Appendix 3

Noise Impact Assessment

Prepared by

Ramboll Hong Kong Limited

AMENDMENT TO THE APPROVED SOCIAL WELFARE FACILITY (RESIDENTIAL CARE HOME FOR THE ELDERLY) IN "RESIDENTIAL (GROUP B)" ZONE AT 349 PRINCE EDWARD ROAD WEST, KOWLOON

NOISE IMPACT ASSESSMENT

Date	**27 August 2024**
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CHAPTERS

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1. INTRODUCTION

1.1 Background

1.1.1 The Application Site (hereafter referred to as the Proposed Development) at 349 Prince Edward Road East, Kowloon, is zoned as "Residential (Group B)" ("R(B)") under the Approved Ho Man Tin Outline Zoning Plan No. S/K10/30 ("the OZP") with a site area of 582.9 m^2 and maximum building height ("BH") of 80 metres above principal datum ("mPD"). This S16 application is submitted to the Town Planning Board for the amendment to the approved Social Welfare Facility (Residential Care Home for the Elderly) (Town Planning Board Ref. A/K10/261) at the Application Site.

1.1.2 Ramboll Hong Kong Ltd. has been commissioned by the Applicant to conduct this Noise Impact Assessment (NIA) for the subject Section 16 Application.

1.2 The Project Location

1.2.1 The Application Site is bounded by Prince Edward Road West to the North and is surrounded by existing elderly home and residential buildings e.g. Woodland Villa, Ka Wah Court and Blue Haven. **Figure 1.1** shows the location and the environ of the Application Site.

1.3 The Project Description

1.3.1 The Proposed Development for Residential Care Home for the Elderly (RCHE) would consist of 11 storeys with basement floor, including supporting facilities, wards, activity and administration uses. The supporting facilities are proposed on G/F and the wards are proposed on 1/F to 7/F, while areas for activity and administration are proposed on the 8/F and 9/F respectively. The E&M facilities are proposed on B1/F and R/F.

1.3.2 The main height of the tower is around 42.5 mPD. The anticipated completion year of the Proposed Development is expected to be in 2027. The layout plans of the Proposed Development is shown in **Appendix 1.1**. Major development parameters are summarised as follows:

Table 1.1 Development Parameters for Proposed Development in Application Site

Building	Residential
Zoning under OZP	"R(B)" under S/K10/30
Site Area, m^2	582.9
No. of Beds	141
No. of Storey above ground	B1/F (E&M facilities) G/F (supporting facilities) 1/F to 7/F (7 typical floors) 8/F (activity use) 9/F (office use) R/F (E&M facilities)
Main Level of Building, mPD	~42.5 (Main Roof Level)
Facilities	Ancillary Area, Common/ Circulation Space
Anticipated Completion Year	2027

1.4 Scope

1.4.1 The scope of this NIA includes road traffic noise impact and fixed noise impact assessments on the Proposed Development.

2. TRAFFIC NOISE IMPACT ASSESSMENT

2.1 Introduction

2.1.1 In this assessment, road traffic noise impact from roads within 300m radius on the Proposed Development has been assessed. Practicable environmental mitigation measures have been recommended as appropriate.

2.2 Assessment Criteria

2.2.1 According to Chapter 9 of the HKPSG which provides guidance for environmental considerations in the planning of both public and private developments and the noise standards are prescribed, the maximum allowed road traffic noise level, measured in terms of L_{10} (1 hr), at typical facade of new dwellings and office uses is recommended to be 70 dB(A) and for isolation room with potential diagnostic treatment to be 55 dB(A).

2.3 Noise Sensitive Receivers for Road Traffic Noise Assessment

2.3.1 The proposed RCHE at the Application Site is a noise sensitive receiver (NSR) of road traffic noise impact. Representative assessment points have been assigned to the rooms with prescribed window for ventilation within G/F to 7/F and 9/F of the Proposed Development. The assessment area is provided in **Figure 2.1**. The locations and details of the representative NSRs selected for assessment are provided in **Figures 2.2a to Figures 2.2e** and **Table 2.1** below, respectively.

Table 2.1 Representative NSRs for Road Traffic Noise Assessment

NSR	Description	Type of Use/ Noise Criteria dB(A)	Assessment Level, mPD
RG01	Interview Room	Office/ 70	G/F at 10.4 mPD
R101	Wards	Dwelling/ 70	1/F at 15.4 mPD
R102	Wards	Dwelling/ 70	
R103	Isolation Room	Office/ 55	
R104	Wards	Dwelling/ 70	
R105	Wards	Dwelling/ 70	
RT01	Wards	Dwelling/ 70	Typical Floors from 2/F to 7/F at 18.5 mPD to 34.3 mPD
RT02	Wards	Dwelling/ 70	
RT03	Wards	Dwelling/ 70	
RT04a	Wards	Dwelling/ 70	
RT04b	Isolation Room	Office/ 55	
RT05	Wards	Dwelling/ 70	
RT06	Wards	Dwelling/ 70	
R901	General Office	Office/ 70	9/F at 40.6 mPD
R902	General Office	Office/ 70	

2.4 Assessment Methodology

2.4.1 As discussed in **Section 2.2**, according to HKPSG, the standard for road traffic noise level expressed in terms of L_{10}(1 hr) at the typical façades of the Proposed

Development is recommended to be 70 dB(A) for dwellings and office uses and 55 dB(A) for isolation room. The assessment is based on the prediction of the maximum L_{10} (1 hr) traffic noise level at NSRs of the Proposed Development due to the projected traffic on the adjacent road network for year 2042, which is considered as the maximum traffic projections within 15 years upon occupation of the Proposed Development in 2027. Traffic data was predicted by the project traffic consultant. Details of information on peak hour traffic volume and percentage of heavy vehicle of the road network within the 300m assessment area provided by the Project traffic consultant is presented in **Appendix 2.1**, which represents the worst-case scenario of the projected traffic flows.

2.4.2 The UK Department of Transport's procedures - "Calculation of Road Traffic Noise" (CRTN) has been used in the prediction of the road traffic noise at the representative NSRs of the Proposed Development within the Application Site. The existing topographic details, such as the existing houses and structures near the Application Site, have been considered in the assessment.

2.4.3 The noise prediction has been carried out using the *Road Noise Module 2.7.2 of Noise Map Enterprise Edition* software, which is a computerised model developed on the basis of the U.K. Department of Transport's CRTN procedures, and is acceptable to the EPD.

2.5 Prediction and Evaluation of Noise Impacts

2.5.1 An assessment on the road traffic noise level at the NSRs based on the above traffic flow data has been conducted. Noise mitigation measure which has already been incorporated in the design of the layout, and considered in the unmitigated scenario include the setback of RCHE block from the site boundary. The Proposed Development is also partially shielded by other surrounding existing buildings in the area.

2.5.2 A summary of the predicted road traffic noise levels at the representative NSRs is provided in **Table 2.2**. The predicted road traffic noise levels at some NSRs would exceed the relevant noise criteria of 70 dB(A) by up to 6 dB(A).The detailed unmitigated results are provided in **Appendix 2.2**.

Table 2.2 Summary of Predicted Unmitigated Road Traffic Noise Levels at Representative NSRs (AM and PM peaks)

NSR	Predicted Road Traffic Noise Level, $L_{10\ (1\text{-hour})}$, dB(A) (Unmitigated)	
	AM	PM
RG01	70	69
R101	76	76
R102	75	75
R103	49	49
R104	59	57
R105	61	60
RT01	75 - 76	75 - 76
RT02	75	74 - 75
RT03	50 - 51	49 – 50
RT04a	55 - 56	55
RT04b	49	48 - 49
RT05	59 - 63	58 – 62
RT06	61 - 63	60 – 62

NSR	Predicted Road Traffic Noise Level, $L_{10\ (1\text{-hour})}$, dB(A) (Unmitigated)	
	AM	PM
R901	57	56
R902	57	56

[1] Bolded values exceed the noise criteria of 55 dB(A) or 70 dB(A).

2.5.3 To mitigate the traffic noise impact, baffle type acoustic window are proposed in order to alleviate the noise levels to comply with the noise criteria.

Baffle Type Acoustic Balcony

2.5.4 Innovative noise mitigation measures are being explored in recent years. It is noted that EPD has published *ProPECC PN5/23 Application of Innovative Noise Mitigation Designs in Planning Private Residential Developments against Road Traffic Noise Impact*. According to EPD's website regarding innovative noise mitigation design and measures (http://www.epd.gov.hk/epd/Innovative/greeny/eng/index.html), different balconies and special design window systems have been implemented in public rental housing, private residential and hostel developments.

2.5.5 As the acoustic window design in ProPECC PN5/23 cannot be adopted in the Proposed Development, the design of acoustic window is drawn from another reference case with a more applicable design to suit the Proposed Development. The acoustic window (baffle type) from a reference case, i.e. approved planning application A/K22/29, is proposed to be equipped at the wards on the first floor to seventh floor of the RCHE which are directly facing Prince Edward Road West. The location of these acoustic window (baffle type) has been indicated in **Figure 2.3a** and **Figure 2.3b**.

2.5.6 According to the EA report of the approved planning application A/K22/29, a sound attenuation performance of 8.8 dB(A) can be achieved to a room of 38.3m^2 in area by an acoustic window (baffle type) with an outer opening size of 3.2m^2, 100mm gap width and 275mm overlapping width. The relevant pages of the said report have been extracts in **Appendix 2.5**.

2.5.7 For the proposed acoustic window (baffle type), the outer window opening shall be equal or smaller than 3.2m^2, the overlapping width shall be larger or equal to 275mm, while 100mm gap width shall be provided. The indicative design of the proposed acoustic window (baffle type) can be referred to **Figure 2.4**. Furthermore, the room sizes of the wards at the RCHE proposed with acoustic window (baffle type) range from around 29m^2 to 47.7m^2. In theory, the smaller the room size designed, the less will be the sound attenuation after adjustment. The sound attenuation for individual ward has been adjusted based on comparison of room size of the case in this Proposed Development and the reference case. Sound attenuation of the baffle type acoustic window adopted for the Proposed Development is estimated based on the reference project and presented in **Appendix 2.4.** The acoustic window (baffle type) is expected to provide at least 7.6 dB(A) of sound attenuation for the dormitories that are smaller in size than the reference case, after adjusting the sound attenuation. Meanwhile, the room sizes of the dormitories at the RCHE proposed with the acoustic window (baffle type) are larger than the one used in the reference case (A/K22/29). Therefore, the sound attenuation performance of the proposed acoustic window (baffle type) is not expected to be less than the reference case, which is equivalent to 8.8 dB(A). As a conservative approach, an 8.8 dB(A) sound reduction will be used for the wards with a room size larger than the reference case in this assessment.

2.5.8 Under the mitigated scenario, there is no exceedance of the noise criteria at the representative NSRs. The summary of the road traffic noise impact assessment results is presented in **Table 2.3**, and the details are presented in **Appendix 2.3**.

Table 2.3 Summary of Predicted Mitigated Road Traffic Noise Levels at Representative NSRs (AM and PM peaks)

NSR	Predicted Road Traffic Noise Level, $L_{10\ (1\text{-hour})}$, dB(A) (Unmitigated)	
	AM	PM
RG01	70	69
R101	69	68
R102	67	66
R103	49	49
R104	59	57
R105	61	60
RT01	67	66 - 67
RT02	66 - 67	65 - 66
RT03	50 - 51	49 – 50
RT04a	55 - 56	55
RT04b	49	48 - 49
RT05	59 - 63	58 – 62
RT06	61 - 63	60 – 62
R901	57	56
R902	57	56

2.6 Conclusion

2.6.1 Noise impacts due to road traffic within 300m radius from the Application Site have been assessed. With the implementation of the proposed noise mitigation measures in the form of baffle type acoustic window, the predicted traffic noise levels at all representative NSRs within the Application Site would comply with the noise criterion of 55 dB(A) for isolation room or 70 dB(A) for dwelling and office uses. No adverse traffic noise impact on the Proposed Development is anticipated.

3. FIXED NOISE IMPACT ASSESSMENT

3.1 Introduction

3.1.1 In this assessment, potential noise impacts arising from the nearby fixed noise sources within 300m radius on the Proposed Development has been assessed by general acoustic principle and Technical Memorandum for the Assessment of Noise from Places Other Than Domestic Premises, Public Places or Construction Sites (IND-TM). Practicable environmental mitigation measures would be recommended, where necessary.

3.2 Government Legislation and Standards

Noise Control Ordinance (NCO)

3.2.1 The Noise Control Ordinance (NCO) provides the statutory framework for the control of fixed plant. The Technical Memorandum for the Assessment of Noise from Places other than Domestic Premises, Public Places or Construction Sites (IND-TM) sets the criteria, Acceptable Noise Level (ANL), for governing noise from existing fixed plant / industrial noise sources.

Hong Kong Planning Standards and Guidelines (HKPSG)

3.2.2 The NCO requires that noise impacts from existing fixed noise sources shall comply with the Acceptable Noise Levels (ANL) laid down in Table 2 of IND-TM, which is influenced by the Area Sensitivity Rating (ASR) determined by the type of area containing the NSR.

3.2.3 The Application Site is located in an urban area not affected by an Influencing Factor defined by the IND-TM. An ASR of "B" has been adopted to the Proposed Development with 65 dB(A) as the noise criteria for day and evening time, and 55 dB(A) for night time. The ANL for ASRs "B" is depicted in **Table 3.1**.

Table 3.1 Relevant Noise Standard for Fixed Noise Sources

	Criteria in Relevant Time Periods	Acceptable Noise Level (ANL)
"B"	Day and Evening (07:00 – 23:00)	65 dB(A)
	Night (23:00 – 07:00)	55 dB(A)

3.2.4 The ASRs proposed in this NIA are intended for assessment only. Nothing in the NIA shall bind the Noise Control Authority in the context of enforcement against any of the fixed plant / industrial noise sources identified and assessed in the future under the NCO.

3.2.5 Since the observed fixed noise sources (**Section 3.3** refers) are existing uses, the ANL criteria is relevant and has been adopted.

3.3 Identification of Potential Noise Impacts

Fixed Noise Sources

3.3.1 Within 300m radius from the boundary of the Application Site, ventilation equipment, including chillers and Variable Refrigerant Volume (VRV) have been identified as the potential fixed noise sources. The locations of the existing fixed noise sources are indicated in **Figure 3.1 to Figure 3.4**. The type and number of equipment adopted for the assessment were based on site observation. The noise assessment assumed all

equipment will be operating simultaneously and continuously as a worst-case scenario. The sound power level of the noise sources was referenced from product catalogues. The details of the fixed noise sources are presented in **Appendix 3.1**.

3.4 Noise Sensitive Receivers for Fixed Noise Assessment

3.4.1 Representative assessment points have been assigned to the wards of the Proposed Development overlooking the industrial noise sources. The NSRs are selected at 1m away from the façade of openable window for ventilation purpose. The locations and details of the representative NSRs selected for assessment are provided in **Figure 3.5** and **Table 3.2** below, respectively.

Table 3.2 Representative NSRs for Fixed Noise Assessment

NSR	Description
FN01	Ward
FN02	Ward
FN03	Ward
FN04	Ward
FN05	Ward

3.5 Assessment Methodology

3.5.1 As the premises were not accessible for site measurement, information such as types of noise source and Sound Power Levels (SWLs) of noisy equipment were referenced from representative catalogues available in the market (**Appendix 3.1** refers). The potential type of noise sources and SWLs were assumed to be same as other facilities of similar operation.

3.5.2 To predict the noise level at the future noise sensitive uses, the following correction factors have been accounted for:

- Distance correction: based on the shortest horizontal distance between the identified noise sources and the NSR, the distance correction is projected based on standard acoustical principle for point source;
- Although it is unlikely that all the identified fixed noise sources will be in operation simultaneously, to be conservative, it has been assumed that all the identified noise sources are in operation at the same time, which also represents a worst-case scenario. Noise sources are assumed to operate continuously instead of in occasion as observed onsite and all noise sources are regarded as point source;
- Façade correction: a +3dB(A) correction is applied to account for noise reflection from façade.

3.5.3 Corrected Noise Level (CNL) at the representative NSRs of the Proposed Development can be calculated by applying the above corrections to the measured SWL of the noise sources in accordance with the following formula:

$$\mathbf{CNL = SWL + C_{dist} + C_{fac} + C_{bar}}$$

Where,

CNL is the corrected noise level at the Assessment Point in dB(A)

SWL is the sound power level of the fixed plant in dB(A)

C_{dist} is the distance correction in dB(A) in accordance with the Technical Memorandum on Noise from Construction Works Other than Percussive Piling

C_{fac} is façade correction, +3 dB(A)

C_{bar} is screening correction, -5 dB(A) for partial screening and -10 dB(A) for complete screening by structure

3.6 Prediction and Evaluation of Noise Impacts

Fixed Noise Assessment Results

3.6.1 Based on the assumptions mentioned above and information of noise sources in **Section 3.3**, noise level estimation for the selected NSRs at the Application Site has been conducted. The predicted industrial noise levels at the representative NSRs are summarised in **Table 3.3**. The details are presented in **Appendix 3.2**.

Table 3.3 Predicted Unmitigated Fixed Noise Levels at Representative NSRs

NSR[1]	Predicted Unmitigated Noise Level, dB(A)	
	Day and Evening (07:00 – 23:00)	Night (23:00 – 07:00)
FN01	51	47
FN02	53	47
FN03	53	47
FN04	53	47
FN05	52	46
Criteria	**65**	**55**

Notes:
[1] The assessment only includes NSRs which reply on opened windows for ventilation.

3.6.2 Based on the proposed layout, the calculated fixed noise levels at all NSRs comply with the noise criteria. No adverse fixed noise impact is anticipated at the Application Site.

3.7 Conclusion

3.7.1 Noise impacts due to existing fixed noise sources within 300m radius of the Application Site have been examined. Based on the proposed layout, no adverse fixed noise impact on the Proposed Development is anticipated.

4. OVERALL CONCLUSION

4.1.1 The potential road traffic noise and fixed noise impacts that may affect the Proposed Development have been assessed.

4.1.2 With noise conscious design of setback as well as mitigation measures including baffle type acoustic window, full compliance of the relevant guidelines under HKPSG recommended criteria of 55 dB(A) for isolation room or 70 dB(A) for dwelling and office uses can be achieved at all noise sensitive, it is anticipated that the Proposed Development will not subject to adverse traffic noise impact.

4.1.3 Fixed noise sources in the vicinity of the Proposed Development have been identified. Assessment on fixed noise impact at representative noise sensitive receivers has been conducted. It is confirmed that the predicted fixed noise level at all NSRs comply with the requirement of relevant technical memorandum under Noise Control Ordinance.

4.1.4 It can be concluded that no adverse traffic and fixed noise impact is anticipated on the Proposed Development with the implementation of the recommended mitigation measures.

Figures

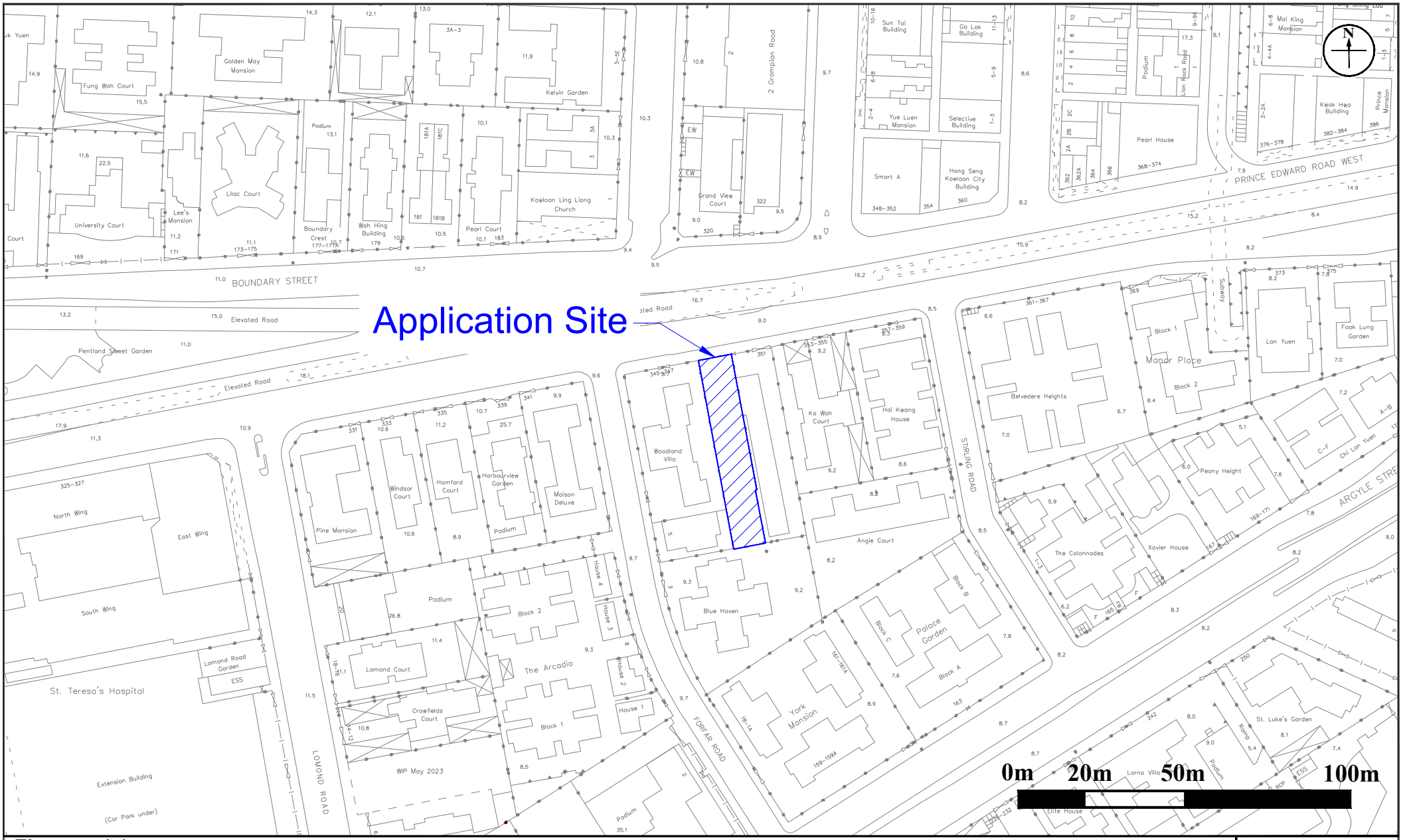

Figure: 1.1	RAMBOLL
Title: Application Site & Its Environ	Drawn by: VS
	Checked by: KY
Project: Amendment to the Approved Social Welfare Facility (Residential Care Home for the Elderly) in "Residential (Group B)" Zone at 349 Prince Edward Road West, Kowloon	Rev.: 1.1
	Date: Aug 2024

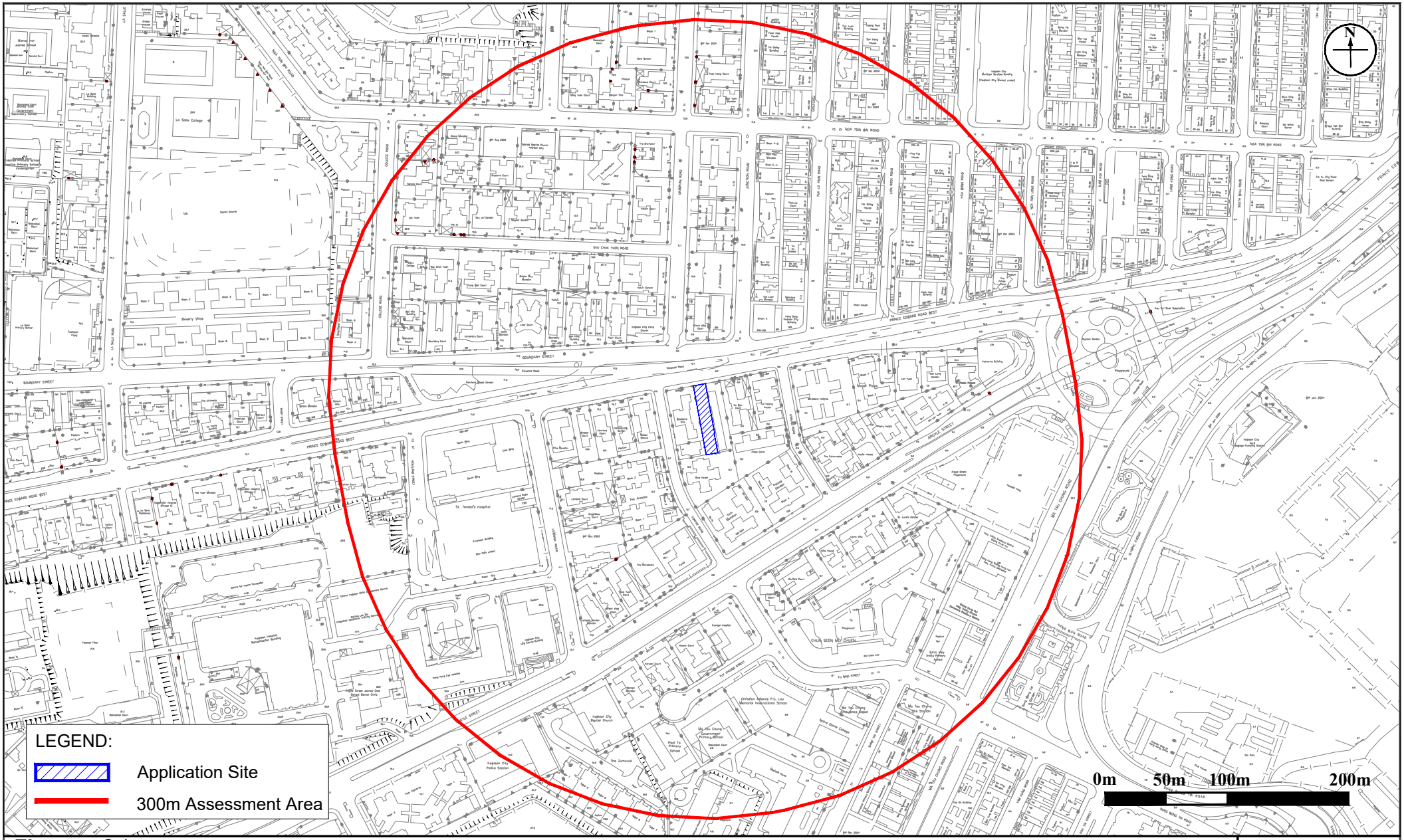

Figure: 2.1

Title: Traffic Noise Assessment Area

Project: Amendment to the Approved Social Welfare Facility (Residential Care Home for the Elderly) in "Residential (Group B)" Zone at 349 Prince Edward Road West, Kowloon

RAMBOLL

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Checked by: KY

Rev.: 1.1

Date: Aug 2024

Legend:

- Site Boundary
- Representative NSRs for TNIA

Figure: 2.2a	RAMBOLL
Title: Representative NSRs for Traffic Noise Impact Assessment (G/F)	Drawn by: VS
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Project: Amendment to the Approved Social Welfare Facility (Residential Care Home for the Elderly) in "Residential (Group B)" Zone at 349 Prince Edward Road West, Kowloon	Rev.: 1.1
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Figure: 2.2b		RAMBOLL
Title: Representative NSRs for Traffic Noise Impact Assessment (1/F)		Drawn by: VS
		Checked by: KY
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Figure:	2.2c	RAMBOLL
Title:	Representative NSRs for Traffic Noise Impact Assessment (Typical Floors - 2/F, 4/F, 6/F & 7/F)	Drawn by: VS Checked by: KY
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Figure:	2.2d	RAMBOLL
Title:	Representative NSRs for Traffic Noise Impact Assessment (Typical Floors - 3/F & 5/F)	Drawn by: VS Checked by: KY
Project:	Amendment to the Approved Social Welfare Facility (Residential Care Home for the Elderly) in "Residential (Group B)" Zone at 349 Prince Edward Road West, Kowloon	Rev.: 1.1 Date: Aug 2024

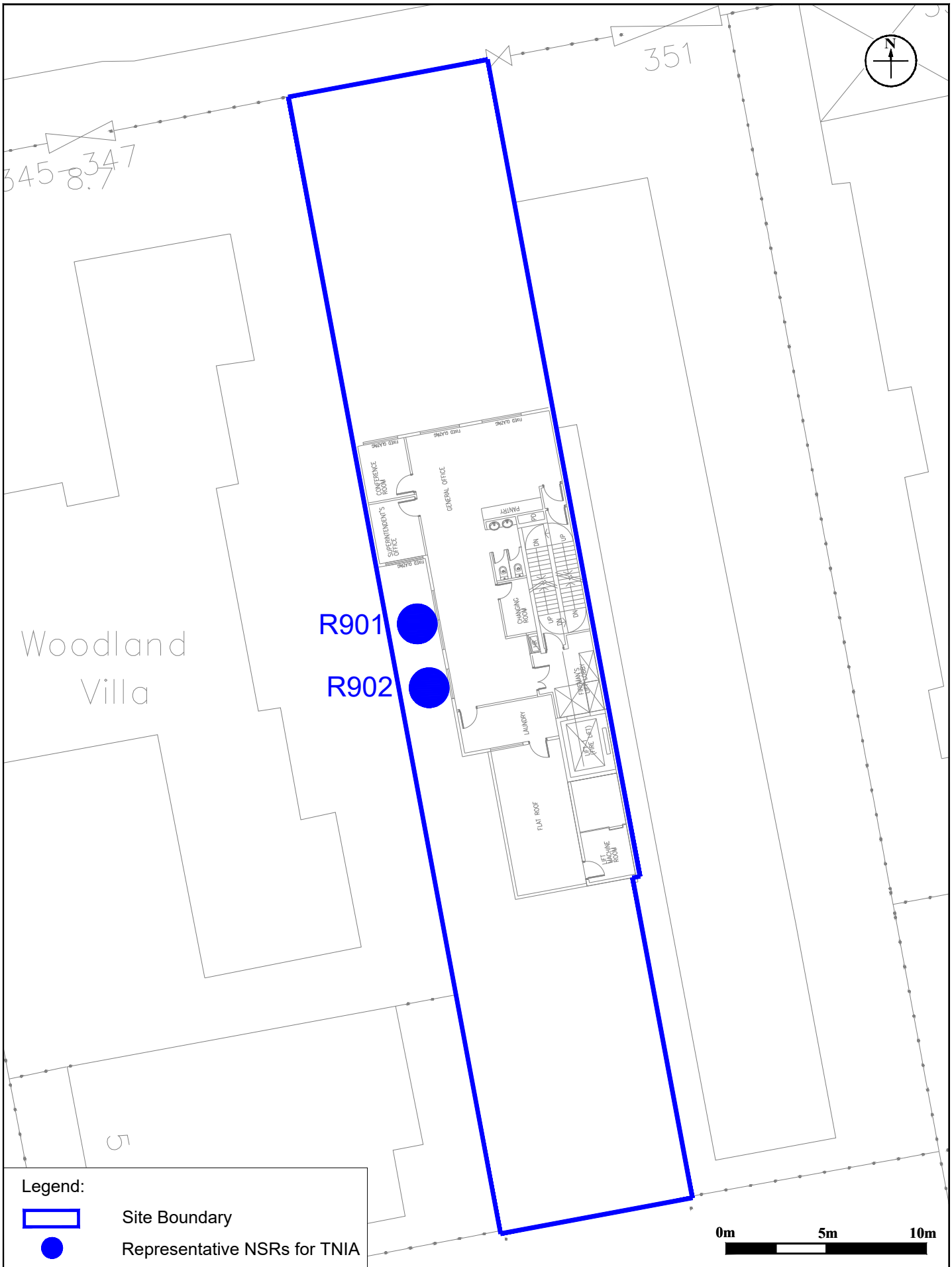
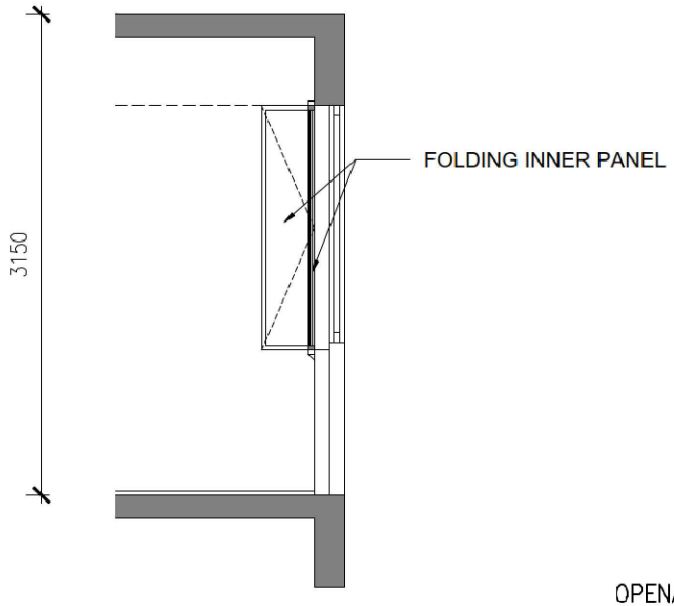


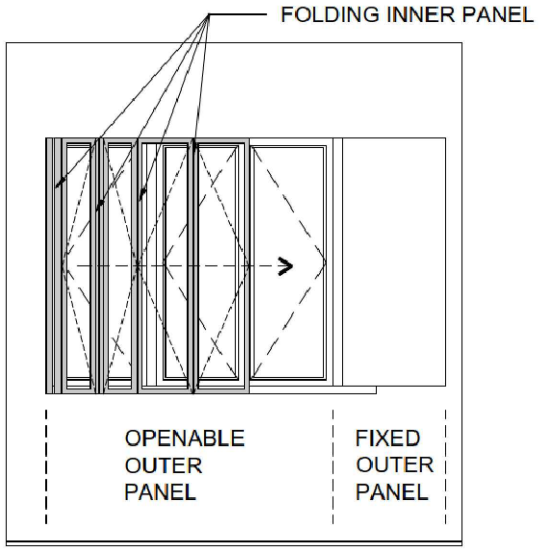
Figure:	2.2e	RAMBOLL
Title:	Representative NSRs for Traffic Noise Impact Assessment (9/F)	Drawn by: VS Checked by: KY
Project:	Amendment to the Approved Social Welfare Facility (Residential Care Home for the Elderly) in "Residential (Group B)" Zone at 349 Prince Edward Road West, Kowloon	Rev.: 1.1 Date: Aug 2024

Figure:	2.3a	RAMBOLL
Title:	Proposed Noise Mitigation Measures for Traffic Noise Impact Assessment (1/F)	Drawn by: VS Checked by: KY
Project:	Amendment to the Approved Social Welfare Facility (Residential Care Home for the Elderly) in "Residential (Group B)" Zone at 349 Prince Edward Road West, Kowloon	Rev.: 1.1 Date: Aug 2024

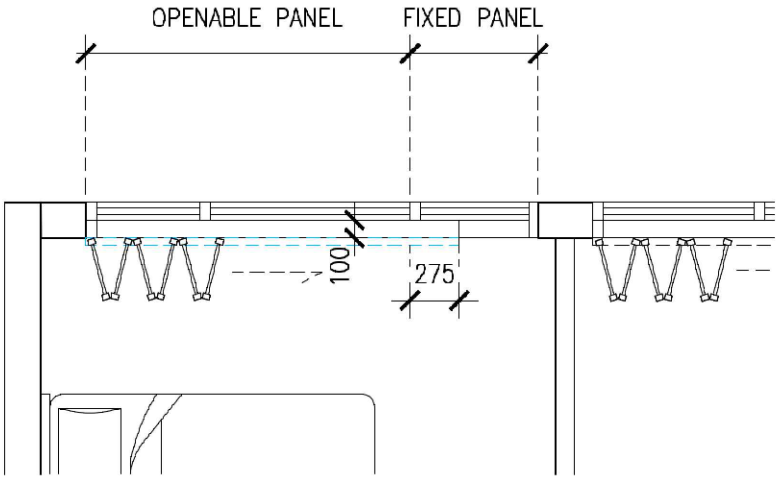
Figure: 2.3b	RAMBOLL
Title: Proposed Noise Mitigation Measures for Traffic Noise Impact Assessment (Typical Floors - 2/F to 7/F)	Drawn by: VS Checked by: KY
Project: Amendment to the Approved Social Welfare Facility (Residential Care Home for the Elderly) in "Residential (Group B)" Zone at 349 Prince Edward Road West, Kowloon	Rev.: 1.1 Date: Aug 2024



SECTION 1:50



ELEVATION (VIEW FROM INSIDE) 1:50



PLAN 1:50

Figure:	2.4	RAMBOLL
Title:	Indicative Design of Baffle Type Acoustic Window	Drawn by: VS Checked by: KY
Project:	Amendment to the Approved Social Welfare Facility (Residential Care Home for the Elderly) in "Residential (Group B)" Zone at 349 Prince Edward Road West, Kowloon	Rev.: 1.1 Date: Aug 2024

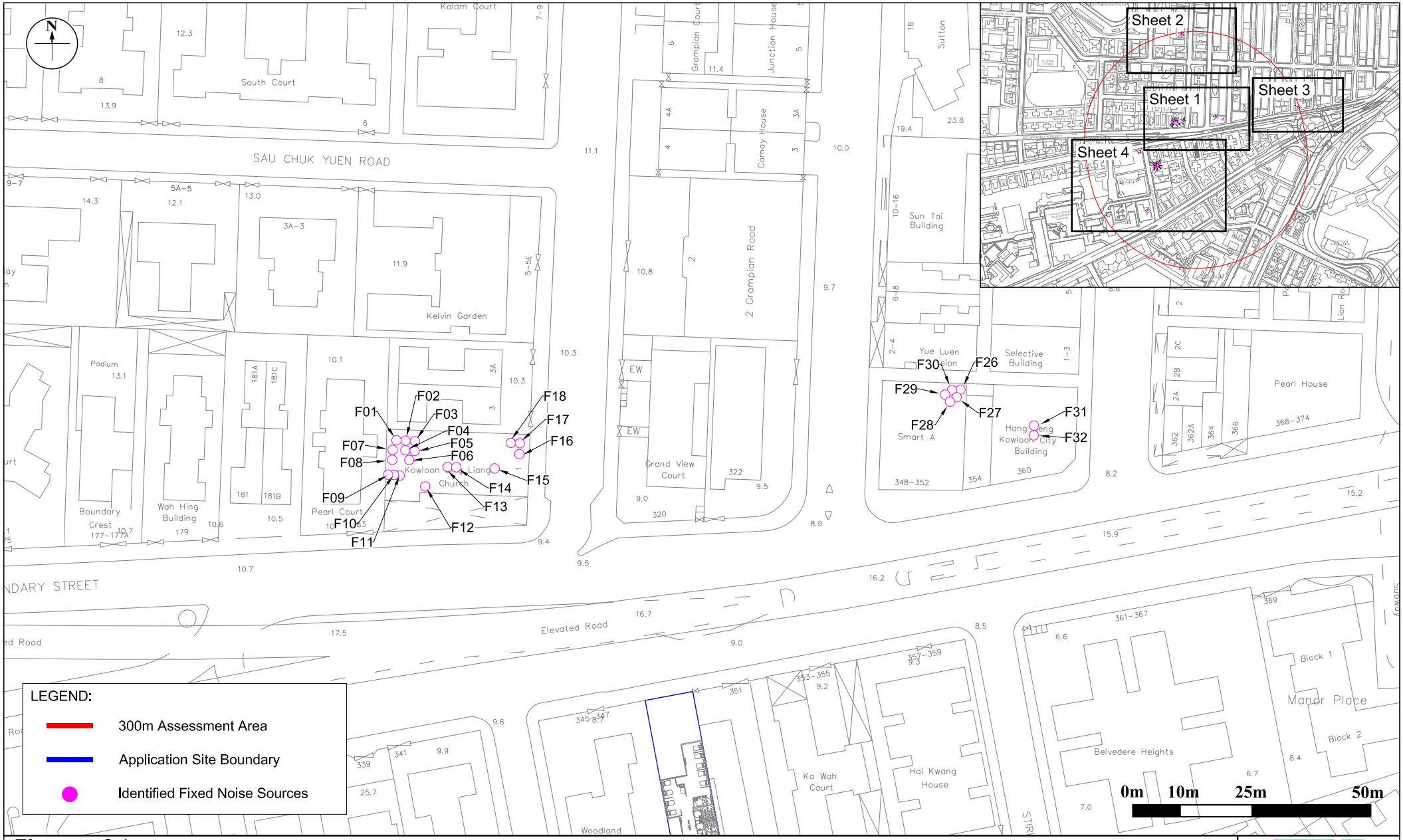


Figure: 3.1	RAMBOLL
Title: Location of Fixed Noise Sources (Sheet 1 of 4)	Drawn by: EC
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	Date: Aug 2024

