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NOISE IMPACT ASSESSMENT REPORT – KITCHEN EXTRACTION SYSTEM

161-162 PARROCK STREET, GRAVESEND DA12 1ER - ARYA FOOD CENTRE

FOR

NEOLIYDIA LTD



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1. EXECUTIVE SUMMARY

The Client is seeking planning approval for the installation of three new compressor units service the premises at 159-161 Parrock Street, Gravesend DA12 1ER.

Sound Licensing has used recent noise monitoring data (Venta Acoustics Report Ref: VA3730.210818.NIA1.1) completed at 161-32 Parrock Street in February 2025 in order to determine prevailing background noise levels that are representative of the nearest noise sensitive property. Which has been identified as the first-floor premises directly above the site at 159-161 Parrock Street, DA12 1ER.

The historic data is considered reasonable given the location of the measurement positions and the existing noise sources in the local vicinity.

Noise calculations of the mechanical plants have been undertaken using all available details and plans provided by the client and obtaining manufacturers' specifications wherever possible. The data and information form the basis of the assessment.

Noise break-out limits for the mechanical plant have been proposed based on the methodologies of British Standard (BS) 4142:2014+A1:2019 and in accordance to Local Authority policy. A robust, worst-case assessment of the noise levels associated to the proposed mechanical plant has been undertaken.

In accordance with BS 4142:2014+A1:2019 guidance, the predicted noise impact due to the operation of the mechanical plant ***"is an indication of the specific sound source having a low impact"***. predicted noise level of the mechanical plant at the nearest noise sensitive property is considered to comply with the Gravesham Borough Council's policy.

2. INTRODUCTION

The client is seeking planning permission for the installation of a kitchen extraction system to service the premises at 159-161 Parrock Street, Gravesend DA12 1ER, the noise from which could have the potential to affect existing noise sensitive properties nearby.

The purposes of this report are:

- To identify prevailing environmental noise levels affecting surrounding properties due to nearby noise sources (e.g. road traffic, aircraft etc);
- Based on the above, to present noise emission limits in accordance with the requirements of BS 4142:2014+A1:2019 and Local Authority policy, and
- To undertake an assessment to demonstrate compliance with the Local Authority noise requirements.

3. SITE DESCRIPTION

Planning permission is being sought for the installation of compressor units to service the premises at 159-161 Parrock Street, Gravesend DA12 1ER (hereafter referred to as 'the site'). The property is a traditionally built two-storey building in the Borough of Gravesham. It is located in a mixed-use area with a large car park opposite and residential properties directly above.

The nearest sensitive residential receptors were noted to be the first-floor windows on the rear façade of 161 Parrock Street at an approximate distance of 4m from the compressor fan motor casing.

The nearest sensitive receptors are identified in figure 3.1. If the noise impact assessment details that there is an indication of the specific sound source having a low impact at these premises then it can be safely assumed it will be met at other properties of equal distance and/or those further away.

Figure 3.1 shows the site highlighted in **blue** with the nearest noise sensitive premises highlighted in **red**.

