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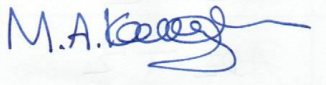
Website: www.martecenviro.co.uk

REFRIGERATION UNITS NOISE ASSESSMENT

Filling Station
Yorkshire Street
Rochdale OL16 2DR

Report Date: 7th February 2023
Ref: 20230207 9386 ASHP.docx
Site Visit by: M A Kenyon
Site Visit: 2nd & 3rd February 2023

Prepared by: M A Kenyon MSc BSc MIOA



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1.0 INTRODUCTION

At the request of Ian Pawson Ltd, Martec Environmental Consultants Ltd. undertook an assessment of Refrigeration Unit noise for a proposed 're-modelling' of the filling station at Yorkshire Street, Rochdale OL16 2DR; this request was in connection with a planning application to demolish some of the existing buildings and to provide new shop facility with new external plant for the refrigeration units.

This report considers the impacts on the site and details the measurements taken, the requirements of current government guidance and makes recommendations for mitigation, as necessary.

Acoustic Terminology is set out at Appendix 1 with the consultants' qualifications at Appendix 2, information on the external units at Appendix 3 and detailed measurements at Appendix 4.

2.0 SITE DESCRIPTION

The current site plan is shown in Figure 1 below; it shows the existing car wash and the background noise monitoring position on the eastern façade of that building also marked.

Under the proposals the car wash and on-site shop [western boundary of

site] would be demolished and replaced with a new 'L shaped building] which is shown in Figure 2 below.

The client has provided details of two different units [See Appendix 3] from the plans it is not clear which units will be installed on the eastern façade of the new 'L shaped' shop building.



Figure 1: Aerial View [Google]

3.2 BS4142:2014 – Rating Industrial Noise Affecting Mixed Residential and Industrial Areas

BS4142:2014+A1:2019 states, *“Response to sound can be subjective and is affected by many factors, both acoustic and non-acoustic. The significance of its impact, for example, can depend on such factors as the margin by which a sound exceeds the background sound level, its absolute level, time of day and change in the acoustic environment, as well as local attitudes to the source of the sound and the character of the neighbourhood...This British Standard describes methods for rating and assessing sound of an industrial and/or commercial nature”*.

This British Standard describes a method for assessing whether a specific sound may have an adverse impact.

The Standard requires that the ambient noise (***totally encompassing sound in a given situation at a given time, usually composed of sound from many sources near and far***) including the “specific” sound from the source in question is measured in terms of the equivalent continuous sound level LAeq [see Appendix 1 for acoustic terms], which is then corrected for the residual sound (total LAeq excluding the “specific” sound).

A correction for character is made if ***“a tone, impulse or other characteristic occurs”***. For tonality a correction of between +2dB and 6dB

is considered acceptable and for impulsivity between 3 and 9dB. See table below.

Character	Just Perceptible	Clearly Perceptible	Highly Perceptible
Tonality	+2dB	+4dB	+6dB
Impulsivity	+3dB	+6dB	+9dB

Table 1: Character Corrections from BS4142

Where the specific sound features characteristics that are neither tonal nor impulsive, though otherwise are readily distinctive against the residual acoustic environment, a penalty of 3 dB can be applied.

Intermittency

“When the specific sound has identifiable on/off conditions...if the intermittency is readily distinctive against the residual acoustic environment, a penalty of 3 dB can be applied”.

Where tonal and impulsive characteristics are present in the specific sound within the same reference period then these two corrections can both be taken into account. If one feature is dominant, then it might be appropriate to apply a single correction. Where both features are likely to affect perception and response, the corrections ought normally to be added in a linear fashion.

The final figure, including any character correction is known as the Rating

level. This Rating Level is then compared with the measured background [LA90] level. The greater this difference the greater the likelihood of “adverse impact” (See Notes 1 & 2 from BS4142:2014 below).

"NOTE 1

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.

NOTE 2

Adverse impacts include, but are not limited to, annoyance and sleep disturbance. Not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact."

4.0 MEASUREMENTS

Background noise measurements were made under façade reflection conditions on the eastern façade of the car wash building, to avoid impact

from any of the existing chilling plant on site.

The site was visited on Thursday 2nd February and instrumentation was installed as shown in Figure 1 above. The instrumentation was collected on Friday 3rd February 2023

The measurements were made with the microphone mounted on a pole at a height of approximately 3m above local ground height and fitted with a RION WS02 "all weather" windmuff. The meter calibrated correctly on installation and collection [See Table 2 below].

The weather conditions on installation were 100% cloud cover, temperatures of around 5 degrees Centigrade with a wind of Beaufort strength 3 to 4 from the southwest initially falling light overnight. On collection the conditions were 100% cloud cover, temperature around 5 degrees C and wind Beaufort 1 from the southwest.

During the site visits the main source of background noise was road traffic noise on installation and on collection.

Model	Instrument	Serial No.	Lab Cal Certificate	Re-Calibration Due
A - Svan 957	Sound Level Meter	12308	1501182-1	01/11/2023
Svan SV12L	Preamp	13471	1501182-1	01/11/2023
GRAS 40AE Mic	Microphone	75146	1501182-1	01/11/2023
B&K 4231	Calibrator	2084928	00001202-1	31/03/2023

Table 2: Instrumentation used on site

5.0 RESULTS

The full results appear in Appendix 4. For the analysis the results prior to 9pm on 11th November have been disregarded on the grounds that it was too windy; the remaining results have been analysed statistically for the daytime period as shown in Chart 1 below.