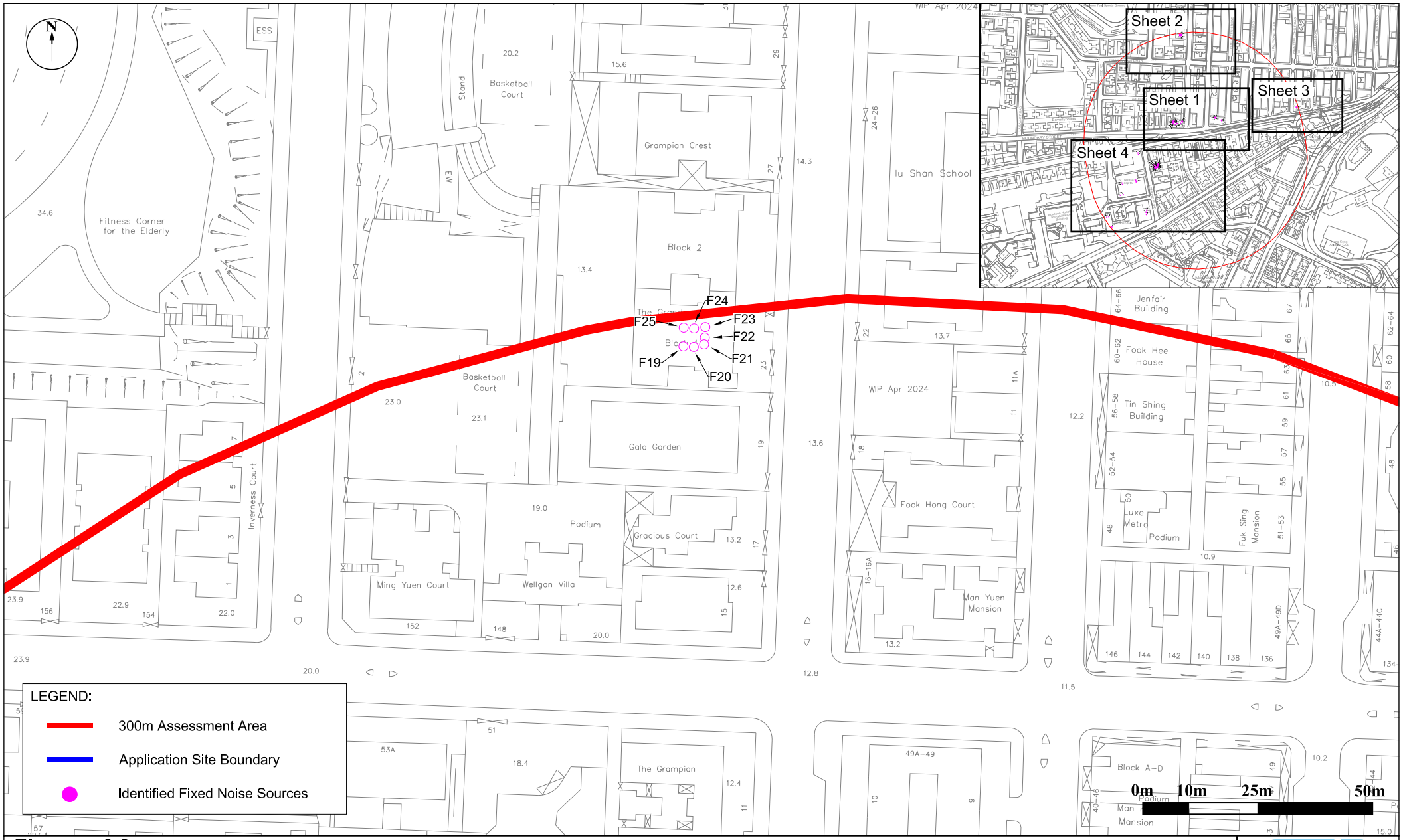

Figure: 3.2

Title: Location of Fixed Noise Sources (Sheet 2 of 4)

Project: Amendment to the Approved Social Welfare Facility (Residential Care Home for the Elderly) in "Residential (Group B)" Zone at 349 Prince Edward Road West, Kowloon

RAMBOLL

Drawn by:	EC
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Date:	Aug 2024

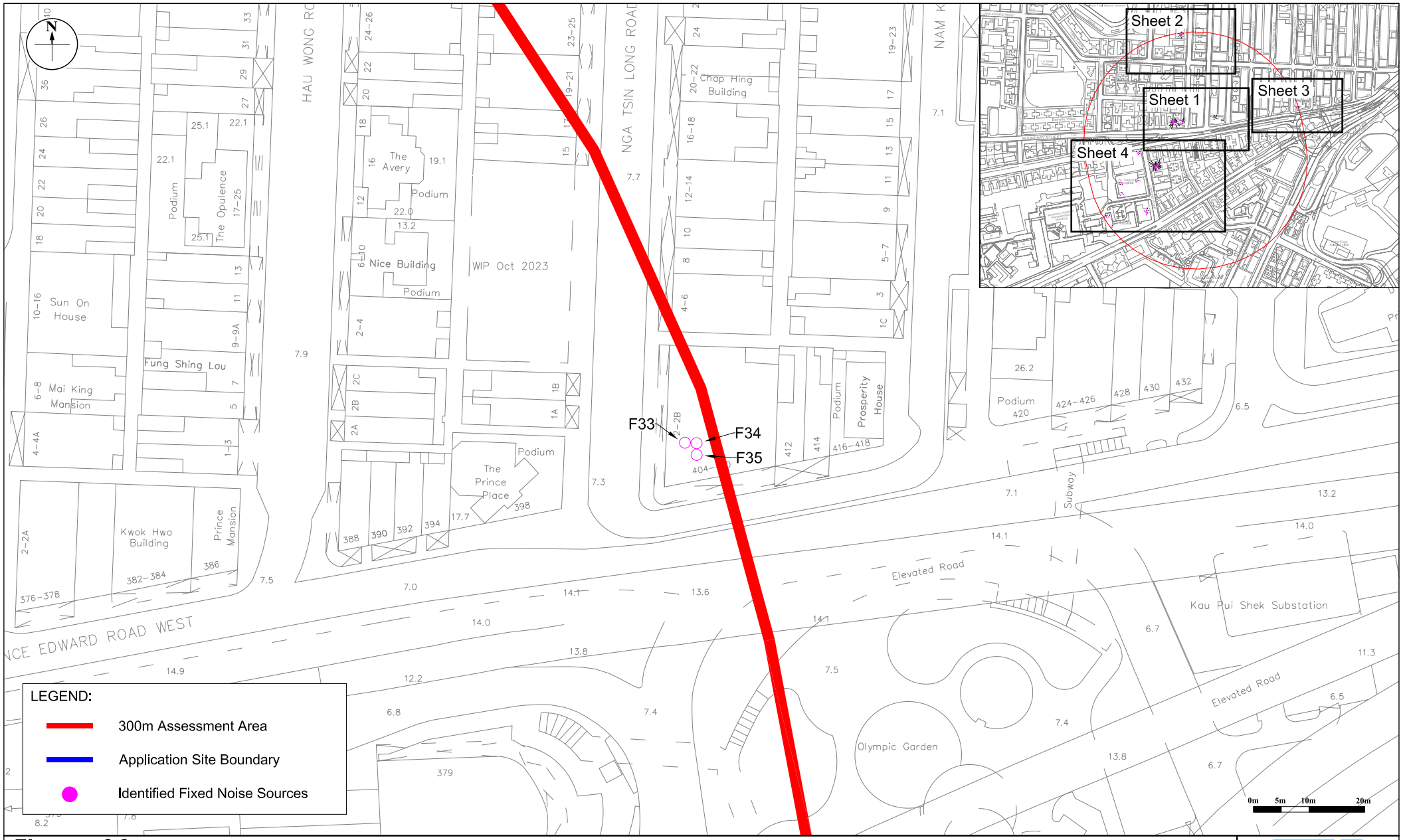

Figure: 3.3	RAMBOLL
Title: Location of Fixed Noise Sources (Sheet 3 of 4)	Drawn by: EC
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Project: Amendment to the Approved Social Welfare Facility (Residential Care Home for the Elderly) in "Residential (Group B)" Zone at 349 Prince Edward Road West, Kowloon	Rev.: 1.1
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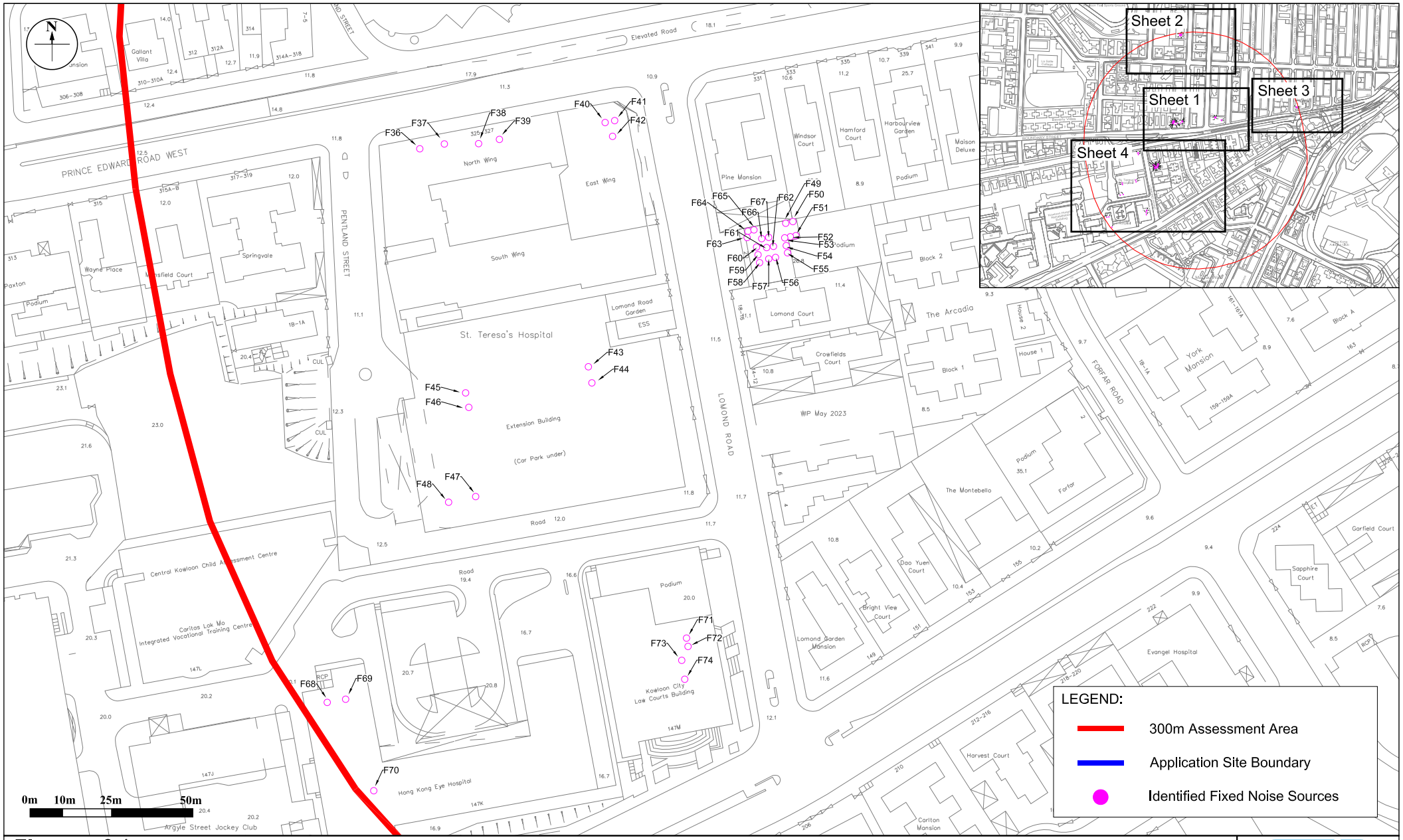


Figure: 3.4	RAMBOLL
Title: Location of Fixed Noise Sources (Sheet 4 of 4)	Drawn by: EC Checked by: KY
Project: Amendment to the Approved Social Welfare Facility (Residential Care Home for the Elderly) in "Residential (Group B)" Zone at 349 Prince Edward Road West, Kowloon	Rev.: 1.1 Date: Aug 2024

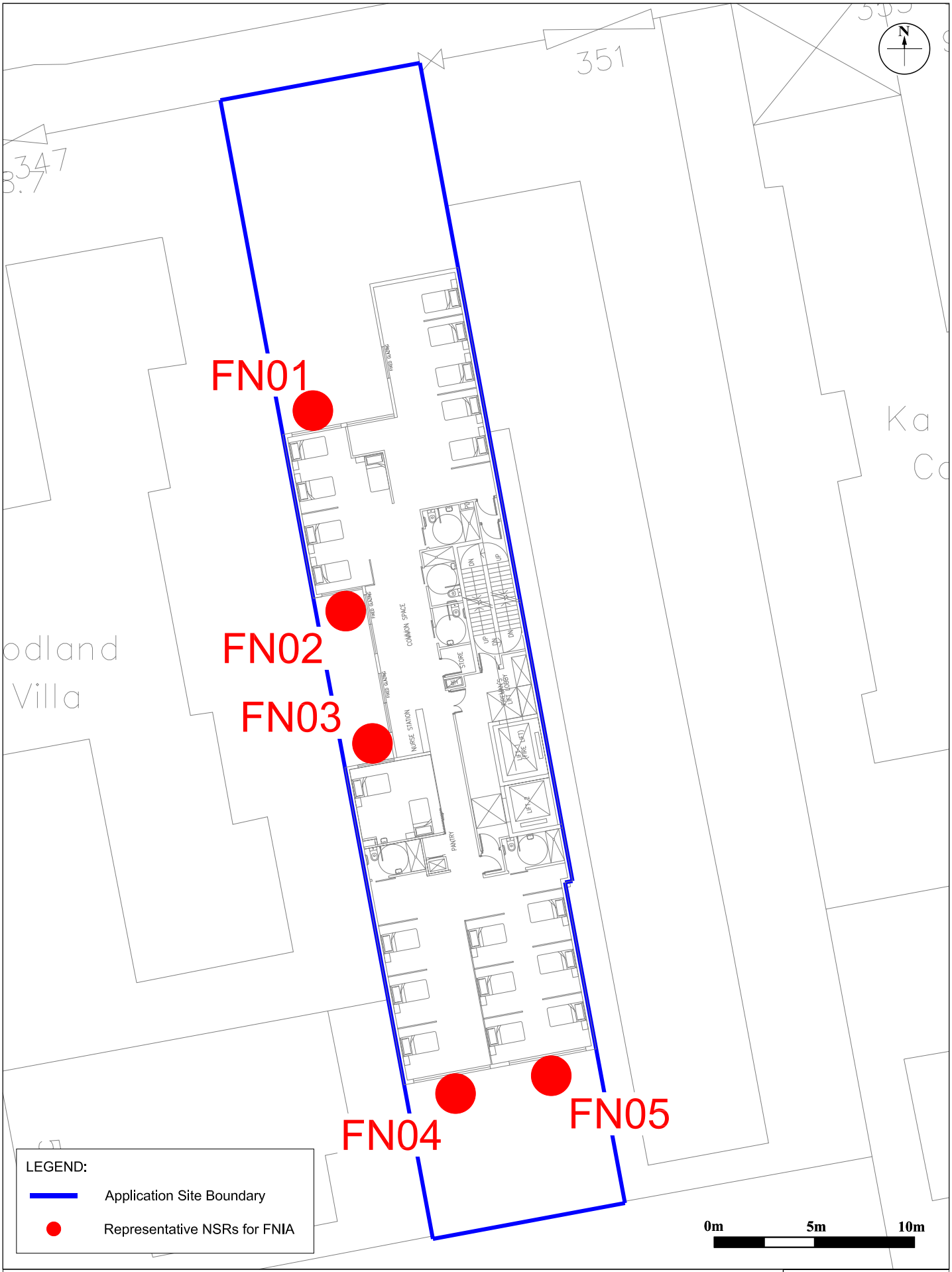
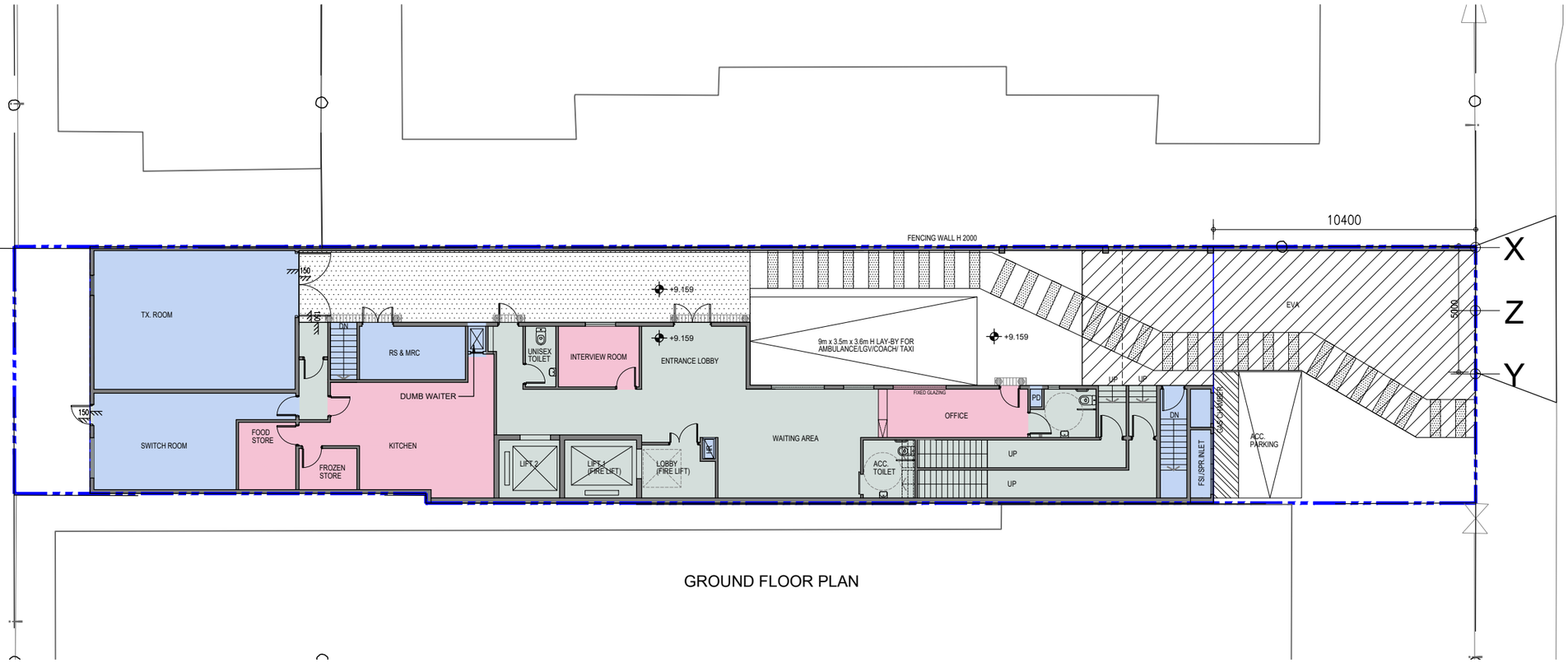


Figure:	3.5	RAMBOLL
Title:	Location of Representative Noise Sensitive Receivers for Fixed Noise Impact Assessment	Drawn by: EC Checked by: KY
Project:	Amendment to the Approved Social Welfare Facility (Residential Care Home for the Elderly) in "Residential (Group B)" Zone at 349 Prince Edward Road West, Kowloon	Rev.: 1.1 Date: Aug 2024

Appendices

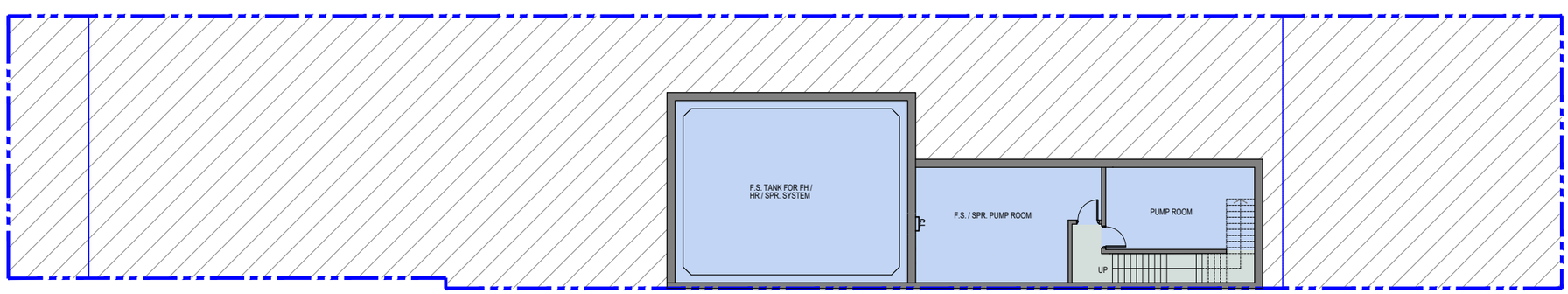
Appendix 1.1

Detailed Layout of the Proposed Development



GROUND FLOOR PLAN

G/F LAYOUT 1:200



B/S LAYOUT 1:200

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PROJECT GEO-TECHNICAL ENGINEER:

張耀新建築工程師有限公司
Wilson & Associates Ltd

PROJECT E/M ENGINEER:

PROJECT LANDSCAPE CONSULTANT:

PROJECT QUANTITY SURVEYOR:

PROJECT:
PURPOSE BUILT C&A HOME DEVELOPMENT AT 349 PRINCE EDWARD ROAD WEST

DRAWING TITLE:
GROUND FLOOR PLAN & BASEMENT FLOOR PLAN

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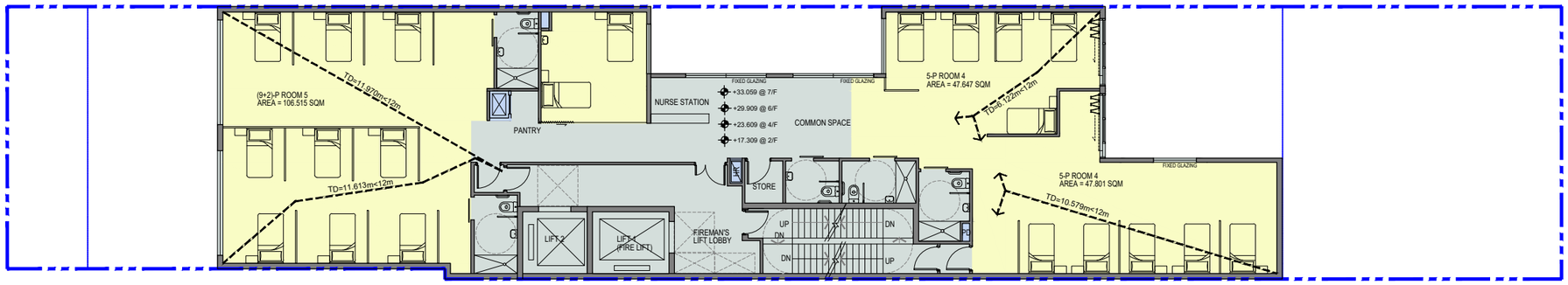
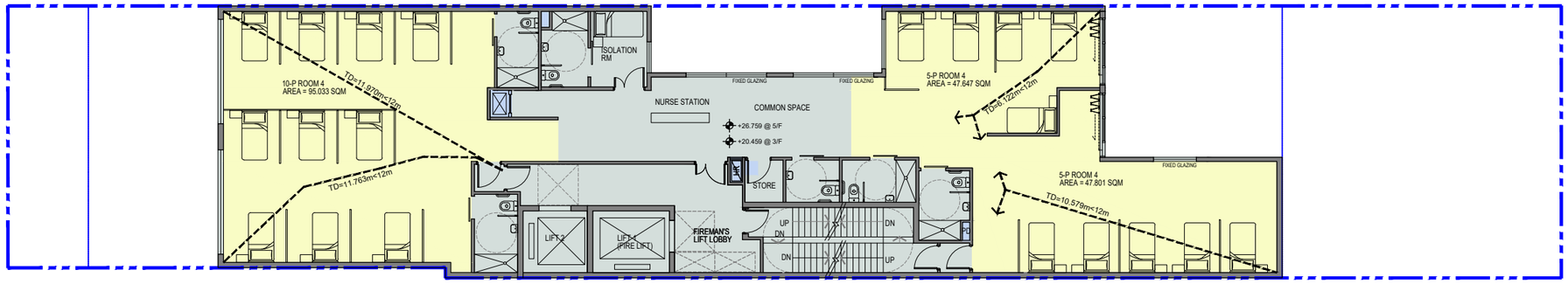
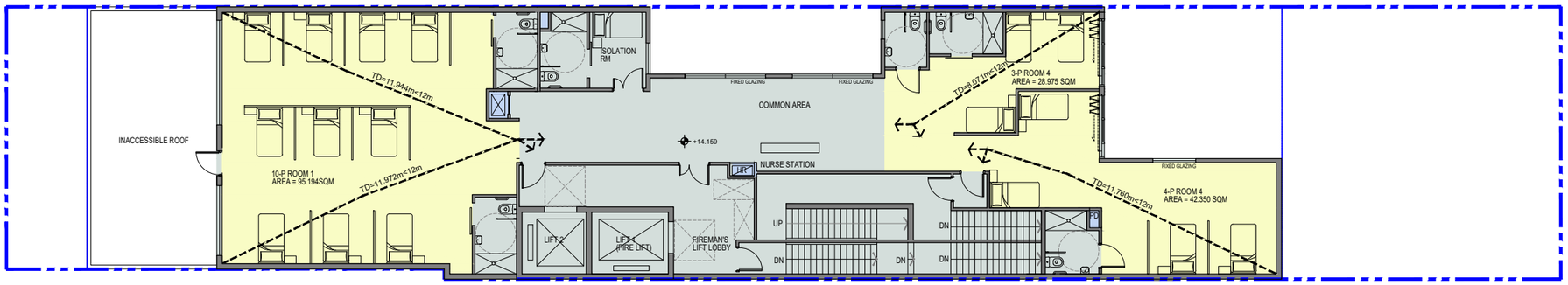


2/F, 4/F, 6/F, 7/F LAYOUT 1:200



3/F, 5/F LAYOUT 1:200



1/F LAYOUT 1:200

- SITE BOUNDARY
- FOOTPATH
- WARD
- ANCILLARY AREA
- COMMON / CIRCULATION SPACE
- PLANT ROOM/ STAIRCASE TO U/G PLANT ROOM

NOS. OF BED (9.5m²/ppl)

G/F	0
1/F	17
2/F	21
3/F	20
4/F	21
5/F	20
6/F	21
7/F	21
TOTAL	141

N

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PROJECT LANDSCAPE CONSULTANT:

PROJECT QUANTITY SURVEYOR:

PROJECT:
PURPOSE BUILT C&A HOME DEVELOPMENT AT
349 PRINCE EDWARD ROAD WEST

DRAWING TITLE:

FIRST FLOOR PLAN &
TYPICAL FLOOR PLAN (3/F,5/F) &
TYPICAL FLOOR PLAN (2/F,4/F,6/F& 7/F)

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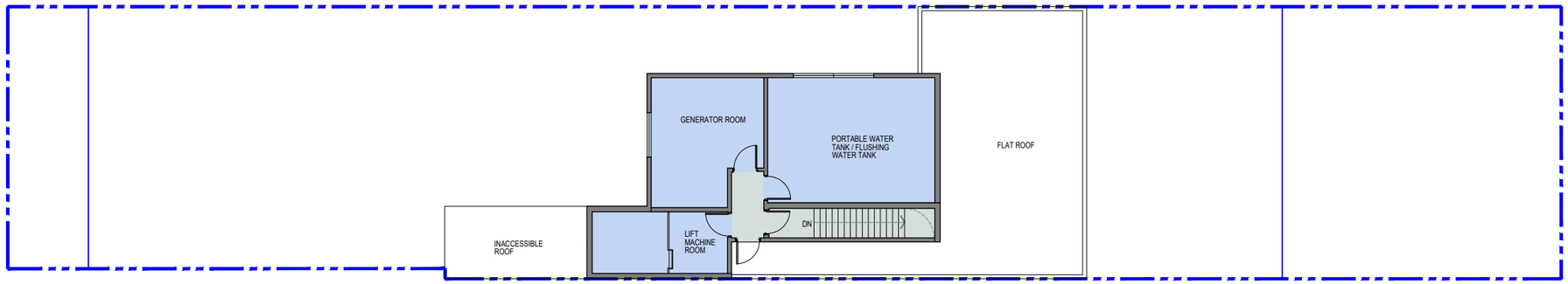
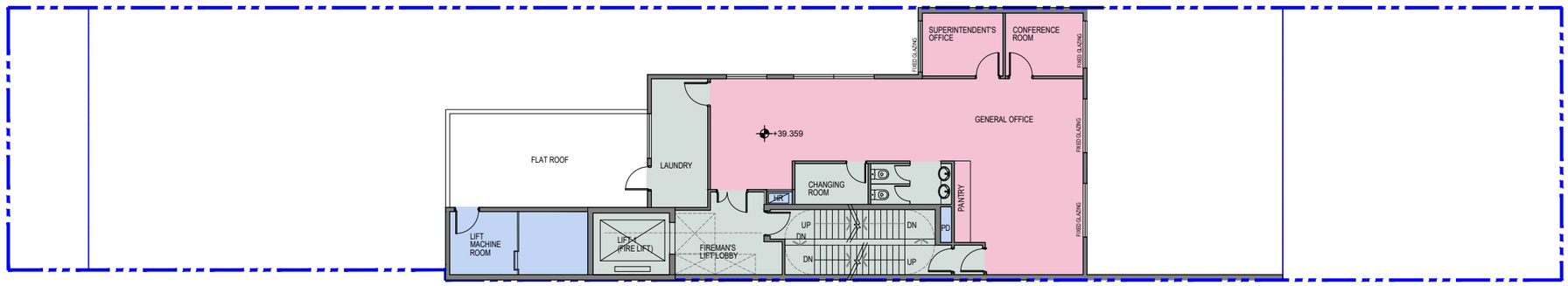
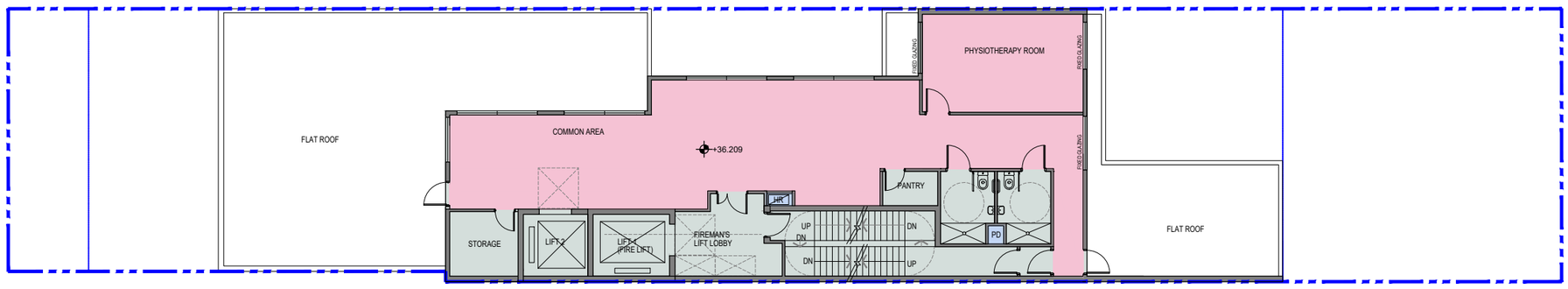


ROOF LAYOUT 1:200



9/F LAYOUT 1:200



8/F LAYOUT 1:200

- SITE BOUNDARY
- FOOTPATH
- WARD
- ANCILLARY AREA
- COMMON / CIRCULATION SPACE
- PLANT ROOM/ STAIRCASE TO U/G PLANT ROOM

NOS. OF BED (9.5m²/ppl)

G/F	0
1/F	17
2/F	21
3/F	20
4/F	21
5/F	20
6/F	21
7/F	21
TOTAL	141

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PURPOSE BUILT C&A HOME DEVELOPMENT AT 349 PRINCE EDWARD ROAD WEST

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8/F & 9/F FLOOR PLAN &
ROOF FLOOR PLAN

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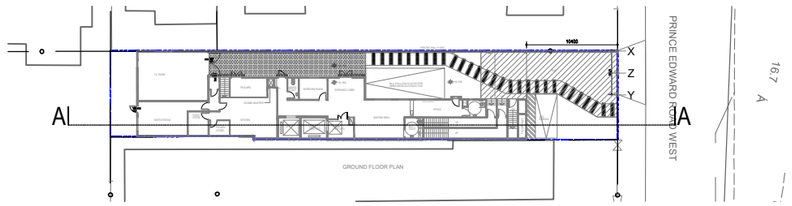

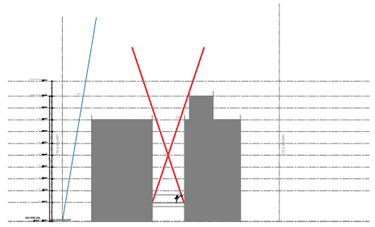

SITE BOUNDARY
FOOTPATH
WARD
ANCILLARY AREA
COMMON / CIRCULATION SPACE
PLANT ROOM/ STAIRCASE TO U/G PLANT ROOM

UPPER ROOF +46.509
MAIN ROOF +42.509
9/F +39.359
8/F +36.209
7/F +33.059
6/F +29.909
5/F +26.759
4/F +23.609
3/F +20.459
2/F +17.309
1/F +14.159
MEAN STREET LEVEL +9.109
G/F +9.159
B/S +5.409

4000
3150
3150
3150
3150
3150
3150
3150
3150
5000
3750
33350

SITE BOUNDARY

LIFT MACHINE ROOM
PLANT ROOM
STAIRCASE
FLAT ROOF
LIFT MACHINE ROOM
FIREMAN'S LIFT LOBBY
STAIRCASE
GENERAL OFFICE
STORAGE
FIREMAN'S LIFT LOBBY
STAIRCASE
ACC.TOILET
PD
ACC.TOILET
CORRIDOR
FLAT ROOF
FLAT ROOF
11-P ROOM
ACC. TOILET
FIREMAN'S LIFT LOBBY
STAIRCASE
PRO-TECTED LOBBY
(5+5)-P ROOM
11-P ROOM
ACC. TOILET
FIREMAN'S LIFT LOBBY
STAIRCASE
PRO-TECTED LOBBY
(5+5)-P ROOM
10-P ROOM
ACC. TOILET
FIREMAN'S LIFT LOBBY
STAIRCASE
PRO-TECTED LOBBY
(5+5)-P ROOM
11-P ROOM
ACC. TOILET
FIREMAN'S LIFT LOBBY
STAIRCASE
PRO-TECTED LOBBY
(5+5)-P ROOM
10-P ROOM
ACC. TOILET
FIREMAN'S LIFT LOBBY
STAIRCASE
PRO-TECTED LOBBY
(5+5)-P ROOM
11-P ROOM
ACC. TOILET
FIREMAN'S LIFT LOBBY
STAIRCASE
PRO-TECTED LOBBY
(5+5)-P ROOM
10-P ROOM
ACC. TOILET
FIREMAN'S LIFT LOBBY
STAIRCASE
STAIRCASE
ACCESSIBLE TOILET
(3+4)-P ROOM
INACCESSIBLE ROOF
SWITCH ROOM
KITCHEN
FIREMAN'S LIFT LOBBY
WAITING ROOM
ACC. TOILET
STAIRCASE
CORRIDOR
STAIRCASE TO B/S
FSI SPR. INLET
LIFT PIT
LIFT PIT
F.S. TANK FOR FH / HR / SPR. SYSTEM
F.S. / SPR. PUMP ROOM

PLANT ROOM
ADMIN.
ACTIVITY
WARD (7 FLOORS)
SUPPORTING FACILITIES
23900 (H<24m)