Figure 3.1 Site Location and Surrounding Land Use

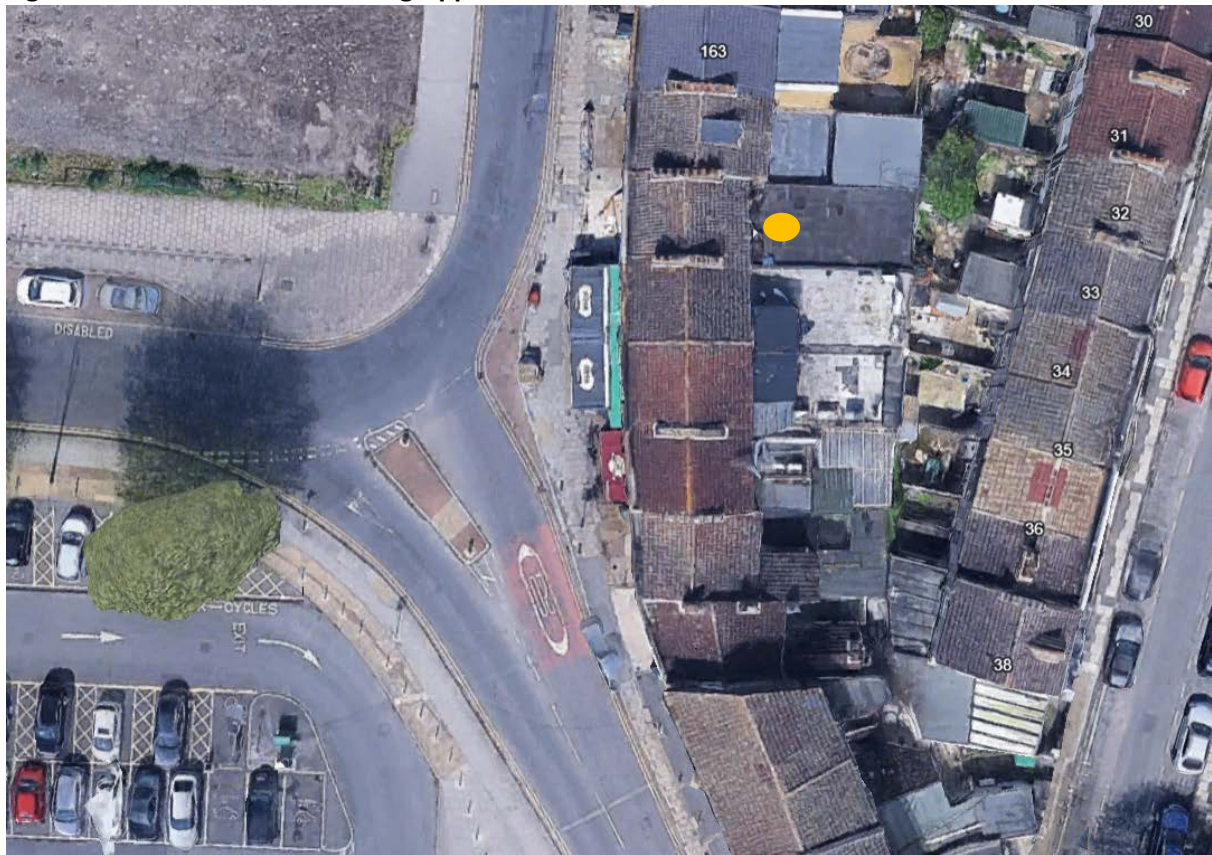


Source: Google Maps

4. DETERMINATION OF BACKGROUND NOISE LEVELS

The measurement positions used during the previous survey are relevant to this site and are indicated in Figure 4.1 below in orange on Figure 4.1 below.

Figure 4.1 Site Plan Showing Approximate Location of Measurement Position



Source: Google Maps

5. NOISE SURVEY RESULTS

5.1 Results

A summary of the measured typical background noise levels at the measurement position is shown in Table 5.1 below.

Table 5.1 Measured Typical Background Noise Levels

Date / Period (hours)	Typical Background Sound Pressure Level, dB
	$L_{A90,15min}$
11/02/25 (11:00 to 00:00)	48
11/02/25 & 13/02/25 (11:00 to 00:00)	48

The typical background noise level at the measurement position during the survey, at the time in which the plant could be operational, is **48dB** $L_{A90,15min}$. This representative noise level is considered appropriate for the assessment.

6. EXTERNAL NOISE EMISSION LIMITS

6.1 Local Authority Requirements

The site lies within the jurisdiction of the Local Authority, Gravesham Borough Council. In previous applications the Environmental Health department have requested that the assessment be completed in accordance with BS4142:2014+A1:2019 and that it should demonstrate that the operating noise level of the plant will be at a minimum of 10dB(A) below the assessed typical background noise level, $L_{A90,T}$.

For the purposes of this report, an assessment has been undertaken in line with BS 4142:2014+A1:2019. A design criterion of achieving a minimum 10dB(A) below the background noise level has been adopted in line with the Local Authorities policy. Taking the noise data in Section 4 and Local Authority requirements above, the following design target has been adopted for mechanical plant as provided in Table 6.1.

Table 6.1 Maximum noise emission design target at residential premises

Date / Period (hours)	Typical Background Sound Pressure Level, dB $L_{A90,15min}$	Rating Noise Level at Nearest Residential Facade, dB $L_{Ar,T}$
29/06/21 (11:00 to 00:00)	48	38
28/06/21 & 30/06/21 (11:00 to 00:00)	48	

6.2 BS 4142:2014+A1:2019

BS 4142:2014+A1:2019 “Methods for rating and assessing industrial and commercial sound” presents a method for assessing the significance and possible adverse impact due to an industrial noise source, based on a comparison of the source noise levels and the background noise levels, both of which are measured or predicted at a noise sensitive receiver e.g. a residential property.