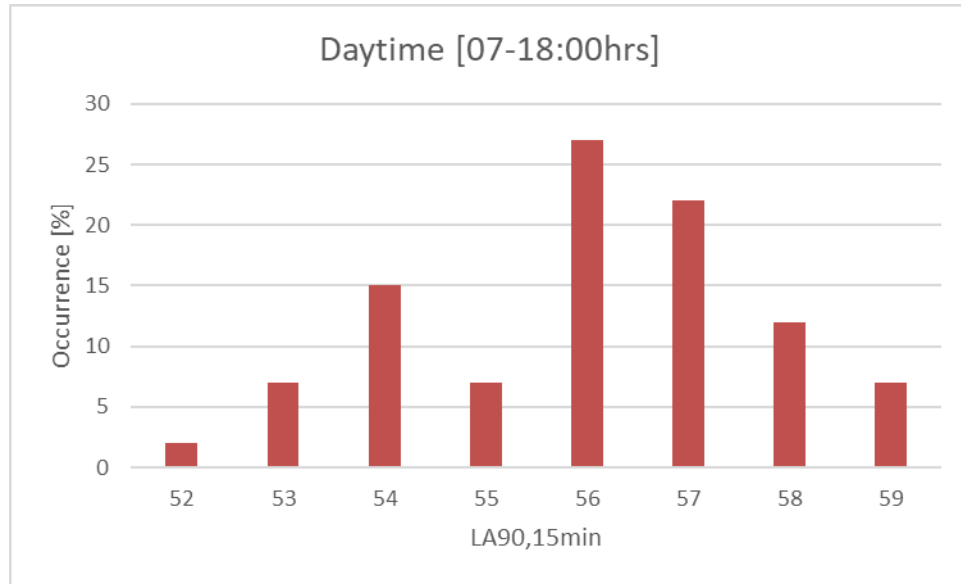


Chart 1: Daytime Background Noise Analysis

From Chart 1, there is a clear modal value at 56 LA90, which also corresponds to the average reading. Similarly, from Charts 2 and 3 below, the evening and nighttime periods have clear modes also corresponding to the period average readings of 54 LA90 [evening] and 37 LA90 [night]; although it should be noted that the average nighttime level was significantly higher at 43 LA90.

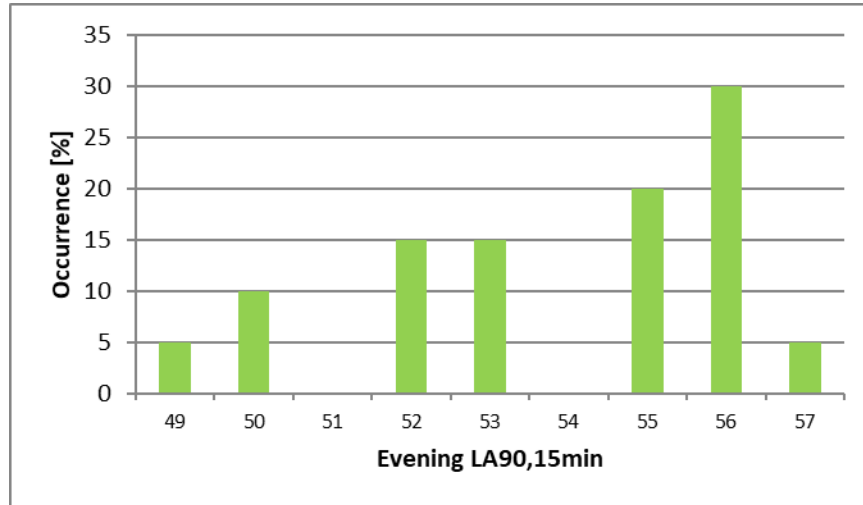


Chart 2: Evening Background Noise Analysis

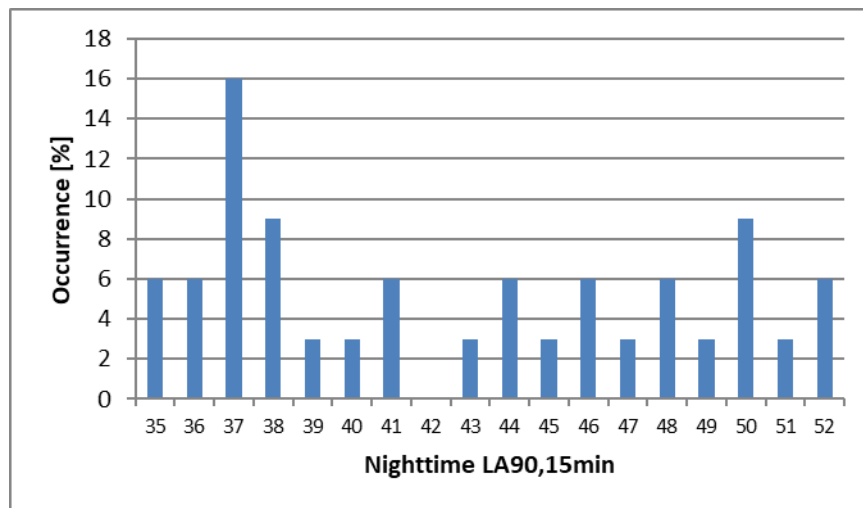


Chart 3: Nighttime Background Noise Analysis

6.0 PREDICTION OF REFRIGERATION UNIT LEVELS

6.1 Noise Prediction Assumptions

Parameter	Source	Details
Horizontal distances	--	From Google the nearest properties in Flannel St are some 27m from the units.
Ground levels – around site	--	Assessed as 'flat' during site visit
Refrigeration Sound Power Level	Client	Daikin 2 x LRYEQ16AY [See Appendix 3]
Source Location	Martec	Assumed to be centre of fan in External Unit
Barrier heights	Client/Martec	None
Receptor positions	Martec	Height of 1.4m for ground floor and 4m for first floor

Table 3: Modelling Parameters Sources and Assumptions

From Appendix 3, it is not clear whether 'System 1' or 'System 2' would be installed on site; consequently, it has been assumed that the 'noisier' system will be installed. Appendix 3 states that the sound pressure level of one unit would be 42 dBA at 10m [assumed to be LAeq] which means that the sound power level would be 70 dBA for a single unit and 73 dBA for two units.