SITE BOUNDARY

PRINCE EDWARD ROAD WEST

SECTION A-A 1:200

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Appendix 2.1

Traffic Forecast

TABLE 1 – PEAK HOUR TRAFFIC FLOW AND VEHICLE COMPOSITION

YEAR 2042 TRAFFIC FORECAST

Date : 29 July 2024 **Job No.: J7350**

Link ID	Road Section	From Road	To Road	Speed Limit (km/hr)	AM Peak Hour		
					Traffic Flows (veh/hr)	Vehicle Composition	
						LV	HV
L029	Ma Tau Chung Road (NB)	Ma Tau Chung Road	Kowloon City Roundabout	50	1,250	70%	30%
L030	Ma Tau Chung Road Flyover (NB)	Ma Tau Chung Road	Prince Edward Road East	50	1,200	78%	22%
L031	Ma Tau Chung Road Flyover (SB)	Prince Edward Road East	Ma Tau Chung Road	50	1,000	78%	22%
L032	Ma Tau Chung Road (SB)	Kowloon City Roundabout	Hang Wan Road	50	1,250	68%	32%
L035	Ma Tau Chung Road (NB)	Sung Wong Toi Road	Ma Tau Chung Road Flyover	50	2,400	74%	26%
L036	Ma Tau Chung Road (SB)	Hang Wan Road	Sung Wong Toi Road	50	1,650	72%	28%
L037	Fu Ning Street (EB)	Shing Tak Street	Ma Tau Chung Road	50	50	0%	100%
L038	Fu Ning Street (WB)	Ma Tau Chung Road	Shing Tak Street	50	700	83%	17%
L039	Access Road to Chun Seen Mei Chuen (NB)	Fu Ning Street	Cul de sac	50	50	87%	13%
L040	Access Road to Chun Seen Mei Chuen (SB)	Cul de sac	Fu Ning Street	50	50	73%	27%
L041	Fu Ning Street (EB)	Fuk Cheung Street	Shing Tak Street	50	250	86%	14%
L042	Fu Ning Street (WB)	Shing Tak Street	Fuk Cheung Street	50	600	83%	17%
L043	Shing Tak Street (NB)	Ma Tau Kok Road	Fu Ning Street	50	50	0%	100%
L044	Shing Tak Street (SB)	Fu Ning Street	Ma Tau Kok Road	50	350	84%	16%
L501	Grampian Road (NB)	Nga Tsin Wai Road	Dumbarton Road	50	300	72%	28%
L502	Grampian Road (SB)	Dumbarton Road	Nga Tsin Wai Road	50	150	84%	16%
L503	Grampian Road (NB)	Sau Chuk Yuen Road	Nga Tsin Wai Road	50	600	68%	32%
L504	Junction Road (NB)	Nga Tsin Wai Road	Carpenter Road	50	300	70%	30%
L505	Junction Road (SB)	Carpenter Road	Nga Tsin Wai Road	50	800	75%	25%
L524	Inverness Road (NB)	Nga Tsin Wai Road	Dumbarton Road	50	350	84%	16%
L525	Inverness Road (SB)	Dumbarton Road	Nga Tsin Wai Road	50	250	89%	11%
L526	Fuk Lo Tsun Road (NB)	Nga Tsin Wai Road	Carpenter Road	50	250	75%	25%
L527	Lion Rock Road (SB)	Carpenter Road	Nga Tsin Wai Road	50	350	84%	16%
L530	Nga Tsin Wai Road (EB)	Inverness Road	Grampian Road	50	350	89%	11%
L531	Nga Tsin Wai Road (WB)	Grampian Road	Inverness Road	50	700	83%	17%
L532	Nga Tsin Wai Road (EB)	Grampian Road	Junction Road	50	550	77%	23%
L533	Nga Tsin Wai Road (WB)	Junction Road	Grampian Road	50	500	84%	16%
L534	Nga Tsin Wai Road (EB)	Junction Road	Fuk Lo Tsun Road	50	750	80%	20%
L535	Nga Tsin Wai Road (WB)	Fuk Lo Tsun Road	Junction Road	50	450	84%	16%
L536	Nga Tsin Wai Road (EB)	Fuk Lo Tsun Road	Lion Rock Road	50	300	70%	30%
L537	Nga Tsin Wai Road (WB)	Lion Rock Road	Fuk Lo Tsun Road	50	550	84%	16%
L538	Nga Tsin Wai Road (EB)	Lion Rock Road	Hau Wong Road	50	400	73%	27%
L539	Nga Tsin Wai Road (WB)	Hau Wong Road	Lion Rock Road	50	550	83%	17%
L546	Nga Tsin Wai Road (EB)	College Road	Inverness Road	50	450	86%	14%
L547	Nga Tsin Wai Road (WB)	Inverness Road	College Road	50	700	83%	17%
L548	College Road (NB)	Sau Chuk Yuen Road	Nga Tsin Wai Road	50	250	80%	20%
L549	College Road (SB)	Nga Tsin Wai Road	Sau Chuk Yuen Road	50	300	92%	8%
L550	Sau Chuk Yuen Road (EB)	College Road	Grampian Road	50	200	96%	4%
L551	Grampian Road (NB)	Boundary Street	Sau Chuk Yuen Road	50	450	57%	43%
L552	Junction Road (NB)	Prince Edward Road West	Nga Tsin Wai Road	50	500	77%	23%
L553	Junction Road (SB)	Nga Tsin Wai Road	Prince Edward Road West	50	750	76%	24%
L554	Fuk Lo Tsun Road (SB)	Nga Tsin Wai Road	Prince Edward Road West	50	300	95%	5%
L555	Lion Rock Road (SB)	Nga Tsin Wai Road	Prince Edward Road West	50	250	83%	17%
L556	Hau Wong Road (NB)	Prince Edward Road West	Nga Tsin Wai Road	50	400	91%	9%
L557	Nga Tsin Long Road (NB)	Nga Tsin Wai Road	Nga Tsin Wai Road	50	100	86%	14%
L562	College Road (NB)	Boundary Street	Sau Chuk Yuen Road	50	300	84%	16%
L563	College Road (SB)	Sau Chuk Yuen Road	Boundary Street	50	200	90%	10%
L564	Boundary Street (EB)	Short Street	College Road	50	850	63%	37%
L565	Boundary Street (EB)	Short Street	Pentland Street	50	1,700	81%	19%
L566	Pentland Street (SB)	Boundary Street	Prince Edward Road West	50	150	95%	5%
L567	Boundary Street Flyover (EB)	Pentland Street	Prince Edward Road East	50	1,550	80%	20%
L568	Boundary Street (EB)	College Road	Prince Edward Road East	50	700	60%	40%
L569	Slip Road of Prince Edward Road West (EB)	Prince Edward Road East	Boundary Street	50	250	82%	18%
L570	Boundary Street (EB)	Slip Road of Prince Edward Road	Grampian Road	50	1,300	72%	28%
L571	Prince Edward Road West (EB)	Grampian Road	Junction Road	50	900	80%	20%
L572	Prince Edward Road West (EB)	Junction Road	Fuk Lo Tsun Road	50	1,000	78%	22%
L573	Prince Edward Road West (EB)	Fuk Lo Tsun Road	Lion Rock Road	50	1,300	82%	18%
L574	Prince Edward Road West (EB)	Lion Rock Road	Hau Wong Road	50	1,550	82%	18%
L575	Prince Edward Road West (EB)	Hau Wong Road	Kowloon City Roundabout	50	1,150	79%	21%
L576	Kowloon City Roundabout (EB)	Prince Edward Road West	Prince Edward Road West	50	2,350	74%	26%
L577	Prince Edward Road West Flyover (WB)	Prince Edward Road East	Slip Road of Prince Edward Road	50	1,900	78%	22%
L578	Kowloon City Roundabout (NB)	Prince Edward Road West	Prince Edward Road West	50	1,250	70%	30%
L579	Slip Road of Prince Edward Road West (WB)	Kowloon City Roundabout	Prince Edward Road West	50	1,100	71%	29%
L580	Slip Road of Prince Edward Road West (WB)	Prince Edward Road West Flyover	Prince Edward Road West	50	600	78%	22%
L581	Prince Edward Road West (WB)	Slip Road of Prince Edward Road	Stirling Road	50	1,650	74%	26%
L582	Prince Edward Road West (WB)	Stirling Road	Junction Road	50	1,400	73%	27%
L583	Prince Edward Road West (WB)	Junction Road	Forfar Road	50	1,600	73%	27%
L584	Prince Edward Road West (WB)	Forfar Road	Slip Road of Prince Edward Road	50	1,700	72%	28%
L585	Prince Edward Road West (WB)	Slip Road of Prince Edward Road	Lomond Road	50	1,500	71%	29%
L586	Prince Edward Road West (EB)	Lomond Road	Boundary Street	50	400	88%	12%
L587	Prince Edward Road West (WB)	Lomond Road	Pentland Street	50	1,650	69%	31%
L588	Prince Edward Road West (EB)	Pentland Street	Lomond Road	50	250	90%	10%
L589	Prince Edward Road West (EB)	Short Street	Pentland Street	50	100	83%	17%
L590	Prince Edward Road West Flyover (WB)	Slip Road of Prince Edward Road	Prince Edward Road West	50	1,350	78%	22%
L591	Prince Edward Road West (WB)	Pentland Street	Prince Edward Road West	50	1,550	68%	32%
L592	Pentland Street (NB)	Cul de sac	Prince Edward Road West	50	150	94%	6%
L593	Pentland Street (SB)	Prince Edward Road West	Cul de sac	50	250	96%	4%
L594	Lomond Road (NB)	Access Road to Hong Kong Eye	Prince Edward Road West	50	800	80%	20%
L595	Lomond Road (SB)	Prince Edward Road West	Access Road to Hong Kong Eye	50	500	87%	13%
L596	Access Road to Hong Kong Eye Hospital (EB)	Cul de sac	Lomond Road	50	350	83%	17%
L597	Access Road to Hong Kong Eye Hospital (WB)	Lomond Road	Cul de sac	50	250	91%	9%
L598	Lomond Road (NB)	Argyle Street	Access Road to Hong Kong Eye	50	700	83%	17%

TABLE 1 – PEAK HOUR TRAFFIC FLOW AND VEHICLE COMPOSITION

YEAR 2042 TRAFFIC FORECAST

Date : 29 July 2024 **Job No.: J7350**

Link ID	Road Section	From Road	To Road	Speed Limit (km/hr)	AM Peak Hour		
					Traffic Flows (veh/hr)	Vehicle Composition	
						LV	HV
L599	Lomond Road (SB)	Access Road to Hong Kong Eye	Argyle Street	50	500	87%	13%
L600	Argyle Street (EB)	Tin Kwong Road	Lomond Road	50	1,650	70%	30%
L601	Argyle Street (WB)	Lomond Road	Tin Kwong Road	50	2,100	82%	18%
L602	Argyle Street (WB)	Fu Ning Street	Lomond Road	50	2,150	81%	19%
L603	Argyle Street (EB)	Lomond Road	Forfar Road	50	1,500	69%	31%
L604	Forfar Road (NB)	Argyle Street	Prince Edward Road West	50	150	54%	46%
L605	Fuk Cheung Street (EB)	Cul de sac	Fu Ning Street	50	100	69%	31%
L606	Fuk Cheung Street (WB)	Fu Ning Street	Cul de sac	50	100	73%	27%
L607	Fu Ning Street (NB)	Fuk Cheung Street	Argyle Street	50	600	82%	18%
L608	Fu Ning Street (SB)	Argyle Street	Fuk Cheung Street	50	250	85%	15%
L609	Argyle Street (WB)	Argyle Street Flyover	Fu Ning Street	50	1,800	81%	19%
L610	Argyle Street (EB)	Forfar Road	Stirling Road	50	1,350	70%	30%
L611	Stirling Road (SB)	Prince Edward Road West	Argyle Street	50	250	77%	23%
L612	Argyle Street (EB)	Stirling Road	Argyle Street Flyover	50	1,600	71%	29%
L613	Argyle Street (WB)	Kowloon City Roundabout	Argyle Street	50	350	70%	30%
L614	Argyle Street (EB)	Argyle Street	Kowloon City Roundabout	50	400	75%	25%
L615	Kowloon City Roundabout (NB)	Ma Tau Chung Road	Argyle Street	50	2,300	70%	30%
L616	Kowloon City Roundabout (NB)	Argyle Street	Argyle Street	50	1,950	70%	30%
L617	Argyle Street Flyover (WB)	Prince Edward Road West	Argyle Street	50	1,450	84%	16%
L618	Argyle Street Flyover (EB)	Argyle Street	Prince Edward Road West	50	1,250	70%	30%
L619	Kowloon City Roundabout (NB)	Argyle Street	Prince Edward Road West	50	2,300	71%	29%

Note: "LV" includes motorcycle, private car and taxi

"HV" includes light / medium / heavy goods vehicle, public / private light bus, non-franchised bus and franchised bus

TABLE 1 – PEAK HOUR TRAFFIC FLOW AND VEHICLE COMPOSITION

YEAR 2042 TRAFFIC FORECAST

Date : 29 July 2024 **Job No.: J7350**

Link ID	Road Section	From Road	To Road	Speed Limit (km/hr)	PM Peak Hour		
					Traffic Flows (veh/hr)	Vehicle Composition	
						LV	HV
L029	Ma Tau Chung Road (NB)	Ma Tau Chung Road	Kowloon City Roundabout	50	1,250	72%	28%
L030	Ma Tau Chung Road Flyover (NB)	Ma Tau Chung Road	Prince Edward Road East	50	1,250	82%	18%
L031	Ma Tau Chung Road Flyover (SB)	Prince Edward Road East	Ma Tau Chung Road	50	1,000	80%	20%
L032	Ma Tau Chung Road (SB)	Kowloon City Roundabout	Hang Wan Road	50	1,200	74%	26%
L035	Ma Tau Chung Road (NB)	Sung Wong Toi Road	Ma Tau Chung Road Flyover	50	2,450	77%	23%
L036	Ma Tau Chung Road (SB)	Hang Wan Road	Sung Wong Toi Road	50	1,700	75%	25%
L037	Fu Ning Street (EB)	Shing Tak Street	Ma Tau Chung Road	50	50	0%	100%
L038	Fu Ning Street (WB)	Ma Tau Chung Road	Shing Tak Street	50	750	88%	12%
L039	Access Road to Chun Seen Mei Chuen (NB)	Fu Ning Street	Cul de sac	50	50	95%	5%
L040	Access Road to Chun Seen Mei Chuen (SB)	Cul de sac	Fu Ning Street	50	50	96%	4%
L041	Fu Ning Street (EB)	Fuk Cheung Street	Shing Tak Street	50	150	87%	13%
L042	Fu Ning Street (WB)	Shing Tak Street	Fuk Cheung Street	50	650	89%	11%
L043	Shing Tak Street (NB)	Ma Tau Kok Road	Fu Ning Street	50	50	0%	100%
L044	Shing Tak Street (SB)	Fu Ning Street	Ma Tau Kok Road	50	200	85%	16%
L501	Grampian Road (NB)	Nga Tsin Wai Road	Dumbarton Road	50	250	78%	22%
L502	Grampian Road (SB)	Dumbarton Road	Nga Tsin Wai Road	50	100	63%	37%
L503	Grampian Road (NB)	Sau Chuk Yuen Road	Nga Tsin Wai Road	50	600	78%	22%
L504	Junction Road (NB)	Nga Tsin Wai Road	Carpenter Road	50	350	74%	26%
L505	Junction Road (SB)	Carpenter Road	Nga Tsin Wai Road	50	700	80%	20%
L524	Inverness Road (NB)	Nga Tsin Wai Road	Dumbarton Road	50	200	79%	21%
L525	Inverness Road (SB)	Dumbarton Road	Nga Tsin Wai Road	50	200	88%	12%
L526	Fuk Lo Tsun Road (NB)	Nga Tsin Wai Road	Carpenter Road	50	250	91%	9%
L527	Lion Rock Road (SB)	Carpenter Road	Nga Tsin Wai Road	50	400	89%	11%
L530	Nga Tsin Wai Road (EB)	Inverness Road	Grampian Road	50	200	81%	19%
L531	Nga Tsin Wai Road (WB)	Grampian Road	Inverness Road	50	600	85%	15%
L532	Nga Tsin Wai Road (EB)	Grampian Road	Junction Road	50	450	76%	24%
L533	Nga Tsin Wai Road (WB)	Junction Road	Grampian Road	50	450	87%	13%
L534	Nga Tsin Wai Road (EB)	Junction Road	Fuk Lo Tsun Road	50	650	80%	20%
L535	Nga Tsin Wai Road (WB)	Fuk Lo Tsun Road	Junction Road	50	500	83%	17%
L536	Nga Tsin Wai Road (EB)	Fuk Lo Tsun Road	Lion Rock Road	50	300	67%	33%
L537	Nga Tsin Wai Road (WB)	Lion Rock Road	Fuk Lo Tsun Road	50	650	83%	17%
L538	Nga Tsin Wai Road (EB)	Lion Rock Road	Hau Wong Road	50	350	71%	29%
L539	Nga Tsin Wai Road (WB)	Hau Wong Road	Lion Rock Road	50	650	83%	17%
L546	Nga Tsin Wai Road (EB)	College Road	Inverness Road	50	300	79%	21%
L547	Nga Tsin Wai Road (WB)	Inverness Road	College Road	50	700	86%	14%
L548	College Road (NB)	Sau Chuk Yuen Road	Nga Tsin Wai Road	50	200	75%	25%
L549	College Road (SB)	Nga Tsin Wai Road	Sau Chuk Yuen Road	50	150	90%	10%
L550	Sau Chuk Yuen Road (EB)	College Road	Grampian Road	50	100	92%	8%
L551	Grampian Road (NB)	Boundary Street	Sau Chuk Yuen Road	50	500	76%	24%
L552	Junction Road (NB)	Prince Edward Road West	Nga Tsin Wai Road	50	550	81%	19%
L553	Junction Road (SB)	Nga Tsin Wai Road	Prince Edward Road West	50	700	79%	21%
L554	Fuk Lo Tsun Road (SB)	Nga Tsin Wai Road	Prince Edward Road West	50	300	86%	14%
L555	Lion Rock Road (SB)	Nga Tsin Wai Road	Prince Edward Road West	50	350	89%	11%
L556	Hau Wong Road (NB)	Prince Edward Road West	Nga Tsin Wai Road	50	350	93%	7%
L557	Nga Tsin Long Road (NB)	Nga Tsin Wai Road	Nga Tsin Wai Road	50	150	86%	14%
L562	College Road (NB)	Boundary Street	Sau Chuk Yuen Road	50	200	76%	24%
L563	College Road (SB)	Sau Chuk Yuen Road	Boundary Street	50	100	88%	13%
L564	Boundary Street (EB)	Short Street	College Road	50	900	75%	25%
L565	Boundary Street (EB)	Short Street	Pentland Street	50	1,550	86%	14%
L566	Pentland Street (SB)	Boundary Street	Prince Edward Road West	50	150	92%	8%
L567	Boundary Street Flyover (EB)	Pentland Street	Prince Edward Road East	50	1,450	85%	15%
L568	Boundary Street (EB)	College Road	Prince Edward Road East	50	800	76%	24%
L569	Slip Road of Prince Edward Road West (EB)	Prince Edward Road East	Boundary Street	50	200	77%	23%
L570	Boundary Street (EB)	Slip Road of Prince Edward Road	Grampian Road	50	1,300	79%	21%
L571	Prince Edward Road West (EB)	Grampian Road	Junction Road	50	800	81%	19%
L572	Prince Edward Road West (EB)	Junction Road	Fuk Lo Tsun Road	50	850	80%	20%
L573	Prince Edward Road West (EB)	Fuk Lo Tsun Road	Lion Rock Road	50	1,150	82%	18%
L574	Prince Edward Road West (EB)	Lion Rock Road	Hau Wong Road	50	1,450	84%	16%
L575	Prince Edward Road West (EB)	Hau Wong Road	Kowloon City Roundabout	50	1,150	81%	19%
L576	Kowloon City Roundabout (EB)	Prince Edward Road West	Prince Edward Road West	50	2,400	76%	24%
L577	Prince Edward Road West Flyover (WB)	Prince Edward Road East	Slip Road of Prince Edward Road	50	1,800	81%	19%
L578	Kowloon City Roundabout (NB)	Prince Edward Road West	Prince Edward Road West	50	1,250	72%	28%
L579	Slip Road of Prince Edward Road West (WB)	Kowloon City Roundabout	Prince Edward Road West	50	1,150	74%	26%
L580	Slip Road of Prince Edward Road West (WB)	Prince Edward Road West Flyover	Prince Edward Road West	50	400	81%	19%
L581	Prince Edward Road West (WB)	Slip Road of Prince Edward Road	Stirling Road	50	1,500	76%	24%
L582	Prince Edward Road West (WB)	Stirling Road	Junction Road	50	1,350	75%	25%
L583	Prince Edward Road West (WB)	Junction Road	Forfar Road	50	1,500	75%	25%
L584	Prince Edward Road West (WB)	Forfar Road	Slip Road of Prince Edward Road	50	1,650	75%	25%
L585	Prince Edward Road West (WB)	Slip Road of Prince Edward Road	Lomond Road	50	1,450	75%	25%
L586	Prince Edward Road West (EB)	Lomond Road	Boundary Street	50	300	90%	10%
L587	Prince Edward Road West (WB)	Lomond Road	Pentland Street	50	1,750	75%	25%
L588	Prince Edward Road West (EB)	Pentland Street	Lomond Road	50	200	94%	6%
L589	Prince Edward Road West (EB)	Short Street	Pentland Street	50	50	95%	5%
L590	Prince Edward Road West Flyover (WB)	Slip Road of Prince Edward Road	Prince Edward Road West	50	1,400	81%	19%
L591	Prince Edward Road West (WB)	Pentland Street	Prince Edward Road West	50	1,750	75%	25%
L592	Pentland Street (NB)	Cul de sac	Prince Edward Road West	50	200	99%	1%
L593	Pentland Street (SB)	Prince Edward Road West	Cul de sac	50	200	98%	2%
L594	Lomond Road (NB)	Access Road to Hong Kong Eye	Prince Edward Road West	50	800	86%	14%
L595	Lomond Road (SB)	Prince Edward Road West	Access Road to Hong Kong Eye	50	400	93%	7%
L596	Access Road to Hong Kong Eye Hospital (EB)	Cul de sac	Lomond Road	50	300	75%	25%
L597	Access Road to Hong Kong Eye Hospital (WB)	Lomond Road	Cul de sac	50	100	93%	7%
L598	Lomond Road (NB)	Argyle Street	Access Road to Hong Kong Eye	50	700	87%	13%

TABLE 1 – PEAK HOUR TRAFFIC FLOW AND VEHICLE COMPOSITION

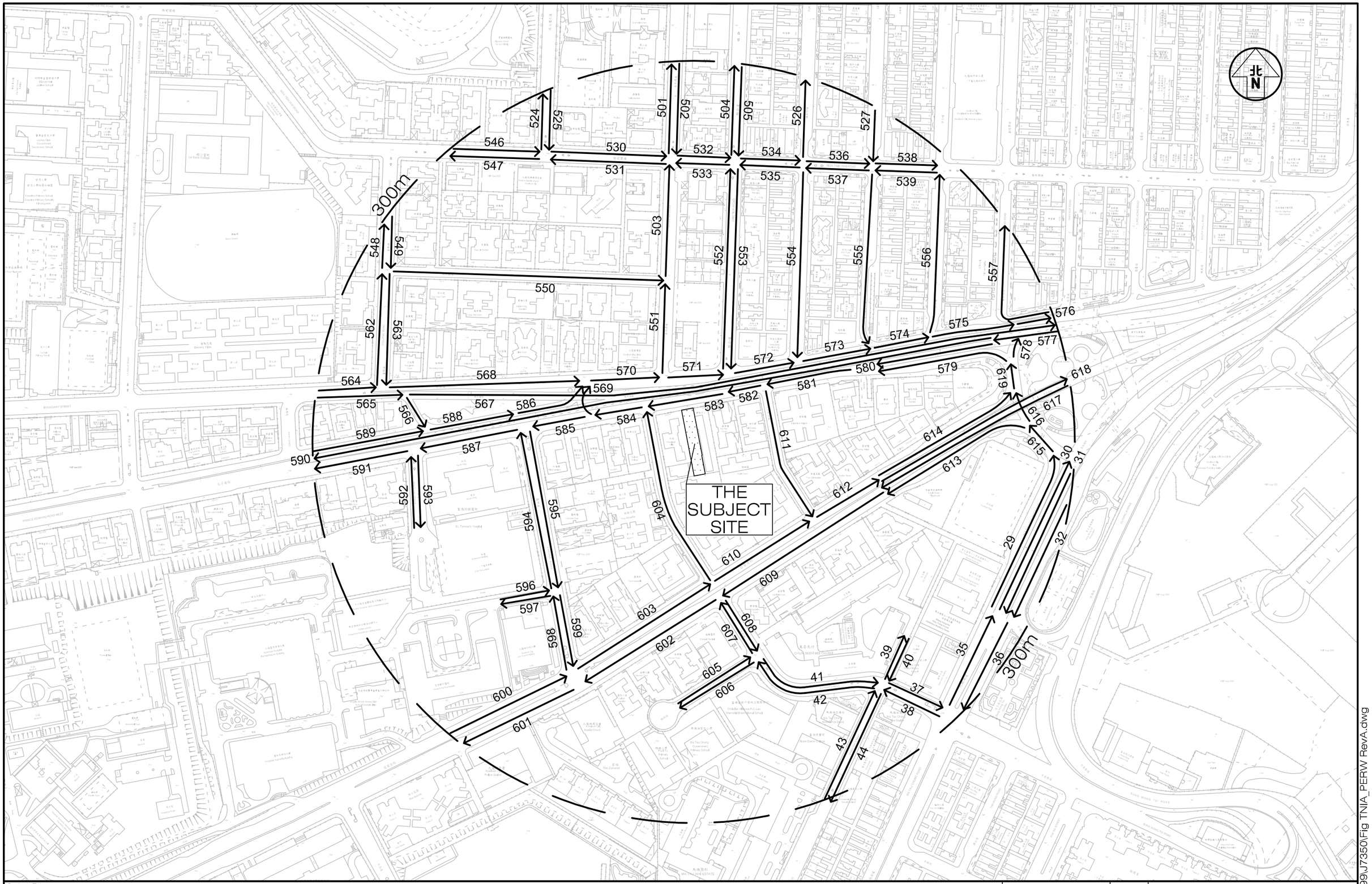
YEAR 2042 TRAFFIC FORECAST

Date : 29 July 2024 **Job No.: J7350**

Link ID	Road Section	From Road	To Road	Speed Limit (km/hr)	PM Peak Hour		
					Traffic Flows (veh/hr)	Vehicle Composition	
						LV	HV
L599	Lomond Road (SB)	Access Road to Hong Kong Eye	Argyle Street	50	500	85%	15%
L600	Argyle Street (EB)	Tin Kwong Road	Lomond Road	50	1,350	76%	24%
L601	Argyle Street (WB)	Lomond Road	Tin Kwong Road	50	2,250	89%	11%
L602	Argyle Street (WB)	Fu Ning Street	Lomond Road	50	2,350	89%	11%
L603	Argyle Street (EB)	Lomond Road	Forfar Road	50	1,250	73%	27%
L604	Forfar Road (NB)	Argyle Street	Prince Edward Road West	50	200	79%	21%
L605	Fuk Cheung Street (EB)	Cul de sac	Fu Ning Street	50	100	91%	9%
L606	Fuk Cheung Street (WB)	Fu Ning Street	Cul de sac	50	50	83%	17%
L607	Fu Ning Street (NB)	Fuk Cheung Street	Argyle Street	50	700	90%	10%
L608	Fu Ning Street (SB)	Argyle Street	Fuk Cheung Street	50	150	85%	15%
L609	Argyle Street (WB)	Argyle Street Flyover	Fu Ning Street	50	1,800	88%	12%
L610	Argyle Street (EB)	Forfar Road	Stirling Road	50	1,050	72%	28%
L611	Stirling Road (SB)	Prince Edward Road West	Argyle Street	50	200	82%	18%
L612	Argyle Street (EB)	Stirling Road	Argyle Street Flyover	50	1,250	73%	27%
L613	Argyle Street (WB)	Kowloon City Roundabout	Argyle Street	50	300	77%	23%
L614	Argyle Street (EB)	Argyle Street	Kowloon City Roundabout	50	300	73%	27%
L615	Kowloon City Roundabout (NB)	Ma Tau Chung Road	Argyle Street	50	2,350	73%	27%
L616	Kowloon City Roundabout (NB)	Argyle Street	Argyle Street	50	2,100	73%	27%
L617	Argyle Street Flyover (WB)	Prince Edward Road West	Argyle Street	50	1,550	90%	10%
L618	Argyle Street Flyover (EB)	Argyle Street	Prince Edward Road West	50	950	74%	26%
L619	Kowloon City Roundabout (NB)	Argyle Street	Prince Edward Road West	50	2,400	73%	27%

Note: "LV" includes motorcycle, private car and taxi

"HV" includes light / medium / heavy goods vehicle, public / private light bus, non-franchised bus and franchised bus



Project Title	PROPOSED SOCIAL WELFARE FACILITY (RESIDENTIAL CARE HOME FOR THE ELDERLY) AT 349 PRINCE EDWARD ROAD WEST, KOWLOON	J7350	Figure No. TNIA/PERW Revision A
Figure Title	LOCATION OF TRAFFIC DATA FOR TRAFFIC NOISE IMPACT ASSESSMENT		Designed by Y C K; Drawn by C C L; Checked by T H C; Scale in A3 1 : 3,000; Date 26 JUL 2024

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Appendix 2.2

Traffic Noise Impact Assessment Results

(Unmitigated Scenario)

Appendix 2.2 - Predicted Road Traffic Noise Levels at Representative NSRs For Year 2042 AM Peak Hour (Unmitigated Scenario)

RCHE - G/F

	NSR	RG01
Floor	**mPD**	L10 1-hour, dB(A)
G/F	10.4	70
Noise Criteria		70
Compliance ?		Yes

RCHE - 1/F

	NSR	R101	R102	R103	R104	R105
Floor	**mPD**	L10 1-hour, dB(A)				
1/F	15.4	76	75	49	59	61
Noise Criteria		70	70	55	70	70
Compliance ?		No	No	Yes	Yes	Yes

RCHE - Typical Floors (2/F-7/F)

	NSR	RT01	RT02	RT03	RT04a	RT04b	RT05	RT06
Floor	**mPD**	L10 1-hour, dB(A)						
2/F	18.5	76	75	50	55	-	59	61
3/F	21.7	76	75	50	-	49	60	61
4/F	24.8	76	75	50	55	-	61	62
5/F	28.0	76	75	50	-	49	62	62
6/F	31.1	76	75	50	55	-	62	62
7/F	34.3	75	75	51	56	-	63	63
Max. Level,dB(A)		76	75	51	56	49	63	63
Noise Criteria		70	70	70	70	55	70	70
Compliance ?		No	No	Yes	Yes	Yes	Yes	Yes

RCHE - 9/F

	NSR	R901	R902
Floor	**mPD**	L10 1-hour, dB(A)	
9/F	40.6	57	57
Noise Criteria		70	70
Compliance ?		Yes	Yes

Compliance Rate

No. of units counted with noise exceedance:	14
Total no. of units at Application Site	30
Compliance Rate (%):	53.3%

Appendix 2.2 - Predicted Road Traffic Noise Levels at Representative NSRs For Year 2042 PM Peak Hour (Unmitigated Scenario)

RCHE - G/F

	NSR	RG01
Floor	**mPD**	L10 1-hour, dB(A)
G/F	10.4	69
Noise Criteria		70
Compliance ?		Yes

RCHE - 1/F

	NSR	R101	R102	R103	R104	R105
Floor	**mPD**	L10 1-hour, dB(A)				
1/F	15.4	76	75	49	57	60
Noise Criteria		70	70	55	70	70
Compliance ?		No	No	Yes	Yes	Yes

RCHE - Typical Floors (2/F-7/F)

	NSR	RT01	RT02	RT03	RT04a	RT04b	RT05	RT06
Floor	**mPD**	L10 1-hour, dB(A)						
2/F	18.5	76	75	49	55	-	58	60
3/F	21.7	76	75	49	-	48	58	60
4/F	24.8	75	74	49	55	-	60	60
5/F	28.0	75	74	49	-	49	61	61
6/F	31.1	75	74	49	55	-	61	61
7/F	34.3	75	74	50	55	-	62	62
Max. Level,dB(A)		76	75	50	55	49	62	62
Noise Criteria		70	70	70	70	55	70	70
Compliance ?		No	No	Yes	Yes	Yes	Yes	Yes

RCHE - 9/F

	NSR	R901	R902
Floor	**mPD**	L10 1-hour, dB(A)	
9/F	40.6	56	56
Noise Criteria		70	70
Compliance ?		Yes	Yes

Compliance Rate

No. of units counted with noise exceedance:	14
Total no. of units at Application Site	30
Compliance Rate (%):	53.3%

Appendix 2.3

Traffic Noise Impact Assessment Results

(Mitigated Scenario)

Appendix 2.3 - (AM Peak) Predicted Road Traffic Noise Reduction Level (L10, dB(A)) during AM Peak Hour of Year 2042 with Noise Mitigation Measures at Proposed Development - Mitigated Scenario

<table>
<tr><td colspan="2"></td><td>RG01</td><td>R101</td><td>R102</td><td>R103</td><td>R104</td><td>R105</td><td>RT01</td><td>RT02</td><td>RT03</td><td>RT04a</td><td>RT04b</td><td>RT05</td><td>RT06</td><td>R901</td><td>R902</td></tr>
<tr><td colspan="2">Noise Mitigation</td><td>-</td><td>Acw</td><td>Acw</td><td>-</td><td>-</td><td>-</td><td>Acw</td><td>Acw</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>Floor</td><td>mPD</td><td colspan="15">L10 1-hour, dB(A)</td></tr>
<tr><td>G/F</td><td>10.4</td><td>-</td><td colspan="5">/</td><td colspan="9" rowspan="2">/</td><td rowspan="8">/</td></tr>
<tr><td>1/F</td><td>15.4</td><td rowspan="8">/</td><td>7.6</td><td>8.8</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>2/F</td><td>18.5</td><td colspan="5" rowspan="8">/</td><td>8.8</td><td>8.8</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>3/F</td><td>21.7</td><td>8.8</td><td>8.8</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>4/F</td><td>24.8</td><td>8.8</td><td>8.8</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>5/F</td><td>28</td><td>8.8</td><td>8.8</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>6/F</td><td>31.1</td><td>8.8</td><td>8.8</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>7/F</td><td>34.3</td><td>8.8</td><td>8.8</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>9/F</td><td>40.6</td><td colspan="9">/</td><td>-</td><td>-</td></tr>
</table>

Noise mitigation measures: Baffle Type Acoustic Window (Acw)

**Please refer to Appendix 2.4 for the above calculated noise reduction level for Baffle Type Acoustic Window.

Appendix 2.3 - (AM Peak) Predicted Road Traffic Noise Reduction Level (L10, dB(A)) during AM Peak Hour of Year 2042 with Noise Mitigation Measures at Proposed Development - Mitigated Scenario

		RG01	R101	R102	R103	R104	R105	RT01	RT02	RT03	RT04a	RT04b	RT05	RT06	R901	R902
Noise Mitigation		-	Acw	Acw	-	-	-	Acw	Acw	-	-	-	-	-	-	-
Floor	mPD	L10 1-hour, dB(A)														
G/F	10.4	70	/					/							/	
1/F	15.4	/	69	67	49	59	61									
2/F	18.5		/					67	67	50	55	-	59	61	/	
3/F	21.7							67	66	50	-	49	60	61		
4/F	24.8							67	66	50	55	-	61	62		
5/F	28							67	66	50	-	49	62	62		
6/F	31.1							67	66	50	55	-	62	62		
7/F	34.3							67	66	51	56	-	63	63		
9/F	40.6							/							57	57
Max. Level,dB(A)		70	69	67	49	59	61	67	67	51	56	49	63	63	57	57
Noise Criteria		70	70	70	55	70	70	70	70	70	70	55	70	70	70	70
Compliance?		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

**The predicted noise level is not the actual noise level at the external facade after the application of baffle type acoustic window . These predicted noise levels are the equivalent noise levels at 1m from the external facade after accounting the reduction in noise levels inside the flat offered by the proposed baffle type acoustic window.

Compliance Rate

No. of units counted with noise exceedance:	0
Total no. of units at Subject Site	30
Compliance Rate (%):	100.0%

Appendix 2.4

Estimation of Maximum Allowed Sound Attenuation of Baffle Type Acoustic Window

Appendix 2.4 - Estimation of Maximum Allowed Sound Attenuation of Baffle Type Acoustic Window

Table of Major Parameters and Room Size of Proposed Development and Corresponding Reference Case, and Sound Attenuation Adjustment

Floor	Room	NSR IDs	Window/ Door	Proposed Development						Reference Case							Adjustment: 10xlog(RA / RAref) (adjust downward only), dB(A) (RAref)	Adjusted sound attenuation, dB(A)
				Outer opening area, m2	Inner opening area, m2	Air gap, m	Overlapping length, m	MPA applied? ***	Room area (RA), m2	Outer opening area, m2	Inner opening area, m2	Air gap, m	Overlapping length, m	MPA applied?	Room area (RAref), m2	Ref. sound attenuation, dB(A)		
1/F	Ward	R101	Window	2.33	1.12	0.1	0.275	No	28.98	3.2	3.8	0.1	0.275	No	38.3	8.8	-1.2	7.6
1/F	Ward	R102	Window	3.18	0.12	0.1	0.275	No	42.35	3.2	3.8	0.1	0.275	No	38.3	8.8	0.0	8.8
2/F-7-F	Ward	RT01	Window	2.33	1.12	0.1	0.275	No	47.65	3.2	3.8	0.1	0.275	No	38.3	8.8	0.0	8.8
2/F-7-F	Ward	RT02	Window	3.18	0.12	0.1	0.275	No	47.80	3.2	3.8	0.1	0.275	No	38.3	8.8	0.0	8.8

The dimensions of major parameters for the proposed baffle type acoustic window for the Proposed Development as shown in the above table, are subject to detailed design stage.

Appendix 2.5

Extracted Pages from Approved Planning Application A/K22/29

3.7 Proposed Noise Mitigation Measures

3.7.1 The following noise mitigation measures are considered and incorporated in the MLP.

a. Acoustic Window (Baffle Type)

According to a precedent case of redevelopment of ex-North Point Estate site to comprehensive development with residential uses (hereinafter referred to as the "Reference Case" for simplicity's sake), acoustic windows (baffle type) are adopted for flats facing roads (Island Eastern Corridor) for the purpose of reducing road traffic noise impact. According to onsite noise measurement, such innovate acoustic window system (opening size of 3.2m^2; 100mm gap; 275mm overlapping) at living room area (about 38.3m^2) can reduce noise level by 8.8 dB(A).

Acoustic window (baffle type) refers to the type of window that has an inner glass panel behind an outer window, both readily openable, for creating an air gap for the supply of fresh air with noise mitigation effect (see **Appendix 3.5**). It comprises two glazing:

i. The outer window opening; and
ii. The inner panel.

The "designed setting" to reduce noise entry to indoor area is that the inner panel is installed behind the outer window opening so that noise outside cannot pass through the opening window and enter indoor area directly. Noise needs to pass through the gap between the inner panel and outer façade in order to enter indoor area. The design can enable natural ventilation through the gap between the outer façade and inner sliding panel on one hand (although extent of natural ventilation may be inferior to the case without the inner sliding panel behind) and prevent most noise from entering indoor environment on the other hand.

In the Proposed Development, the configurations of the optimised acoustic windows design are shown in **Appendix 3.5**. With the optimised configurations, the noise reduction effectiveness of the acoustic windows in this Proposed Development (i.e. opening size and gap not more than Reference Case; overlapping not less than Reference Case) should not be worse than the Reference Case, it is anticipated that the proposed acoustic window (Baffle Type) should have at least the same noise reduction performance when noise enters from outdoor to indoor area.

The sound attenuation performance of acoustic window is determined with reference to the redevelopment project of ex-North Point Estate. The noise reduction of enhanced acoustic balcony without MPA applied at living room of reference case reaches 8.8 dB(A) (For living room of 38.3m^2, with outer opening of about 3.2m^2, air gap of 100mm and overlapping length of 275mm). The outer window opening of dormitory is around 3.14 m^2, which is smaller than that of the reference case of 3.2m^2. In addition, air gap of 100mm and overlapping length of 375mm will be provided which is no worse than the reference case (see **Appendix 3.5**).