The specific noise level due to the source is determined, with a series of corrections for tonality, impulsivity, intermittency or other unusual characteristic. The rating level is then compared to the background noise level and the significance of the new noise source likelihood of any adverse impact is determined in accordance with the following advice:

“The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occur. A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context. A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context. 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.”

7. PROPOSED COMPRESSORS FOR COLD FRIDGES AND ASSOCIATED NOISE LEVELS

It is proposed to install the following items of plant at the rear of the premises:

Table 7.0 Proposed Kitchen Extraction & Intake Fan Motors

External Compressors	Quantity	Make	Model	Reference Noise Level* L _{W(A)}
FREEZER	2	IBS	TAG 2522Z	Sound Pres. Lev at 10m (L _{pA}) 22(dBA) Sound Power Lev. (L _W A) 34(dBA)
CHILLER	1	TECUMSEH	TAG 4546Z	Sound Pres. Lev. at 10m (L _{pA}) 19(dBA) Sound Power Lev. (L _W A) 29 (dBA)

*Reference sound power level. Manufacturer's specifications are provided in Appendix B.

In reference to section 6.2 of this report, a penalty addition (+3dB) has been applied for intermittency as the system will be switched on & off as and when required. Penalty additions have not been applied for tonality as manufacturers' data shows no significant characteristics, or for impulsiveness as it is considered that these characteristics will not be perceptible sufficient to attract attention at the noise receptors. Penalty additions have not been applied for any other sound characteristics as mechanical plant of this type generally do not demonstrate such features.

8. NOISE IMPACT ASSESSMENT

This section presents calculations to predict the noise impact of the proposed compressor units, located at the site, at the nearest noise sensitive properties.

8.1 Proposed Operational Hours and Background Noise Levels

The Freezers and Chiller will operate as required during the opening hours of the proposed business. The opening hours are from 08:00 - 22:45 hours Monday to Friday, 08:00 - 22:45 hours on Saturday and 08:00 to 22:45 hours on Sunday.

The typical background noise level at the measurement position during the survey is **48dB** $L_{A90,15min}$. The design range is **38dB** $L_{Ar,T}$ at the façade of the nearest residential premises.

8.2 Nearest Noise Sensitive Properties

The nearest sensitive residential receptors were noted to be the first-floor windows on the rear façade of 161 Parrock Street at an approximate distance of 4.0 m from the compressor fan motor casing.

8.3 Description of Calculation Process

In accordance with the methodologies of BS 4142:2014+A1:2019, calculations have been undertaken to predict noise levels in which the mechanical plant could be operational at its maximum level. Given the distances between the noise sources and the noise sensitive receptors, point source calculations have been used.

8.4 Noise Level Predictions

Calculations to predict the noise of cooling system fans operating at the facade of the residential property is given below.

The rating noise level at the 1st floor window, with the mechanical plants operating, is predicted to be **38dB** $L_{Ar,T}$ which is **10dB(A) below** the typical background noise level (48dB $L_{A90,15min}$).

In accordance with BS 4142:2014+A1:2019 guidance, noise from the mechanical plant ***“is an indication of the specific sound source having a low impact”***. *The lower the rating level is relative to the measured background level, the less likely it is that the specific sound source will have an adverse impact.*

8.5 Vibration

In addition to the control of airborne noise transfer, it is important to consider the transfer of noise as vibration to adjacent properties as well as any sensitive areas of the same building. Vibration from the system is not expected, however, as a precaution plant should wherever possible be installed on suitable type isolators. The fans should be installed with flexible connections to adjacent structures.

Uncertainty

The levels of uncertainty in the data and calculations are considered to be medium given the robust exercise undertaken in noise monitoring and the confidence in the data statistical analysis. Manufacturers' data for the plant is highly likely to be robust. Detailed calculations and resultant noise levels at the residential location are considered to be confidently predicted.