6.2 Predicted Noise Level at Nearest Property

Predictions have been conducted using the provisions of BS5228:2009 as shown in Table 4 for the nearest bedroom window.

BS5228 SWL Method			Octave Band Centre Frequency [Hz]					dBA
Version 1.6			SWL Spectrum	125	250	500	1000	2000
© 2015 Martec Environmental Consultants Ltd			Shape (dBLin)	63.3	62.7	60.7	56.5	51.6
BS5228-1:2009 Predictions			Adjustment to a Given Level					73.0
			Height	Dist from Source				
Element								
Sound Power Level			0.5		74.5	73.9	71.9	67.7
Attenuations					62.8	73.0		
Receiver [distance correction]			4.0	26.0	36.4	36.4	36.4	36.4
Proportion of Soft Ground & HPR	0.0	0.0			0.0	0.0	0.0	0.0
Barrier Attenuation			0.0	0.0	0.0	0.0	0.0	0.0
Percentage on Time			100.0		0.0	0.0	0.0	0.0
Façade Reflection			0.0		0.0	0.0	0.0	0.0
Predicted Level at Reciever			External SPL/dBLin	38.1	37.5	35.5	31.3	26.4
				37				

Table 4: Predicted Level at Neighboring Property [LAeq free field]

6.3. Character Corrections

Character corrections should be added to the 'specific sound level' if it exhibits any tonality, impulsivity, other specific characteristics and/or intermittency at the assessment location. Based on our site visit and knowledge of such units, corrections to be applied are as follows:

- Tonality – From previous experience we consider that the is unlikely to be considered tonal
- Intermittency – We expect that the intermittency of the plant will not be distinguishable at the sensitive receiver over the residual noise climate, and we have not applied correction for intermittency.

- Impulsivity – Plant such as this is not normally impulsive. Other Sound Characteristics – We do not consider that the ASHPs will have any other sound characteristics.

6.4 BS4142 Assessment

The British Standard 4142:2014 initial estimate at the nearby property is as follows in Table 4:

Condition	Nighttime Bedroom Window	Daytime/Evening Bedroom Window
Measured/Predicted Ambient Level	37	37
Residual Level	0	0
Specific Noise Level	37	37
Tonal Correction	0	0
Impulsive Character	0	0
Other Character	0	0
Intermittancy	0	0
Rating Level [Specific + Character Correction]	37	37
Background Noise Level LA90	37	56
Excess over Background	0	-19
	Indication of Low Impact, depending on the context	Indication of Low Impact, depending on the context

Table 5: BS4142 Assessment

6.5 Discussion of assessment

It is a requirement of BS4142 that factors affecting the assessment [uncertainty] are considered:

1. For the purposes of assessment two of the louder units have been assumed, i.e. possibly over-predicting the noise impact.
2. Normally Martec would use sleep disturbance criteria for the nighttime period, i.e. are levels below 45 LAeq outside residents' open windows as opposed to comparisons with the background levels which in this case are lower for the 'depths' of the night.
3. Daytime background levels are very much higher and it is considered that residents would be very unlikely to notice any noise from the refrigeration units.
4. Overall, the assessment is considered sufficiently robust, and demonstrates that appropriate noise limits can be met by the ASHP; however, as with all such assessments they cannot demonstrate that the limits will be met under any and all circumstances.

7.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the measured background levels and the assumptions set out above, BS4142 would rate the predicted refrigeration unit noise levels impact as 'Low' even for the nighttime period, when Martec would generally use [higher] sleep disturbance criteria.

Consequently, it is considered that the noise impact of the refrigeration units should not bar the grant of planning consent for the proposals.

APPENDIX 1

EXPLANATION OF ACOUSTIC TERMS

The dB or the decibel, is the unit of noise. The number of decibels or the level, is measured using a sound level meter. It is common for the sound level meter to filter or 'weight' the incoming sound so as to mimic the frequency response of the human ear. Such measurements are designated **dB(A)**.

A doubling of the sound is perceived, by most people, when the level has increased by 10 dB(A). The least discernible difference is 2 dB(A). Thus, most people cannot distinguish between, say 30 and 31 dB(A).

The Background level of noise is most commonly represented by the level which is exceeded for 90% of the time i.e., the LA90.

If a noise varies over time, then the **equivalent continuous level, or LAeq**, is the notional constant level of noise which would contain the same amount of acoustic energy as the time varying noise.

The following table gives an approximate indication of the comparative loudness of various noises expressed in terms of the A weighted scale:

Source of noise	dB(A)	Nature of Noise
Inside Quiet bedroom at night	25-30	Very Quiet
Quiet office	40-45	
Rural background noise	35-45	
Normal conversational level	55-65	
Busy restaurant	65-75	
Inside suburban electric train	70-80	
Hand clap @ 1m	75-85	
HGV accelerating @ 5m away	85-90	Very Loud

APPENDIX 2

QUALIFICATIONS AND EXPERIENCE OF M. A. KENYON

My full name is Melville Alexander Kenyon. I am the principal of the firm of Martec Environmental Consultants Ltd, a consultancy company that specialises in environmental noise assessment and control. I graduated in 1982 with a bachelor's degree in Engineering and subsequently a master's degree in Environmental Acoustics. I have been a corporate member of the professional body for noise and vibration specialists, the Institute of Acoustics, since 1988, and have sat on the British Standards Committee dealing with noise in buildings [BS.8233:1999].

I have lectured at Liverpool John Moores University on the Diploma of Acoustics course and at Manchester Metropolitan University on their Environmental Health degree course.

