## Acoustic Impact Report

### 1. Introduction

This report details the plant to be installed on the roof plant above fourth floor and the acoustic measures taken to limit noise impact to the surrounding area. This report is to be read in conjunction with the 24 hour noise survey report carried out on the fourth floor roof which sets out the noise criteria in which the proposed plant is to achieve and Tate and Hindle Design Ltd drawing no. 3700_SK_(03) 16.

### 2. Acoustic Criteria

[See 24 hour noise survey report (ref: QF4875/PF2804/RP1) for details]
Building operation hours: 08 00 – 22 00
Lowest $LA_{90}$ level recorded between building operation hours: 52.6 dBA at 21 42 hrs.
Noise level to be achieved at 1 metre from façade of nearest residential property: 42.6 dBA.

### 3. Proposed Plant

3.1 Refrigerant condenser units

- 2No. Daikin VRVII Heat recovery units – REYQ48M7W1B – each unit made up of 3No. REYQ16 modules (See Appendix A1)
- 1No. Daikin VRVII Heat recovery unit – REYQ16M7W1B (See Appendix A1)
- 3 No. Airedale heat pump units – CUHS2.5S (See Appendix A2)

3.2 Air handling units

- 1No. fresh air supply air handling unit – (1.5 $m^3$/s @ 300 Pa) – AHU to be provided with attenuation on atmospheric and supply side as required on final selection of unit.
- 1No. WC extract unit – (0.21$m^3$/s @ 200Pa) - Vent-axia model ATQ250-12C - attenuation on atmospheric and supply side as required.

### 4. Acoustic Treatment

The nearest premises are approximately 8 to 10 metres distance from the edge of the plant enclosure and two stories below the level of the plant enclosure. To maintain the noise level of 42.6 dBA at 1 metre from these façades the proposed plant is to be installed within an enclosure constructed with plain panels at the north and south ends and acoustic louvres along the west and east ends. The residential properties on the faces looking onto the north and south enclosure walls will then be protected from the direct noise of the plant with the east and west walls benefiting from directivity as well as the attenuation of the acoustic louvres.

See attached manufacturers literature for acoustic enclosure details (Appendix B1).

Appendix A1

DAIKIN

# technical data

## VRV II Systems

REYQ-M7W1B

Inverter heat recovery

# 1 Specifications

## 1-1 Survey 8-48HP

| REYQ-M | | | 8 | 10 | 12 | 14 | 16 |
|---|---|---|---|---|---|---|---|
| MODULES | REYQ8M | | 1 | | | | |
| | REYQ10M | | | 1 | | | |
| | REYQ12M | | | | 1 | | |
| | REYQ14M | | | | | 1 | |
| | REYQ16M | | | | | | 1 |
| EQUIVALENT HORSEPOWER | | HP | 8 | 10 | 12 | 14 | 16 |
| NUMBER OF OUTDOOR UNITS | | | 1 | 1 | 1 | 1 | 1 |
| NUMBER OF COMPRESSORS | | | 2 | 2 | 2 | 3 | 3 |
| NUMBER OF CONNECTABLE INDOOR UNITS | | | 13 | 16 | 20 | 20 | 20 |
| MINIMUM CAPACITY INDEX | | | 100 | 125 | 150 | 175 | 200 |
| MAXIMUM CAPACITY INDEX | | | 260 | 325 | 390 | 455 | 520 |
| COOLING CAPACITY | | kW | 22.4 | 28.0 | 33.5 | 40.0 | 44.5 |
| HEATING CAPACITY | | kW | 25.0 | 31.5 | 37.5 | 45.0 | 50.0 |
| POWER INPUT | Cooling | kW | 6.97 | 9.00 | 10.60 | 14.30 | 15.60 |
| | Heating | kW | 6.89 | 9.51 | 10.80 | 12.90 | 14.0 |
| EER | | | 3.21 | 3.11 | 3.16 | 2.80 | 2.85 |
| COP | | | 3.63 | 3.38 | 3.47 | 3.49 | 3.57 |
| CAPACITY STEPS | | | 29 | 29 | 29 | 35 | 35 |
| DIMENSIONS | Height | mm | 1,600 | 1,600 | 1,600 | 1,600 | 1,600 |
| | Width | mm | 930 | 930 | 1,240 | 1,240 | 1,240 |
| | Depth | mm | 765 | 765 | 765 | 765 | 765 |
| WEIGHT | | kg | 245 | 245 | 295 | 340 | 340 |

