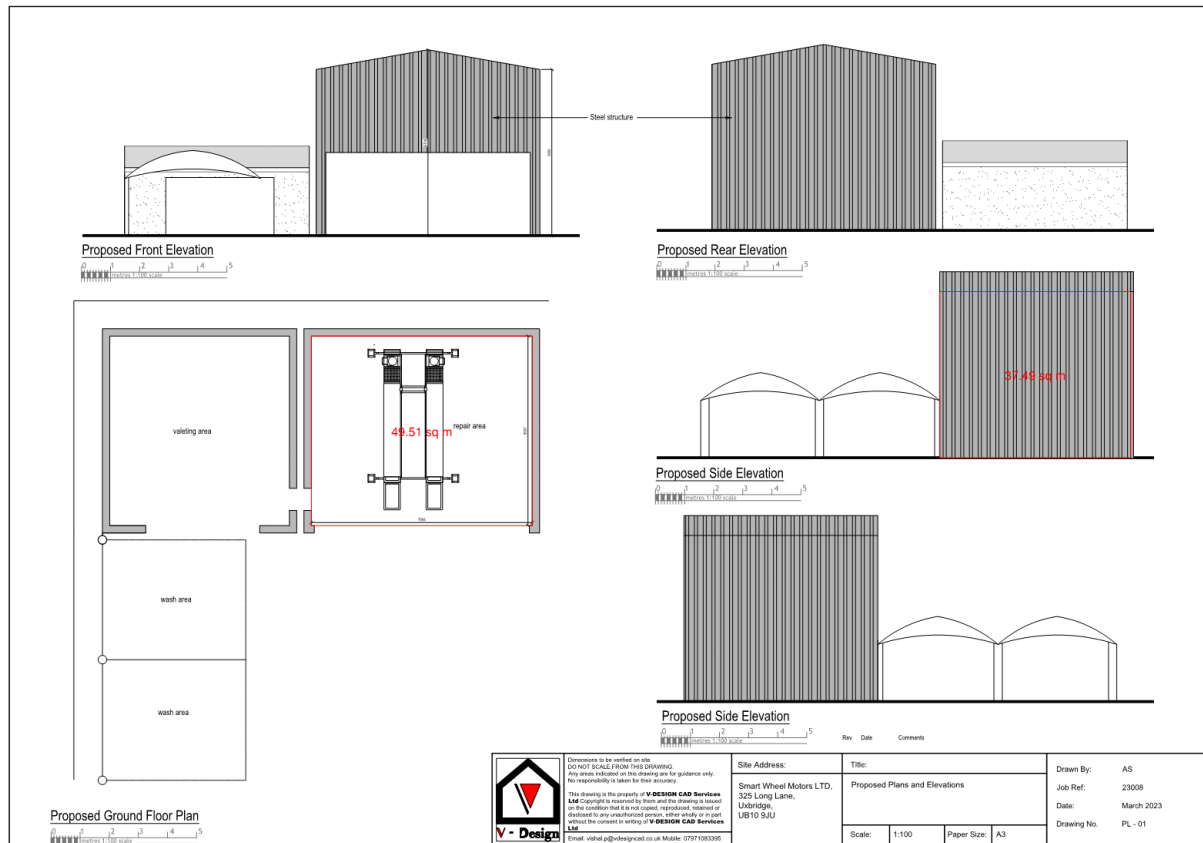
From this survey the representative background noise level at the nearby sensitive receptors was found to be 55 dB L_{A90} during the daytime period.

Using guidance in BS 4142 including any corrections, noise levels from daily operations should not generally exceed -11 dB below the background noise level at the window of the nearby noise sensitive receptors taken into account all pertinent factors.

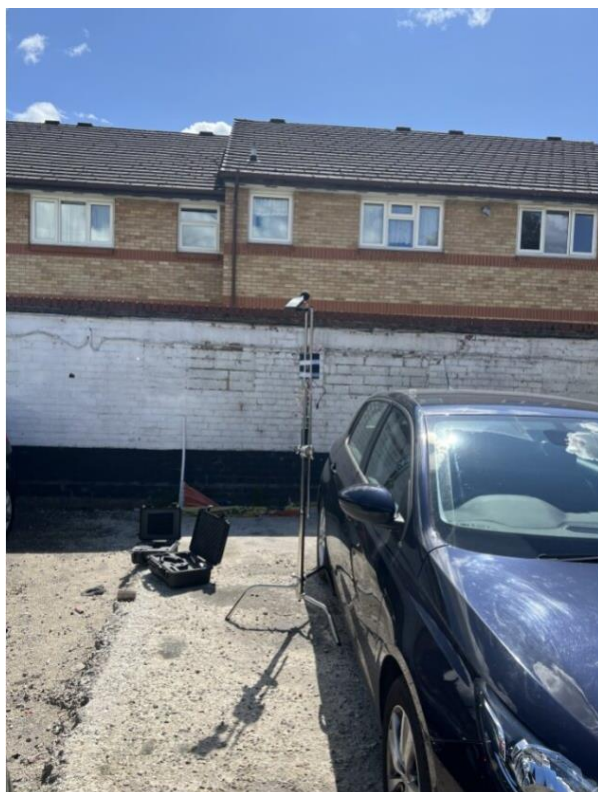
Based on manufacturer's noise level data along with measurements on-site, calculations show that operational noise levels at nearby noise sensitive receptors would not exceed the noise level target which is a positive indication of low noise impact in accordance with BS 4142 where complaints are deemed unlikely.