The firm of Martec Environmental Engineering was formed in the 1970's and joined The Association of Noise Consultants in 1996. It is now known as Martec Environmental Consultants Ltd.

Since its formation, Martec has advised many groups of both residents and developers about the problems of noise and vibration in the environment.

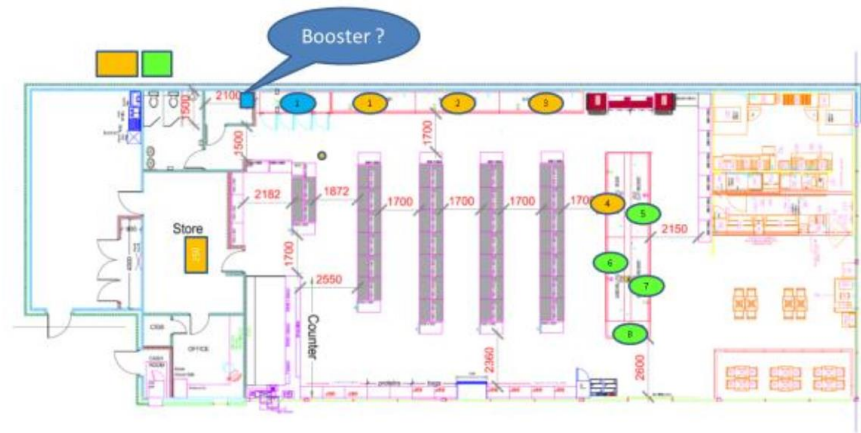
APPENDIX 3



Produced on 10/10/2018 with Refrigeration Xpress V2.9.0 - database Central 11.1.3

Project name Vali Clock PFS
Project address United Kingdom
Reference PJ
Client name Jordon
Only the data published in the data book are correct. This program uses close approximations of these data.
Material List

Model	Qty	Description
LREQ6BY1	1	MT condensing unit
LYEQ16AY	1	Heat pump condensing unit
FXMQ250MB	1	VRV FXMQ-MB - Ducted unit large ESP
LCBKQ3AV19	1	Booster unit
BRC1H519W	1	Remote controller incl buzzer (white)
Piping 1/2"	21.0m	
Piping 3/4"	10.0m	
Piping 1"	5.0m	
Piping 1 1/4"	20.0m	
Piping 1 1/2"	31.0m	
Piping 1 3/4"	24.0m	
Piping 2"	69.0m	



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Outdoor unit System 1

Name	Model	Temperature	Required Cap.	Available Cap.	Distance	Total Length
System 1	LRYEQ16AY - Heat pump condensing unit		22.14kW (101.8%)	21.75kW		33.9m
Indoor 1	FXMQ250MB			31.50kW	15.0m	17.0m
Freezer 1		-30.0°C	2.19kW	4.06kW	5.0m	22.0m
Refrigerator 1		-6.0°C	4.69kW	4.69kW	2.0m	22.1m
Refrigerator 2		-6.0°C	4.69kW	4.69kW	2.0m	25.8m
Refrigerator 3		-6.0°C	4.69kW	4.69kW	2.0m	29.3m
Refrigerator 4		-6.0°C	4.69kW	4.69kW	6.0m	33.9m

The total piping equivalent length takes the pressure drop created by refnests, T-joints and elbows into account. The designer needs to include other line components causing a pressure drop in the piping length.

The maximum allowed pressure value (PS value) of the different refrigerators, freezers and evaporators, connected to a ZEAS or CVP system must be equal to or greater than 24 bar.

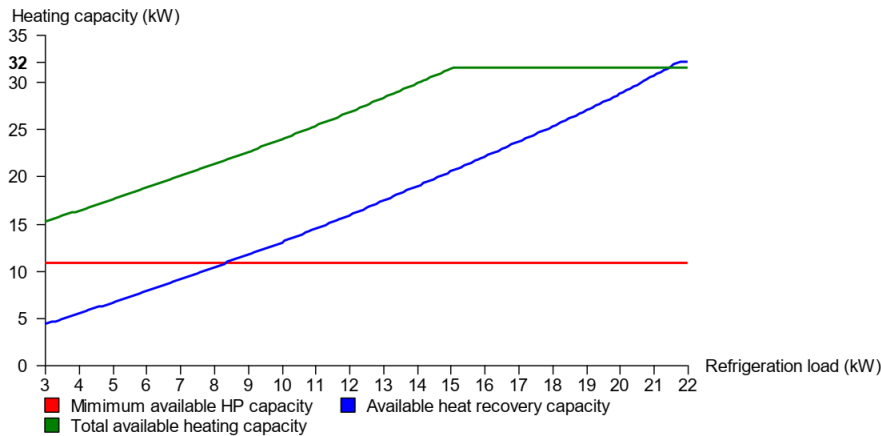
All refrigerators, freezers and evaporators must be designed for the use of classified Fluid Group II (non toxic and non-flammable refrigerants) refrigerants.

Outdoor air temperature	32.0°C
Evaporation temperature	-6.0°C
Piping length on refrigeration side	33.9m

AC Cooling and Heating

Heating capacity at 20.0°CDB indoor and -10.0°CDB ambient, based on a refrigeration load of 21.75kW	
Maximum available heat recovery capacity, corrected for 17.0m piping length	32.13kW
Available heat pump capacity, corrected for 17.0m piping length	10.89kW
Total available heating capacity, corrected for 17.0m piping length	43.02kW
Maximum heating capacity delivered by the indoor units	31.50kW
Heating capacity actually delivered to the shop	31.50kW
AC cooling capacity at 19.5°CWB indoor and 32.0°CDB ambient, based on a refrigeration load of 21.75kW	
Available AC cooling capacity, corrected for 17.0m piping length	13.84kW
Maximum cooling capacity delivered by the indoor units	28.69kW
Cooling capacity actually delivered to the shop	13.84kW

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The heating capacity shown only takes the HP capacity of 1 HP compressor into account.