8. CONCLUSION

Sound Licensing has undertaken an environmental noise survey at the site in order to determine prevailing background noise levels that are representative of the nearest noise sensitive properties. The operation of the proposed cooling systems, in accordance with BS 4142:2014+A1:2019 guidance, indicates to creating a low impact. All worst-case scenarios have been applied to the assessment. The predicted cumulative operating noise level of cooling system is demonstrated to comply with the Gravesham Borough Council's policy.

APPENDIX A – Acoustic Terminology

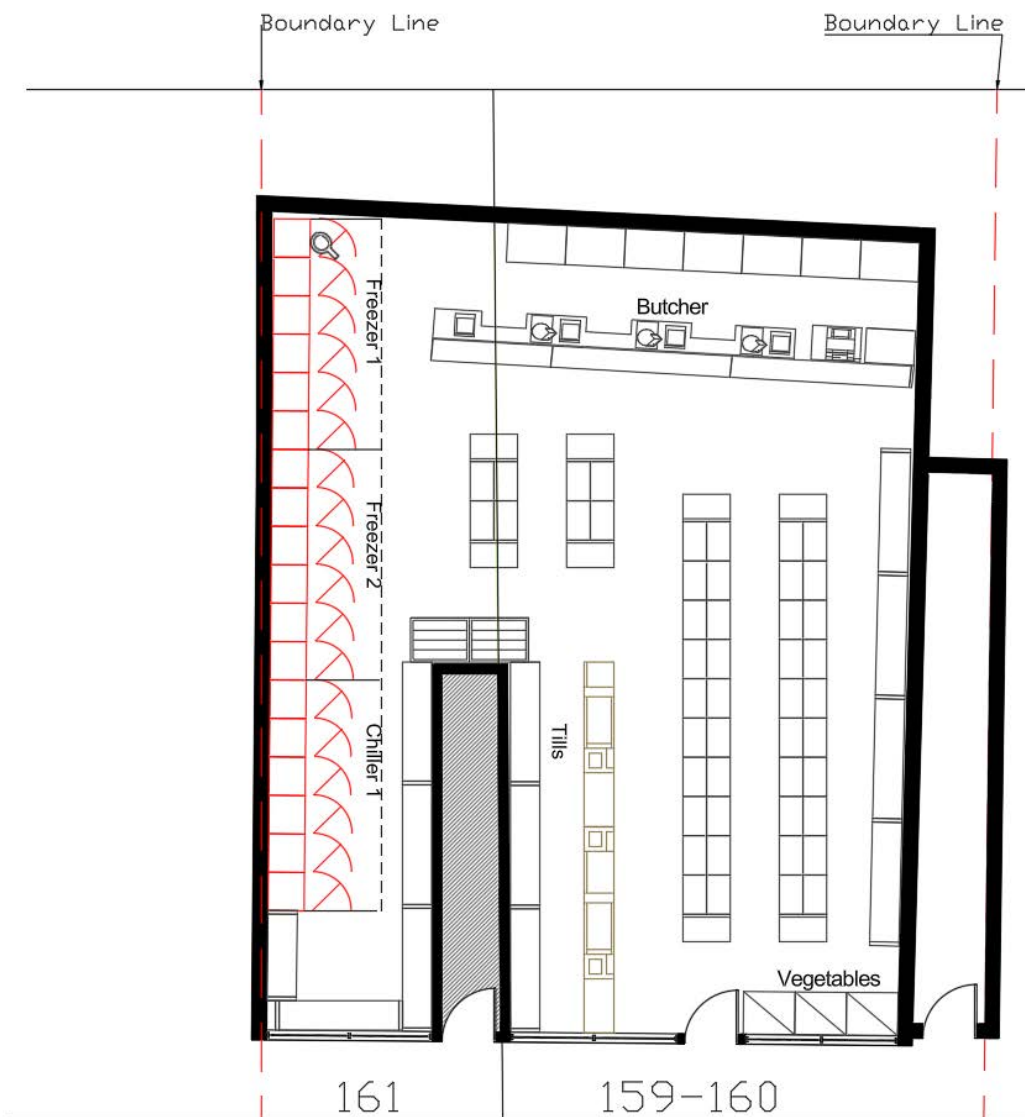
Parameter	Description
Acoustic environment	Sound from all sound sources as modified by the environment
Ambient sound	Totally encompassing sound in a given situation at a given time, usually composed of sound from many sources near and far
Ambient sound level, $L_a = LA_{eq,T}$	Equivalent continuous A-weighted sound pressure level of the totally encompassing sound in a given situation at a given time, usually from many sources near and far, at the assessment location over a given time interval, T
Background sound level, $LA_{90,T}$	A-weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given time interval, T, measured using time weighting F and quoted to the nearest whole number of decibels
Decibel (dB)	A logarithmic scale representing the sound pressure or power level relative to the threshold of hearing (20×10^{-6} Pascals).
Equivalent continuous A-weighted sound pressure level, $LA_{eq,T}$	Value of the A-weighted sound pressure level in decibels of continuous steady sound that, within a specified time interval, $T = t_2 - t_1$, has the same mean-squared sound pressure as a sound that varies with time
Measurement time interval, T_m	Total time over which measurements are taken
Rating level, $L_{Ar,Tr}$	Specific sound level plus any adjustment for the characteristic features of the sound
Reference time interval, T_r	Specified interval over which the specific sound level is determined
Residual sound	Ambient sound remaining at the assessment location when the specific sound source is suppressed to such a degree that it does not contribute to the ambient sound
Residual sound level, $L_r = LA_{eq,T}$	Equivalent continuous A-weighted sound pressure level of the residual sound at the assessment location over a given time interval, T
Specific sound level, $L_s = LA_{eq,Tr}$	Equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location over a given reference time interval, T_r
Specific sound source	Sound source being assessed