It is noted that the room size of typical dormitories is ranged from approximately 40 m^2 to 50m^2, which is larger than the living room of 38.3m^2 in reference case. Therefore, the base case of RCHE supposed with larger window opening will

even perform worse, leading to higher noise reduction of the acoustic window system. Therefore, the maximum sound reduction performance of the acoustic window applied at typical dormitories should not be less than that in reference case, which is equivalent to 8.8 dB(A).

As for the Staff Dormitory/ Sleep-in Room at 3/F, its room size is around 25m^2, which is smaller than the living room area of the reference case. It is considered that the amount of sound energy that can enter to room indoors should be proportional to the area of the window opening and in turn correlated to the room size. Therefore, an adjustment on the sound attenuation of acoustic window is made using ratio of room size of Staff Dormitory and Reference Case (which represents the ratio of sound energy that can enter indoor area) and then converted to decibel scale using 10 x log function. In this case, the sound attenuation of acoustic window in staff dormitory is determined as 6.9 dB(A) (i.e. 8.8 + 10 x log(25/38.3)), which is higher than the required noise reduction by 0.4 dB(A).

For Isolation/ Quiet Room, acoustic window (Baffle Type) is proposed where noise exceedance is found (with maximum of 2 dBA exceedance). It is noted that the room size of these room is ranged from around 9m^2 to 10m^2, which is larger than the bedroom in reference case (room size of about 6.8m^2 with outer opening of about 0.7 m^2 and noise reduction performance of 6.9 dB(A)). Same principle for dormitories applies to these Isolation/ Quiet Room should not be worse than that of the reference case and can attain the noise reduction of maximum 6.9 dB(A).

b. Fixed Glazing

For some locations where ventilation opening is not necessary but exposing to the major road traffic noise source that possibly lead to noise exceedance, they will be dedicated as fixed glazing.

3.7.2 **Figure 3.2** shows the proposed noise mitigation measures.

3.8 Assessment Result with Proposed Noise Mitigation Measures

3.8.1 The predicted road traffic noise levels at the selected representative NSRs based on the noise mitigation measures discussed above were assessed.

3.8.2 The result in **Appendix 3.4** indicated no non-compliance of road traffic noise standard is found with the proposed noise mitigation measures in place.

3.9 Conclusion

3.9.1 Road traffic noise impact assessment has been carried out for the proposed development.

3.9.2 Practical and effective noise mitigation measures have been explored which include and acoustic window (baffle type) and fixed glazing. With the proposed noise mitigation measures in place, the road traffic noise level can comply with relevant standards.

Appendix 3.1

Inventory of Potential Fixed Noise Sources

Noise Source ID	Description of Noise Sources	Sources	SWL, dB(A), L_{eq} (30 min)				Source Location			Directivity Factor (Q)	No. of Plant
		Existing/ Planned	Daytime & Evening Time (0700-2300)	Ref	Nighttime (2300-0700)	Ref	X	Y	Z, mPD		
F01	VRV at the roof of Kowloon Ling Liang Church	Existing	71	[21]	OFF	[21]	837213.04	820947.14	0.0	2	1
F02	VRV at the roof of Kowloon Ling Liang Church	Existing	71	[21]	OFF	[21]	837214.96	820947.08	0.0	2	1
F03	VRV at the roof of Kowloon Ling Liang Church	Existing	71	[21]	OFF	[21]	837216.91	820946.96	0.0	2	1
F04	VRV at the roof of Kowloon Ling Liang Church	Existing	71	[21]	OFF	[21]	837214.89	820945.05	0.0	2	1
F05	VRV at the roof of Kowloon Ling Liang Church	Existing	71	[21]	OFF	[21]	837216.86	820944.91	0.0	2	1
F06	VRV at the roof of Kowloon Ling Liang Church	Existing	71	[22]	OFF	[22]	837215.72	820942.99	0.0	2	1
F07	VRV at the roof of Kowloon Ling Liang Church	Existing	66	[23]	OFF	[23]	837212.22	820945.13	0.0	2	1
F08	VRV at the roof of Kowloon Ling Liang Church	Existing	66	[23]	OFF	[23]	837212.14	820943.05	0.0	2	1
F09	Condensing Unit at the roof of Kowloon Ling Liang Church	Existing	57	[19]	OFF	[19]	837211.27	820939.92	0.0	2	1
F10	Condensing Unit at the roof of Kowloon Ling Liang Church	Existing	57	[19]	OFF	[19]	837212.50	820939.85	0.0	2	1
F11	VRV at the roof of Kowloon Ling Liang Church	Existing	68	[18]	OFF	[18]	837213.72	820939.72	0.0	2	1
F12	VRV at the roof of Kowloon Ling Liang Church	Existing	58	[13]	OFF	[13]	837219.06	820937.44	0.0	2	1
F13	Condensing Unit at the roof of Kowloon Ling Liang Church	Existing	57	[19]	OFF	[19]	837223.80	820941.55	0.0	2	1
F14	Condensing Unit at the roof of Kowloon Ling Liang Church	Existing	57	[19]	OFF	[19]	837225.61	820941.47	0.0	2	1
F15	Air Conditioner at the roof of Kowloon Ling Liang Church	Existing	67	[20]	OFF	[20]	837233.69	820941.23	0.0	2	1
F16	VRV at the roof of Kowloon Ling Liang Church	Existing	68	[24]	OFF	[24]	837238.86	820944.23	0.0	2	1
F17	VRV at the roof of Kowloon Ling Liang Church	Existing	68	[24]	OFF	[24]	837238.98	820946.53	0.0	2	1
F18	VRV at the roof of Kowloon Ling Liang Church	Existing	68	[24]	OFF	[24]	837237.10	820946.61	0.0	2	1
F19	Chiller at the roof of The Grandeur (Block 1)	Existing	68	[24]	OFF	[24]	837231.03	821184.01	0.0	2	1
F20	Chiller at the roof of The Grandeur (Block 1)	Existing	68	[24]	OFF	[24]	837233.30	821183.90	0.0	2	1
F21	Chiller at the roof of The Grandeur (Block 1)	Existing	68	[24]	OFF	[24]	837235.54	821184.46	0.0	2	1
F22	Chiller at the roof of The Grandeur (Block 1)	Existing	68	[24]	OFF	[24]	837235.70	821185.93	0.0	2	1
F23	Chiller at the roof of The Grandeur (Block 1)	Existing	68	[24]	OFF	[24]	837235.81	821188.20	0.0	2	1
F24	Chiller at the roof of The Grandeur (Block 1)	Existing	68	[24]	OFF	[24]	837233.35	821187.91	0.0	2	1
F25	Chiller at the roof of The Grandeur (Block 1)	Existing	68	[24]	OFF	[24]	837231.09	821188.08	0.0	2	1
F26	Cooling Tower at the roof of Smart A	Existing	82	[1]	OFF	[1]	837331.64	820957.79	0.0	2	1
F27	Chiller at the roof of Smart A	Existing	83	[8]	OFF	[8]	837330.83	820956.20	0.0	2	1
F28	Chiller at the roof of Smart A	Existing	83	[8]	OFF	[8]	837329.41	820955.25	0.0	2	1
F29	Chiller at the roof of Smart A	Existing	83	[8]	OFF	[8]	837328.42	820956.74	0.0	2	1
F30	Chiller at the roof of Smart A	Existing	83	[8]	OFF	[8]	837329.83	820957.69	0.0	2	1
F31	Chiller at the roof of Hang Seng Kowloon City Building	Existing	92	[11]	OFF	[11]	837347.09	820950.24	0.0	2	1
F32	Chiller at the roof of Hang Seng Kowloon City Building	Existing	92	[11]	OFF	[11]	837347.05	820948.18	0.0	2	1
F33	Cooling Tower at the roof of 404-410 Nga Tsin Long Road	Existing	82	[1]	OFF	[1]	837554.55	820985.74	0.0	2	1
F34	Cooling Tower at the roof of 404-410 Nga Tsin Long Road	Existing	84	[2]	OFF	[2]	837556.64	820985.65	0.0	2	1
F35	Cooling Tower at the roof of 404-410 Nga Tsin Long Road	Existing	91	[3]	OFF	[3]	837556.65	820983.54	0.0	2	1
F36	Cooling Tower at the roof of St.Teresa Hospital (North Wing)	Existing	OFF	[4]	OFF	[4]	837057.24	820849.86	0.0	2	1
F37	Cooling Tower at the roof of St.Teresa Hospital (North Wing)	Existing	86	[4]	OFF	[4]	837064.78	820851.35	0.0	2	1
F38	Cooling Tower at the roof of St.Teresa Hospital (North Wing)	Existing	86	[4]	86	[4]	837075.31	820851.44	0.0	2	1
F39	Cooling Tower at the roof of St.Teresa Hospital (North Wing)	Existing	86	[4]	86	[4]	837081.72	820852.75	0.0	2	1
F40	Chiller at the roof of St.Teresa Hospital (East Wing)	Existing	98	[10]	OFF	[10]	837114.21	820857.93	0.0	2	1
F41	Chiller at the roof of St.Teresa Hospital (East Wing)	Existing	98	[10]	98	[10]	837117.13	820858.51	0.0	2	1
F42	Chiller at the roof of St.Teresa Hospital (East Wing)	Existing	OFF	[10]	OFF	[10]	837116.49	820853.68	0.0	2	1
F43	Chiller at the roof of St.Teresa Hospital (Extension Building)	Existing	85	[12]	85	[12]	837109.05	820782.82	0.0	2	1
F44	Chiller at the roof of St.Teresa Hospital (Extension Building)	Existing	85	[12]	85	[12]	837110.13	820777.87	0.0	2	1
F45	Chiller at the roof of St.Teresa Hospital (Extension Building)	Existing	85	[12]	85	[12]	837071.33	820774.80	0.0	2	1
F46	Chiller at the roof of St.Teresa Hospital (Extension Building)	Existing	85	[12]	85	[12]	837072.30	820770.34	0.0	2	1
F47	Chiller at the roof of St.Teresa Hospital (Extension Building)	Existing	98	[9]	98	[9]	837074.42	820742.90	0.0	2	1
F48	Chiller at the roof of St.Teresa Hospital (Extension Building)	Existing	98	[9]	98	[9]	837066.10	820741.17	0.0	2	1
F49	VRV at the roof of St. Teresa Hospital (Staff Quarter)	Existing	72	[17]	72	[17]	837169.72	820826.96	0.0	2	1
F50	VRV at the roof of St. Teresa Hospital (Staff Quarter)	Existing	70	[16]	70	[16]	837171.90	820827.47	0.0	2	1
F51	VRV at the roof of St. Teresa Hospital (Staff Quarter)	Existing	70	[16]	70	[16]	837172.81	820823.15	0.0	2	1
F52	VRV at the roof of St. Teresa Hospital (Staff Quarter)	Existing	70	[16]	70	[16]	837171.13	820822.82	0.0	2	1
F53	VRV at the roof of St. Teresa Hospital (Staff Quarter)	Existing	70	[16]	70	[16]	837169.41	820822.47	0.0	2	1
F54	VRV at the roof of St. Teresa Hospital (Staff Quarter)	Existing	72	[17]	72	[17]	837169.86	820820.07	0.0	2	1
F55	VRV at the roof of St. Teresa Hospital (Staff Quarter)	Existing	72	[17]	72	[17]	837170.27	820817.88	0.0	2	1
F56	VRV at the roof of St. Teresa Hospital (Staff Quarter)	Existing	68	[14]	68	[14]	837166.58	820816.43	0.0	2	1
F57	VRV at the roof of St. Teresa Hospital (Staff Quarter)	Existing	71	[15]	71	[15]	837164.49	820816.02	0.0	2	1
F58	VRV at the roof of St. Teresa Hospital (Staff Quarter)	Existing	72	[17]	72	[17]	837161.68	820814.84	0.0	2	1
F59	VRV at the roof of St. Teresa Hospital (Staff Quarter)	Existing	70	[16]	70	[16]	837161.20	820817.27	0.0	2	1
F60	VRV at the roof of St. Teresa Hospital (Staff Quarter)	Existing	72	[17]	72	[17]	837160.74	820819.64	0.0	2	1
F61	VRV at the roof of St. Teresa Hospital (Staff Quarter)	Existing	72	[17]	72	[17]	837163.84	820819.49	0.0	2	1

Noise Source ID	Description of Noise Sources	Sources	SWL, dB(A), L_{eq} (30 min)				Source Location			Directivity Factor (Q)	No. of Plant
		Existing/ Planned	Daytime & Evening Time (0700-2300)	Ref	Nighttime (2300-0700)	Ref	X	Y	Z, mPD		
F62	VRV at the roof of St. Teresa Hospital (Staff Quarter)	Existing	72	[17]	72	[17]	837165.93	820819.85	0.0	2	1
F63	VRV at the roof of St. Teresa Hospital (Staff Quarter)	Existing	72	[17]	72	[17]	837157.84	820822.57	0.0	2	1
F64	VRV at the roof of St. Teresa Hospital (Staff Quarter)	Existing	70	[16]	70	[16]	837158.12	820824.51	0.0	2	1
F65	VRV at the roof of St. Teresa Hospital (Staff Quarter)	Existing	70	[16]	70	[16]	837159.94	820824.91	0.0	2	1
F66	VRV at the roof of St. Teresa Hospital (Staff Quarter)	Existing	72	[17]	72	[17]	837162.33	820822.22	0.0	2	1
F67	VRV at the roof of St. Teresa Hospital (Staff Quarter)	Existing	70	[16]	70	[16]	837164.48	820822.63	0.0	2	1
F68	Chiller at the roof of Hong Kong Eye Hospital	Existing	97	[7]	97	[7]	837028.79	820679.62	0.0	2	1
F69	Chiller at the roof of Hong Kong Eye Hospital	Existing	97	[7]	97	[7]	837034.44	820680.60	0.0	2	1
F70	Chiller at the roof of Hong Kong Eye Hospital	Existing	96	[9]	96	[9]	837043.09	820652.45	0.0	2	1
F71	Cooling Tower at the roof of Kowloon City Law Courts Building	Existing	92	[5]	OFF	[5]	837139.21	820699.38	0.0	2	1
F72	Cooling Tower at the roof of Kowloon City Law Courts Building	Existing	92	[5]	OFF	[5]	837139.68	820696.82	0.0	2	1
F73	Chiller at the roof of Kowloon City Law Courts Building	Existing	94	[6]	OFF	[6]	837137.74	820692.56	0.0	2	1
F74	Chiller at the roof of Kowloon City Law Courts Building	Existing	94	[6]	OFF	[6]	837138.67	820686.74	0.0	2	1

Notes:

[1] The noise level is referenced to Ryowo FT-20.
[2] The noise level is referenced to Ryowo FT-25.
[3] The noise level is referenced to Ryowo FT-50.
[4] The noise level is referenced to Ryowo FC-300.
[5] The noise level is referenced to Ryowo FWS-127-7.5.
[6] The noise level is referenced to Trane CGAM 70.
[7] The noise level is referenced to Trane RTAC 300 .
[8] The noise level is referenced to York YLCA 0080 T-TP.
[9] The noise level is referenced to York YLAA 0485SE.
[10] The noise level is referenced to York YCAS 0835 EB.
[11] The noise level is referenced to Carrier 30RB 090R.
[12] The noise level is referenced to McQuay MCS135.1.
[13] The noise level is referenced to Mitsubishi FDC125VS.
[14] The noise level is referenced to Mitsubishi FDC400KXE6.
[15] The noise level is referenced to Mitsubishi FDC450KXE6.
[16] The noise level is referenced to Mitsubishi FDC504KXE6.
[17] The noise level is referenced to Mitsubishi FDC560KXE6.
[18] The noise level is referenced to Daikin RU08K.
[19] The noise level is referenced to Daikin R50GV1.
[20] The noise level is referenced to Daikin R125FU.
[21] The noise level is referenced to Daikin RUXYQ12AB.
[22] The noise level is referenced to Daikin RXYQ216PBYD.
[23] The noise level is referenced to Daikin RXYQ72PBYD.
[24] The noise level is referenced to Daikin RXYQ96PBYD.

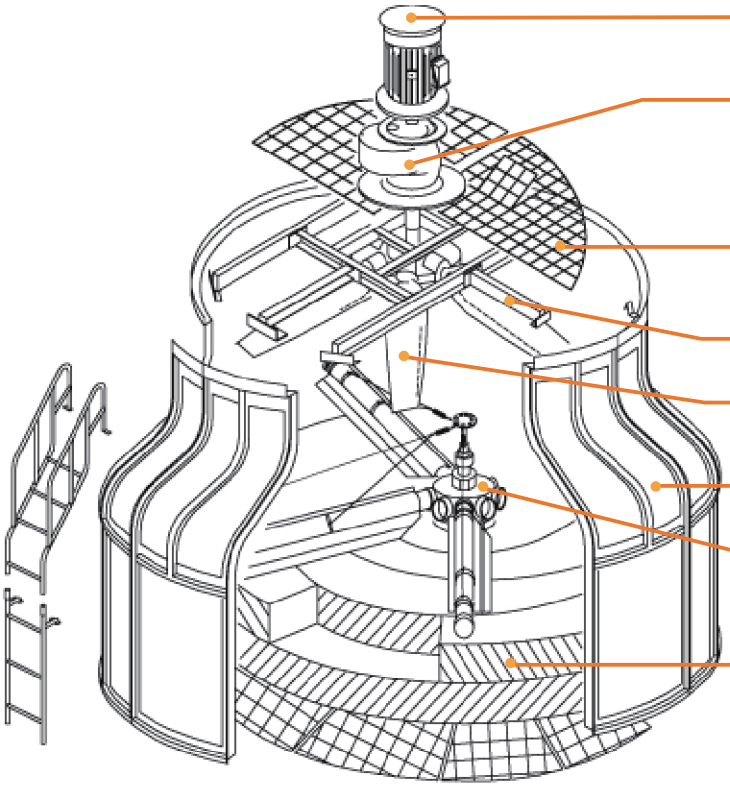
Catalogue of Ryowo FT-20, FT-25, FT-50

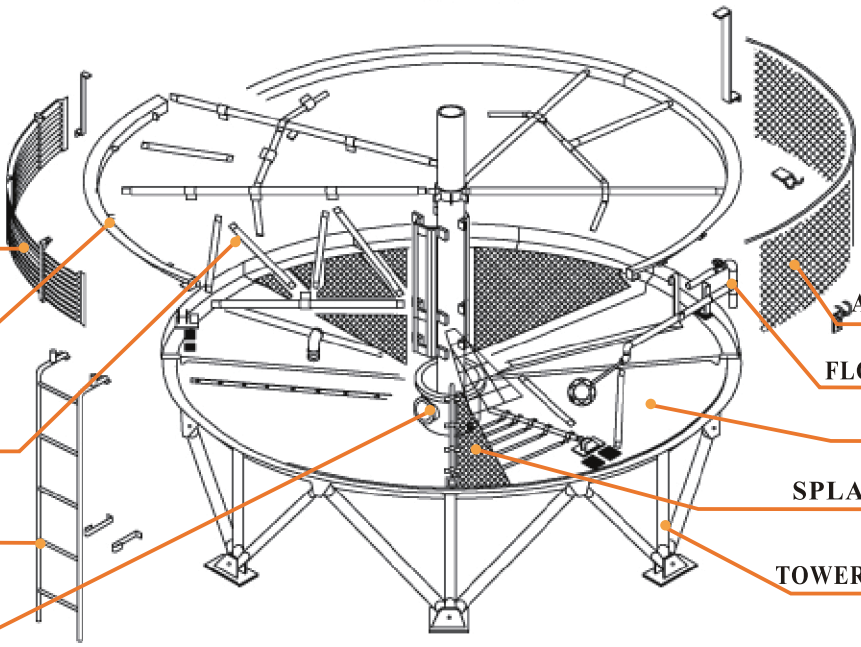
菱和
ryowo™

FRP COUNTER FLOW FT SERIES

COOLING TOWER

STRUCTURE





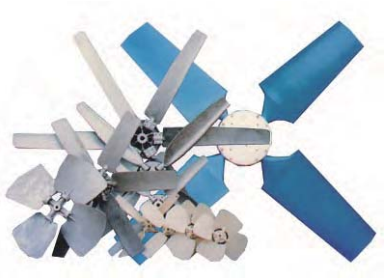
PRINCIPLE OF OPERATION

Hot water is distributed over the filler through the low velocity automatic sprinkler system and is mixed with the upward draft of ambient air causing evaporation and thus heat is removed from the water. The cooled water falls into the basin and is pumped to the heat sources for recirculation.

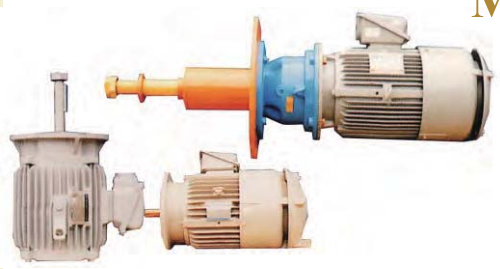
COMPONENT FUNCTION & FEATURE

AXIAL FAN

All fans are induced-draft axial type with adjustable pitch. Material chosen are non-corrosion of plastic, FRP or alu-minium alloy. The high efficiency design ensures low running cost and the lowest possible noise level . Fan blade pitches is factory set and balanced.



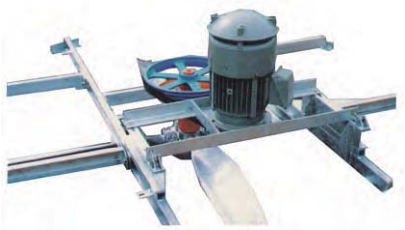
MOTOR



The motors, totally enclosed, fan cooled flange type, 380V/ 3ph/ 50 Hz, induction weather proof, are specially designed for RYOWO. Motors from 5.5 kw and up are Y- start and below are direct-on-line start.

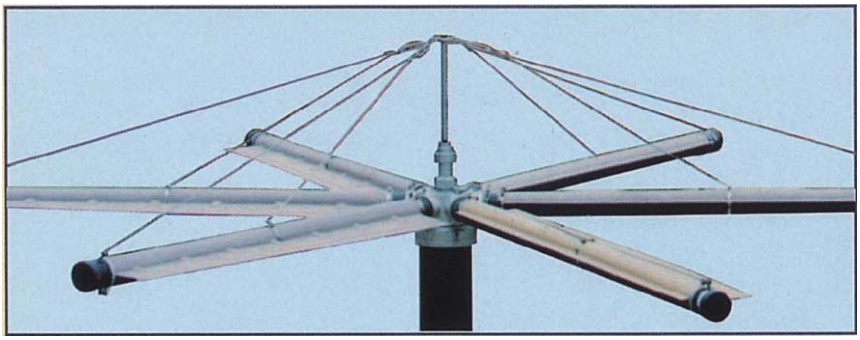
TRANSMISSION SYSTEM

The fans of small models are designed to be driven by low speed motor of 6,8,10 or 12 poles which can minimise the numbers of transmission parts used. For large models, the fans are vee-belt or gear driven with 4 poles motors so the speed of fans can be adjustable to suit various application.



SPRINKLER SYSTEM

Automatic rotary sprinkler system with rotary head and sprinkler pipe distributes the hot water over the entire face area of the filler. Sprinkler pipes are non-clogging, require low-pressure to operate, and assures uniform water flow with minimal operating pump head. The F.R.P. eliminators attached to sprinkler pipes are specifically designed for Low pre Ssure drop and minimises the drift loss of water.

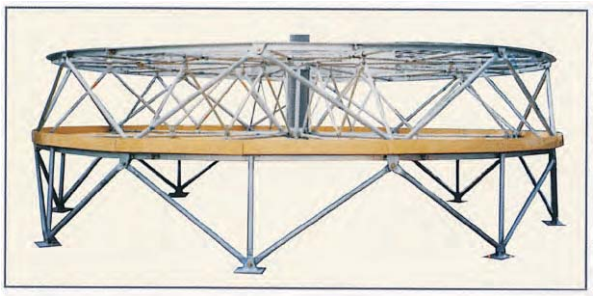


COMPONENT FUNCTION & FEATURE

CASING & BASIN

F.R.P. (fibreglass reinforced polyester) formed casings are durable, non-corrosive, weather-proof, and light weight. Cylindrical form is shaped to fully withstand wind pressure, vibration and such F.R.P. casings obliviate need for painting, reduce maintenance costs and guarantee long dependable service.

Bowl-shape basins are also made from F.R.P. with built in socket or flanged outlets for piping connections. For large models, a F.R.P. aux. suction tank is employed and fitted with piping flanges or sockets.



STEEL STRUCTURE

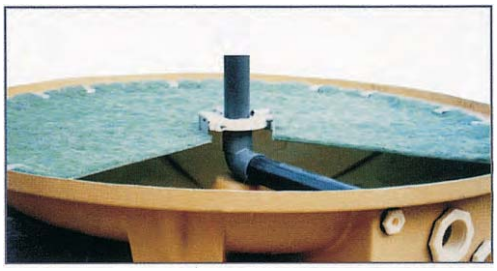
All supporting steel members are hot-dip galvanized to minimise rusting and corrosion ensuring long service life even in corrosive atmosphere. The stainless hardware members are also available upon request.

FILLER

High performance RYOWO V-30 film filler is the heart of the tower. The specially formed PVC sheets maximize the air/water contact area and minimise air pressure drop to assure efficient heat transfer while keeping fan power requirement low. It is virtually immune to corrosion and decay.

Eliminator

Specially made drift eliminator consisted of 2 types of sheets forms a “v” shape path for the transmission of the cooling tower discharge air stream. The small water droplets in the stream impact the surfaces of the drift eliminator sheets and are separated from the stream such that the drift loss ratio maintain at less than 0.001% of circulating water flow rate.



SPLASH MAT (LOW NOISE MODELS)

Specially designed noise absorbing splash mat is provided for low noise models on the water basin to minimise the unpleasant water dripping noise in the basin.

SPECIFICATION FOR FT SERIES

SPECIFICATION FOR FT SERIES

ITEM	MODEL			FT-8	FT-10	FT-15	FT-20	FT-25	FT-30	FT-40	FT-50	FT-60	FT-80	FT-100	FT-125	FT-150	FT-175	FT-200	FT-225	FT-250	FT-300	FT-350	FT-400	FT-500	FT-600	FT-700	FT-800	FT-1000
Capacity	27 ℃ WB	Circulating water flow rate	m^3/ hr	6.2	7.8	11.7	15.6	19.5	23.4	31.2	39.1	46.9	62.5	78.1	97.7	117.2	136.7	156.2	175.8	195.3	234.4	273.4	312.5	390.6	468.7	546.8	625.0	781.2
		Make-up water (Approx.)	m^3/ hr	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.6	0.7	0.9	1.1	1.4	1.7	2.0	2.2	2.5	2.8	3.4	3.9	4.5	5.6	6.7	7.8	8.9	11.2
	28 ℃ WB	Circulating water flow rate	m^3/ hr	5.6	7.4	10.6	14.4	17.8	21.5	28.7	36.3	42.5	58.8	70.6	88.2	107.5	125.0	142.5	160.0	176.2	212.5	250.0	287.5	337.5	431.2	512.4	575.0	718.7
		Make-up water (Approx.)	m^3/ hr	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.5	0.6	0.8	1.0	1.3	1.5	1.8	2.0	2.3	2.5	3.0	3.6	4.1	4.8	6.2	7.3	8.2	10.3
	Air flow rate (Approx.)		m^3/ min	70	85	140	160	230	280	330	420	450	700	830	950	1150	1200	1250	1600	1750	2000	2200	2450	2700	3500	3750	5000	5400
	Hot water temperature		ºC	37																								
	Cold water temperature		ºC	32																								
Overall Dimension	Diameter (ϕ)		mm	920	920	1160	1160	1490	1660	1660	1890	2100	2100	2900	2900	2900	3310	3310	3960	3960	4360	4760	4760	5600	6600	6600	7600	7600
	Height (H)		mm	1560	1700	1585	1835	1945	1885	2035	2110	2300	2475	2910	3110	3110	3300	3450	3920	3920	3990	4195	4255	4590	5310	5510	5660	5860
	Height (w/o motor) (m)		mm	1390	1530	1395	1645	1760	1720	1785	1860	1980	2155	2590	2790	2790	2880	3030	3300	3300	3290	3495	3495	3830	4470	4670	4720	4940
Material	Air inlet mesh			PVC																								
	Basin			FRP																								
	Casing			FRP																								
	Eliminator			FRP																								
	Fan			FRP			ABS Plastic										Aluminium alloy								FRP			
	Filler			PVC																								
	Motor support			Steel (Hot-dip galvanized)																								
	Sprinkler head			Aluminium alloy			ABS Plastic																					
	Sprinkler pipe			PVC pipe																								
	Stand pipe			PVC pipe																								
	Structure			Steel (Hot-dip galvanized)																								
Fan	TYPE			Axial-flow																								
	Diameter		mm	550	640			770		930		1200		1500			1800		2400				3000		3400		3700	
	Speed		rpm	970								750					600		450				375		314			
	Driven type			Direct driven															Belt driven						Gear driven			
Motor	TYPE			Totally enclosed fan cooled outdoor 3 phase induction motor																								
	Power source			380V / 3 / 50Hz																								
	Rated output		kw	0.18		0.37		0.75				1.5		2.2			3.7		5.5		7.5		11		15		22	
	No of pole		Pole	6								8					10		4									
Distribution System	TYPE			Automatic sprinkler system																								
	Inlet dia		mm	40		50		80				100		125		150			200					250			300	
	Outlet dia			15		20					40			65					75				100	75			100	
	No of outlet			4								6		4					6					8			10	
Piping	Inlet		mm	40		50			80			100		125		150			200					250			300	
	Outlet		mm	40		50			80			100		125		150			200					250			300	
	Drain		mm					25							50					80					100			
	Overflow		mm					25							50					80					100			
	Float valve		mm					15						20				25		32					50			80
	Manual make-up		mm					15							20			25		32					50			80
Weight	Dry weight		Kg	56	65	75	85	105	130	150	180	250	270	500	540	580	870	900	1300	1350	1550	1720	2050	2450	3950	4050	4700	4900
	Operating weight		Kg	140	150	200	210	290	370	390	550	840	860	1600	1640	1680	2170	2200	2700	2750	3350	3720	3950	6150	9350	9450	11900	12100
Noise Level	Sound pressure level		dBA	45.5	47	48	50	52	54	58	59	58	59	61	61.5	62	62	62	63	63	64	64.5	61.5	62	65	66	73	74

NOTE : Nominal cooling capacity is based on 13 ℓ / min / RT (1 RT=3,900 Kcal / hr) at 37ºC inlet water tpmperature, 32ºC outlet water temperature and 27ºC ambient wet bulb temperature.

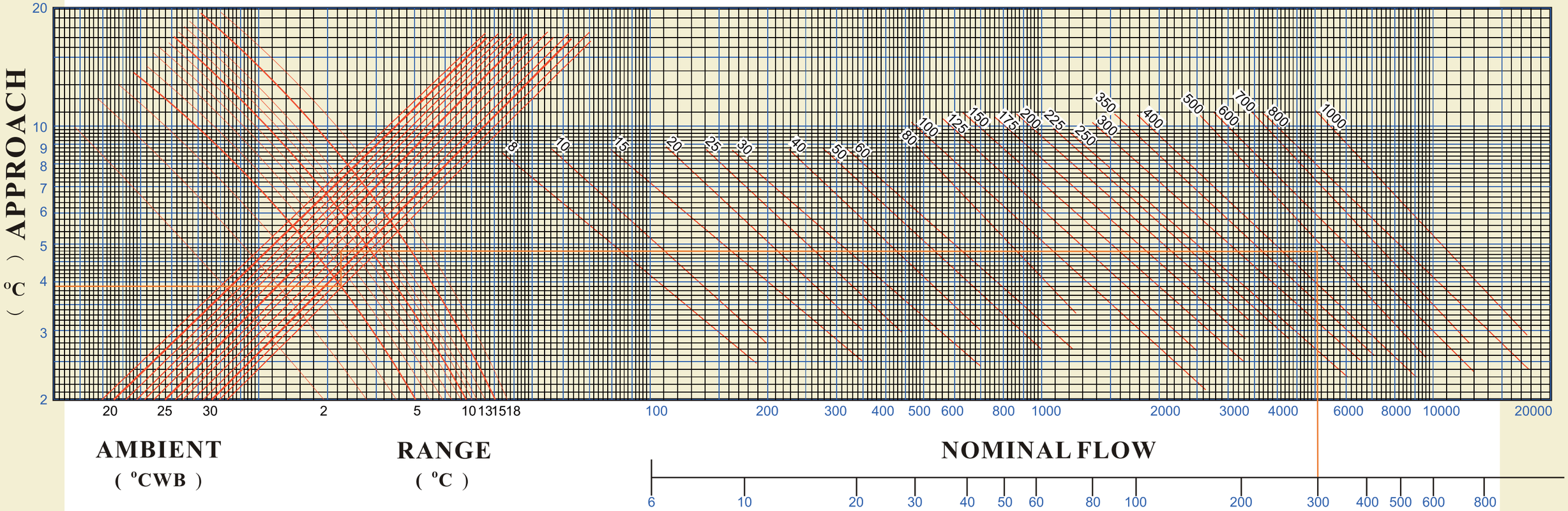
The SPLs are measured 16m horizontally from the edge of the tower at 1.5m above the foundation level.

Pump head is obtained by adding resistance of piping/condenser and the tower height(H).

The unit dimension in this catalogue is metric. Specifications listed in this catalogue are subject to change without further noticefor technical improvement of our products.

FT OR FT/LN SERIES QUICK SELECTION TABLE

(20°CWB~30°CWB)



EXAMPLE:

RATE :300m³/hr

INLET WATER TEMP :37°C

OUTLET WATER TEMP :32°C

WET BULB TEMP :28°C

RANGE: INLET WATER TEMP-OUTLET WATER TEMP
: 37°C - 32°C = 5°C

APPROACH: OUTLET WATER TEMP-WET BULB TEMP
: 37°C - 32°C = 5°C

TOWER SELECTED: FT - 500 OR FT/LN - 500

COOLING TOWER	CT							
NOMINAL FLOW	m³/hr							
INLET WATER	HWT°C							
OUTLET WATER	CWT°C							
AMBIENT WB	WB°C							
RANGE	(HWT-CWT)°C							
APPROACH	(CWT-WB)°C							
MODEL								

SPECIFICATION FOR FT/LN(LOW NOISE TYPE)

SPECIFICATION FOR FT/LN(LOW NOISE TYPE)

ITEM	MODEL			FT/LN 8	FT/LN 10	FT/LN 15	FT/LN 20	FT/LN 25	FT/LN 30	FT/LN 40	FT/LN 50	FT/LN 60	FT/LN 80	FT/LN 100	FT/LN 125	FT/LN 150	FT/LN 175	FT/LN 200	FT/LN 225	FT/LN 250	FT/LN 300	FT/LN 350	FT/LN 400	FT/LN 500	FT/LN 600	FT/LN 700	FT/LN 800	FT/LN 1000
Capacity	27 ºC WB	Circulating water flow rate	m^3/ hr	6.2	7.8	11.7	15.6	19.5	23.4	31.2	39.1	46.9	62.5	78.1	97.7	117.2	136.7	156.2	175.8	195.3	234.4	273.4	312.5	390.6	468.7	546.8	625.0	781.2
		Make-up water (Approx.)	m^3/ hr	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.6	0.7	0.9	1.1	1.4	1.7	2.0	2.2	2.5	2.8	3.4	3.9	4.5	5.6	6.7	7.8	8.9	11.2
	28 ºC WB	Circulating water flow rate	m^3/ hr	5.6	7.1	10.6	14.4	17.8	21.5	28.7	36.3	42.5	58.8	70.6	88.2	107.5	125.0	142.5	160.0	176.2	212.5	250.0	287.5	337.5	431.2	512.4	575.0	718.7
		Make-up water (Approx.)	m^3/ hr	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.5	0.6	0.8	1.0	1.3	1.5	1.8	2.0	2.3	2.5	3.0	3.6	4.1	4.8	6.2	7.3	8.2	10.3
	Air flow rate (Approx.)		m^3/ min	70	85	140	160	230	280	330	420	450	700	830	950	1150	1200	1250	1600	1750	2000	2200	2450	2700	3500	3750	5000	5400
	Hot water temperature		ºC	37																								
	Cold water temperature		ºC	32																								
Overall Dimension	Diameter		mm	920	1160	1160	1490	1660	1660	1890	1890	2100	2100	2900	2900	2900	3310	3310	3960	3960	4360	4760	4760	5600	6600	6600	7600	7600
	Height （H）		mm	1755	1620	1870	1945	1885	2145	2220	2220	2340	2515	3060	3260	3260	3450	3600	3920	3920	3990	4195	4255	4590	5310	5510	5660	5860
	Height (w/o motor) (m)		mm	1530	1395	1645	1760	1720	1785	1860	1860	1980	2155	2590	2790	2790	2880	3030	3300	3300	3290	3495	3495	3830	4470	4670	4720	4940
Material	Air inlet mesh			PVC																								
	Basin			FRP																								
	Casing			FRP																								
	Eliminator			FRP																								
	Fan			ABS Plastic					Aluminium alloy															FRP				
	Filler			PVC																								
	Motor support			Steel (Hot-dip galvanized)																								
	Sprinkler head			ABS Plastic										Aluminium alloy														
	Sprinkler pipe			PVC pipe																								
	Stand pipe			PVC pipe																								
	Structure			Steel (Hot-dip galvanized)																								
	Splash mat			Nylon																								
Fan	TYPE			Axial-flow																								
	Diameter		mm	640		770			930			1200		1500			1800		2400			3000		3400		3700		
	Speed		rpm	750					600			500		440			375					314		257				
	Driven type			Direct driven										Belt driven										Gear driven				
Motor	TYPE			Totally enclosed fan cooled outdoor 3 phase induction motor																								
	Power source			380V / 3 / 50Hz																								
	Rated output		kw	0.2		0.37			1.1			1.5		3.7				5.5		7.5		11		15		22		
	No of pole		Pole	8					10			12		4														
Distribution System	TYPE			Automatic sprinkler system																								
	Inlet dia		mm	40	50			80				100		125		150			200				250			300		
	Outlet dia			15	20			40						65					75				100	75		100		
	No of outlet			4								6		4					6					8		10		
Piping	Inlet		mm	40	50			80				100		125		150			200				250			300		
	Outlet		mm	40	50			80				100		125		150			200				250			300		
	Drain		mm	25										50					80				100					
	Overflow		mm	25										50					80				100					
	Float valve		mm	15								20					25		32				50			80		
	Manual make-up		mm	15										20			25		32				50			80		
Weight	Dry weight		Kg	80	85	100	125	145	240	280	290	380	400	600	640	680	970	1000	1400	1450	1700	1920	2250	2650	4250	4350	5100	5300
	Operating weight		Kg	160	205	220	290	375	470	625	635	970	990	1700	1740	1780	2270	2300	2800	2850	3500	3920	4250	6350	9650	9750	12300	12500
Noise Level	Sound pressure level		dBA	40	41	42.5	43.5	44.5	46	47	48	48	49.5	52	52.5	53	54	54.5	55	55	56	57	58	60	62	62.5	65	66

GUARANTEE:

All components are guaranteed against defective material for a period of one (1) year.