The refrigeration load in winter will be different than in summer. Please contact the refrigerated cabinet supplier to find out what would be the drop in refrigeration load between winter and summer ambient conditions.

Refrigerant Charge

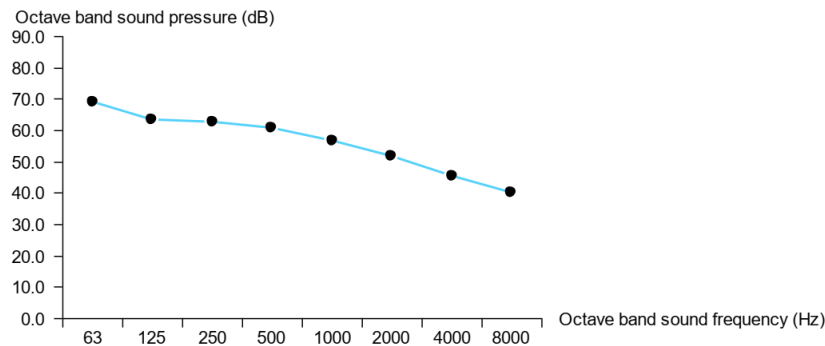
Total refrigerant charge addition based on the outdoor unit model	3.5kg
Total refrigerant charge of the liquid piping length	2.6kg
Total refrigerant charge on the indoor units and biddle air curtains	2.4kg
Total refrigerant charge on the refrigerator / freezer / evaporator side	5.0kg
Total refrigerant charge addition	13.5kg
Maximal correction additional charge	0.7kg
Base charge	11.5kg
Total refrigerant charge	25.8kg
Refrigerant type	R410A
Global Warning Potential (GWP)	2087.5
Tonnes of CO ₂ equivalent	53.8

The system contains fluorinated greenhouse gases.

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1.1. Sound Data LRYEQ16AY



LRYEQ16AY has a sound pressure of 42.0 dB(A) at 10.0m.

Octave band sound frequency	Octave band sound pressure
63 Hz	69.1 dB
125 Hz	63.3 dB
250 Hz	62.7 dB
500 Hz	60.7 dB
1000 Hz	56.5 dB
2000 Hz	51.6 dB
4000 Hz	45.3 dB
8000 Hz	40.1 dB

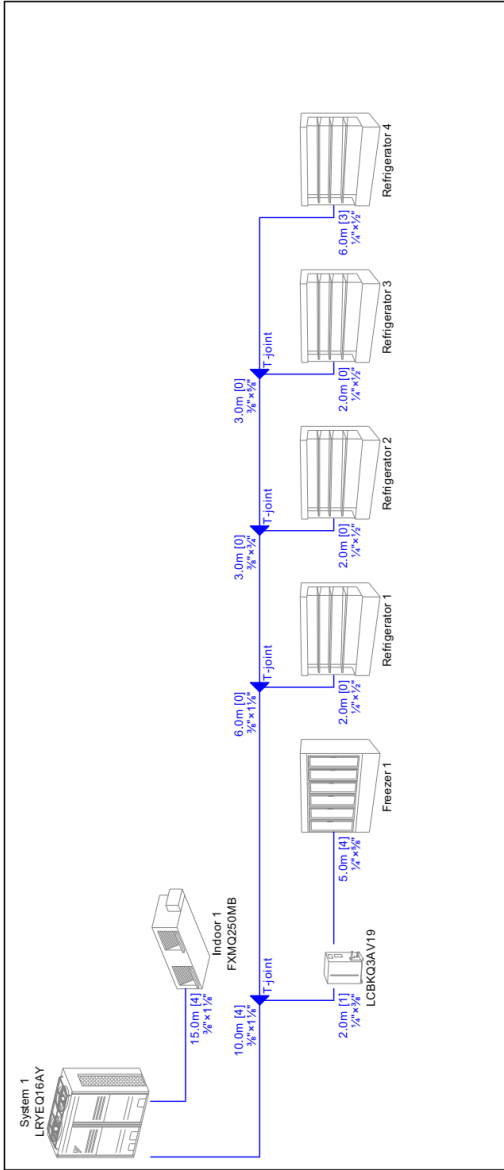
Important note: When several outdoor units are placed close to each other, the sound produced by these units may differ from the data calculated by the software.

Note: The sound pressure level at given distance is the real sound pressure delivered by the unit at free field conditions.

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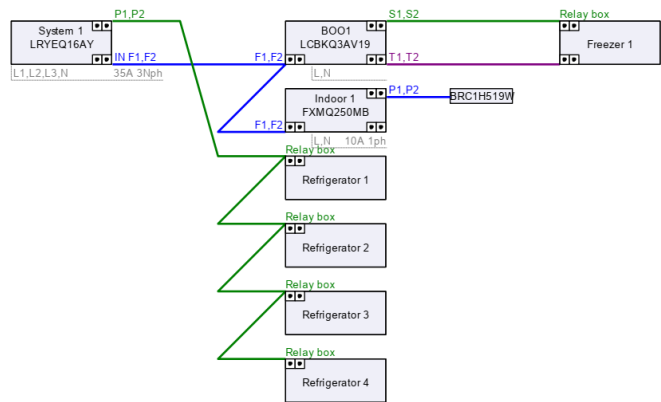
1.2. Piping System 1



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1.3. Wiring System 1



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2. Outdoor unit System 2

Name	Model	Temperature	Required Cap.	Available Cap.	Distance	Total Length
System 2	LREQ6BY1 - MT condensing unit		15.63kW (103.1%)	15.16kW		31.1m
Refrigerator 5		-6.0°C	4.69kW	4.69kW	2.0m	24.8m
Refrigerator 6		-6.0°C	4.69kW	4.69kW	2.0m	27.4m
Refrigerator 7		-6.0°C	4.69kW	4.69kW	2.0m	29.9m
Refrigerator 8		-6.0°C	1.56kW	1.56kW	3.0m	31.1m

The total piping equivalent length takes the pressure drop created by refnests, T-joints and elbows into account. The designer needs to include other line components causing a pressure drop in the piping length.