References:

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

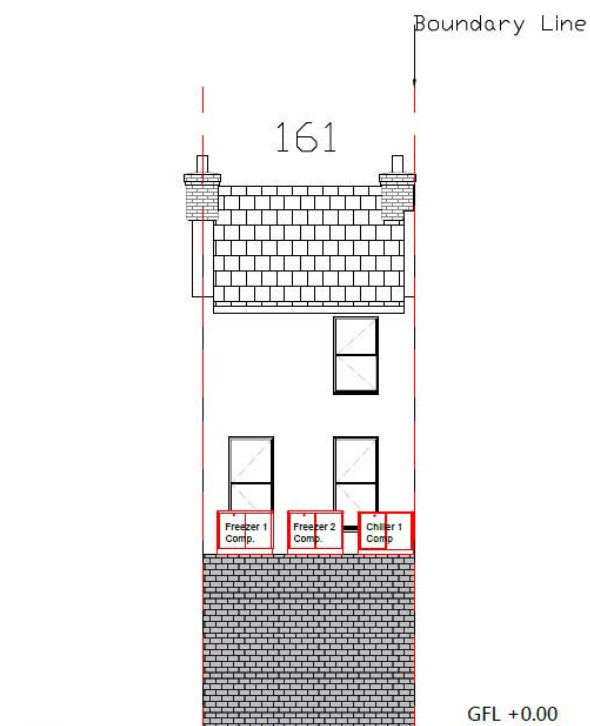
APPENDIX B – Data Sheets and Figures

Proposed Ground Floor Plan

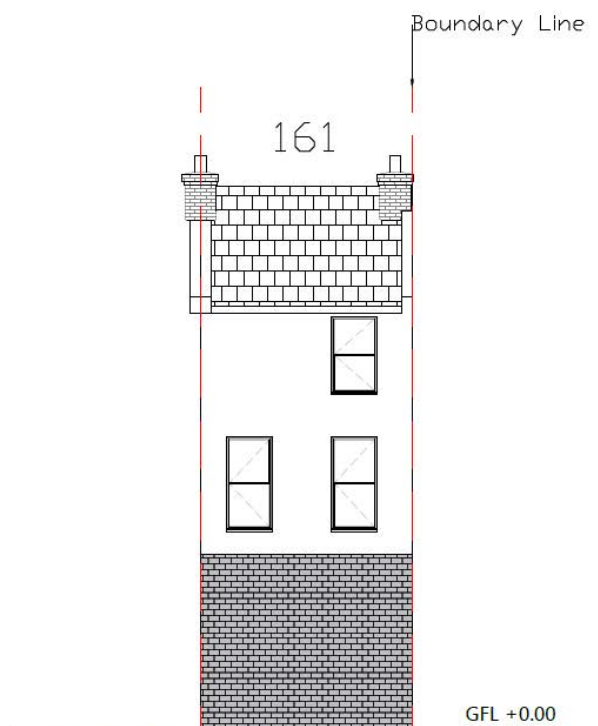


Proposed Floor Plans - Arya Food Centre

Existing and Proposed Rear Elevation



Proposed Rear Elevation



Existing Rear Elevation

FREEZERS – TAG2522Z 3 HP

TECHNICAL SHEET

COMPRESSOR

Type	Hermetic
Brand	TECUMSEH
Model	TAG 2522 Z
Nominal Power	3 HP
Oil Type	Ester Oil
Oil Quantity	1,96 l