When return to RYOWO with transportation prepaid , all parts found by factory inspection to be defective will be repaired replaced without charge , FOB HONG KONG.

No liability will be assumed for loss or damage resulting from misuse of products.

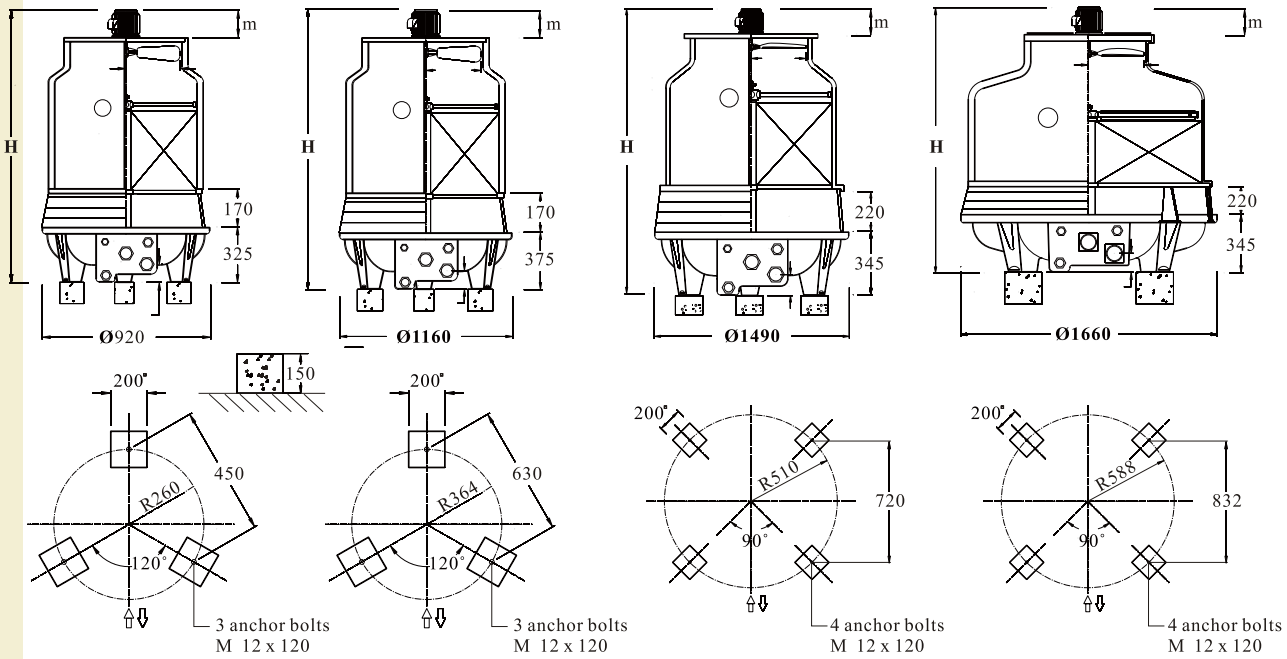
APPLICATION

For inquiry on RYOWO cooling towers , please contact local agents and specify the following conditions:

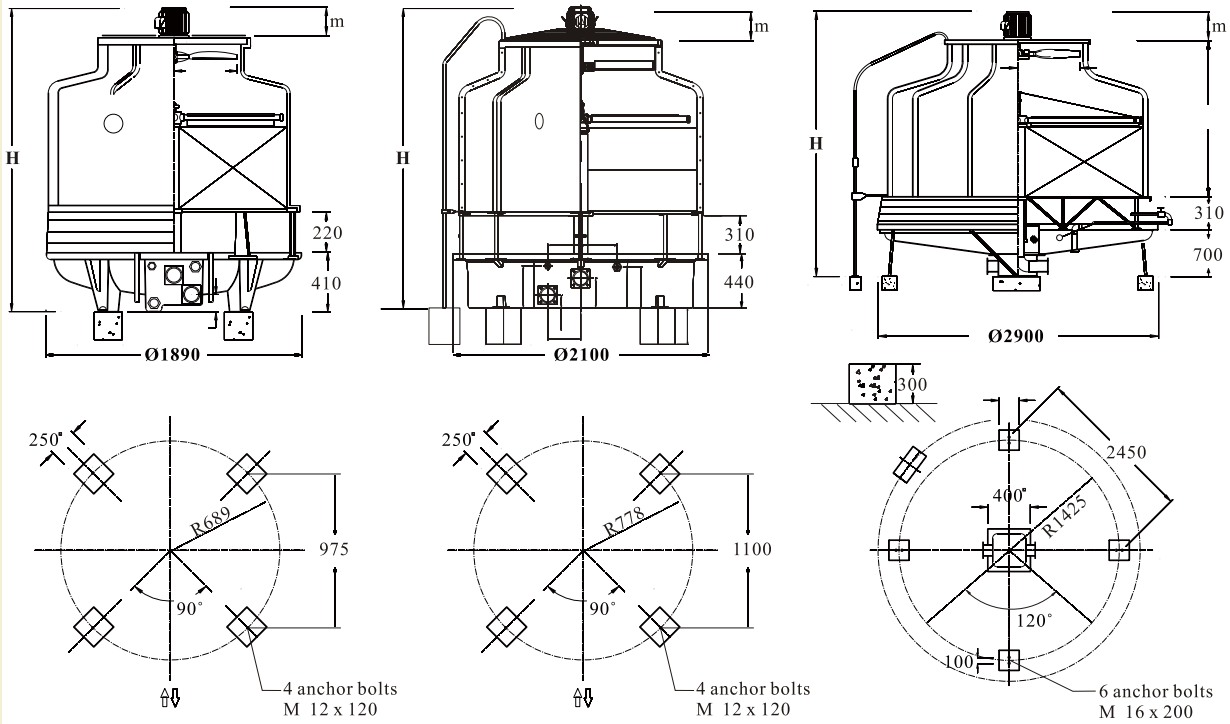
a). Circulating water flow
b). Inlet water temperature
c). outlet water temperature
d). ambient wet bulb temperature
e). power sources-voltage & frequency

TOWER FOUNDATION

FT-8 10 FT/LN-8 FT-15·20 FT/LN-10 15 FT-25 FT/LN-20 FT-30 40 FT/LN-25 30

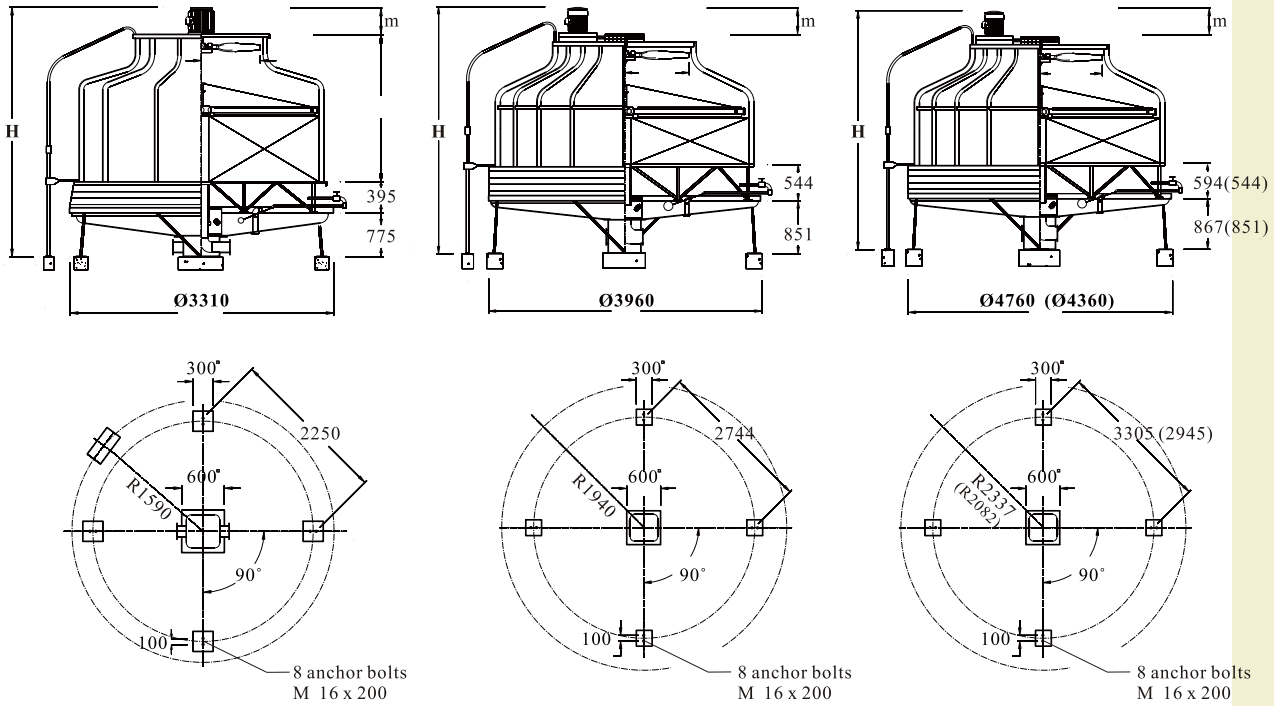


FT-50 FT/LN-40·50 FT· FT/LN-60·80 FT· FT/LN-100·125·150

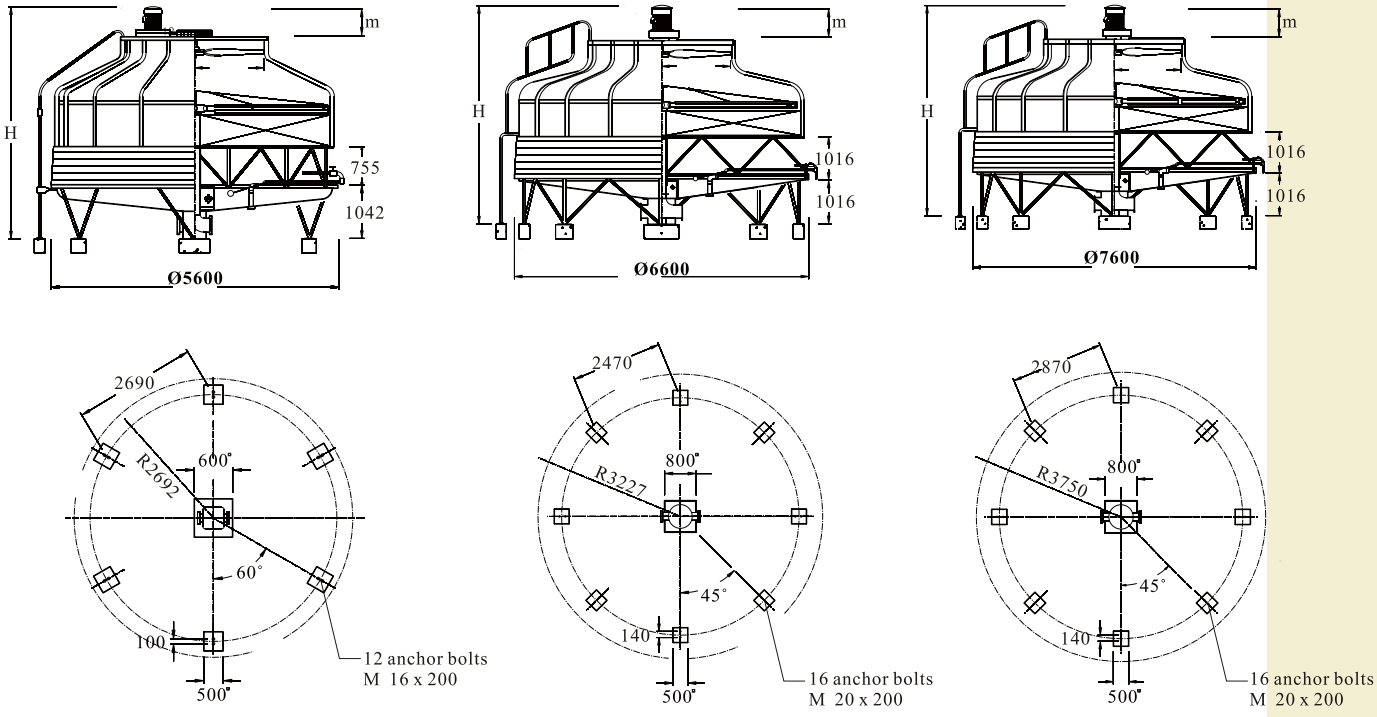


TOWER FOUNDATION

FT· FT/LN-175· 200 **FT· FT/LN-225·250** **FT· FT/LN-(300) ·350·400**



FT· FT/LN- 500 **FT· FT/LN-600 · 700** **FT· FT/LN-800 · 1000**



AVAILABLE OPTIONAL ACCESSORIES

DISCHARGE HOOD

This option is available on small models. It provides another direction of discharge air leaving the tower. It is made of F.R.P. with services door and wiring mesh on the air outlet.

HIGH TEMPERATURE FILLER

For high temperature operation such as waste water treatment , P.P. filler can withstand up to 80℃inlet water. (Special arrangement should be made for other components, please contact us for details.)

STAINLESS STEEL COMPONENTS

As an option, we can provide type 304 stainless steel major steel members, bolts and nuts.

TWO-SPEED MOTOR

As an option, two-speed motor can be provided in 4P/6P single winding configeration. A considerable reduction in noise and energy management can be achieved.

F.R.P. AIR INLET LOUVER

Inlet louver constructed of F.R.P. material can be provided, which matches the rest of tower and prevents water splashing out from the tower.

BASIN HEATERS

Electric immersion heaters with thermostat and control box are available to keep the basin water from freezing in sub-zero weather.

BODY COLOR

Cooling tower installed on the roof of building may be barely noticeable from the ground, and a colored cooling tower matching to building color will make it "good look".

JOB REFERENCES

FT-400 X 2
Bank of China, Shen Zhen

FT/LN-600 X 11
Hotel Lisboa, Macau

FT-1000 X 3
FT-500 X 10
CITIC Plaza, Guangzhou

FT/LN-300 X 6
Hong Kong University

FT-200 X 2
Miami University, U.S.A

Catalogue of Ryowo FC-300

菱和
RYOWO™

FRP

CROSS FLOW FC SERIES

COOLING TOWER

COMPONENT FUNCTION & GRSYTR

LOW NOISE FAN

Airfoil-shaped blades are totally fabricated from fiberglass rainforced polyester (FRP) with an additional epoxy coating for the resistance of ultra violet ray and acid rain corrosion. The hubs are of cast aluminum alloy.

Blades with large chord are axial type with adjustable pitch for permitting maximum utilization of rated horsepower and optimum performance. The aerodynamic shape together with the lower tip speed ensure a lower noise level.

MOTOR AND DRIVE

The fan motors are totally enclosed fan cooled (TEFC) foot mounted with weatherproof Ip44 Class E insulation. The motors are mounted on an adjustable base located inside the fan stack ensuring lower noise level.

The fans are vee-belt driven and are located in the bottle neck of fan stack ensuring free and smooth air discharge and high efficiency with low energy consumption. (Ip54 Motor can be provided upon request)

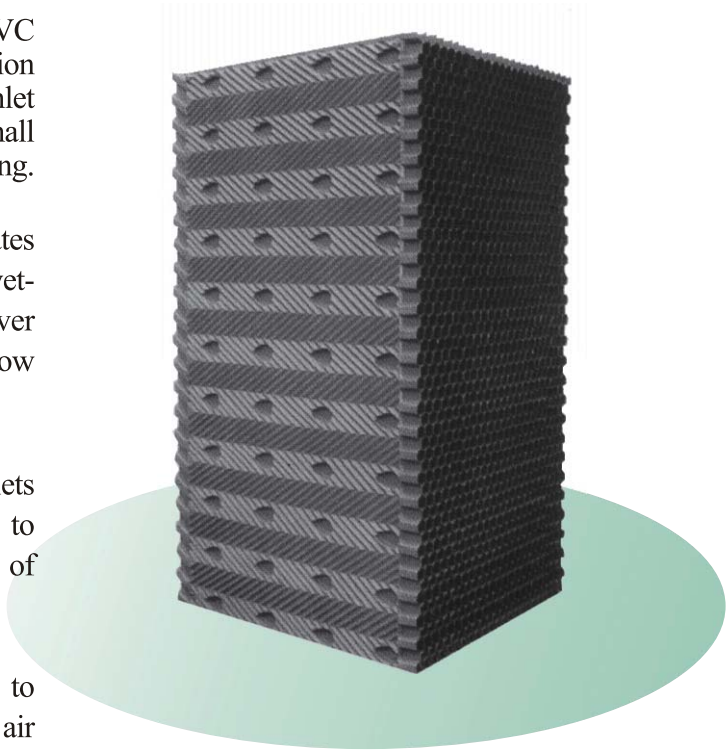
3 IN 1 FILLER

Filler is vacuum-formed of 0.4mm thickness PVC film with excellent chemical and high distortion resistance, and is suitable for operation with inlet water temperature up to 55°C. Its compact small package design is easier to taking out for cleaning.

The special configuration of the filler incorporates the function of drift eliminator, louver and wet-deck surface. The honeycomb shaped louver feature contributes minimum resistance to airflow and prevent the ingress of foreign matters.

The drift eliminator feature prevents water droplets from escaping in the exhaust air stream so as to ensure the drift loss to be less than 0.0005% of Circulating water flow rate.

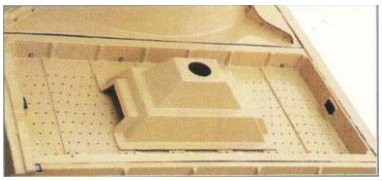
The wet-deck surfaces are special designed to provide maximum air/water contact and low air pressure drop to ensure high efficient heat transfer.

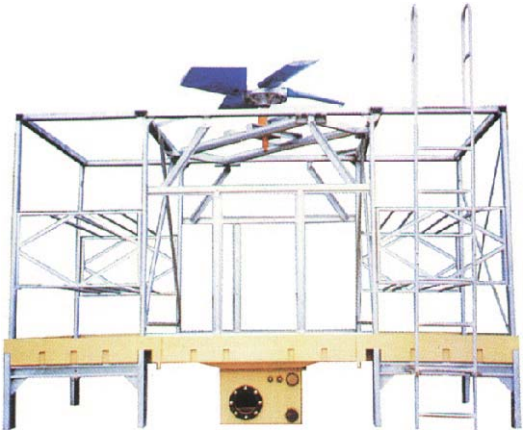


DESIGN FEATURES

DISTRIBUTION SYSTEM

FRP open type gravity flow hot water distribution trays are non-corrosive and long life, and are specially designed for nonclogging operation and ease of inspection. A distribution cap is attached on top and prevents water from splashing out, and a redistribution layer of PVC mesh is placed on top of the filler to provide full coverage of the filler by gravity feed.





STEEL STRUCTURE

All supporting steel members are hot-dip galvanize to minimize rusting and corrosion ensuring long service life even in corrosive atmosphere. The stainless hardware members are also available upon request.

CASING AND BASIN

Casing and basin are made of FRP which excels in corrosion, chemical and weather resistance. It is light weight and easy to assemble and obviates need of painting, and thus reduces maintenance costs and guarantees long dependable service.

FAN STACK

Fan stack are made of FRP. The special aerodynamic design as well as the location of fan provide more than 10% of motor power saving. Furthermore, because of the longer stack, it can discharge the hot moist air away from the tower so as to mini-mize the chance of re-cirulation.

INSPECTION DOOR

Inspection doors are furnished to provide convenient access to the interior for inspecion , maintenance, adjustment of float valve, cleaning of the lift-out strainer and flushing of sump.

SPECIFICATION

ITEM	MODER			ONE CELL							TWO CELLS					THREE CELLS			FOUR CELLS		
				FC-100	FC-125	FC-150	FC-175	FC-200	FC-225	FC-250	FC-300	FC-350	FC-400	FC-450	FC-500	FC-600	FC-675	FC-750	FC-800	FC-900	FC-1000
CAPACITY	27°C WB	circulating water flow rate	m^3/hr	78.0	97.5	117.0	136.5	156.0	175.5	195.0	234.0	273.0	312.0	351.0	390.0	468.0	526.5	585.0	624.0	702.0	780.0
		make-up water(approx.)	m^3/hr	1.1	1.4	1.7	2.0	2.2	2.5	2.8	3.3	3.9	4.5	5.0	5.6	6.7	7.5	8.4	8.9	10.0	11.2
	28°C WB	circulating water flow rate	m^3/hr	70	88	105	123	140	158	175	210	245	280	315	350	420	473	525	560	630	700
		make-up water(approx.)	m^3/hr	1.0	1.3	1.5	1.8	2.0	2.3	2.5	3.0	3.5	4.0	4.5	5.0	6.0	6.8	7.5	8.0	9.0	10.0
	Air flow rate(Approx.)		m^3/min	630	800	960	1135	1285	1460	1660	1920	2270	2570	2920	3320	3855	4380	4950	5140	5840	6640
	Hot water temperature		℃	37																	
	Cold water temperature		℃	32																	
OVERALL DIMENSION	Width		mm	1650		2000		2300	2600		4000		4600	5200		6900		7800	9200	10400	
	Length		mm	3650		4000		4300	4400		4000		4300	4400		4300		4400	4300	4400	
	Height		mm	3400																	
MATERIAL	Casing			FRP																	
	Steel structure			Steel (hot-dip galvanized)																	
	Filler			PVC																	
	Distribution tray			FRP																	
	Cold water basin			FRP																	
	Sump tank			FRP																	
	Fan			Blade : FRP , Hub : Aluminum Cast alloy																	
	Fan stack			FRP																	
FAN ASSEMBLY	Fan	TYPE		Axial-flow																	
		Diameter X Nos.	∅ mm	1400 x 1		1600 x 1		1800 X1	2000 x 1		1600 x 2	1800 X1	2000 x 2	1800 X3	2000 x 3	1800 X4		2000 x 4			
		Number of blades		4																	
		Fan speed(Approx.)	rpm	470	540	375	420	420	335	370	375	420	420	335	370	420	335	370	420	335	370
		Drive system		V-belt drive																	
	Motor	TYPE		Totally enclosed fan cooled outdoor 3 phase induction motor 4 poles																	
		Power source		380V / 3 / 50Hz																	
		Rated output	Kw	2.2 x 1	3.7 x 1		5.5 x 1		7.5 x 1	3.7 x 2	5.5 x 2		7.5 x 2	5.5 x 3	7.5 x 3	5.5 x 4		7.5 x 4			
		Quantity		1							2			3		4					
DISTRIBUTION SYSTEM				Open gravity + redistribution layer																	
PIPING DIMENSION	Hot water inlet pipe		mm	∅100 x 2			∅125 x 2				∅100 x 4		∅125 x 4			∅125 x 6			∅125 x 8		
	Cold water outlet pipe		mm	∅125 x 1		∅150 x 1			∅200 x 1			∅250 x 1				∅200 x 2			∅250 x 2		
	Drain pipe		mm	∅50 x 1		∅ 50 x 1			∅ 50 x 1							∅50 x 2					
	Overflow pipe		mm	∅50 x 1		∅ 50 x 1			∅80 x 1							∅80 x 2					
	Float valve		mm	∅25 x 1				∅40 x 1				∅ 40 x 1				∅40 x 2			∅ 40 x 2		
	Manual make-up		mm	∅25 x 1				∅40 x 1				∅ 40 x 1				∅40 x 2			∅ 40 x 2		
MAKE-UP	Evaporation loss(Approx.)		%	Approx 0.83																	
	Drift loss		%	Less than 0.005																	
WEIGHT	Net weight		kg	970	985	1160	1205	1345	1390	1450	2270	2360	2640	2730	2850	3985	4120	4300	5280	5460	5700
	Operating weight		kg	2475	2490	2975	3020	3450	3750	3810	5455	5545	6400	7000	7120	9850	10755	10935	12800	14005	14245
NOISE LEVEL	Measuring point D=1.13$\sqrt{LxW}$		dBA	64	65	65	66	66	66	67	67	68	68	69	70	70	71	71	72	73	73

ITEM	MODER			ONE CELL					TWO CELLS						THREE CELLS				FOUR CELLS				FIVE CELLS	
				FC/LN-100	FC/LN-125	FC/LN-150	FC/LN-175	FC/LN-200	FC/LN-250	FC/LN-300	FC/LN-350	FC/LN-400	FC/LN-450	FC/LN-500	FC/LN-600	FC/LN-700	FC/LN-800	FC/LN-900	FC/LN-1000
CAPACITY	27°C WB	circulating water flow rate	m^3/hr	78.0	97.5	117.0	136.5	156.0	195.0	234.0	273.0	312.0	351.0	390.0	468.0	546.0	624.0	702.0	780.0
		make-up water(approx.)	m^3/hr	1.1	1.4	1.7	2.0	2.2	2.8	3.3	3.9	4.5	5.0	5.6	6.7	7.8	8.9	10.0	11.2
	28°C WB	circulating water flow rate	m^3/hr	70	88	105	123	140	175	210	245	280	315	350	420	490	560	630	700
		make-up water(approx.)	m^3/hr	1.0	1.3	1.5	1.8	2.0	2.5	3.0	3.5	4.0	4.5	5.0	6.0	7.0	8.0	9.0	10.0
	Air flow rate(Approx.)		m^3/min	530	680	830	980	1100	1360	1660	1960	2200	2490	2940	3300	3920	4400	4900	5500
	Hot water temperature		℃	37															
	Cold water temperature		℃	32															
OVERALL DIMENSION	Width		mm	2000		2300		2600	4000		4600	5200		6900		7800	9200	10400	11500	13000
	Length		mm	4000		4300		4400	4000		4300	4400		4300		4400	4300	4400	4300	4400
	Height		mm	3700																
MATERIAL	Casing			FRP																
	Steel structure			Steel (hot-dip galvanized)																
	Filler			PVC																
	Distribution tray			FRP																
	Cold water basin			FRP																
	Sump tank			FRP																
	Fan			Blade : FRP , Hub : Aluminum Cast alloy																
	Fan stack			FRP																
FAN ASSEMBLY	Fan	TYPE		Axial-flow																
		Diameter X Nos.	∅ mm	1600 x 1		1800 x 1		2000 x 1	1600 x 2		1800 x 2	2000 x 2		1800 x 3	2000 x 3	1800 x 4	2000 x 4	1800 x 5	2000 x 5
		Number of blades		4															
		Fan speed(Approx.)	rpm	270	340	300	360	310	340	300	360	310	300	360	310	360	310	360	310
		Drive system		V-belt drive															
	Motor	TYPE		Totally enclosed fan cooled outdoor 3 phase induction motor 4 poles															
		Power source		380V / 3 / 50Hz															
		Rated output	Kw	1.5 x 1	2.2 x 1		3.7 x 1		2.2 x 2		3.7 x 2		2.2 x 3		3.7 x 3		3.7 x 4		3.7 x 5
		Quantity		1					2				3			4			5
DISTRIBUTION SYSTEM				Open gravity + redistribution layer															
PIPING DIMENSION	Hot water inlet pipe		mm	∅100 x 2				∅125 x 2	∅100 x 4			∅125 x 4	∅100 x 6		∅125 x 6	∅100 x 8	∅125 x 8		∅125 x 10	
	Cold water outlet pipe		mm	∅125 x 1		∅150 x 1			∅200 x 1			∅250 x 1	∅200 x 2				∅250 x 2		∅200 x 3	
	Drain pipe		mm	∅50 x 1		∅ 50 x 1			∅50 x 1				∅50 x 2							
	Overflow pipe		mm	∅50 x 1		∅ 50 x 1			∅80 x 1				∅80 x 2							
	Float valve		mm	∅25 x 1					∅40 x 1				∅40 x 2					∅ 40 x 2		
	Manual make-up		mm	∅25 x 1					∅40 x 1				∅40 x 2					∅ 40 x 2		
MAKE-UP	Evaporation loss(Approx.)		%	Approx 0.83																
	Drift loss		%	Less than 0.005																
WEIGHT	Net weight		kg	1080	1120	1240	1260	1530	2230	2450	2470	2880	3700	3800	4550	5000	6050	6100	7550	
	Operating weight		kg	2250	2340	2640	2730	3170	4340	4920	5090	5910	7560	7820	9080	10180	11820	12910	14990	
NOISE LEVEL	Measuring point D=1.13$\sqrt{LxW}$		dBA	60	61	62	63	64	65	65	66	66	67	68	68	69	70	71	71	

Note: Nominal cooling capacity is based on 131 / min/ RT(1RT=3,900 Kcal /hr) at 37 ℃ hot water in, 32℃ cold water out 27℃ ambient wet bulb. The SPLs are measured 1.13$\sqrt{WxL}$ horizontally away from air intake side of the tower at 1.5m above the foundation level. Pump head of the cooling tower is approximate equal to the height of tower(H). Dimension shown in this catalogue is metric sized and specifications are subject to change without further notice for technical improvement of our products.

GUARANTEE:

All components are guaranteed against defective material for a period of one(1) year. When return to RYOWO with transportation prepaid, all parts found by factory inspection to be defective will be repaired or replaced without charge, FOB Hong Kong or FOB ShenZhen, PRC. No liability will be assumed for loss or damage resulting form misuse of our products.

FC&FC/LN SERIES QUICK SELECTION TABLE

UNIT ： m^3/hr ℃

WET BULB 湿球(℃)	RANGE 温差(℃)	APPROACH 冷幅	HWT 进水温(℃)	CWT 出水温(℃)	FC • FC/LN 100	FC • FC/LN 125	FC • FC/LN 150	FC • FC/LN 175	FC • FC/LN 200	FC • FC/LN 225	FC • FC/LN 250	FC • FC/LN 300	FC • FC/LN 350	FC • FC/LN 400	FC • FC/LN 450	FC • FC/LN 500	FC • FC/LN 600	FC • FC/LN 675	FC • FC/LN 750	FC • FC/LN 800	FC • FC/LN 900	FC • FC/LN 1000
26	3	3	32	29	60.2	75.3	90.4	105.6	120.5	135.7	150.6	180.7	211.3	241.0	271.6	301.3	361.4	407.3	451.8	481.9	543.1	602.4
		5	34	31	100.5	125.6	150.7	176.2	200.9	226.4	251.1	301.4	352.3	401.8	452.8	502.3	602.7	679.3	753.4	803.6	905.6	1.004.5
	4	3	33	29	54.2	67.7	81.3	95.0	108.4	122.2	135.5	162.6	190.1	216.8	244.3	271.0	325.1	366.4	406.4	433.5	488.5	541.9
		5	35	31	88.7	110.9	133.1	155.7	177.5	200.0	221.9	266.3	311.3	355.1	400.1	443.8	532.6	600.2	665.8	710.1	800.3	887.6
	5	3	34	29	46.3	57.8	69.4	81.1	92.6	104.2	115.7	138.8	162.3	185.0	208.6	231.3	277.6	312.8	347.0	370.1	417.1	462.6
		5	36	31	74.3	92.9	111.5	130.3	148.6	167.5	185.8	222.9	260.6	297.2	334.9	371.5	445.8	502.4	557.3	594.4	669.8	743.0
		6	37	32	89.2	111.5	133.7	156.4	178.4	201.0	223.0	267.5	312.8	356.7	401.9	445.9	535.1	602.9	668.8	713.4	804.0	891.7
		7	38	33	105.5	131.9	158.3	185.0	211.1	237.8	263.8	316.6	370.1	422.1	475.6	527.6	633.1	713.5	791.4	844.1	951.4	1.055.2
	6	10	41	36	162.1	202.6	243.1	284.3	324.2	365.3	405.2	486.2	568.5	648.4	730.6	810.4	972.5	1.096.0	1.215.6	1.296.7	1.461.2	1.620.8
		4	36	30	54.2	67.7	81.3	95.0	108.4	122.2	135.5	162.6	190.1	216.8	244.3	271.0	325.1	366.4	406.4	433.5	488.5	541.9
		5	37	31	64.5	80.6	96.8	113.1	128.9	145.4	161.2	193.4	226.2	258.0	290.8	322.5	386.9	436.0	483.7	515.9	581.4	644.9
		7	39	33	90.7	113.3	136.0	159.0	181.3	204.3	226.6	271.9	317.9	362.6	408.6	453.2	543.8	612.9	679.9	725.2	817.2	906.5
		10	42	36	137.8	172.3	206.8	241.7	275.6	310.6	344.6	413.4	483.4	551.2	621.2	689.0	826.9	931.8	1.033.6	1.102.4	1.242.4	1.378.1
	7	5	38	31	58.0	72.5	86.9	101.6	115.9	130.6	144.8	173.8	203.3	231.8	261.2	289.8	347.7	391.9	434.6	463.6	522.4	579.5
		7	40	33	80.8	101.0	121.3	141.8	161.6	182.2	202.1	242.5	283.6	323.3	364.4	404.2	485.0	545.5	606.3	646.7	728.8	808.4
		10	43	36	122.8	153.5	184.3	215.5	245.7	276.9	307.1	368.6	430.9	491.4	553.8	614.3	737.1	830.6	921.4	982.8	1.107.5	1.228.5
	9	5	40	31	48.2	60.2	72.2	84.4	96.2	108.5	120.4	144.4	168.9	192.6	217.0	240.7	288.8	325.5	361.1	385.1	434.0	481.4
		7	42	33	66.3	82.9	99.4	116.3	132.6	149.4	165.7	198.9	232.5	265.1	298.8	331.5	397.7	448.3	497.2	530.3	597.6	662.9
		10	45	36	100.5	125.6	150.7	176.2	200.9	226.4	251.1	301.4	352.3	401.8	452.8	502.3	602.7	679.3	753.4	803.6	905.6	1.004.5
27	3	3	33	30	65.4	81.8	98.1	114.7	130.8	147.4	163.5	196.1	229.4	261.5	294.8	326.9	392.3	442.1	490.4	523.1	589.5	653.9
		5	35	32	103.3	129.1	154.9	181.1	206.5	232.7	258.1	309.7	362.1	413.0	465.4	516.2	619.4	698.0	774.2	825.8	930.7	1.032.4
		7	37	34	155.0	193.8	232.6	271.9	310.1	349.4	387.6	465.1	543.8	620.2	698.9	775.3	930.4	1.048.4	1.162.9	1.240.4	1.397.9	1.550.5
	4	3	34	30	58.0	72.5	86.9	101.6	115.9	130.6	144.8	173.8	203.3	231.8	261.2	289.8	347.7	391.9	434.6	463.6	522.4	579.5
		5	36	32	92.0	115.1	138.1	161.4	184.1	207.4	230.1	276.1	322.9	368.1	414.8	460.2	552.2	622.3	690.3	736.3	829.7	920.3
		7	38	34	134.9	168.7	202.4	236.6	269.9	304.1	337.4	404.8	473.4	539.8	608.3	674.8	809.7	912.4	1.012.1	1.079.6	1.216.6	1.349.5
	5	3	35	30	48.5	60.7	72.8	85.1	97.1	109.4	121.4	145.7	170.3	194.2	218.9	242.8	291.3	328.3	364.1	388.4	437.8	485.5
		4	36	31	63.5	79.4	95.3	111.4	127.0	143.2	158.8	190.5	222.8	254.0	286.3	317.6	381.1	429.4	476.3	508.1	572.5	635.1
		5	37	32	78.0	97.5	117.0	136.5	156.0	175.5	195.0	234.0	273.0	312.0	351.0	**390.0**	468.0	526.5	585.0	624.0	702.0	780.0
		6	38	33	94.3	117.9	141.5	165.4	188.6	212.6	235.9	283.0	330.8	377.3	425.2	471.6	565.9	637.8	707.5	754.6	850.4	943.3
		7	39	34	112.6	140.7	168.8	197.4	225.1	253.7	281.3	337.6	394.8	450.2	507.4	562.8	675.4	761.0	844.1	900.4	1.014.7	1.125.5
		8	40	35	132.7	165.8	199.0	232.6	265.3	299.0	331.7	398.0	465.4	530.6	598.0	663.3	795.9	896.9	994.9	1.061.3	1.196.0	1.326.6
		10	42	37	171.4	214.3	257.1	300.6	342.8	386.3	428.5	514.2	601.2	685.6	772.6	857.0	1.028.5	1.159.0	1.285.5	1.371.2	1.545.2	1.714.0
	6	3	36	30	42	52.5	63.0	73.7	84.0	94.7	105.1	126.1	147.4	168.1	189.4	210.1	252.1	284.0	315.1	336.1	378.8	420.1
		5	38	32	67.7	84.7	101.6	118.9	135.5	152.7	169.4	203.3	237.7	271.1	305.5	338.8	406.6	458.2	508.2	542.1	610.9	677.6
		7	40	34	98.1	122.6	147.1	172.0	196.1	221.0	245.2	294.2	344.0	392.3	442.1	490.4	588.5	663.2	735.6	784.7	884.3	980.8
		9	42	36	131.3	164.1	196.9	230.2	262.6	295.9	328.2	393.8	460.4	525.1	591.7	656.3	787.6	887.6	984.5	1.050.1	1.183.4	1.312.7
		10	43	37	148.5	185.6	222.8	260.5	297.0	334.7	371.3	445.5	521.0	594.1	669.5	742.6	891.1	1.004.2	1.113.9	1.188.1	1.338.9	1.485.2
	7	5	39	32	61.3	76.6	91.9	107.4	122.4	138.0	153.1	183.7	214.7	244.9	275.9	306.1	367.3	413.9	459.2	489.8	551.9	612.2
		7	41	34	86.9	108.6	130.3	152.4	173.8	195.8	217.3	260.7	304.7	347.6	391.6	434.5	521.3	587.5	651.6	695.1	783.3	868.9
		9	43	36	116.8	146.0	175.3	204.8	233.6	263.3	292.0	350.4	409.7	467.2	526.5	584.0	700.8	789.8	876.0	934.4	1.053.0	1.168.0
		10	44	37	131.3	164.1	196.9	230.2	262.6	295.9	328.2	393.8	460.4	525.1	591.7	656.3	787.6	887.6	984.5	1.050.1	1.183.4	1.312.7
	8	6	41	33	65.9	82.4	98.8	115.6	131.8	148.5	164.8	197.6	231.1	263.5	296.9	329.4	395.3	445.4	494.1	527.0	593.9	658.8
		8	43	35	91.6	114.5	137.3	160.6	183.1	206.3	228.8	274.6	321.1	366.2	412.6	457.7	549.2	619.0	686.6	732.4	825.3	915.4
		10	45	37	118.6	148.3	177.9	208.0	237.2	267.3	296.5	355.8	416.0	474.4	534.6	593.0	711.6	801.9	889.5	948.8	1.069.3	1.186.0
	9	6	42	33	59.7	74.6	89.6	104.8	119.5	134.7	149.4	179.3	209.6	239.0	269.3	298.8	358.5	404.0	448.1	478.0	538.6	597.5
		8	44	35	83.1	103.9	124.7	145.8	166.3	187.4	207.8	249.4	291.6	332.5	374.8	415.7	498.8	562.0	623.5	665.0	749.4	831.2
		10	46	37	107.4	134.3	161.1	188.4	214.3	242.0	268.6	322.3	376.7	429.6	484.1	537.0	644.4	726.2	805.6	859.3	968.3	1.074.0
	10	6	43	33	57.5	71.9	86.2	100.8	115.0	129.5	143.6	172.4	201.6	229.9	259.0	287.3	344.8	388.5	430.9	459.7	518.0	574.6
		8	45	35	78.5	98.1	117.7	137.6	157.0	176.9	196.1	235.4	275.3	313.9	353.8	392.3	470.8	530.5	588.5	627.7	707.4	784.7
		10	47	37	100.9	126.1	151.3	176.9	201.7	227.3	252.2	302.6	353.8	403.4	454.6	504.3	605.2	682.0	756.5	806.9	909.3	1.008.6
28	3	3	34	31	68.6	85.8	103.0	120.4	137.3	154.7	171.7	206.0	240.8	274.6	309.5	343.3	412.0	464.3	514.9	549.2	619.0	686.6
		5	36	33	113.9	142.4	170.9	199.8	227.9	256.8	284.9	341.8	399.7	455.8	513.6	569.7	683.6	770.4	854.6	911.6	1.027.3	1.139.4
	4	3	35	31	60.7	75.9	91.1	106.5	121.5	136.9	151.9	182.2	213.0	242.9	273.8	303.7	364.4	410.6	455.5	485.8	547.5	607.3
		5	37	33	99.5	124.4	149.2	174.5	199.0	224.2	248.6	298.4	349.0	397.9	448.4	497.4	596.9	672.5	746.0	795.8	896.8	994.7
		8	40	36	169.1	211.4	253.7	296.6	338.2	381.1	422.8	507.4	593.2	676.4	762.3	845.6	1.014.7	1.143.5	1.268.3	1.352.9	1.524.7	1.691.1
	5	3	36	31	50.9	63.7	76.4	89.3	101.9	114.7	127.3	152.8	178.6	203.7	229.6	254.6	305.5	344.3	381.9	407.3	459.1	509.2
		4	37	32	66.3	82.9	99.4	116.3	132.6	149.4	165.7	198.9	232.5	265.1	298.8	331.5	397.7	448.3	497.2	530.3	597.6	662.9
		5	38	33	82.6	103.3	72.2	144.9	165.3	186.2	206.6	247.9	289.9	330.5	372.5	413.2	495.8	558.8	619.7	661.1	745.0	826.4
		6	39	34	98.6	123.2	99.4	172.9	197.2	222.2	246.5	295.7	345.7	394.3	444.4	492.9	591.5	666.5	739.3	788.6	888.7	985.7
		7	40	35	117.2	146.5	150.7	205.6	234.4	264.2	293.0	351.7	411.1	468.8	528.4	586.1	703.3	792.5	879.1	937.7	1.056.7	1.172.1
		9	42	37	157.4	196.8	98.1	276.1	314.9	354.8	393.6	472.3	552.2	629.7	709.6	787.1	944.6	1.064.5	1.180.7	1.259.4	1.419.2	1.574.2
	6	4	38	32	58.0	72.5	154.9	101.6	115.9	130.6	144.8	173.8	203.3	231.8	261.2	289.8	347.7	391.9	434.6	463.6	522.4	579.5
		6	40	34	85.9	107.3	232.6	150.7	171.8	193.6	214.8	257.7	301.4	343.6	387.2	429.5	515.5	580.9	644.3	687.2	774.5	859.1
		8	42	36	119.6	149.5	86.9	209.8	239.2	269.5	299.0	358.7	419.5	478.3	539.0	598.0	717.5	808.6	896.8	956.6	1.078.0	1.195.8
		10	44	38	153.2	191.5	138.1	268.7	306.3	345.2	383.0	459.5	537.2	612.7	690.5	765.9	919.0	1.035.7	1.148.8	1.225.4	1.380.9	1531.7
	7	5	40	33	64.5	80.6	202.4	113.1	128.9	145.4	161.2	193.4	226.2	258.0	290.8	322.5	386.9	436.0	483.7	515.9	581.4	644.9
		7	42	35	91.6	114.5	72.8	85.1	183.1	206.3	228.8	274.6	321.1	366.2	412.6	457.7	549.2	619.0	686.6	732.4	825.3	915.4
		10	45	38	137.3	171.7	95.3	111.4	274.6	309.5	343.3	412.0	481.7	549.2	619.0	686.6	823.9	928.4	1.029.9	1.098.5	1.238.0	1.373.2
	8	5	41	33	58.9	73.6	117.0	136.5	117.7	132.7	147.1	176.6	206.4	235.4	265.3	294.2	353.1	397.9	441.4	470.8	530.5	588.5
		7	43	35	83.1	103.9	141.5	165.4	166.3	187.4	207.8	249.4	291.6	332.5	374.8	415.7	498.8	562.0	623.5	665.0	749.4	831.2
		10	46	38	124.3	155.3	168.8	197.4	248.5	280.0	310.6	372.7	435.8	497.0	560.0	621.2	745.4	840.1	931.8	993.9	1.120.0	1.242.4
	9	5	42	33	55.1	68.9	199.0	232.6	110.2	124.2	137.8	165.3	193.2	220.4	248.3	275.5	330.5	372.5	413.2	440.8	496.6	550.9
		8	45	36	89.6	112.1	257.1	300.6	179.3	202.1	224.2	269.0	314.5	358.6	404.2	448.4	538.0	606.3	672.5	717.4	808.4	896.6
		10	47	38	116.8	146.0	63.0	73.7	233.6	263.3	292.0	350.4	409.7	467.2	526.5	584.0	700.8	789.8	876.0	934.4	1.053.0	1.168.0
	10	5	43	33	51.4	64.7	101.6	118.9	102.8	115.9	128.5	154.3	180.3	205.7	231.8	257.1	308.5	247.6	385.6	411.3	463.5	514.1
		10	48	38	107.0	133.7	101.6	118.9	214.0	241.1	267.5	321.0	375.3	428.0	482.3	535.0	641.9	723.4	802.4	856.0	964.6	1.069.9