The maximum allowed pressure value (PS value) of the different refrigerators, freezers and evaporators, connected to a ZEAS or CVP system must be equal to or greater than 24 bar.

All refrigerators, freezers and evaporators must be designed for the use of classified Fluid Group II (non toxic and non-flammable refrigerants) refrigerants.

Outdoor air temperature	32.0°C
Evaporation temperature	-6.0°C
Piping length on refrigeration side	31.1m

Refrigerant Charge

Total refrigerant charge addition based on the outdoor unit model	1.0kg
Total refrigerant charge of the liquid piping length	1.9kg
Total refrigerant charge on the refrigerator / freezer / evaporator side	3.6kg
Total refrigerant charge addition	6.4kg
Maximal correction additional charge	0.6kg
Base charge	5.2kg
Total refrigerant charge	12.3kg
Refrigerant type	R410A
Global Warning Potential (GWP)	2087.5
Tonnes of CO ₂ equivalent	25.6

The system contains fluorinated greenhouse gases.

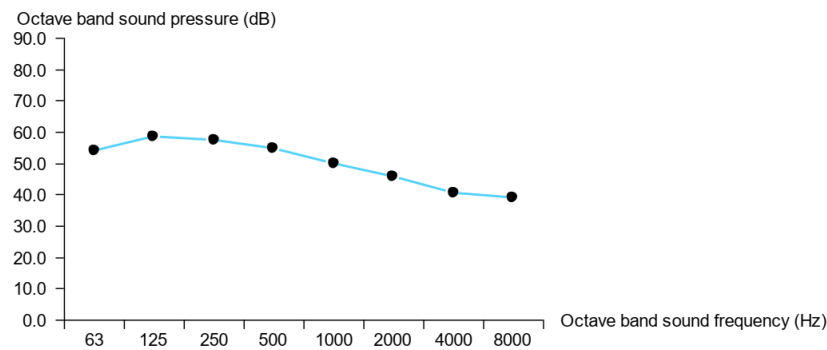
Outdoor Unit Limitations

Maximum distance between outdoor unit and furthest cabinet	130.0m
Maximum distance between first refnet and furthest cabinet	50.0m
Maximum level difference between outdoor unit and cabinets (outdoor unit below)	10.0m
Maximum level difference between outdoor unit and cabinets (outdoor unit above)	35.0m
Maximum level difference between booster unit and freezer cabinet/evaporator	10.0m
Maximum piping length between booster unit and freezer cabinet/evaporator	30.0m
Minimum refrigeration load (Te = -10.0°C)	2.00kW
Smallest connectable refrigeration cabinet (Te = -10.0°C)	
Minimum refrigeration load on the booster unit (Te = -35.0°C)	0.60kW
Maximum number of booster units per outdoor unit	1

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2.1. Sound Data LREQ6BY1



LREQ6BY1 has a sound pressure of 36.0 dB(A) at 10.0m.

Octave band sound frequency	Octave band sound pressure
63 Hz	54.1 dB
125 Hz	58.4 dB
250 Hz	57.2 dB
500 Hz	54.7 dB
1000 Hz	49.9 dB
2000 Hz	45.9 dB
4000 Hz	40.4 dB
8000 Hz	38.9 dB

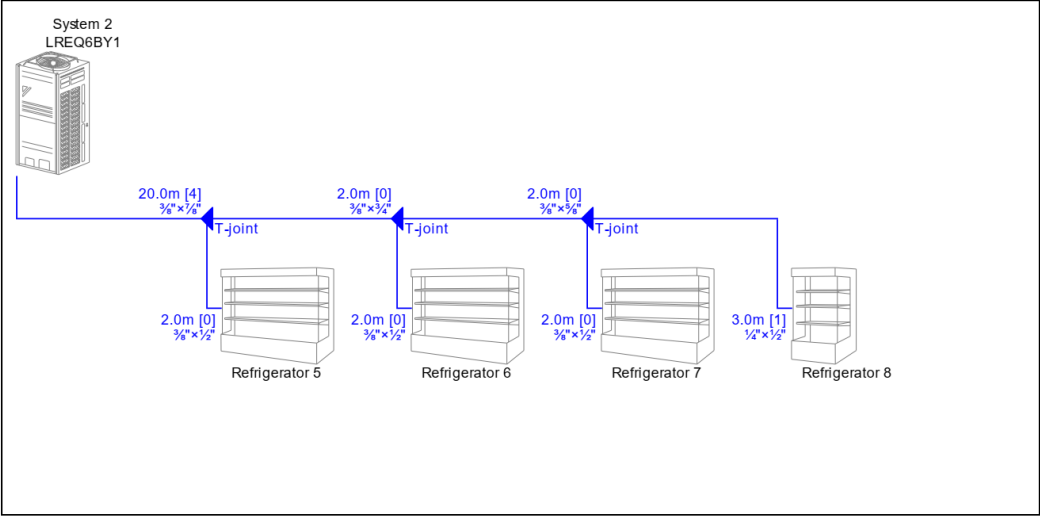
Important note: When several outdoor units are placed close to each other, the sound produced by these units may differ from the data calculated by the software.

Note: The sound pressure level at given distance is the real sound pressure delivered by the unit at free field conditions.