CONDANSER

Cabin Type	Split Type
Type	Monoblok
Fin Type	Al Fin
Pipe Diameter	5/16
Heat Transfer Area	36 m ²
Air Flow	5401 m ³ /h
Fan Diameter	500 mm
Number of Fan	1
Fan Speed	1400 rpm
Fan Voltage	1 PH

ELECTRICAL DETAILS

Voltage	380V 3Ph 50Hz
Max Operating Current	13,8 A
Max Power Consumption	5,7 kW

CONNECTIONS

Suction Line Pipe	1x28 mm
Liquid Line Pipe	1x10 mm

DIMENSIONS

Width	470 mm
Lenght	1175 mm
Height	910 mm

WEIGHT

Weight of Device	0
Weight of Device with Packing	0

NOISE LEVEL DATA

Sound Pres. Lev. at 10 m (LpA)	22 (dBA)
Sound Power Lev. (LwA)	34 (dBA)



Cooling Capacity	: 4557 W
Power Input	: 3206 W
Refrigerant	: R404A
COP	: 1,42
Evaporation Temperature	: -25 °C
Condensation Temperature	: 45 °C
Suction Gas Temperature	: 20°C
Subcooling	: 0 °C
Ambient	: 35 °C

SYSTEM COMPONENTS

Liquid Receiver	4 l
Drier	
Solenoid Valve	
Sight Glass	
HP Switch	
LP Switch	
Fan Pressure Switch	
Electrostatic Painted Closed Cabinet	
Entegre IP55 Elektrical Box	
Overload relay	
Circuit breaker	
Phase failure relays	
Evaporator fan and resistance circuit breaker	



CHILLER - TAG 4546Z 3HP

TECHNICAL SHEET

COMPRESSOR

Type	Hermetic
Brand	TECUMSEH
Model	TAG 4546 Z
Nominal Power	3 HP
Oil Type	Ester Oil
Oil Quantity	1,96 l

CONDANSER

Cabin Type	Split Type
Type	Monoblok
Fin Type	Al Fin
Pipe Diameter	5/16
Heat Transfer Area	27 m ²
Air Flow	4430 m ³ /h
Fan Diameter	450 mm
Number of Fan	1
Fan Speed	1400 rpm
Fan Voltage	1 PH

ELECTRICAL DETAILS

Voltage	380V 3Ph 50Hz
Max Operating Current	12,2 A
Max Power Consumption	3,3 kW

CONNECTIONS

Suction Line Pipe	1x22 mm
Liquid Line Pipe	1x10 mm

DIMENSIONS

Width	470 mm
Lenght	1175 mm
Height	910 mm

WEIGHT

Weight of Device	0
Weight of Device with Packing	0

NOISE LEVEL DATA

Sound Pres. Lev. at 10 m (LpA)	19 (dBA)
Sound Power Lev. (LwA)	29 (dBA)



Cooling Capacity	: 5476 W
Power Input	: 2949 W
Refrigerant	: R404A
COP	: 1,86
Evaporation Temperature	: -10 °C
Condensation Temperature	: 45 °C
Suction Gas Temperature	: 20°C
Subcooling	: 0 °C
Ambient	: 35 °C

SYSTEM COMPONENTS

Liquid Receiver	5 l
Drier	
Solenoid Valve	
Sight Glass	
HP Switch	
LP Switch	
Fan Pressure Switch	
Electrostatic Painted Closed Cabinet	
Entegre IP55 Elektrical Box	
Overload relay	
Circuit breaker	
Phase failure relays	
Evaporator fan and resistance circuit breaker	



<u>Adding dB</u>								
<u>Levels to be added</u> (Max. of eight)								
<i>Enter values</i>	30	28	31	0	0	0	0	0
				Total = 34.6 dB				

Cumulative Sound Pressure Level @ Nearest Sensitive Receptor + Intermittency (3dB) = 38dB L_{Ar,T}