APPENDIX A – SITE PLAN





APPENDIX B – SITE PHOTOS



APPENDIX C – PLANT NOISE CALCULATION SHEETS

	QTY	63 Hz	125 Hz	250 Hz	500 Hz	1.0 kHz	2.0 kHz	4.0 kHz	dBA
Air Compressor (Lp)	1	64.9	64.7	56.7	52.2	52.9	52.1	49.0	59
Calculated Source Level (Lw)		75.9	75.7	67.7	63.2	63.9	63.1	60.0	70
Air Impact Gun (Lp)	1	74	72	66	67	65	66	63	72
Calculated Source Level (Lw)		86	84	78	79	77	78	75	84
Combined Source Level (Lw)	2	86	85	78	79	77	78	75	84
Service Garage	QTY	63 Hz	125 Hz	250 Hz	500 Hz	1.0 kHz	2.0 kHz	4.0 kHz	dBA
Combined Source Level (Lw)	2	86	85	78	79	77	78	75	84
Reflection Factor (Q)	4	6	6	6	6	6	6	6	
100mm Insulated Panel SRI	1	-14.0	-17.0	-21.0	-23.0	-20.0	-31.0	-43.0	
10Log(S) -14	270	10.3	10.3	10.3	10.3	10.3	10.3	10.3	
Distance Attenuation (-20Log(R))	15.8	-24.0	-24.0	-24.0	-24.0	-24.0	-24.0	-24.0	
Lw to Lp at 1m	-11	-11	-11	-11	-11	-11	-11	-11	
SPL at Receiver (Lp)		53.7	49.2	38.4	37.5	38.4	28.8	13.7	42

	QTY	63 Hz	125 Hz	250 Hz	500 Hz	1.0 kHz	2.0 kHz	4.0 kHz	dBA
Car Washing (Lp) a 5m	1.0	60.4	58.0	55.5	57.9	55.4	57.7	57.7	64
Distance Correction	5.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	
Calculated Source Level (Lp)		74.4	72.0	69.5	71.9	69.4	71.7	71.7	78
Barrier Attenuation	1.0	-8.0	-10.0	-11.0	-14.0	-17.0	-20.0	-22.0	
Distance Attenuation	8.1	-18.2	-18.2	-18.2	-18.2	-18.2	-18.2	-18.2	
Reflection Q	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
SPL at Receiver (Lp)		48.2	43.8	40.3	39.7	34.2	33.5	31.5	42

APPENDIX D – TECHNICAL DATA SHEETS



Mercury Mech 2.2 - 3.0 - 4.0

Construction features and advantages:

- Working pressure 8 and 10 bar, with power from 2.2 to 4 kW.
- User-friendly ON / OFF electromechanical control: the absence of idle running ensures remarkable energy savings.
- Floor-standing or 200-litre tank versions, with or without dryer, ready for operation.
- Models on tank with ball valve for easy condensate drainage.
- High compactness.
- Low energy consumption.
- Extremely silent: only 58-60 dB(A).
- The machine is supplied ready for use.
- Oil filter and oil separator filter (both spin-on type) and air filter, all quite large: this means long service intervals and lower costs.
- Phases sequence relay for controlling the direction of rotation of air-end.



MERCURY MECH Belt driven rotary screw compressors



2.2-4 kW (3-5.5 HP)

ELECTROMECHANICAL														
Model	Code	Tank capacity	Motor power		Air outflow rate			Working pressure		Noise level	Connec-tion	Net weight		Net dimensions
		ℓ	kW	HP	l/min.	m³/h	c.f.m.	bar	p.s.i.	dB(A)	G	kg	lbs	L x W x H (cm)
Floor-standing compressor - Single-phase														
MERCURY Mech 2.2-10 M	V51JT60N1N564	—	2.2	3	240	14.4	8.5	10	145	58	1/2"	98	216	60 x 48 x 76