EXAMPLE:

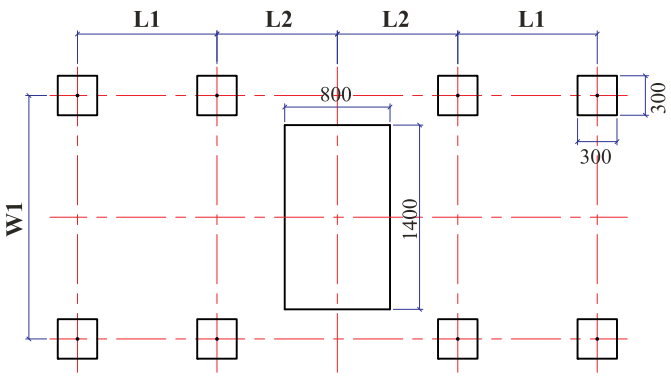
WATER FLOW RATE : $390m^3/hr$
INLET WATER TEMP : 37℃
OUTLET WATER TEMP : 32℃
WET BULB TEMP : 27℃

RANGE : INLET WATER TEMP-OUTLET WATER TEMP
: 37℃-32℃=5℃
APPROACH : OUTLET WATER TEMP-WET BULB TEMP
: 32℃-27℃=5℃

TOWER SELECTED : **FC OR FC/LN-500**

FOUNDATION

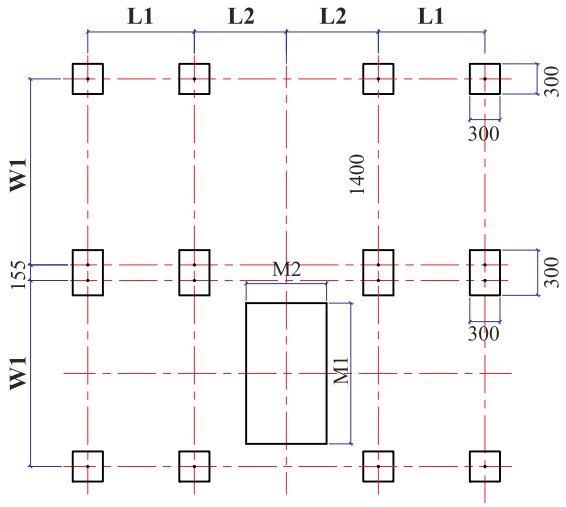
MODEL : FC 100,125,150,175,200,225,250 . FC/LN 100,125,150,175,200



MODEL	FC						
	100	125	150	175	200	225	250
L1	1060	1060	1060	1060	1060	1060	1060
L2	740	740	915	915	1065	1115	1115
W1	1500	1500	1850	1850	2150	2450	2450

MODEL	FC / LN				
	100	125	150	175	200
L1	1060	1060	1060	1060	1060
L2	915	915	1065	1115	1115
W1	1850	1850	2150	2450	2450

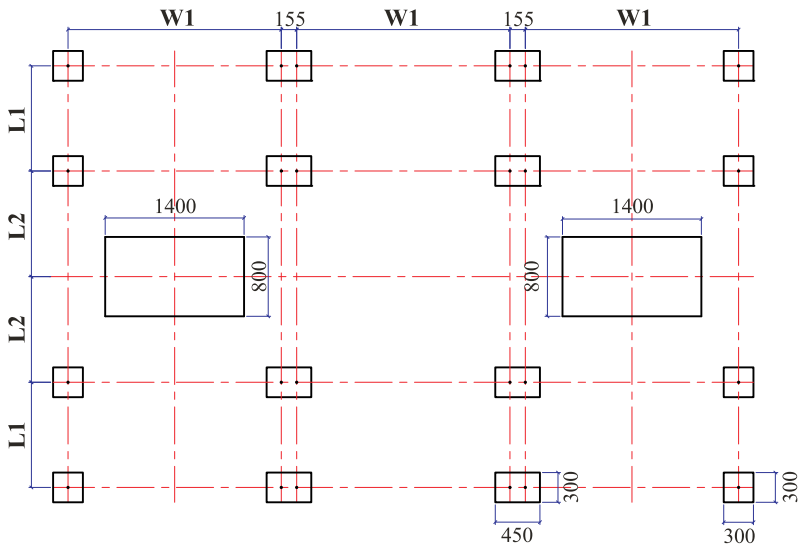
TWO CELLS MODEL : FC 300,350,400,450,500 . FC/LN 250,300,350,400



MODEL	FC				
	300	350	400	450	500
L1	1060	1060	1060	1060	1060
L2	915	915	1065	1115	1115
W1	1850	1850	2150	2450	2450

MODEL	FC / LN			
	250	300	350	400
L1	1060	1060	1060	1060
L2	915	1065	1065	1115
W1	1850	2150	2150	2450

THREE CELLS MODEL : FC 600,675,750 . FC/LN 450,500,600

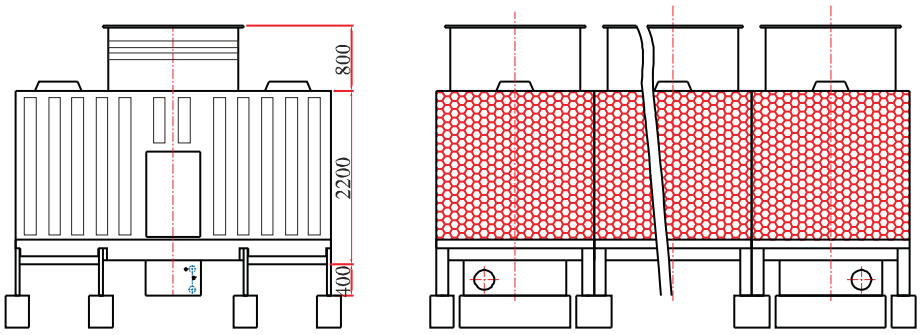


MODEL	FC		
	600	675	750
L1	1060	1060	1060
L2	1065	1115	1115
W1	2150	2450	2450

MODEL	FC		
	450	500	600
L1	1060	1060	1060
L2	1065	1065	1115
W1	2150	2150	2450

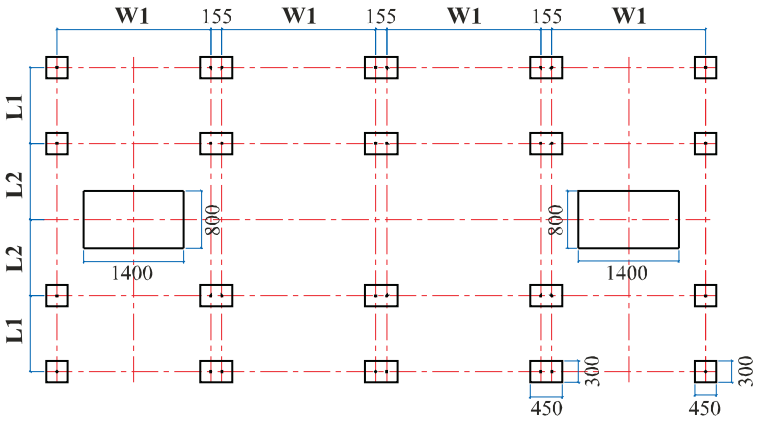
FOUNDATION

3~5 CELLS



• Water outlet at air inlet side

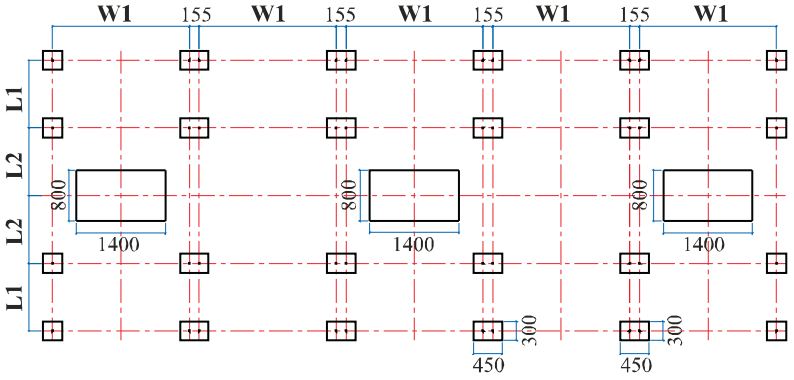
FOUR CELLS MODEL: FC800,900,1000. FC/LN 700,800



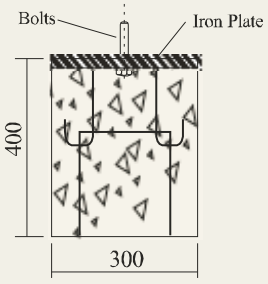
MODEL	FC		
	800	900	1000
L1	1060	1060	1060
L2	1065	1115	1115
W1	2150	2450	2450

MODEL	FC / LN	
	700	800
L1	1060	1060
L2	1065	1115
W1	2150	1115

FIVE CELLS MODEL: FC/LN 900,1000



MODEL	FC / LN	
	900	1000
L1	1060	1060
L2	1065	1115
W1	2150	2450



NOTES:
1. Bolts required are M16 x 100.
2. The direction of water outlet can be changed upon request.
3. The above drawing are for reference. Do not scale drawing. All dimendions are in mm.
* 4. For FC/LN only.

AVAILABLE OPTIONAL ACCESSORIES

AIR INTAKE LOUVER

Air intake louver constructed of F.R.P. material can be provided, which matches the rest of thetower. Stainless steel made air inlet screen can also be provided .

BASIN HEATERS

Electric immersion heaters with thermostat and control box are available to keep the basin water fromfreezing in sub-zero weather when the tower is turned off.

DISTRIBUTION TRAY COVER

FRP made covers are available in easily removable sections to facilitate the cleaning of trays to prevent the accumulation of leaves, debris and algae in the hot water distribution trays. For snowing area, distribution tray covers are strongly recommended.

HIGH TEMPERATURE FILLER

An optional high temperature Filler is available for towers operating above 55°C and can increase the allowable entering water temperature to 65°C.

HAND RAIL

Galv. Steel tubing handrails are available to provide safe walkways between cells on multicells towers.

STAINLESS STEEL HARDWARE

As an alternative, all primary steel components, bolts & nuts can be provided with a stainless steel SS 304 Mat erial.(This does not include bearing box and motors).

BODY COLOR

Cooling tower installed on the roof of building may be b arely noticeable from the ground, and a colored cooling tower matching to building color will make it " good look ".

RYOWO (HOLDING) CO .,LTD.

Rm. 1218, Angyle Centre 1,
688 Nathan Rd., MongKok,
Kowloon, Hong Kong

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Fax: (852) 27893802

Http://www.ryowo.com
e-mail: ryinfo@ryowo.com

DONGGUAN RYOWO COOLING TOWER CO., LTD.

No.263 MeiJing Road West,Dalang,Dongguan,Guangdong,PRC

Tel : (86)-769 89399698
Fax: (86)-769 82973398

(86)-769 89399699
Postal Code: 523795

RYOWO™ COOLING TOWER MANUFACTURER SINCE 1978

BROCH-EN-(04)-2013

Catalogue of Ryowo FWS-127-7.5

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ryowo™



RYOWO COOLING TOWER

FWS SERIES

Low Noise Cross Flow Type

CTI CERTIFIED

bsi. ANAB ACCREDITED

ISO 9001 : 2008 FM 601004

The RYOWO™ Group is the pioneer and manufacturer of fiberglass-reinforced polyester (FRP) cooling towers in Hong Kong.

We offer a full range of product lines in FRP, stainless steel and galvanized steel water-cooling towers. With our vital production station, Dongguan RYOWO Cooling Tower Company Limited, we manufacture, market and service a full range of water-cooling towers. Over 90% of the cooling tower parts are from our own factory and, as a result, control of cost and quality are ensured.

RYOWO has been a member of the Cooling Technology Institute since 1982. With our own R&D department and testing facilities, we have six lines of product which are CTI-201 certified.

In 2004, our R & D department successfully developed a CTI STD-20l rated product line, the FWS series, the highest standard of water-cooling towers with guaranteed cooling capacity. In order to expand the application of our cooling towers, we developed the integrated drift eliminator, and used the super low noise fan as an option in this series.

FWS

Low Noise Cross Flow Type

CTI CERTIFIED

MANUFACTURER'S PUBLISHED THERMAL PERFORMANCE IS CERTIFIED BY THE COOLING TOWER INSTITUTE UNDER THE PROVISIONS OF STD-201(11)

CERTIFICATION VALIDATION NUMBER

04-27-01

THE COOLING TOWER YOU CAN RELY ON

MODEL DESIGNATION

STD 201 Certified Line

FWS-300-15-AS /L

Model Nos

/E is for integrated drift eliminator
/AE is for additional drift eliminator
/L is for additional louver installed in front of air inlet face
/SLF is for super low noise fan

GI for FRP Casing & Basin, HDG Structure
SS for FRP Casing & Basin, SS Structure
AG for HDG Casing, Basin & Structure
AS for SS Casing, Basin, SS Structure

There are a total of 71 models for the FWS series with 15 different configurations to meet various requirements and provide a high degree of flexibility.

Factory assembled

Most FWS cooling towers can be factory assembled and delivered to site.

High flexible

All FWS models can be fitted with RYOWO special integrated drift eliminators to achieve drift loss less than 0.001% and equipped with OSHA handrail and caged ladder to comply with requirement.

Complied with OSHA requirement

Accessible

Super low noise fan to reduce the sound power level, maintaining the same thermal performance.

FRP / HDG / SS MATERIAL ARE AVAILABLE

All Hot dip galvanized

All Stainless steel

FRP Casing + SS Basin

The standard FWS cooling towers are made of FRP casing & basin with hot dip galvanized structure. Optional stainless steel casing & basin and structure can also be provided upon request.

3 SPECIFICATION

Model	Nominal Water Flow M^3/hr	Dimension L mm	W mm	h mm	H mm	Fan Motor kW	Fan Dia mm	Piping In mm	Out mm	Fv mm	Of mm	Dr mm	Sound Power Level	Weight Dry kgs	Wet kgs
FWS-94-3.7	94	4000	2000	4125	4625	3.7	1600	100x2	150	25	50	50	88	1335	2300
FWS-94-5.5	107				4705	5.5							91	1385	2350
FWS-94-7.5	119				4745	7.5							93	1400	2365
FWS-127-5.5	127				4705	5.5							90	1570	3000
FWS-127-7.5	141	4400	2300	4125	4745	7.5	1800	100x2	150	25	50	50	92	1585	3015
FWS-127-11	160				4825	11							94	1650	3080
FWS-169-7.5	169	4400	2600	4125	4745	7.5	2000	125x2	200	25	50	50	92	1690	3700
FWS-169-11	192				4825	11							94	1760	3770
FWS-169-15	213				4870	15							95	1770	3780
FWS-200-7.5	190	4600	2600	4145	4785	7.5	2400	125x2	200	40	80	50	91	2195	4000
FWS-200-11	215				4865	11							93	2250	4055
FWS-200-15	235				4910	15							95	2255	4060
FWS-250-7.5	210	4800	3200	4345	4985	7.5	2400	125x2	200	40	80	50	90	2890	5000
FWS-250-11	240				5065	11							93	2945	5055
FWS-250-15	265				5110	15							94	2950	5060
FWS-275-7.5	225	5200	3200	4145	4785	7.5	2900	150x2	200	40	80	50	89	3050	5160
FWS-275-11	255				4865	11							92	3105	5215
FWS-275-15	285				5910	15							94	3110	5220
FWS-300-7.5	235	6000	3200	4345	4895	7.5	2400	150x2	200	40	80	50	89	3310	6500
FWS-300-11	270				5065	11							91	3365	6555
FWS-300-15	300				5110	15							93	3370	6560
FWS-300-18.5	320				5175	18.5							94	3410	6600
FWS-300-22	340				5215	22							95	3470	6660
FWS-330-7.5	260	6300	3200	4145	4785	7.5	2900	150x2	250	50	80	50	88	3405	6595
FWS-330-11	300				4865	11							91	3460	6650
FWS-330-15	330				4910	15							93	3465	6655
FWS-330-18.5	350				5175	18.5							94	3505	6695
FWS-330-22	375				5215	22							95	3565	6755
FWS-350-7.5	275	5400	3600	5425	6065	7.5	3000	150x2	250	50	80	50	89	3580	6770
FWS-350-11	315				6145	11							91	3635	6825
FWS-350-15	350				6190	15							93	3640	6830
FWS-350-18.5	375				6255	18.5							94	3680	6870
FWS-350-22	400				6295	22							95	3740	6930
FWS-400-7.5	285	6600	3600	4345	4985	7.5	3000	125x4	250	50	80	50	87	3630	7000
FWS-400-11	325				5065	11							89	3685	7055
FWS-400-15	360				5110	15							91	3690	7060
FWS-400-18.5	385				5135	18.5							92	3730	7100
FWS-400-22	410				5195	22							93	3790	7160
FWS-400-30	450				5255	30							94	3820	7185
FWS-500-7.5	305	6000	4200	5355	5990	7.5	3400	125x4	250	50	80	50	87	4230	8000
FWS-500-11	345				6070	11							90	4285	8055
FWS-500-15	385				6115	15							91	4290	8060
FWS-500-18.5	410				6180	18.5							93	4325	8100
FWS-500-22	435				6220	22							94	4390	8120
FWS-500-30	485				6280	30							95	4415	8145
FWS-550-7.5	315	6600	3600	5355	5990	7.5	3000	125x4	250	50	80	50	87	4350	8080
FWS-550-11	360				6070	11							89	4405	8135
FWS-550-15	400				6115	15							91	4410	8140
FWS-550-18.5	430				6180	18.5							92	4450	8180
FWS-550-22	455				6220	22							94	4510	8240
FWS-550-30	500				6280	30							95	4535	8275
FWS-600-11	435	7000	4200	5500	6255	11	3700	150x4	300	50	80	50	89	5015	9000
FWS-600-15	485				6300	15							91	5020	9005
FWS-600-18.5	520				6365	18.5							92	5060	9045
FWS-600-22	550				6405	22							94	5120	9085
FWS-600-30	610				6465	30							95	5140	9110
FWS-600-37	650				6485	37							96	5330	9300
FWS-700-11	515	7000	5000	5500	6255	11	3700	150x4	300	50	80	50	89	5650	12000
FWS-700-15	570				6300	15							91	5655	12005
FWS-700-18.5	610				6365	18.5							92	5690	12055
FWS-700-22	645				6405	22							93	5755	12120
FWS-700-30	720				6465	30							95	5780	12145
FWS-700-37	765				6485	37							96	5970	12335
FWS-800-11	555	7500	5000	6400	7155	11	4200	150x4	300	50	80	50	88	6905	14880
FWS-800-15	615				7200	15							90	6910	14885
FWS-800-18.5	655				7265	18.5							91	6945	14920
FWS-800-22	695				7305	22							93	7010	14985
FWS-800-30	760				7365	30							95	7035	15010
FWS-800-37	820				7385	37							98	7225	15200
FWS-800-45	880				7405	45	4200	150x4	350	50	80	50	99	7255	15230
FWS-800-55	940				7495	55							100	7365	15340

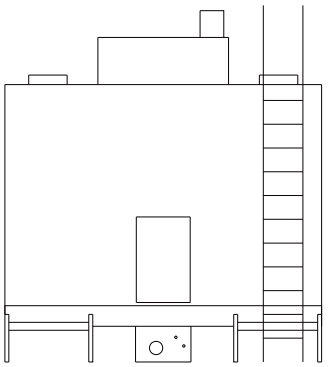
Notes:

1/CTI Certification applies to the operation with the Wet Bulb Temp. between 12.8°C and 32.2°C, Max. Entering Water Temp. 51.7°C, Min. Range of 2.2°C and Min. Approach of 2.8°C.

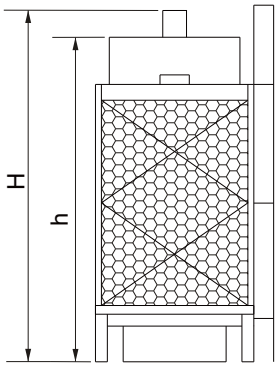
2/The nominal water flows are based upon 37°C HWT, 32°C CWT, 28°C WBT, 32°C DBT and 101.3 kPa Barometric pressure.

3/Sound Power Level is in dBA re 10^{-12} Watt.

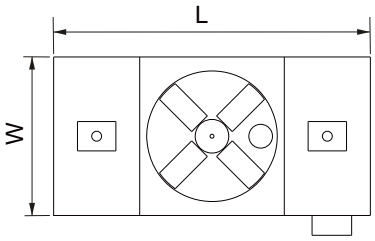
4/Data and specifications are subjected to change without prior notice.



Casing Panel

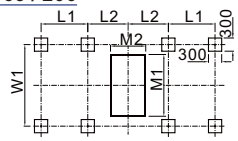


Air Intake

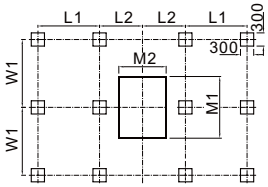


Top view

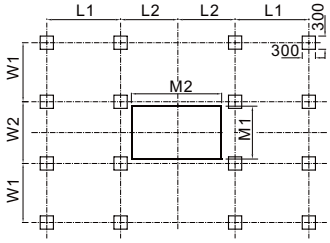
FWS 94 / 127 / 169 / 200



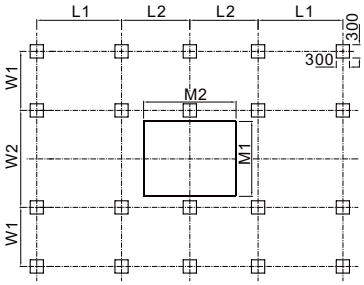
FWS 250 / 275 / 300 / 330 / 350 / 400 / 550



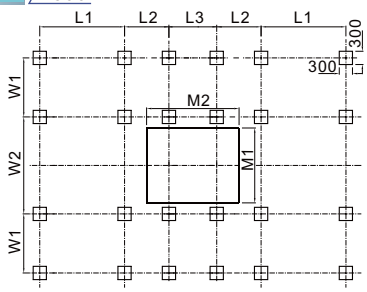
FWS 500



FWS 600 / 700



FWS 800



Model	L1	L2	L3	W1	W2	M1	M2
FWS 94 3 7	1060	915		1850		1400	800
FWS 94 5 5	1060	915		1850		1400	800
FWS 94 7 5	1060	915		1850		1400	800
FWS 127 5 5	1060	1115		2150		1400	800
FWS 127 7 5	1060	1115		2150		1400	800
FWS 127 11	1060	1115		2150		1400	800
FWS 169 7 5	1060	1115		2450		1400	800
FWS 169 11	1060	1115		2450		1400	800
FWS 169 15	1060	1115		2450		1400	800
FWS 200 7 5	1400	875		2450		1400	1100
FWS 200 11	1400	875		2450		1400	1100
FWS 200 15	1400	875		2450		1400	1100
FWS 250 7 5	1400	975		1540		1400	1100
FWS 250 11	1400	975		1540		1400	1100
FWS 250 15	1400	975		1540		1400	1100
FWS 275 7 5	1400	1175		1540		1400	1100
FWS 275 11	1400	1175		1540		1400	1100
FWS 275 15	1400	1175		1540		1400	1100
FWS 300 7 5	1848	1127		1540		1400	1100
FWS 300 11	1848	1127		1540		1400	1100
FWS 300 15	1848	1127		1540		1400	1100
FWS 300 18 5	1848	1127		1540		1400	1100
FWS 300 22	1848	1127		1540		1400	1100
FWS 330 7 5	1848	1277		1540		1400	1100
FWS 330 11	1848	1277		1540		1400	1100
FWS 330 15	1848	1277		1540		1400	1100
FWS 330 18 5	1848	1277		1540		1400	1100
FWS 330 22	1848	1277		1540		1400	1100
FWS 350 7 5	1675	1000		1740		2100	1200
FWS 350 11	1675	1000		1740		2100	1200
FWS 350 15	1675	1000		1740		2100	1200
FWS 350 18 5	1675	1000		1740		2100	1200
FWS 350 22	1675	1000		1740		2100	1200
FWS 400 7 5	1925	1350		1740		1400	1100
FWS 400 11	1925	1350		1740		1400	1100
FWS 400 15	1925	1350		1740		1400	1100
FWS 400 18 5	1925	1350		1740		1400	1100
FWS 400 22	1925	1350		1740		1400	1100
FWS 400 30	1925	1350		1740		1400	1100
FWS 500 7 5	1675	1300		1340	1400	1300	2100
FWS 500 11	1675	1300		1340	1400	1300	2100
FWS 500 15	1675	1300		1340	1400	1300	2100
FWS 500 18 5	1675	1300		1340	1400	1300	2100
FWS 500 22	1675	1300		1340	1400	1300	2100
FWS 500 30	1675	1300		1340	1400	1300	2100
FWS 550 7 5	1925	1350		1740		2100	1300
FWS 550 11	1925	1350		1740		2100	1300
FWS 550 15	1925	1350		1740		2100	1300
FWS 550 18 5	1925	1350		1740		2100	1300
FWS 550 22	1925	1350		1740		2100	1300
FWS 550 30	1925	1350		1740		2100	1300
FWS 600 11	1925	1550		1340	1400	1300	2100
FWS 600 15	1925	1550		1340	1400	1300	2100
FWS 600 18 5	1925	1550		1340	1400	1300	2100
FWS 600 22	1925	1550		1340	1400	1300	2100
FWS 600 30	1925	1550		1340	1400	1300	2100
FWS 600 37	1925	1550		1340	1400	1300	2100
FWS 700 11	1925	1550		1340	2200	1300	2100
FWS 700 15	1925	1550		1340	2200	1300	2100
FWS 700 18 5	1925	1550		1340	2200	1300	2100
FWS 700 22	1925	1550		1340	2200	1300	2100
FWS 700 30	1925	1550		1340	2200	1300	2100
FWS 700 37	1925	1550		1340	2200	1300	2100
FWS 800 11	2050	1090	1170	1340	2200	1300	2100
FWS 800 15	2050	1090	1170	1340	2200	1300	2100
FWS 800 18 5	2050	1090	1170	1340	2200	1300	2100
FWS 800 22	2050	1090	1170	1340	2200	1300	2100
FWS 800 30	2050	1090	1170	1340	2200	1300	2100
FWS 800 37	2050	1090	1170	1340	2200	1300	2100
FWS 800 45	2050	1090	1170	1340	2200	1300	2100
FWS 800 55	2050	1090	1170	1340	2200	1300	2100

Notes:

1/The footing dimensions are for preliminary layout only. For detail footing drawing, please consult RYOWO engineers.
2/Dimensions are in mm.

5 MODEL SELECTION

Model	Temp.	Water flow rate at indicated HWT, CWT & WBT (M^3/HR)											
	HWT°C	33	33	37	33	32	37	35	34	33	37	36	35
	CWT °C	28	27	32	28	27	32	30	29	28	32	31	30
	WBT °C	23	23	24	24	24	25	25	25	25	26	26	26
FWS-94-3.7		88	66	142	77	62	131	97	81	65	119	101	85
FWS-94-5.5		100	75	161	88	71	149	110	92	74	135	115	96
FWS-94-7.5		111	84	179	97	79	165	122	102	82	150	128	107
FWS-127-5.5		119	89	192	104	84	177	131	109	88	161	137	114
FWS-127-7.5		132	99	213	115	93	196	145	121	98	178	152	127
FWS-127-11		150	112	242	131	106	223	164	137	111	202	173	144
FWS-169-7.5		158	119	254	138	112	234	174	145	117	213	182	152
FWS-169-11		179	135	288	157	127	266	197	165	133	242	207	173
FWS-169-15		199	150	320	174	141	295	219	183	148	268	229	192
FWS-200-7.5		176	129	295	152	121	270	195	160	127	244	206	169
FWS-200-11		199	146	334	172	136	306	221	182	144	276	233	191
FWS-200-15		218	160	365	188	149	334	242	198	157	302	255	209
FWS-250-7.5		194	143	325	169	134	298	216	178	141	269	227	187
FWS-250-11		222	163	371	193	153	340	246	203	161	308	260	214
FWS-250-15		245	180	410	213	169	376	272	224	178	340	287	236
FWS-275-7.5		208	153	348	181	143	319	231	190	151	288	243	200
FWS-275-11		236	174	394	205	162	361	262	216	171	327	276	227
FWS-275-15		264	194	441	229	181	404	293	241	191	365	308	254
FWS-300-7.5		217	162	357	189	151	328	240	199	159	298	253	210
FWS-300-11		250	186	410	217	174	377	276	229	183	343	291	241
FWS-300-15		277	206	456	242	193	419	307	254	204	381	323	268
FWS-300-18.5		291	217	478	254	203	440	322	267	214	400	339	281
FWS-300-22		305	227	501	266	213	461	338	280	224	419	355	295
FWS-330-7.5		240	179	395	209	168	363	266	220	176	330	280	232
FWS-330-11		277	206	456	242	193	419	307	254	204	381	323	268
FWS-330-15		305	227	501	266	213	461	338	280	224	419	355	295
FWS-330-18.5		323	241	532	282	226	489	358	297	237	444	377	312
FWS-330-22		342	254	562	298	238	517	379	314	251	470	399	330
FWS-350-7.5		254	189	419	221	177	386	282	233	186	350	297	245
FWS-350-11		291	216	480	254	202	442	323	267	213	401	340	281
FWS-350-15		324	240	534	282	225	491	358	297	237	445	377	312
FWS-350-18.5		347	257	572	302	241	526	384	318	254	477	404	335
FWS-350-22		370	274	610	322	257	561	410	339	271	509	431	357
FWS-400-7.5		263	196	433	230	184	398	292	242	193	362	307	254
FWS-400-11		300	223	494	262	209	454	333	276	221	413	350	290
FWS-400-15		333	247	547	290	232	503	368	305	244	457	388	321
FWS-400-18.5		356	265	585	310	248	538	394	326	261	489	415	344
FWS-400-22		379	282	623	330	264	573	419	348	278	520	442	366
FWS-400-30		416	309	684	362	290	629	460	382	305	571	485	402
FWS-500-7.5		282	209	465	245	196	428	312	258	206	388	329	272
FWS-500-11		319	237	526	278	222	484	353	292	233	439	372	308
FWS-500-15		356	264	587	310	247	540	394	326	261	490	415	344
FWS-500-18.5		379	281	625	330	263	575	420	347	277	522	442	366
FWS-500-22		402	298	663	350	279	610	445	369	294	553	469	388
FWS-500-30		448	333	740	390	312	680	497	411	328	617	523	433
FWS-550-7.5		291	218	473	254	205	436	322	268	215	397	338	282
FWS-550-11		332	249	541	291	234	498	367	306	246	454	387	322
FWS-550-15		369	277	601	323	260	554	408	340	273	504	430	358
FWS-550-18.5		397	298	646	347	279	595	439	365	294	542	462	384
FWS-550-22		420	315	683	367	295	630	464	387	311	574	489	407
FWS-550-30		461	346	751	404	325	692	510	425	342	631	537	447
FWS-600-11		401	301	653	351	282	602	444	370	297	549	467	389
FWS-600-15		448	336	728	392	315	672	495	412	332	612	521	434
FWS-600-18.5		480	360	781	420	338	720	531	442	355	656	558	465
FWS-600-22		508	381	826	444	357	762	561	467	376	694	591	492
FWS-600-30		563	422	916	493	396	845	623	518	417	769	655	545
FWS-600-37		600	450	976	525	422	900	663	552	444	820	698	581
FWS-700-11		475	356	774	416	334	713	526	437	352	649	553	460
FWS-700-15		526	394	856	460	370	789	582	484	390	719	612	510
FWS-700-18.5		563	422	916	493	396	845	623	518	417	769	655	545
FWS-700-22		595	446	969	521	419	893	658	548	441	813	693	577
FWS-700-30		664	498	1081	581	468	997	735	612	492	908	773	644
FWS-700-37		706	529	1149	618	497	1059	781	650	523	965	822	684
FWS-800-11		512	386	828	449	362	764	566	472	381	697	595	497
FWS-800-15		567	427	917	497	401	847	627	523	422	772	659	550
FWS-800-18.5		604	455	977	530	427	902	667	557	450	823	702	586
FWS-800-22		641	483	1037	562	454	957	708	591	477	873	745	622
FWS-800-30		701	528	1134	615	496	1046	774	646	522	954	815	680
FWS-800-37		756	570	1223	663	535	1129	836	697	563	1030	879	734
FWS-800-45		811	611	1312	712	574	1212	897	748	604	1105	943	787
FWS-800-55		867	653	1402	760	613	1294	958	799	646	1180	1008	841

Notes:

1/CTI Certification applies to the operation with the Wet Bulb Temp. between 12.8℃ and 32.2℃, Max. Entering Water Temp. 51.7℃, Min. Range of 2.2℃ and Min. Approach of 2.8℃.

2/This table is for quick selection only. For more precise selection, please consult RYOWO engineers.