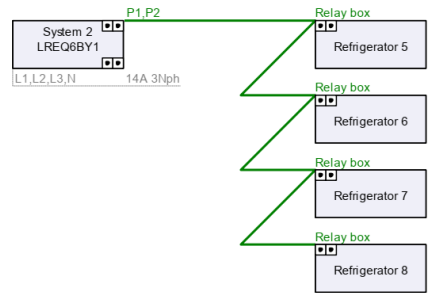
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2.2. Piping System 2



Wiring System 2



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APPENDIX 4

A4.1 DETAILS OF NOISE MEASUREMENTS [façade Levels]

Date & time	Duration	L _{Amax,F}	L _{Amin}	L _{Aeq}	LA01	LA10	LA50	LA90
02/02/2023 14:30:06	00:15:00	86	52.5	65.9	74.2	67.5	64.4	60
02/02/2023 14:45:06	00:15:00	78.6	51.5	64.3	69.6	66.8	63.6	58.8
02/02/2023 15:00:06	00:15:00	79.2	53.6	63.6	68.9	66.1	63	58
02/02/2023 15:15:06	00:15:00	84.1	49.8	63	70.3	64.3	60.2	55.3
02/02/2023 15:30:06	00:15:00	79.9	51.6	60.9	67.4	63.3	59.8	55.9
02/02/2023 15:45:06	00:15:00	73.9	52.8	60.5	66.3	63.2	59.3	56
02/02/2023 16:00:06	00:15:00	72.7	51.3	61.7	67.9	64.4	60.7	56.7
02/02/2023 16:15:06	00:15:00	73.8	52.9	61.7	67.7	64.3	60.8	56.5
02/02/2023 16:30:06	00:15:00	77	53.3	61.3	66.7	63.8	60.4	56.5
02/02/2023 16:45:06	00:15:00	94.2	53	66.2	70.9	64.8	60.9	56.5
02/02/2023 17:00:06	00:15:00	97.3	53.4	68.6	74.8	65.3	61.5	57.3
02/02/2023 17:15:06	00:15:00	82.3	52.6	65.2	73.1	67.3	64	58.7
02/02/2023 17:30:06	00:15:00	79.7	50.7	63.6	70.2	66.1	62.5	57.8
02/02/2023 17:45:06	00:15:00	87.3	50.2	66.5	78	66.9	63.6	58.6
02/02/2023 18:00:06	00:15:00	74.1	50.3	64.5	70	67.1	63.8	59.5
02/02/2023 18:15:06	00:15:00	87.2	53.5	64.8	70.8	67	63.4	59.2
02/02/2023 18:30:06	00:15:00	79.5	53.3	64.2	69.6	66.8	63.2	58.9
02/02/2023 18:45:06	00:15:00	79	53.6	64.2	71.5	66.4	63.4	59.1
02/02/2023 19:00:06	00:15:00	72.4	50.6	63.7	68.5	66.3	63.2	57.9
02/02/2023 19:15:06	00:15:00	92.2	51.3	67.5	74.7	66.7	63.2	59
02/02/2023 19:30:06	00:15:00	92.7	53.2	66.5	72.4	66.8	63.3	58.9
02/02/2023 19:45:06	00:15:00	86.4	53.4	64.8	70.8	67	63.4	58.3
02/02/2023 20:00:06	00:15:00	82.5	50.5	63.8	70.5	66.3	63	57.5
02/02/2023 20:15:06	00:15:00	83.9	51.3	64.6	71.4	66.8	63.5	58.7
02/02/2023 20:30:06	00:15:00	74.5	50.8	63.3	68.9	66.3	62.6	56.3
02/02/2023 20:45:06	00:15:00	85.8	52.9	64.6	70.7	66.9	63.1	58.2
02/02/2023 21:00:06	00:15:00	73.2	49.9	63.5	69.5	66.6	62.6	55.9
02/02/2023 21:15:06	00:15:00	71.7	49.1	63	69	66.1	62.1	55.3
02/02/2023 21:30:06	00:15:00	72.5	49.1	63.2	69.6	66.4	62.3	54.9
02/02/2023 21:45:06	00:15:00	75.8	52.2	62.8	69.2	65.8	61.5	55.9
02/02/2023 22:00:06	00:15:00	87.9	45.9	64.4	72.6	66.4	60.9	52.1
02/02/2023 22:15:06	00:15:00	71.5	46.5	62.9	69.1	66.2	61.8	54.6
02/02/2023 22:30:06	00:15:00	82.9	46.1	63.2	69.8	65.9	60.9	53.3
02/02/2023 22:45:06	00:15:00	75.6	47.8	62.3	69.3	65.8	60.4	52.9
02/02/2023 23:00:06	00:15:00	75.4	44.2	61.4	68.4	65.1	59.8	50.1
02/02/2023 23:15:06	00:15:00	92.6	46.3	63.5	68.9	64.7	59.5	52.7
02/02/2023 23:30:06	00:15:00	74.2	48.5	61.1	68.6	64.6	59.1	53.3
02/02/2023 23:45:06	00:15:00	82.1	49.6	62.5	70.5	65.8	60.1	55.1
03/02/2023 00:00:06	00:15:00	85.5	46.3	62.8	71.9	65	59.1	50.9
03/02/2023 00:15:06	00:15:00	85.1	45.4	61.7	69.5	65.5	57.7	50.8
03/02/2023 00:30:06	00:15:00	72	40.2	60.5	68.7	64.9	56.3	48.6