| REYQ-M | | | 18 | 20 | 22 | 24 | 26 | 28 | 30 | 32 |
|---|---|---|---|---|---|---|---|---|---|---|
| MODULES | REYQ8M | | 1 | | | | | | | |
| | REYQ10M | | 1 | 2 | 1 | 1 | 1 | | | |
| | REYQ12M | | | | 1 | | | 1 | | |
| | REYQ14M | | | | | 1 | | | 1 | |
| | REYQ16M | | | | | | 1 | 1 | 1 | 2 |
| EQUIVALENT HORSEPOWER | | HP | 18 | 20 | 22 | 24 | 26 | 28 | 30 | 32 |
| NUMBER OF OUTDOOR UNITS | | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| NUMBER OF COMPRESSORS | | | 4 | 4 | 4 | 5 | 5 | 5 | 6 | 6 |
| NUMBER OF CONNECTABLE INDOOR UNITS | | | 20 | 20 | 22 | 32 | 32 | 32 | 32 | 32 |
| MINIMUM CAPACITY INDEX | | | 225 | 250 | 275 | 300 | 325 | 350 | 375 | 400 |
| MAXIMUM CAPACITY INDEX | | | 585 | 650 | 715 | 780 | 845 | 910 | 975 | 1.040 |
| COOLING CAPACITY | | kW | 50.4 | 56.0 | 61.5 | 68.0 | 72.5 | 78.0 | 84.5 | 89.0 |
| HEATING CAPACITY | | kW | 56.5 | 63.0 | 69.0 | 76.5 | 81.5 | 87.5 | 95.0 | 100.0 |
| POWER INPUT | Cooling | kW | 16.00 | 18.00 | 19.60 | 23.24 | 24.60 | 26.20 | 29.90 | 31.20 |
| | Heating | kW | 16.50 | 19.00 | 20.50 | 22.60 | 23.80 | 25.30 | 27.50 | 28.60 |
| EER | | | 3.15 | 3.11 | 3.14 | 2.92 | 2.95 | 2.98 | 2.83 | 2.85 |
| COP | | | 3.42 | 3.32 | 3.37 | 3.38 | 3.42 | 3.46 | 3.45 | 3.50 |
| CAPACITY STEPS | | | 41 | 41 | 41 | 46 | 46 | 46 | 51 | 51 |
| DIMENSIONS | Height | mm | 1,600 | 1,600 | 1,600 | 1,600 | 1,600 | 1,600 | 1,600 | 1,600 |
| | Width | mm | 1,860 | 1,860 | 2,170 | 2,170 | 2,170 | 2,480 | 2,480 | 2,480 |
| | Depth | mm | 765 | 765 | 765 | 765 | 765 | 765 | 765 | 765 |
| WEIGHT | | kg | 490 | 490 | 540 | 585 | 585 | 635 | 680 | 680 |

# 1 Specifications

## 1-1 Survey 8-48HP

| REYQ-M | | | 34 | 36 | 38 | 40 | 42 | 44 | 46 | 48 |
|---|---|---|---|---|---|---|---|---|---|---|
| MODULES | REYQ8M | | | | | | | | | |
| | REYQ10M | | 2 | 2 | 1 | 1 | 1 | | | |
| | REYQ12M | | | | 1 | | | 1 | | |
| | REYQ14M | | 1 | | | 1 | | | 1 | |
| | REYQ16M | | | 1 | 1 | 1 | 2 | 2 | 2 | 3 |
| EQUIVALENT HORSEPOWER | | HP | 34 | 36 | 38 | 40 | 42 | 44 | 46 | 48 |
| NUMBER OF OUTDOOR UNITS | | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| NUMBER OF COMPRESSORS | | | 7 | 7 | 7 | 8 | 8 | 8 | 9 | 9 |
| NUMBER OF CONNECTABLE INDOOR UNITS | | | 34 | 36 | 38 | 40 | 40 | 40 | 40 | 40 |
| MINIMUM CAPACITY INDEX | | | 425 | 450 | 475 | 500 | 525 | 550 | 575 | 600 |
| MAXIMUM CAPACITY INDEX | | | 1,105 | 1,170 | 1,235 | 1,300 | 1,365 | 1,430 | 1,495 | 1,560 |
| COOLING CAPACITY | | kW | 96.0 | 100.5 | 106.0 | 112.5 | 117.0 | 122.5 | 129.0 | 133.5 |
| HEATING CAPACITY | | kW | 108.0 | 113.0 | 119.0 | 126.5 | 131.5 | 137.5 | 145.0 | 150.0 |
| POWER INPUT | Cooling | kW | 32.20 | 33.60 | 35.20 | 38.90 | 40.20 | 41.80 | 45.50 | 46.90 |
| | Heating | kW | 32.10 | 33.30 | 34.80 | 37.00 | 38.10 | 39.60 | 41.80 | 42.90 |
| EER | | | 2.98 | 2.99 | 3.01 | 2.89 | 2.91 | 2.93 | 2.84 | 2.85 |
| COP | | | 3.36 | 3.39 | 3.42 | 3.42 | 3.45 | 3.47 | 3.47 | 3.50 |
| CAPACITY STEPS | | | 56 | 56 | 56 | 61 | 61 | 61 | 68 | 68 |
| DIMENSIONS | Height | mm | 1,600 | 1,600 | 1,600 | 1,600 | 1,600 | 1,600 | 1,600 | 1,600 |
| | Width | mm | 3,100 | 3,100 | 3,410 | 3,410 | 3,410 | 3,720 | 3,720 | 3,720 |
| | Depth | mm | 765 | 765 | 765 | 765 | 765 | 765 | 765 | 765 |
| WEIGHT | | kg | 830 | 830 | 880 | 925 | 925 | 975 | 1.020 | 1.020 |