Model	Temp.	Water flow rate at indicated HWT, CWT & WBT (M^3/HR)											
	HWT°C	34	38	37	36	35	39	38	37	36	39	38	37
	CWT °C	29	33	32	31	30	34	33	32	31	34	33	32
	WBT °C	26	27	27	27	27	28	28	28	28	29	29	29
FWS-94-3.7		68	125	106	89	72	131	112	94	75	117	98	79
FWS-94-5.5		78	142	121	101	82	149	127	107	86	133	111	90
FWS-94-7.5		87	158	135	112	91	166	141	119	95	148	124	100
FWS-127-5.5		92	169	144	120	97	177	151	127	102	158	132	107
FWS-127-7.5		102	187	160	133	107	196	168	141	113	176	147	118
FWS-127-11		116	212	181	151	122	223	190	160	128	200	166	134
FWS-169-7.5		123	223	191	160	129	234	200	169	136	210	176	142
FWS-169-11		140	254	217	181	147	266	228	192	154	239	200	162
FWS-169-15		155	282	241	201	163	295	252	213	171	265	222	179
FWS-200-7.5		134	257	217	178	141	271	229	190	149	241	198	157
FWS-200-11		152	291	245	202	160	307	259	215	169	273	225	178
FWS-200-15		166	318	268	221	175	336	283	235	184	298	246	195
FWS-250-7.5		149	284	239	197	157	299	252	210	165	266	219	174
FWS-250-11		170	324	274	225	179	342	289	240	189	304	251	199
FWS-250-15		187	358	302	249	198	377	319	265	208	336	277	220
FWS-275-7.5		159	304	257	211	168	321	271	225	177	285	235	187
FWS-275-11		180	345	291	239	190	363	307	255	201	323	266	212
FWS-275-15		202	385	325	268	213	406	343	285	224	361	298	237
FWS-300-7.5		168	314	267	221	177	331	281	235	187	296	245	197
FWS-300-11		193	361	306	254	203	380	323	270	214	340	282	226
FWS-300-15		214	401	340	282	226	422	358	300	238	378	313	251
FWS-300-18.5		225	421	357	296	237	443	376	315	250	397	329	264
FWS-300-22		236	441	374	310	249	465	394	330	262	416	345	276
FWS-330-7.5		186	347	295	245	196	366	311	260	206	327	272	218
FWS-330-11		214	401	340	282	226	422	358	300	238	378	313	251
FWS-330-15		236	441	374	310	249	465	394	330	262	416	345	276
FWS-330-18.5		250	468	397	329	264	493	418	350	278	441	366	293
FWS-330-22		264	494	420	348	279	521	442	370	294	466	386	310
FWS-350-7.5		196	368	312	259	207	388	329	275	218	347	287	230
FWS-350-11		225	422	358	296	237	445	377	315	250	397	329	263
FWS-350-15		250	469	397	329	263	494	419	350	277	441	366	292
FWS-350-18.5		267	502	426	353	282	529	449	375	297	473	392	313
FWS-350-22		285	536	454	376	301	565	479	400	317	504	418	334
FWS-400-7.5		204	381	323	268	215	401	341	285	226	359	298	239
FWS-400-11		232	434	369	306	245	458	388	325	258	409	339	272
FWS-400-15		257	481	408	339	271	507	430	360	286	453	376	301
FWS-400-18.5		275	515	437	362	290	542	460	385	306	485	402	322
FWS-400-22		293	548	465	386	309	577	490	410	325	516	428	343
FWS-400-30		322	601	510	423	339	633	538	450	357	567	470	377
FWS-500-7.5		217	409	346	287	229	431	365	305	242	385	319	255
FWS-500-11		246	462	392	324	259	487	413	345	273	435	360	288
FWS-500-15		274	516	437	362	289	543	461	385	305	486	402	322
FWS-500-18.5		292	549	466	385	308	579	491	410	325	517	428	343
FWS-500-22		310	583	494	409	327	614	521	435	345	549	454	363
FWS-500-30		346	650	551	456	364	685	580	485	384	612	507	405
FWS-550-7.5		227	418	356	296	239	440	375	315	252	395	329	265
FWS-550-11		259	478	407	339	273	503	428	360	287	451	376	303
FWS-550-15		288	531	452	376	303	559	476	400	319	501	418	337
FWS-550-18.5		309	571	486	405	326	601	512	430	343	539	449	362
FWS-550-22		327	604	514	428	345	636	541	455	363	570	475	383
FWS-550-30		360	664	565	471	379	699	595	500	399	627	522	421
FWS-600-11		313	577	492	409	330	608	518	435	347	545	454	366
FWS-600-15		349	644	548	456	368	678	577	485	387	608	506	408
FWS-600-18.5		374	690	588	489	394	726	619	520	415	652	543	438
FWS-600-22		396	730	622	518	417	768	655	550	439	689	574	463
FWS-600-30		439	810	689	574	462	852	726	610	487	765	637	513
FWS-600-37		468	863	735	612	493	908	774	650	519	815	679	547
FWS-700-11		371	683	582	485	390	719	613	515	411	646	538	433
FWS-700-15		410	756	644	537	432	796	678	570	455	714	595	480
FWS-700-18.5		439	810	689	574	462	852	726	610	487	765	637	513
FWS-700-22		464	856	729	607	489	901	768	645	515	808	674	543
FWS-700-30		518	955	814	678	546	1006	857	720	575	902	752	606
FWS-700-37		551	1015	865	720	580	1069	910	765	611	959	799	644
FWS-800-11		401	733	626	523	422	772	659	555	445	694	580	469
FWS-800-15		445	813	694	579	468	855	730	615	493	769	642	519
FWS-800-18.5		473	865	739	617	498	911	778	655	525	819	684	553
FWS-800-22		502	918	784	655	529	966	825	695	557	869	726	587
FWS-800-30		549	1004	857	716	578	1057	902	760	609	950	794	642
FWS-800-37		593	1083	925	772	624	1140	973	820	657	1025	856	692
FWS-800-45		636	1163	993	829	670	1224	1045	880	705	1100	919	743
FWS-800-55		679	1242	1060	885	715	1307	1116	940	753	1175	982	794

Notes:

1/CTI Certification applies to the operation with the Wet Bulb Temp. between 12.8℃ and 32.2℃, Max. Entering Water Temp. 51.7℃, Min. Range of 2.2℃ and Min. Approach of 2.8℃.

2/This table is for quick selection only. For more precise selection, please consult RYOWO engineers.

City University of
Hong Kong

The Hong Kong
Polytechnic University

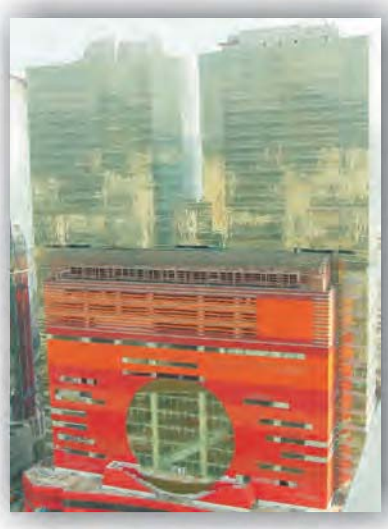
The University of
Hong Kong

The Ritz-Carlton Hotel

FWS series

Kai Tak Cruise Terminal

Studio City, Macau



Mega Box

Galaxy Casino & Resort, Macau

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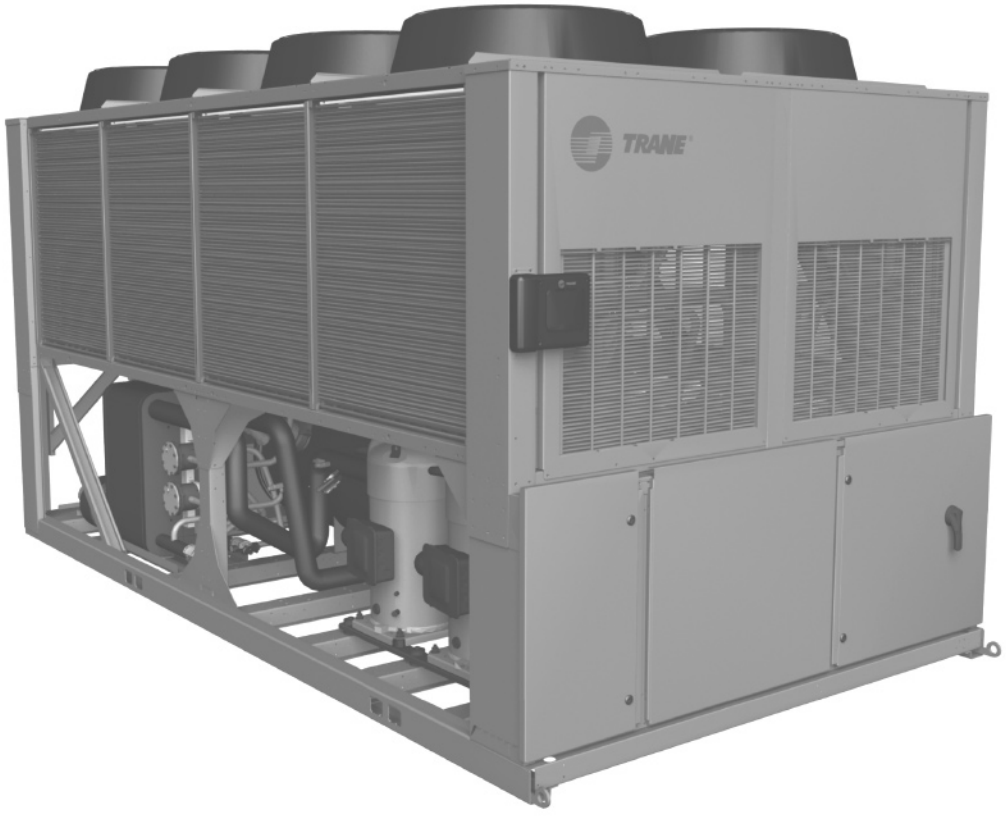
ryowo™

COOLING TOWER MANUFACTURER SINCE 1978

Catalogue of Trane CGAM 70

Installation
Operation
Maintenance

AquaStream™ 3G air-cooled liquid chillers
Models CGAM



September 2011

CG-SVX19C-E4

TRANE
Cooling and Heating Systems and Services

Contents

General information

Foreword

These instructions are given as a guide to good practice in the installation, start-up, operation, and maintenance by the user, of Trane CGAM chillers. They do not contain full service procedures necessary for the continued successful operation of this equipment. The services of a qualified technician should be employed through the medium of a maintenance contract with a reputable service company. Read this manual thoroughly before unit start-up.

Units are assembled, pressure tested, dehydrated, charged and run tested before shipment.

Warnings and cautions

Warnings and Cautions appear at appropriate sections throughout this manual. Your personal safety and the proper operation of this machine require that you follow them carefully. The constructor assumes no liability for installations or servicing performed by unqualified personnel.

WARNING!: Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION!: Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices or for equipment or property-damage-only accidents.

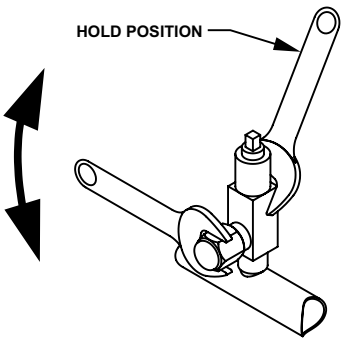
Safety recommendations

To avoid death, injury, equipment or property damage, the following recommendations should be observed during maintenance and service visits:

1. The maximum allowable pressures for system leak testing on low and high pressure side are given in the chapter “Installation”. Always provide a pressure regulator.
2. Disconnect the main power supply before any servicing on the unit.
3. Service work on the refrigeration system and the electrical system should be carried out only by qualified and experienced personnel.

Proper servicing of the service valves is required. Use a backup wrench as shown in Figure 1 when loosening or tightening the service valve cap.

Figure 1 - Servicing of service valves



Reception

On arrival, inspect the unit before signing the delivery note.

Reception in France only:

In case of visible damage: The consignee (or the site representative) must specify any damage on the delivery note, legibly sign and date the delivery note, and the truck driver must countersign it. The consignee (or the site representative) must notify Trane Epinal Operations - Claims team and send a copy of the delivery note. The customer (or the site representative) should send a registered letter to the last carrier within 3 days of delivery.

Note: for deliveries in France, even concealed damage must be looked for at delivery and immediately treated as visible damage.

Reception in all countries except France:

In case of concealed damage: The consignee (or the site representative) must send a registered letter to the last carrier within 7 days of delivery, claiming for the described damage. A copy of this letter must be sent to Trane Epinal Operations - Claims team.

Warranty

Warranty is based on the general terms and conditions of the manufacturer. The warranty is void if the equipment is repaired or modified without the written approval of the manufacturer, if the operating limits are exceeded or if the control system or the electrical wiring is modified. Damage due to misuse, lack of maintenance or failure to comply with the manufacturer’s instructions or recommendations is not covered by the warranty obligation. If the user does not conform to the rules of this manual, it may entail cancellation of warranty and liabilities by the manufacturer.

General information

The following pictograms can be found on the unit. Take necessary precautions to avoid damage and injury.

Figure 2 - Warning pictograms

1 = Risk that unit is powered up
2 = Risk hazard due to fan rotation
3 = Risk hazard of burns on compressors or refrigeration piping
4 = Unit contains refrigerant gas. See specific warnings.
5 = Risk of residual voltage when speed drive or softstarter options are present
6 = Unit under pressure
7 = Risk to cut, particularly on heat exchanger fins
8 = Read instructions before installation
9 = Disconnect all electric power before servicing
10 = Read technical instructions

Refrigerant

The refrigerant provided by the manufacturer meets all the requirements of our units. When using recycled or reprocessed refrigerant, it is advisable to ensure its quality is equivalent to that of a new refrigerant. For this, it is necessary to have a precise analysis made by a specialized laboratory. If this condition is not respected, the manufacturer warranty could be cancelled.

Environmental Protection / Compliance with F-Gas regulation

This equipment contains a fluorinated gas covered by the Kyoto Protocol [or an ozone depleting substance covered by Montreal Protocol].The type and quantity of refrigerant per circuit is indicated on the product nameplate. The Global Warming Potential of the refrigerant implemented in Trane Air Conditioning and Refrigeration Equipment is presented in the table by type of refrigerant.

Refrigerant type	GWP (1) value
R134a	1 300
R407C	1 653
R410A	1 975
R404A	3 784
R22 (2)	1 780

The operator (contractor or end user) must check local environmental regulations impacting installation, operation and disposal of the equipment; in particular need to recover environmentally harmful substances (refrigerant, oil, antifreeze agents, etc.) Do not vent into the atmosphere any refrigerant. The handling of refrigerant shall be fulfilled by a qualified service engineer.

(1) GWP = global warming potential
(2) Covered by Montreal Protocol

Maintenance contract

It is strongly recommended that you sign a maintenance contract with your local Service Agency. This contract provides regular maintenance of your installation by a specialist in our equipment. Regular maintenance ensures that any malfunction is detected and corrected in good time and minimizes the possibility that serious damage will occur. Finally, regular maintenance ensures the maximum operating life of your equipment. We would remind you that failure to respect these installation and maintenance instructions may result in immediate cancellation of the warranty.

Training

To assist you in obtaining the best use of it and maintaining it in perfect operating condition over a long period of time, the manufacturer has at your disposal a refrigeration and air conditioning service school. The principal aim of this is to give operators and technicians a better knowledge of the equipment they are using, or that is under their charge. Emphasis is particularly given to the importance of periodic checks on the unit operating parameters as well as on preventive maintenance, which reduces the cost of owning the unit by avoiding serious and costly breakdown.

Model number

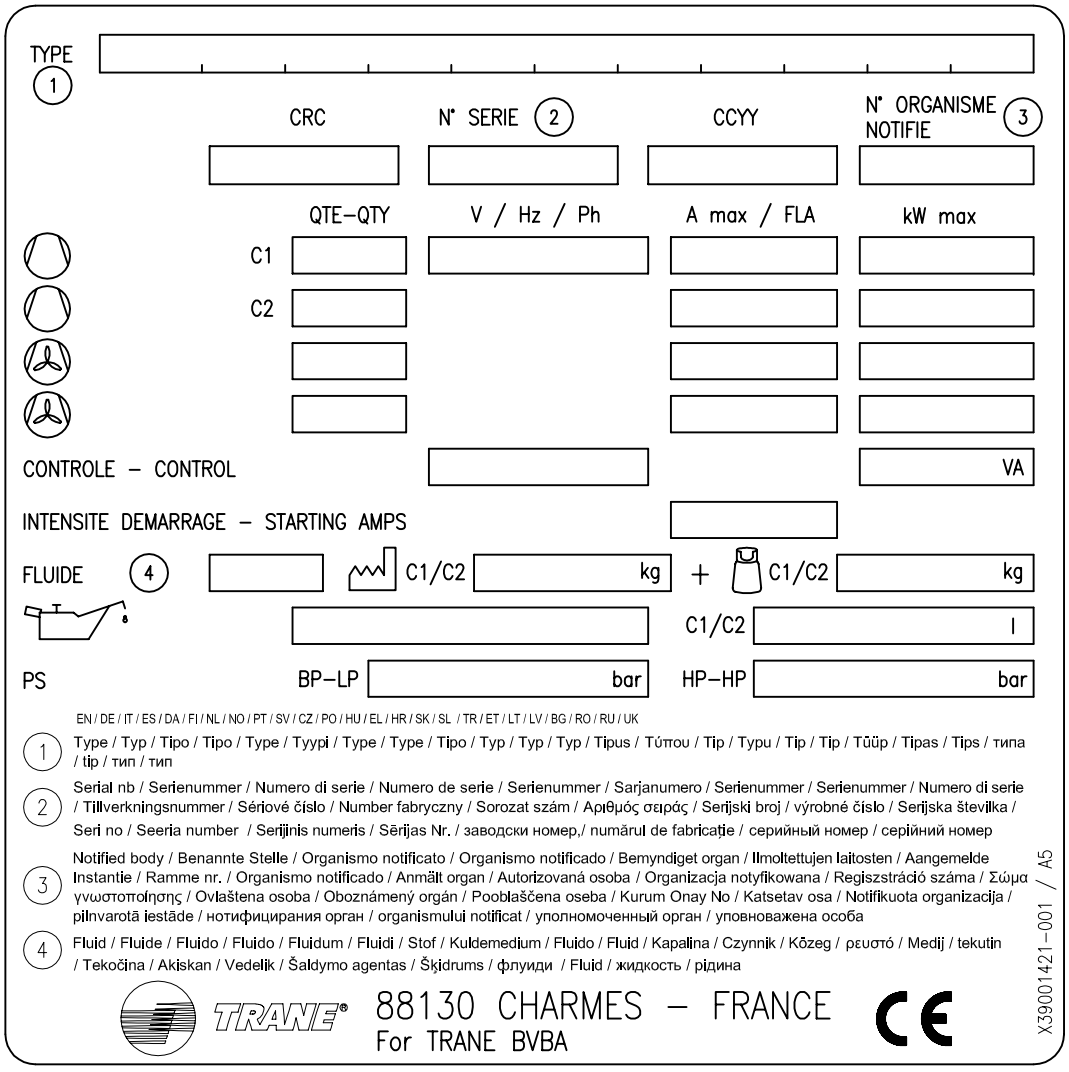
Unit nameplate

The unit nameplates are applied to the exterior surface of the control panel door. A compressor nameplate is located on each compressor.

The unit nameplate provides the following information:

- Unit model and size descriptor.
- Unit serial number
- Identifies unit electrical requirements.
- Lists correct operating charges of R410A and refrigerant oil.
- Lists unit test pressures

Figure 3 - Unit nameplate



Model number

Digit 1-4 — Chiller Model

CGAM = Air-Cooled Scroll Packaged Chiller

Digit 5-7 — Unit Nominal Tonnage

020 = 20 Tons
023 = 23 Tons
026 = 26 Tons
030 = 30 Tons
035 = 35 Tons
039 = 39 Tons
040 = 40 Tons
045 = 45 Tons
046 = 46 Tons
050 = 50 Tons
052 = 52 Tons
060 = 60 Tons
070 = 70 Tons
080 = 80 Tons
090 = 90 Tons
100 = 100 Tons
110 = 110 Tons
120 = 120 Tons
140 = 140 Tons
150 = 150 Tons
160 = 160 Tons
170 = 170 Tons

Digit 8 — Unit Voltage

E = 400 Volt 50 Hz 3 Phase

Digit 9 — Manufacturing Plant

1 = Epinal, France

Digit 10-11 — Design Sequence

A-Z =Factory/ABU Assigned

Digit 12 — Unit Type

1 = Standard Efficiency/ Performance

2 = High Efficiency/Performance

Digit 13 — Agency Listing

B = CE Certification (EUR)

Digit 14 — Pressure Vessel Code

4 = Europe Standard

Digit 15 — Unit Application

A = Standard Ambient (32-115F/0-46C)

B = High Ambient (up to-52C)

C = Low Ambient (0 to 115/-18 to 46C)

D = Wide Ambient (-18 to 52C)

Digit 16 — Refrigerant Isolation Valves

1 = No Isolation Valves

Digit 17

A

Digit 18 — Freeze Protection (Factory-Installed Only)

X = Without Freeze Protection

2 = With Freeze Protection (CH530 Control)

Digit 19 — Insulation

A = Factory Insulation - All Cold Parts

Digit 20 — Factory Charge

1 = Full Factory Refrigerant Charge (HFC-410A)

Digit 21 — Evaporator Application

A = Standard Cooling (5.5 to 18°C)

B = Low Temperature Processing (lower than 5.5°C)

C = Ice-Making - hardwired interface (-7 to 18°C)

Digit 22 — Water Connection (Evap)

1 = Grooved Pipe Connection

2 = Grooved Pipe with Flange Adapter

Digit 23 — Condenser Fin Material

A = Lanced Aluminum Fins

B = Non-Lanced Aluminum Fins

E = Non-Lanced Aluminum Fins w/ Pre-Coat (Black Epoxy)

Digit 24 — Condenser Heat Recovery

X = No Heat Recovery

2 = Partial Heat Recovery w/o Fan Control

3 = Full Heat Recovery

Digit 25

X

Digit 26 — Starter Type

A = Across the Line Starter/Direct on Line

B = Solid State Soft Starter

C = Across the Line Starter/Power Factor Correction

Digit 27 — Incoming Power Line Connection

1 = Single Point Power Connection

Digit 28 — Power Line Connection Type

B = Disconnect Switch

Digit 29 — Enclosure Type

2 = IP54 Protection

Digit 30 — Unit Operator Interface

A = Dyna-View/English
B = Dyna-View/Spanish-Spain
D = Dyna-View/French
E = Dyna-View/German
F = Dyna-View/Dutch
G = Dyna-View/Italian
J = Dyna-View/Portuguese-Portugal
R = Dyna-View/Russian
T = Dyna-View/Polish
U = Dyna-View/Czech
V = Dyna-View/Hungarian
W = Dyna-View/Greek
Y = Dyna-View/Romanian
Z = Dyna-View/Swedish

Model number

Digit 31 — Remote Interface (digital comm)

X = No Remote Digital Communication

1 = LonTalk LCI-C Interface with Modbus Interface

2 = LonTalk/Tracer Summit Interface

3 = Time of Day Scheduling

4 = BACNet Interface

Digit 32 — Ext. Chilled/Hot Water and Curr. Demand Limit Setpoint

X = No Ext. Chilled Water Setpoint

A = Ext Chilled Water and Demand Limit Setpoint - 4-20mA

B = Ext Chilled Water and Demand Limit Setpoint - 2-10Vdc

C = Auxiliary setpoint

Digit 33 —% Capacity

X = Without % Capacity

1 = With % Capacity

Digit 34 — Programmable Relays

X = No Programmable Relays

A = Programmable Relays

Digit 35 — Pump Type

X = No Pumps and no Contactors

1 = No Pumps w/ Single Contactors

2 = No Pumps w/ Dual Contactors

3 = No Pumps w/ Single Contactors Single High Head Pump

4 = No Pumps w/ Dual Contactors Dual High Head Pump

5 = Single Standard Head Pump

6 = Single High Head Pump

7 = Dual Standard Head Pump

8 = Dual High Head Pump

Digit 36 — Pump Flow Control

X = No Pump Flow Control

A = Pump Flow Controlled by Triple Duty Valve

B = Pump Flow Controlled by Variable Speed Drive

Digit 37 — Buffer Tank

X = No Tank

1 = With Tank

Digit 38 — Short Circuit Rating

A = Default A Short Circuit Rating

Digit 39 — Installation Accessories

1 = Elastomeric Isolators

4 = Neoprene Pads

Digit 40 — Water Strainer

X = No Strainer

A = With Water Strainer Factory-Installed

Digit 41 — Sound Attenuator Package

1 = Compact

3 = Super Quiet

4 = Super Quiet with Night Noise Setback

5 = Comprehensive Acoustic Package

Digit 42 — Appearance Options

X = No Appearance Options

A = Architectural Louvered Panels

B = Half Louvers

C = Access Guards

D = Access Guards and Half Louvers

Digit 43

X

Digit 44 — Label and Literature Language

A = Bulgarian

B = Spanish and English

C = German

D = English

E = French

H = Dutch SI (Hollandais)

J = Italian

L = Danish

M = Swedish

N - Norwegian

P = Polish

R = Russian

T = Czech

U = Greek

V = Portuguese

Y = Romanian

Z = Serbian

1 = Slovak

2 = Croatian

3 = Hungarian

Digit 45 — Enhanced phase monitoring

X = Not installed

1 = Installed

Digit 46 — Shipping Package

X = No Skid (Standard)

A = Unit Containerization Package

Digit 47

X

Digit 48 — Flow switch setpoint

C = Setpoint 15

F = Setpoint 35

H = Setpoint 45

L = Setpoint 60

Digit 49

X

Digit 50 — Specials

X = None

S = Special

Notes:

1. If a digit is not defined it may be held for future use.

Model number

The compressor nameplate provides the following information:

- Compressor model number.
- Compressor serial number.
- Compressor electrical characteristics.
- Utilization range.
- Recommended refrigerant.

Model Number Coding System

The model numbers for the unit and the compressors are comprised of numbers and letter which represent features of the equipment. Each position, or group of positions, in the number is used to represent a feature. For example, Unit Voltage, contains the letter “E”. From the chart, it can be seen that an “E” in this position means that the unit voltage is 400/50/3.

Compressor Model Number (located on compressor nameplate)

Digit 1,2,3,4

CSHD - Light Commercial

CSHN - Commercial

Digit 5,6,7 – Capacity- 60 Hz ARI KBtu/Hr (approximate)

125 - CSHD

161 - CSHD

184 - CSHN

250 - CSHN

315 - CSHN

374 - CSHN

Digit 8 – Voltage

J - 200-230/3/60

K - 460/3/60-400/3/50

F - 230/3/50

D - 575/3/60

X - 380/3/60

Y - 200/3/50 (CSHD 125 only)

Digit 9 – Unloading

(0 – no unloading)

Digit 10 – Design Sequence

Digit 11 – Protection Module Voltage

0 - Int Line Break- CSHD

A - 115 VAC

B - 230 VAC

H - 24 VAC

K - 115/230 VAC – CSHN

Digit 12 – Basic Compressor Variation

M - Suction & Discharge Tube, oil equalizer with seal nut, Grade 32 POE oil

Unit description

Units are scroll type, air-cooled, liquid chillers, designed for installation outdoors. The units have one or two independent refrigerant circuits, two or more compressors per circuit. Units are packaged with an evaporator and condenser.

Note: Each unit is a completely assembled, hermetic package that is factory-piped, wired, leak-tested, dehydrated, charged and tested for proper control operations prior to shipment. The chilled water inlet and outlet openings are covered for shipment.

Units feature Trane's exclusive Adaptive Control logic with CH530 controls. It monitors the control variables that govern the operation of the chiller unit. Adaptive Control logic can correct these variables, when necessary, to optimize operational efficiencies, avoid chiller shutdown, and keep producing chilled water.

Each refrigerant circuit is provided with filter, sight glass, electronic expansion valve, and charging valves.

The evaporator is a brazed plate and frame heat exchanger which is equipped with water drain and vent connections. The condenser is an air-cooled fin coil.

The condensers are available in three configurations depending on the tonnage of the unit. Units may be referred to the size by the condenser configuration. The three configurations are slant, V and W.

Accessory/options information

Check all the accessories and loose parts which are shipped with the unit against the original order. Included in these items will be rigging diagrams, electrical diagrams, and service literature, which are placed inside the control panel and/or starter panel for shipment. Also check for optional components, such as flange adapters and isolators.

The unit isolators and the flange adapter ship on brackets attached to the frame of the unit.

Pre-installation

Inspection checklist

When the unit is delivered, verify that it is the correct unit and that it is properly equipped. Compare the information which appears on the unit nameplate with the ordering and submittal information.

Inspect all exterior components for visible damage. Report any apparent damage or material shortage to the carrier and make a "unit damage" notation on the carrier's delivery receipt. Specify the extent and type of damage found and notify the appropriate Trane Sales Office. Do not proceed with installation of a damaged unit without sales office approval.

Mandatory Start-up Checklist

***This checklist is not intended to be a substitution for the contractors installation instruction. This checklist is intended to be a guide for the Trane technician just prior to unit 'start-up'. Many of the recommended checks and actions could expose the technician to electrical and mechanical hazards. Refer to the appropriate sections in the unit manual for appropriate procedures, component specifications and safety instructions.

Except where noted; it is implied that the technician is to use this checklist for inspection / verification of prior task completed by the general contractor at installation.

1. Unit clearances adequate for service and to avoid air recirculation, etc.
2. Unit exterior inspected
3. Crankcase heaters working for 24 hours prior to arrival of Trane technician performing start up
4. Correct voltage supplied to unit and electric heaters (imbalance not to exceed 2%)
5. Unit power phasing (A-B-C sequence) proper for compressor rotation
6. Copper power wiring meets sizing requirement in job submittal
7. Unit properly grounded
8. All automation and remote controls installed/wired
9. All wiring connections tight
10. Prove chilled water side Interlock and Interconnecting Wiring Interlock and externals (chilled water pump)
11. Field installed control wiring landed on correct terminals (external start/stop, emergency stop, chilled water reset…)
12. Shipping hardware for compressors removed
13. Verify all refrigerant and oil valves are open/back seated
14. Compressor oil levels (1/2 -3/4 high in glass) proper
15. Verify chilled water strainer is clean and free of debris and evaporator chilled water circuits are filled
16. Close the fused-disconnect switch(es) that supplies power to the chilled water pump starter
17. Start the chilled water pump to begin circulation of the water. Inspect piping for leaks and repair as necessary
18. With water circulating through the system, adjust water flow and check water pressure drop through evaporator
19. Adjust the chilled water flow switch for proper operation
20. Return chilled water pump to auto
21. Verify all CH530 Menu Items on DynaView and KestrelView
22. Fan amperages within nameplate specs
23. All panels/doors secured prior to start-up
24. All coil fins inspected and straightened
25. Rotate fans before starting unit to inspect for potential audible and visual signs of rubbing. Start unit
26. Press AUTO key. The unit will start if the chiller control calls for cooling and the safety interlocks are closed
27. Check the EXV sight glasses after sufficient time has elapsed allowing entering and leaving water to stabilize
28. Check the evaporator and the condenser refrigerant pressure under Refrigerant Report on CH530 TechView
29. Confirm Superheat and subcooling values are normal
30. Compressor operation normal and within amperage rating
31. Operating log completed
32. Press stop key
33. Inspect fans again after being under load to ensure no signs or rubbing exist
34. Verify the chilled water pump runs for at least 1 minute after the chiller is commanded to stop (for normal chilled water systems)

Unit storage

If the chiller is to be stored for more than one month prior to installation, observe the following precautions:

- Store the chiller in a dry, vibration-free, secure area.
- Units charged with refrigerant should not be stored where temperatures exceed 68°C.
- At least every three months, attach a gauge and manually check the pressure in the refrigerant circuit. If the refrigerant pressure is below 13 bar at 20°C (or 10 bar at 10°C), call a qualified service organization and the appropriate Trane sales office.

Installation requirements and contractor responsibilities

A list of the contractor responsibilities typically associated with the unit installation process is provided.

Pre-installation

Type of requirement	Trane-supplied Trane-installed	Trane-supplied Field-installed	Field-supplied Field-installed
Foundation			Meet foundation requirements
Rigging			• Safety chains • Clevis connectors • Lifting beams
Isolation		Isolation pads or neoprene isolators (optional)	Isolation pads or neoprene isolators (optional)
Electrical	• Disconnect switch • Unit mounted starter		• Wiring sizes per submittal and local codes and regulations • Terminal lugs • Ground connection(s) • BAS wiring (optional) • Control voltage wiring • Chilled water pump contactor and wiring including interlock • Option relays and wiring
Water piping	• Flow switch • Water strainer (option)		• Taps for thermometers and gauges • Thermometers • Water flow pressure gauges • Isolation and balancing valves in water piping • Vents and drain • Pressure relief valves
Insulation	• Insulation		• Insulation
Water piping connection components	• Grooved pipe	• Flange adapters	

General Data

Table 2 - CGAM - Standard Efficiency Compact - DUPLEX V units

Size		40	46	52	60	70	80	90	100
Eurovent Performances (1)									
Net capacity	(kW)	110.6	127.6	143.6	159.7	186.8	222.1	249.0	274.5
Total power input	(kW)	40.3	43.8	50.2	58.7	67.9	78.7	87.9	100.5
EER		2.75	2.92	2.86	2.72	2.75	2.82	2.83	2.73
Main power supply		400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
Sound power level	(dBA)	90.9	90.8	91.1	91.8	93.6	95.6	94.7	93.7
System Data									
Refrigerant circuit	#	2	2	2	2	2	2	2	2
Capacity steps	%	25-50-75-100	21-43-71-100	25-50-75-100	25-50-75-100	21-43-71-100	25-50-75-100	22-44-72-100	25-50-75-100
Units Amps (2)									
Maximum amps	(A)	96.0	106.0	116.0	137.5	156.0	182.4	205.3	228.2
Start-up amps - standard unit	(A)	217.9	238.9	248.9	267.0	331.3	357.6	414.1	437.0
Start-up amps - with soft starter option	(A)	145.9	168.9	178.9	214.0	255.3	281.6	333.1	356.0
Short circuit unit capacity	(kA)	15	15	15	15	15	15	15	15
Min supply cable size	(mm^2)	95	95	95	95	150	150	185	185
Max supply cable size	(mm^2)	150	150	150	150	240	240	240	240
Compressor									
Number	#	4	4	4	4	4	4	4	4
Type		Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll
Model		CSHD125&CSHD125	CSHD125&CSHD161	CSHD161&CSHD161	CSHN184&CSHN184	CSHN184&CSHN250	CSHN250&CSHN250	CSHN250&CSHN315	CSHN315&CSHN315
Motor RPM	(rpm)	2900	2900	2900	2900	2900	2900	2900	2900
Power factor	#	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Sump heater per circuit	(W)	160&160	160&160	160&160	160&160	160&160	160&160	160&160	160&160
Evaporator									
Quantity	#	1	1	1	1	1	1	1	1
Type		BPHE	BPHE	BPHE	BPHE	BPHE	BPHE	BPHE	BPHE
Water volume/storage (total)	(L)	9.1	10.5	14.3	15.6	18.9	24.0	26.5	32.4
Antifreeze heater	(W)	120	180				240		
Min. flow	(L/Sec)	2.6	3.0	3.4	3.7	4.4	5.2	5.8	6.5
Max. flow	(L/Sec)	7.7	8.9	10.1	11.2	13.1	15.6	17.5	19.4
Pump Package (Option Standard Head)									
Nb Pump Set	#	1	1	1	1	1	1	1	1
Motor RPM	(rpm)	2890	2890	2890	2890	2890	2890	2890	2890
Pump power (single / dual) - standard head	(kW)	3.0	4.0	4.0	4.0	5.5	5.5	5.5	5.5
Rated amps (single / dual) - standard head	(A)	6.1	7.59	7.59	7.59	10.6	10.6	10.6	10.6
Pump power (single / dual) - high head	(kW)	5.5	5.5	5.5	7.5	7.5	7.5	7.5	7.5
Rated amps (single / dual) - high head	(A)	10.6	10.6	10.6	13.8	13.8	13.8	13.8	13.8
Hydraulic Module Components									
Expansion tank volume	(L)	25	25	25	25	25	25	25	25
User volume expansion capacity	(L)	380	380	380	380	380	380	380	380

General Data

Size		40	46	52	60	70	80	90	100
Max. Water-side pressure without pump	(kPa)	1000	1000	1000	1000	1000	1000	1000	1000
Max. Water-side pressure with pump	(kPa)					400			
Antifreeze heater	(W)					910			
Water tank volume	(L)	515	515	515	515	515	515	515	515
Water tank antifreeze heater	(W)					800			
Condenser									
Type		Fin and Tube	Fin and Tube	Fin and Tube	Fin and Tube	Fin and Tube	Fin and Tube	Fin and Tube	Fin and Tube
Qty of coils	#	2	2	2	2	2	2	2	2
Fan									
Type		Propeller	Propeller	Propeller	Propeller	Propeller	Propeller	Propeller	Propeller
Quantity per circuit	#	2	2	2	2	2	3	3	3
Diameter	(mm)	732	732	732	732	732	732	732	732
Drive type		Direct	Direct	Direct	Direct	Direct	Direct	Direct	Direct
Airflow per fan	(m3/h)	13485	16114	16122	16129	17638	16088	17189	17195
Static pressure	(Pa)	0	0	0	0	0	0	0	0
Motor rpm	#	920	920	920	920	920	920	920	920
Unit Water Connection									
Chilled water	(mm)	65	65	65	80	80	80	80	80
Type (standard)		Grooved	Grooved	Grooved	Grooved	Grooved	Grooved	Grooved	Grooved
Dimensions									
Unit length with buffer tank	(mm)	3416	3416	3416	3416	3416	4330	4330	4330
Unit length without buffer tank	(mm)	2905	2905	2905	2905	2905	3819	3819	3819
Unit width	(mm)	2266	2266	2266	2266	2266	2266	2266	2266
Unit height	(mm)	2150	2150	2150	2150	2150	2150	2150	2150
Weight									
Operating weight(3)	(kg)	1503	1545	1571	1753	1794	2053	2185	2302
Shipping weight(3)	(kg)	1471	1512	1534	1715	1753	2007	2136	2248
Additional weight (single pump standard head)	(kg)	171	177	176	177	184	186	187	186
Additional weight (dual pump standard head)	(kg)	209	221	221	221	235	236	237	237
Additional weight (single pump high head)	(kg)	179	179	178	220	220	221	222	222
Additional weight (dual pump high head)	(kg)	226	226	225	317	316	318	318	319
Additional shipping weight (buffer tank)	(kg)	381	380	381	381	382	381	382	381
Refrigerant & Oil Charge									
Refrigerant Charge (Circuit 1/Circuit 2)	(kg)	10.9/10.9	13.2/13.2	13.2/13.2	16.3/16.3	18.1/18.1	20/20	21.8/21.8	23.6/23.6
Oil Charge (Circuit 1/Circuit 2)	(L)	6.6 / 6.6	6.6 / 6.6	6.6 / 6.6	13.4 / 13.4	13.4 / 13.4	13.4 / 13.4	13.4 / 13.4	13.4 / 13.4

(1) Eurovent Conditions (Evap. 12°C/7°C - Air. 35°C)
(2) amps for base unit without pump package, without freeze protection
(3) without pump package

Catalogue of Trane RTAC 300

Air-cooled helical-rotary chillers Series R™

412 - 1451 kW
RTAC

Customer benefits

- Reliability: Trane helical-rotary compressor with only 3 moving parts
- Eurovent certified class A
- Ease of installation: wide choice of hydraulic modules
- Reliability: main components designed and manufactured by Trane
- Advanced Adaptive Control™ to keep chiller online in extreme operating conditions
- Optional remote monitoring by Trane Intelligent Services
- Single power supply connection
- Exact load matching

Main features

- Rental crash frame
- Integral hydraulic module (pumps)
- Compact design: reduced footprint and low profile design
- Falling film evaporator - high COP
- Two acoustic packages: SN and LN
- Wide operating map: airside and waterside
- Easy customized couple connections

Chiller model	RTAC 120	RTAC 200	RTAC 300	RTAC 400
Cooling capacity	412	737	1077	1451
Power input (kW)	135	232.90	370	498
Refrigerant type	R134a	13	R134a	R134a
Minimum chiller load (%)	30	17	13	10
Qty. of compressors	2	2	3	4
Number of refrigerant circuits	2	2	2	2
Power supply (V/Ph/Hz)	400/3/50	400/3/50	400/3/50	100/3/50
Max. amps (A)	390	562	844	1096
Starting amps (A)	410	594	813	1002
Length (mm)	5041	5960	10058	12244
Width (mm)	2260	2260	2250	2250
Height (mm)	2411	2381	2530	2530
Weight (kg)	4506	5590	9375	11929
Sound pressure level 10 m free field dB(A)	65	68	69	81

Cooling capacity and power input at Eurovent conditions:
12/7°C entering/leaving water temperature and 35°C ambient temperature according to EN 14-511

Trane® is a brand of Ingersoll Rand®. Ingersoll Rand (NYSE:IR) advances the quality of life by creating comfortable, sustainable and efficient environments. Our people and our family of brands—including Ingersoll Rand®, Trane®,
Thermo King® and Club Car® — work together to enhance the quality and comfort of air in homes and buildings; transport and protect food and perishables; and increase industrial productivity and efficiency. We are a global business committed to a world of sustainable progress and enduring results.