Refrigeration Units Noise Assessment

03/02/2023 00:45:06	00:15:00	82	43	60.5	69	64.5	54.9	47.6
03/02/2023 01:00:06	00:15:00	71.3	41.7	59.5	68.7	63.9	54.7	46.8
03/02/2023 01:15:06	00:15:00	72.1	40.8	58	67.7	62.6	52.2	45.8
03/02/2023 01:30:06	00:15:00	82	42.8	59.2	69	61.5	50.1	46.5
03/02/2023 01:45:06	00:15:00	69.4	40.9	56.7	67.1	61.4	49.8	43.6
03/02/2023 02:00:06	00:15:00	76.9	38.7	56.3	66.9	60.1	48.6	43.1
03/02/2023 02:15:06	00:15:00	70.1	36.8	55.7	66.5	59.9	49.6	40.9
03/02/2023 02:30:06	00:15:00	71.1	36.6	56.9	68.1	61.2	48.6	41.3
03/02/2023 02:45:06	00:15:00	69.5	35.5	54.6	66.3	58.1	46.4	40
03/02/2023 03:00:06	00:15:00	70.3	37.8	54.6	67	57.4	46.4	41
03/02/2023 03:15:06	00:15:00	77.1	36.5	55.1	66.4	58	46.8	39.6
03/02/2023 03:30:06	00:15:00	75.1	35.6	58.1	68.5	61.7	54.4	40.4
03/02/2023 03:45:06	00:15:00	71.6	35.9	54.3	67.2	55.8	43.1	38.1
03/02/2023 04:00:06	00:15:00	70.7	36.5	54.9	66.8	58.9	44.3	38.6
03/02/2023 04:15:06	00:15:00	70.4	35.6	54.5	66.5	58.2	44.7	37.8
03/02/2023 04:30:06	00:15:00	72.3	35.9	56.2	68.6	58.9	46	38.7
03/02/2023 04:45:06	00:15:00	71.8	38.1	57.7	68.7	62.3	48.2	40.4
03/02/2023 05:00:06	00:15:00	72.9	37	57.5	68.8	61.9	49.2	43.9
03/02/2023 05:15:06	00:15:00	77.1	35.9	57.1	67.6	61.1	47.8	39.8
03/02/2023 05:30:06	00:15:00	73.4	38.7	60.7	70.5	65.2	54.2	42.2
03/02/2023 05:45:06	00:15:00	75.5	43.8	64.5	72.7	69.1	60.3	48.7
03/02/2023 06:00:06	00:15:00	76.5	46.3	64.6	72.8	68.7	61	51.7
03/02/2023 06:15:06	00:15:00	79.5	44.9	64.9	72.9	68.9	61.3	52.5
03/02/2023 06:30:06	00:15:00	75.9	48.2	65.3	73.3	69.3	62.7	53.9
03/02/2023 06:45:06	00:15:00	79.1	47.3	66.2	73.8	69.9	63.9	55.2
03/02/2023 07:00:06	00:15:00	79	47.8	67.4	72.8	70.6	66.7	58.6
03/02/2023 07:15:06	00:15:00	78.5	51.2	67.2	72.9	70	66.6	58.4
03/02/2023 07:30:06	00:15:00	74.9	54.5	67.6	73.1	70.3	67.1	60.6
03/02/2023 07:45:06	00:15:00	75.8	55.2	68.1	72.8	70.6	67.9	62.2
03/02/2023 08:00:06	00:15:00	75	53.5	67.1	72.2	69.8	66.6	60.2
03/02/2023 08:15:06	00:15:00	75.4	55	68.3	74.6	73	66.2	61.1
03/02/2023 08:30:06	00:15:00	74.7	54.2	66	71.6	68.6	65.4	60.6
03/02/2023 08:45:06	00:15:00	76.3	49.8	64.5	69.7	67.1	63.9	58.7
03/02/2023 09:00:06	00:15:00	72	51.6	62.6	68.9	65.6	61.4	56.2
03/02/2023 09:15:06	00:15:00	75.3	50.9	63.8	68.9	66.6	63.1	58.6
03/02/2023 09:30:06	00:15:00	82.1	54.8	65.7	71.8	68.3	64.2	59.9
03/02/2023 09:45:06	00:15:00	73.6	53.7	66.5	71.5	69.3	65.9	60.1
03/02/2023 10:00:06	00:15:00	75.1	51.9	66.3	71.5	68.9	65.9	59.7
03/02/2023 10:15:06	00:15:00	74.8	53.4	66	71.7	68.8	65.2	59.7
03/02/2023 10:30:06	00:15:00	74.6	51.9	65.6	70.9	68.4	64.9	59.3
03/02/2023 10:45:06	00:15:00	83.8	53.9	65.2	70.8	67.6	64.7	59.4
03/02/2023 11:00:06	00:15:00	84.5	51.9	66.2	71.7	68.3	65.2	61.2
03/02/2023 11:15:06	00:15:00	71.4	48.8	65.3	69.9	67.9	64.9	59.3
03/02/2023 11:30:06	00:15:00	76.6	52.9	65.9	70.7	68.5	65.4	60.5
03/02/2023 11:45:06	00:15:00	74.5	52.2	66.5	72	69.3	65.7	61.5

Refrigeration Units Noise Assessment

03/02/2023 12:15:06	00:15:00	74.1	49.4	66.6	72	69.3	66.1	59.7
03/02/2023 12:30:06	00:15:00	97	51.5	72.1	80.5	69.5	66.6	61.6
03/02/2023 12:45:06	00:15:00	77.3	51.4	66.1	72	68.8	65.4	59.2
03/02/2023 13:00:06	00:15:00	83.9	54.4	65.9	71.5	68.5	65.1	59.5
03/02/2023 13:15:06	00:15:00	77.2	49.6	66.2	71.6	68.9	65.5	60.1
03/02/2023 13:30:06	00:15:00	91.1	53.5	67.9	77.5	69	65.2	59.3
03/02/2023 13:32:19	00:02:13	84.8	54.4	65.9	76.7	67.1	60.9	57.4