We are committed to using environmentally conscious print practices that reduce waste.

Catalogue of York YLCA 0080 T-TP

Return to Content

ECOFRIO v2
Air cooled chiller / heat pump

YLCA / YLHA 0040 to 0150

A complete range from 39.6 kW up to 151 kW

The **YORK YLCA/YLHA** air-cooled chillers and heat pumps represents the right solution for any kind of installation.

With thousands of units installed all around Europe and Africa, used for different applications and in different climate conditions are one of the most flexible and reliable scroll type chillers in the market.

The standard product configuration and the different options and accessories selectable by the customer make these units ideal where a compact, and high performance unit is required.

Features

YLCA/YLHA 0040 to 0080

- 2 capacity steps (1 for size 40)
- LWT & RWT Control
- Plate heat exchanger
- Condenser fins (blue fin)
- Pressostatic LAK (-18°C)

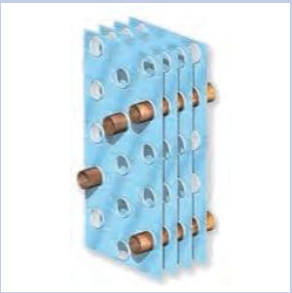
YLCA/YLHA 0100 to 0150

- Same features as YLCA/YLHA 40 to 80
- 4 capacity steps
- High efficiency at full and partial load
- Reduced noise levels
- 1/4 turn lock for easy access

Options / Accessories

- Unit without pack
- BMS Communication (Carel and Modbus protocol)
- Remote control
- Remote terminal
- Water filter (unit without Hydro Pack)
- Flow switch (unit without Hydro Pack)
- Low noise version
- Dual pump version
- Antivibration mountings
- Condenser protection grille

Low noise version with special insulation in the compressor chamber.



Special coating on the condenser fins for improved corrosion protection.

Pump built-in for space saving and easy installation.

ECOFRIO v2

YLCA / YLHA 0040 to 0150

Technical features

T Three phases supply **P** Hydro Pack **H** Heat pump

Model			YLCA / YLHA						
			0040 T-TP	0050 T-TP	0060 T-TP	0080 T-TP	0100 T-TP	0120 T-TP	0150 T-TP
Performance	Cooling capacity c/o units (1)	kW	39.3	51.8	60.1	77	100.3	118.5	150.5
	Total Input Power (1) (3)	kW	13.69	18.3	20.03	27.11	34.47	40.44	54.14
	EER (1)		2.87	2.83	3	2.84	2.91	2.93	2.78
	ESEER (1)		3.15	3.18	3.3	3.15	3.74	3.83	3.66
	Cooling capacity h/p units (1)	kW	37.6	51.2	60.1	71.7	95.4	113.6	144.5
	Heating capacity h/p units (1)	kW	38.8	52.8	60	75.2	104.6	120	150.5
	Total Input Power cool/heat mode (1)	kW	13.48 / 12.81	17.65 / 18.21	20.03 / 20.2	26.46 / 26.86	36.14 / 37.76	43.69 / 40	51.06 / 53.94
	EER / COP (1)		2.79 / 3.03	2.93 / 2.9	3 / 2.97	2.71 / 2.8	2.64 / 2.77	2.6 / 3	2.83 / 2.79
	ESEER (1)		3.15	3.18	3.29	2.91	3.39	3.43	3.73
	Capacity steps	%	0 / 100	0-50-100			0-25-50-75-100		
	Sound power level STD / LN	dB(A)	78 / 73	81 / 76	87 / 77	83 / 79	82 / 78	82 / 78	84 / 80
Compressor	Type		Scroll						
	Quantity		1	2			4		
Air side heat exchanger	Fans quantity		2			3	4		
	Working ambient temp. cool. / heat. mode		-18°C ~ 46°C / -10°C ~ 20°C						
Water side heat exchanger	Type		Single Plate Heat Exchanger				Dual Plate Heat Exchanger		
	Unit water volume (2)	Litres	131	188	194	285	193	195	214
	Pump Type		Multistage horizontal pumps						
	Nominal water flow	l/h	6 820	8 960	10 400	13 350	17 600	20 470	25 970
	Available pressure (1) (2)	kPa	105	108	158	123	187	202	186
	Pressure drop (1) (3)	kPa	75	39	50	63	59	33	27
	Working range water leaving temperature cooling / heating (4)		-5°C ~ 15°C / 30°C ~ 50°C						
	Water connections (2)	inch	1 1/4"	2"			2 1/2"		
Dimensions & Weight	Height / Width / Depth	mm	1573/1500/822	1600 / 1011 / 2104		1600/1118/2944	2190 / 1101 / 3416		2263/1101/3770
	Weight without pack / pack c/o	kg	340 / 380	524 / 580	555 / 611	715 / 785	1 124 / 1 220	1 190 / 1 286	1 415 / 1 503
	Weight without pack / pack h/p	kg	337 / 397	537 / 593	568 / 624	735 / 805	1 154 / 1 250	1 220 / 1 316	1 445 / 1 703
Electrical features	Voltage / Phases / Frequency	V/ph/hz	400 / 3 / 50+N+E						
	Maximum Unit current	A	33	46.2	49.2	70.5	80	108	120

YLCA: Cooling only units models. YLHA: Air to water heat pump models.
(1) net values at Eurovent nominal conditions (2) version P with hydro kit with filter (3) version without hydro kit (4) below 6°C with glycol
Nominal conditions: Cooling capacities in kW given for 7°C water leaving temperature Δt 5°C and 35°C ambient temperature
Heating capacities in kW given for 45°C water leaving temperature and 7°C ambient temperature

Compatibility table / Codes

Model	0040 TP	0050 TP	0060 TP	0080 TP	0100 TP	0120 TP	0150 TP
YLCA Cooling only unit (Pack included)	S668554084	S668525182	S668526182	S668528182	S668521182	S668551156	S668551507
YLHA Heat pump unit (Pack included)	S668654084	S668625182	S668626182	S668628182	S668621182	S668651156	S668651506

Model	0040 T	0050 T	0060 T	0080 T	0100 T	0120 T	0150 T
YLCA Cooling only unit (without Pack)	S668554080	S668525180	S668526180	S668528180	S668521180	S668551154	S668551503
YLHA Heat pump unit (without Pack)	S668654080	S668625180	S668626180	S668628180	S668621180	S668651154	S668651504
Use this unit code when a factory fitted option is NOT required							
Accessories (Supplied loose)							
AVM mounting	S613029002	S613026080		S613028180	S613021580		
Mechanical flow switch	S611992021						
Water Filter *	S611300150	S611300170			S611300190		
Remote control	S613802011						
Remote terminal	S613802231				-		
Cable for remote connection of the terminal	-				S613802241		
B.M.S. Communication	S613802041				S613802051		

Model	0040 TP	0050 TP	0060 TP	0080 TP	0100 TP	0120 TP	0150 TP
YLCA Cooling only unit (Pack included)	S668000226	S668000247	S668000251	S668000255	S668000259	S668000107	S668000111
YLHA Heat pump unit (Pack included)	S668000228	S668000248	S668000252	S668000256	S668000260	S668000131	S668000135

Model	0040 T	0050 T	0060 T	0080 T	0100 T	0120 T	0150 T
YLCA Cooling only unit (without Pack)	S668000038	S668000245	S668000249	S668000253	S668000257	S668000105	S668000109
YLHA Heat pump unit (without Pack)	S668000039	S668000246	S668000250	S668000254	S668000258	S668000129	S668000133
Use this unit code when a factory fitted option is required							
Options (Factory fitted)							
Low Noise version	S613990550	S613990650		S613990850	S613991050	S613991285	S613991584
Softstart	S606744692	S606744693			S606744694		
Dual pumps **	-	S613990540	S613990640	S613990840	S613991040	S613991286	S613991585
Condenser protection grille	S613995090	S613995091		S613995092	S613995093		S613995094

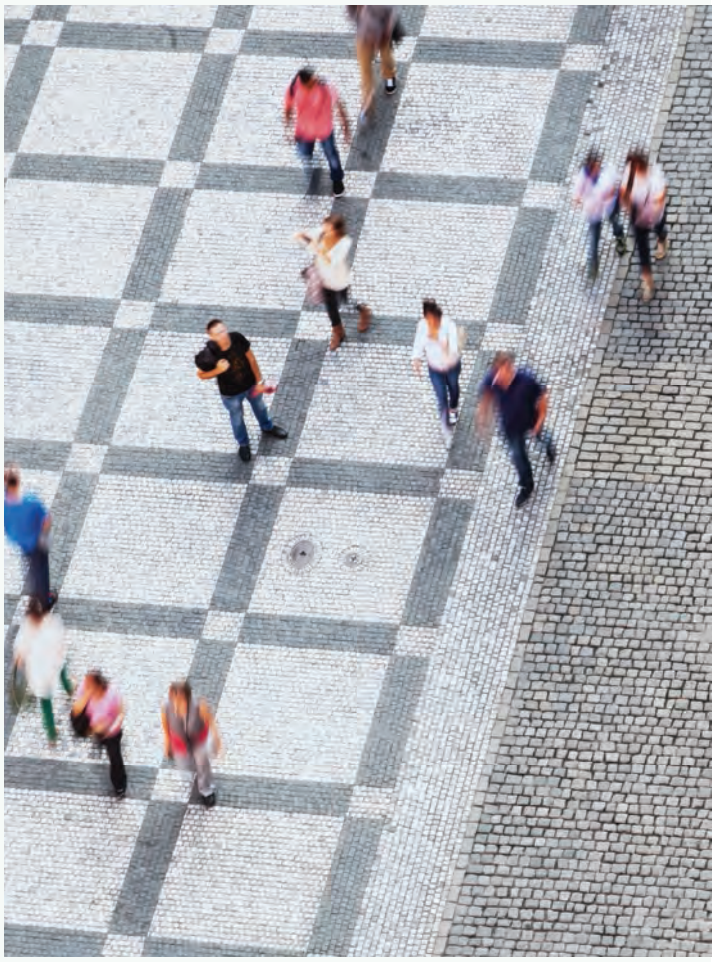
** included with unit version "P" only for unit without pack. Filter size: 2" for YLCA 40-50-60-80 and 2 1/2" for YLHA 100-120-150.*
*** Dual pump option has to be ordered with units with hydrokit.*

Catalogue of York YLAA 0485SE

YORK®

INSTALL CONFIDENCE

Catalogue Content



YORK® Commercial & Industrial HVAC 2016

Johnson Controls

A more comfortable, safe and sustainable world

Johnson Controls

Solutions for your success

Every building is unique in design and technical requirements.

Our customers always receive customised building solutions to meet their individual needs.

Johnson Controls can handle many challenges with its innovative and flexible solutions. From A to Z, from consulting to planning, installation, maintenance (service, inspection and repair) and modernisation – Johnson Controls supports customers throughout the entire life cycle of a building.

AIR CONDITIONING SOLUTIONS

- Chillers & fan coils
- Absorption chillers
- Cooling towers
- Dry coolers
- Air Handling Units

BUILDING AUTOMATION

- Monitoring, control and optimisation
- Standardised communication protocols

SECURITY SOLUTIONS

- Identity management
- Facility zoning
- Video surveillance systems
- Alarm systems

Our well thought-out solutions guarantee a high level of comfort and energy efficiency.

The majority of our products are already rated as Class A for Energy Efficiency, with high levels of compatibility and flexibility allowing for future additions to be carried out without difficulty.

External systems can be easily integrated using BACnet® or proprietary solutions.

Our service team is available to you 24 hours a day with one of the largest service networks in Europe.

AIR CONDITIONING SOLUTIONS

- Air systems
- VRF systems
- Roof-top air-conditioners
- Minisplits

ROOM CONTROL

- Integration of HVAC controls with lighting and automatic blinds

SERVICE & SOLUTIONS

- Maintenance solutions
- Modernisation solutions
- Energy performance contract solutions
- Renewable energy solutions

ENERGY MANAGEMENT

- Energy monitoring
- Real time consumption Mgmt
- Continuous commissioning

Reference sites

Our commitment to sustainability and energy efficiency dates back to 1885, with Warren Johnson's invention of the first electric room thermostat. Since then our focus has always been to increase a building's efficiency and operational performance.

The following sites represent building solutions we have developed for our customers based on wide-ranging cross industrial experience in HVAC&R equipment, controls, fire and security systems, and services for commercial and industrial buildings.

7

1

3

5

8

2

4

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1

First building in Austria to be awarded a Green Building Certificate

Johnson Controls Metasys® Building Automation System helps UNIQA Towers in Vienna achieve a Green Building Certificate for energy efficiency.

3

Cisco. UK

Smart+Connected Communities installation designed to save energy costs and improves performance.

5

THI GROUP

Solutions for the hospitality industry.

7

IBM Headquarters

Adding value and conserving energy from the inside out.

2

The Gregor Mendel Institute

State-of-the-art technologies for world-class research.

4

Fiserv (Europe) Ltd

Utilising latest developments in chiller's technology delivers energy savings and ongoing cost reductions for Fiserv.

6

British Embassy. Berlin

Full Lifecycle Solution for British Governement's first Private Finance Initiative outside the UK.

8

Cologne Convention Center

The centrifugal chillers and the building automation system are indispensable in creating and managing an optimal indoor environment.

Catalogue content

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Air Handling Systems & Terminal Devices

Packaged Equipment & Large Split Systems

Comprehensive Solutions

Chillers & Heat Pumps

SCROLL COMPRESSOR CHILLERS AND HEAT PUMPS

SCREW COMPRESSOR CHILLERS AIR-COOLED & WATER-COOLED

CENTRIFUGAL COMPRESSOR CHILLERS WATER-COOLED

ABSORPTION CHILLERS AND HEAT PUMPS

CENTRAL PLANT OPTIMISATION™ 10

Johnson Controls

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ECOFRIO v2 / ECOFRIO v2 Plus
Air cooled chiller / heat pump

YLCA 0012 to 0027 / YLHA 0012 to 0027 Plus

A complete range from 12 kW up to 25.8 kW

The **YORK YLCA/YLHA** air-cooled chillers and heat pumps represents the right solution for any kind of installation.

With thousand. of units installed all around Europe and Africa, used for different applications and in different climate conditions are one of the most flexible and reliable scroll type chillers in the market.

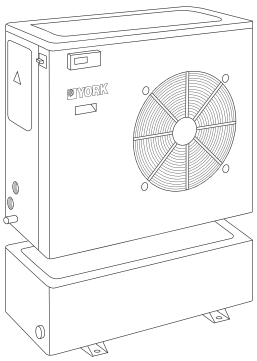
The standard product configuration and the different options and accessories selectable by the customer make these units ideal where a compact, and high performance unit is required.

Features

- Scroll compressor units
- Very compact units
- High efficiency units
- Leaving and return water temperature control
- Hydro pack standard
- Buffer tank supresion function
- Dynamic set point function
- Fan speed control as standard
- Coated condenser fins as standard (blue fin)
- Flow switch and water filter included

Options / Accessories

- Condenser copper fins
- BMS Communication (Carel and Modbus protocol)
- Remote control / Remote terminal
- High pressure fans
- External buffer tank
- Tray cable heater (YLHA Plus)
- Condenser protection grill



External Buffer tank in accessories

ECOFRIO v2 / ECOFRIO v2 Plus

YLCA 0012 to 0027 / YLHA 0012 to 0027 Plus

Technical features

T Three phases supply **C** Hydro Pack

Model			YLCA G1				YLHA PLUS G1			
			0012 TC	0015 TC	0020 TC	0027 TC	0012 TC	0015 TC	0020 TC	0027 TC
Performance	Cooling capacity (1)	kW	12.6	14.8	19.9	26.2	12.2	14.1	19.8	26.4
	Total Input Power (1)	kW	4.32	5.9	6.96	9.26	4.31	5.62	7.07	9.07
	EER (1)		2.92	2.51	2.86	2.83	2.83	2.51	2.8	2.91
	ESEER		3.07	2.87	3.66	3.07	3.05	2.77	3.27	3.24
	Heating capacity (1)	kW	-	-	-	-	12.2	15.8	19.8	25.7
	Total Input Power (1)	kW	-	-	-	-	4.31	5.32	6.64	8.77
	COP (1)		-	-	-	-	2.83	2.97	2.98	2.93
	Heating capacity (2)	kW	-	-	-	-	12.6	16.4	20.5	26.8
	COP (2)		-	-	-	-	3.86	4.0	3.79	3.8
	Capacity steps	%	0 / 100							
	Sound power level	dB(A)	73	73	74	78	73	73	74	78
	Sound pressure level at 10 m	dB(A)	43	43	44	48	43	43	44	48
Compressor	Type		Scroll							
	Quantity		1							
Air side heat exchanger	Fans quantity		2							
	Working ambient temp. cool / heat mode		(5) (-18°C) -10°C ~ 46°C		-18°C ~ 46°C		-18°C ~ 46°C / -15°C ~ 20°C			
Water side heat exchanger	Type		Plate Heat Exchanger							
	Unit water volume	Litres	1.5	2	2.8	3.2	1.5	2	2.8	3.2
	Pump Type		Multi stage							
	Nominal water flow in cooling	l/h	2 065	2 530	3 360	4 405	1 980	2 375	3 335	4 440
	Available pressure (1) (3)	kPa	115	152	134	191	118	160	130	191
	Working water leaving temp. cooling/heating mode (4)	°C	-5°C to 15°C / 30°C to 50°C							
	Water connections	inch	1"		1 1/4"		1"		1 1/4"	
Dimensions & Weight	Height / Width / Depth	mm	1 270 / 905 / 460		1270/1430/502	1270/1876/502	1 270 / 905 / 460		1270/1430/502	1270/1876/502
	Weight	kg	146	160	220	290	150	164	235	330
Electrical features	Voltage / Phases / Frequency	V/ph/hz	400-3-50+N+E							
	Maximum Unit current	A	11.6	15.8	18.1	23	11.6	12.4	15.5	21

(1) net values at Nominal conditions (2) net values at floor heating conditions (3) with filter (4) below 6°C with glycol (5) -18°C with LAK option
Nominal conditions: Cooling capacities for 7°C water leaving temperature Δt 5°C and 35°C ambient temperature
Heating capacities for 45°C water leaving temperature Δt 5°C and 7°C ambient temperature
Floor heating conditions: Heating capacities for 35°C water leaving temperature Δt 5°C and 7°C ambient temperature

Compatibility table / Codes

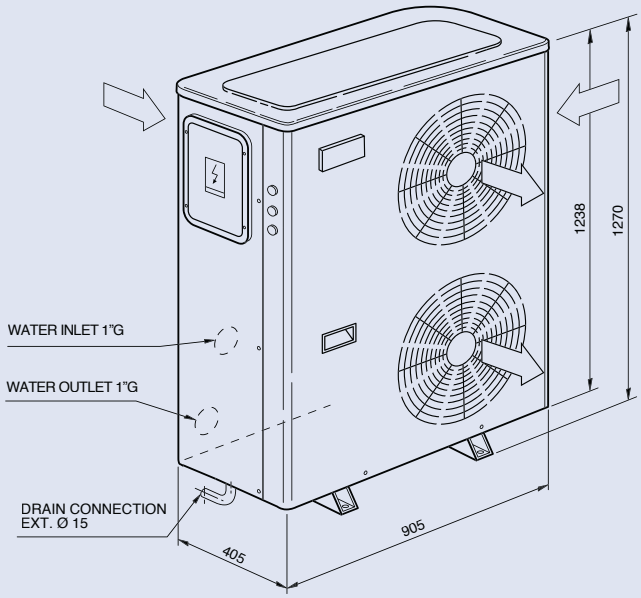
YLCA Model		0012 TC	0015 TC	0020 TC	0027 TC
Cooling only units (Pack included)		S668551282	S668551582	S668552082	S668552782
YLHA Plus Model				**0012 TC**	**0015 TC**	**0020 TC**	**0027 TC**
Heat pump units (Pack included)				S668651285	S668651585	S668652085	S668652785
Use this unit code when a factory fitted option is NOT required							
Accessories (Supplied loose)							
Water tank	30 Liters	S613990300	-	S613990300	-
	115 Liters	-	S613991150	-	S613991150
Water tank + heater	30 L + 4.5 kW (3~)	-		S613990305	-
	30 L + 6 kW (3~)	-		S613990306	-
	115 L + 10.5 kW (3~)	-			S613991151
Remote control		S613802011			
Remote terminal		S613802231			
BMS Communication		S613802041			
Anti vibration mounting		S613029001	S613029002	S613029001	S613029002
Compressor heater		S613760322	STANDARD	S613760322	STANDARD
Tray cable heater		-		S611080788	-

YLCA Model		0012 TC	0015 TC	0020 TC	0027 TC
Cooling only units (Pack included)		S668000010	S668000012	S668000014	S668000016
YLHA Plus Model				**0012 TC**	**0015 TC**	**0020 TC**	**0027 TC**
Heat pump units (Pack included)				S668000239	S668000242	S668000243	S668000244
Use this unit code when a factory fitted option is required							
Options (Factory fitted)							
High pressure fans		S611991083		S611991085	S611991083		S611991085
Condenser protection grill		S613995085	S613995086	S613995087	S613995085	S613995086	S613995087
LAK -18°C		S613112083	STANDARD				

Manufacturer reserves the rights to change specifications without prior notice.

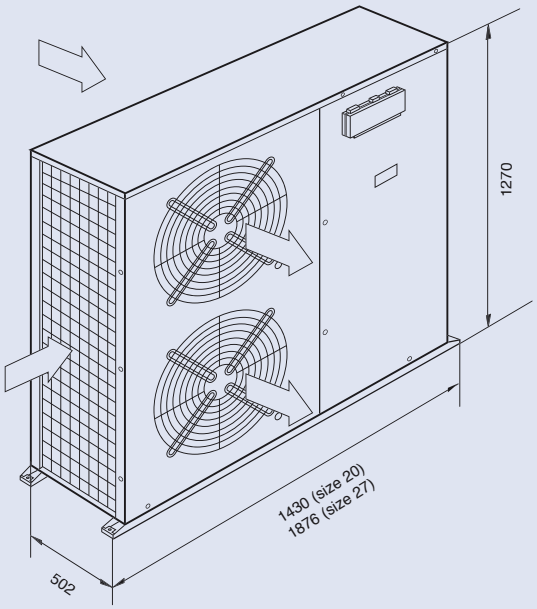
Dimensions, hydraulic connections and space requirements

YLCA-YLHA PLUS 0012/0015 TC



All dimensions in mm. Drawings not a scale.

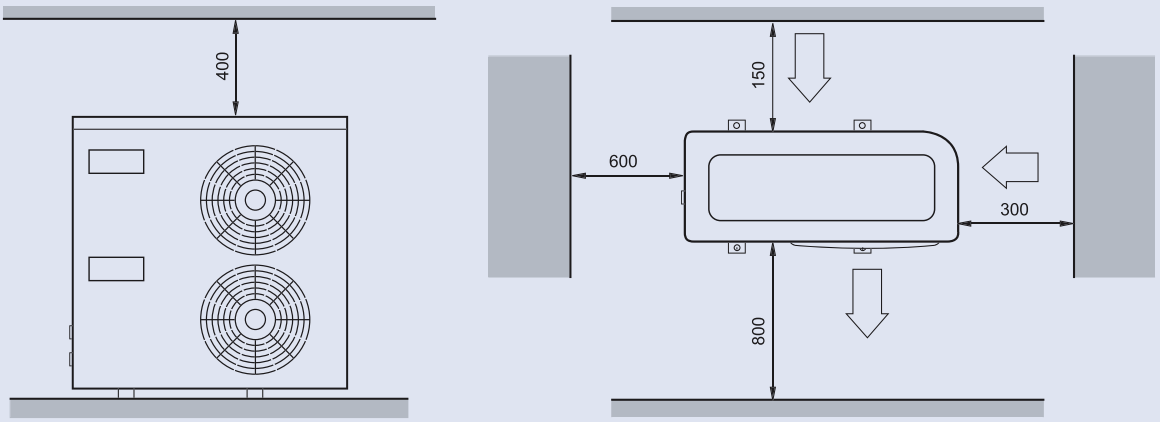
YLCA-YLHA PLUS 0020/0027 TC



All dimensions in mm. Drawings not a scale.

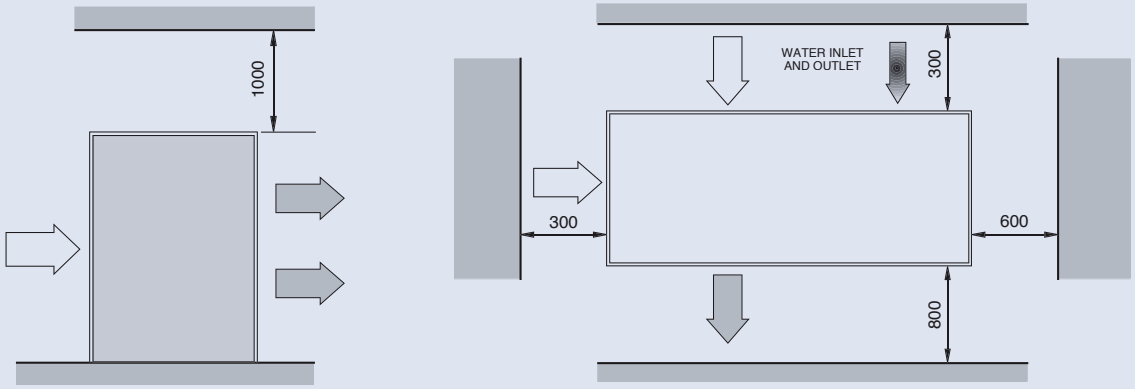
YLCA-YLHA PLUS 0012 to 0027

Models YLCA-YLHA PLUS 0012/0015



All dimensions in mm. Drawings not a scale.

Models YLCA-YLHA PLUS 0020/0027



All dimensions in mm. Drawings not a scale.

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ECOFRIO v2
Air cooled chiller / heat pump

YLCA / YLHA 0040 to 0150

A complete range from 39.6 kW up to 151 kW

The **YORK YLCA/YLHA** air-cooled chillers and heat pumps represents the right solution for any kind of installation.

With thousands of units installed all around Europe and Africa, used for different applications and in different climate conditions are one of the most flexible and reliable scroll type chillers in the market.

The standard product configuration and the different options and accessories selectable by the customer make these units ideal where a compact, and high performance unit is required.

Features

YLCA/YLHA 0040 to 0080

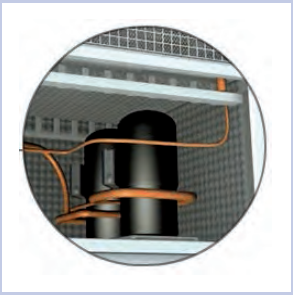
- 2 capacity steps (1 for size 40)
- LWT & RWT Control
- Plate heat exchanger
- Condenser fins (blue fin)
- Pressostatic LAK (-18°C)

YLCA/YLHA 0100 to 0150

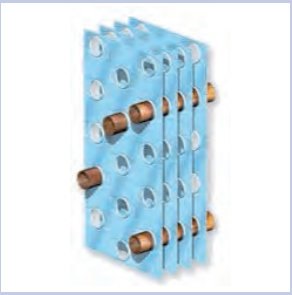
- Same features as YLCA/YLHA 40 to 80
- 4 capacity steps
- High efficiency at full and partial load
- Reduced noise levels
- 1/4 turn lock for easy access

Options / Accessories

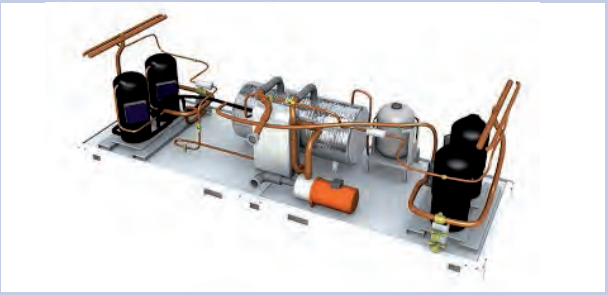
- Unit without pack
- BMS Communication (Carel and Modbus protocol)
- Remote control
- Remote terminal
- Water filter (unit without Hydro Pack)
- Flow switch (unit without Hydro Pack)
- Low noise version
- Dual pump version
- Antivibration mountings
- Condenser protection grille



Low noise version with special insulation in the compressor chamber.



Special coating on the condenser fins for improved corrosion protection.



Pump built-in for space saving and easy installation.

ECOFRIO v2

YLCA / YLHA 0040 to 0150

Technical features

T Three phases supply **P** Hydro Pack **H** Heat pump

Model			YLCA / YLHA						
			0040 T-TP	0050 T-TP	0060 T-TP	0080 T-TP	0100 T-TP	0120 T-TP	0150 T-TP
Performance	Cooling capacity c/o units (1)	kW	39.3	51.8	60.1	77	100.3	118.5	150.5
	Total Input Power (1) (3)	kW	13.69	18.3	20.03	27.11	34.47	40.44	54.14
	EER (1)		2.87	2.83	3	2.84	2.91	2.93	2.78
	ESEER (1)		3.15	3.18	3.3	3.15	3.74	3.83	3.66
	Cooling capacity h/p units (1)	kW	37.6	51.2	60.1	71.7	95.4	113.6	144.5
	Heating capacity h/p units (1)	kW	38.8	52.8	60	75.2	104.6	120	150.5
	Total Input Power cool/heat mode (1)	kW	13.48 / 12.81	17.65 / 18.21	20.03 / 20.2	26.46 / 26.86	36.14 / 37.76	43.69 / 40	51.06 / 53.94
	EER / COP (1)		2.79 / 3.03	2.93 / 2.9	3 / 2.97	2.71 / 2.8	2.64 / 2.77	2.6 / 3	2.83 / 2.79
	ESEER (1)		3.15	3.18	3.29	2.91	3.39	3.43	3.73
	Capacity steps	%	0 / 100	0-50-100			0-25-50-75-100		
	Sound power level STD / LN	dB(A)	78 / 73	81 / 76	87 / 77	83 / 79	82 / 78	82 / 78	84 / 80
Compressor	Type		Scroll						
	Quantity		1	2			4		
Air side heat exchanger	Fans quantity		2			3	4		
	Working ambient temp. cool. / heat. mode		-18°C ~ 46°C / -10°C ~ 20°C						
Water side heat exchanger	Type		Single Plate Heat Exchanger				Dual Plate Heat Exchanger		
	Unit water volume (2)	Litres	131	188	194	285	193	195	214
	Pump Type		Multistage horizontal pumps						
	Nominal water flow	l/h	6 820	8 960	10 400	13 350	17 600	20 470	25 970
	Available pressure (1) (2)	kPa	105	108	158	123	187	202	186
	Pressure drop (1) (3)	kPa	75	39	50	63	59	33	27
	Working range water leaving temperature cooling / heating (4)		-5°C ~ 15°C / 30°C ~ 50°C						
	Water connections (2)	inch	1 1/4"	2"			2 1/2"		
Dimensions & Weight	Height / Width / Depth	mm	1573/1500/822	1600 / 1011 / 2104		1600/1118/2944	2190 / 1101 / 3416		2263/1101/3770
	Weight without pack / pack c/o	kg	340 / 380	524 / 580	555 / 611	715 / 785	1 124 / 1 220	1 190 / 1 286	1 415 / 1 503
	Weight without pack / pack h/p	kg	337 / 397	537 / 593	568 / 624	735 / 805	1 154 / 1 250	1 220 / 1 316	1 445 / 1 703
Electrical features	Voltage / Phases / Frequency	V/ph/hz	400 / 3 / 50+N+E						
	Maximum Unit current	A	33	46.2	49.2	70.5	80	108	120

YLCA: Cooling only units models. YLHA: Air to water heat pump models.
(1) net values at Eurovent nominal conditions (2) version P with hydro kit with filter (3) version without hydro kit (4) below 6°C with glycol
Nominal conditions: Cooling capacities in kW given for 7°C water leaving temperature Δt 5°C and 35°C ambient temperature
Heating capacities in kW given for 45°C water leaving temperature and 7°C ambient temperature

Compatibility table / Codes

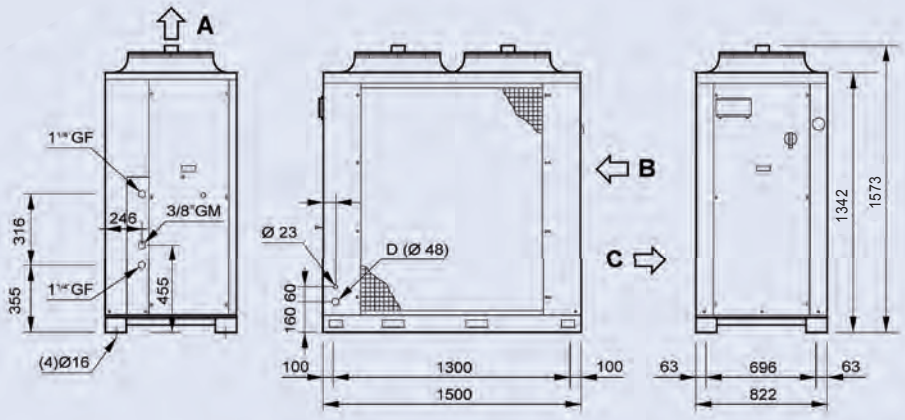
Model	0040 TP	0050 TP	0060 TP	0080 TP	0100 TP	0120 TP	0150 TP
YLCA Cooling only unit (Pack included)	S668554084	S668525182	S668526182	S668528182	S668521182	S668551156	S668551507
YLHA Heat pump unit (Pack included)	S668654084	S668625182	S668626182	S668628182	S668621182	S668651156	S668651506
Model	**0040 T**	**0050 T**	**0060 T**	**0080 T**	**0100 T**	**0120 T**	**0150 T**
YLCA Cooling only unit (without Pack)	S668554080	S668525180	S668526180	S668528180	S668521180	S668551154	S668551503
YLHA Heat pump unit (without Pack)	S668654080	S668625180	S668626180	S668628180	S668621180	S668651154	S668651504
Use this unit code when a factory fitted option is NOT required							
Accessories (Supplied loose)							
AVM mounting	S613029002	S613026080		S613028180	S613021580		
Mechanical flow switch	S611992021						
Water Filter *	S611300150	S611300170			S611300190		
Remote control	S613802011						
Remote terminal	S613802231				-		
Cable for remote connection of the terminal	-				S613802241		
B.M.S. Communication	S613802041				S613802051		

Model	0040 TP	0050 TP	0060 TP	0080 TP	0100 TP	0120 TP	0150 TP
YLCA Cooling only unit (Pack included)	S668000226	S668000247	S668000251	S668000255	S668000259	S668000107	S668000111
YLHA Heat pump unit (Pack included)	S668000228	S668000248	S668000252	S668000256	S668000260	S668000131	S668000135
Model	**0040 T**	**0050 T**	**0060 T**	**0080 T**	**0100 T**	**0120 T**	**0150 T**
YLCA Cooling only unit (without Pack)	S668000038	S668000245	S668000249	S668000253	S668000257	S668000105	S668000109
YLHA Heat pump unit (without Pack)	S668000039	S668000246	S668000250	S668000254	S668000258	S668000129	S668000133
Use this unit code when a factory fitted option is required							
Options (Factory fitted)							
Low Noise version	S613990550	S613990650		S613990850	S613991050	S613991285	S613991584
Softstart	S606744692	S606744693			S606744694		
Dual pumps **	-	S613990540	S613990640	S613990840	S613991040	S613991286	S613991585
Condenser protection grille	S613995090	S613995091		S613995092	S613995093		S613995094

** included with unit version "P" only for unit without pack. Filter size: 2" for YLCA 40-50-60-80 and 2 1/2" for YLHA 100-120-150.*
*** Dual pump option has to be ordered with units with hydrokit.*

Dimensions and hydraulic connections

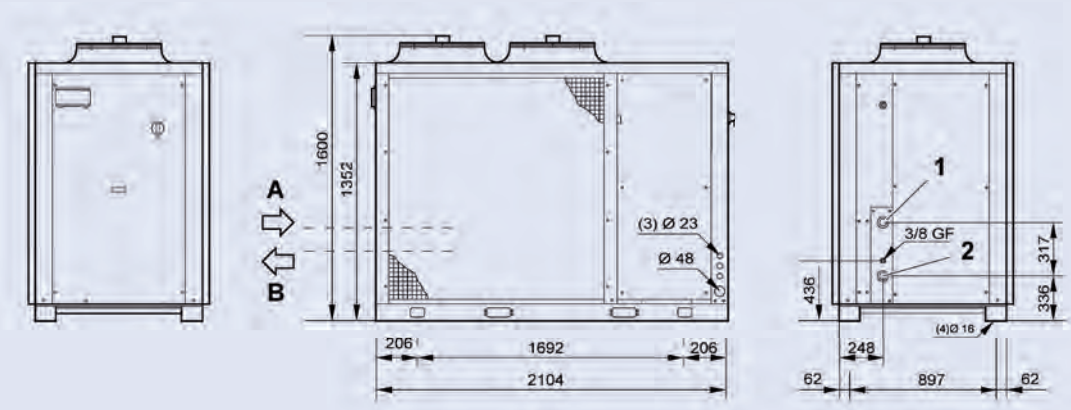
YLCA-YLHA 0040 T-TP



All dimensions in mm. Drawings not a scale.

Unit	A	B	C
YLCA/YLHA 0040	Air outlet	Water inlet	Water outlet

YLCA-YLHA 0050 and 0060 T-TP

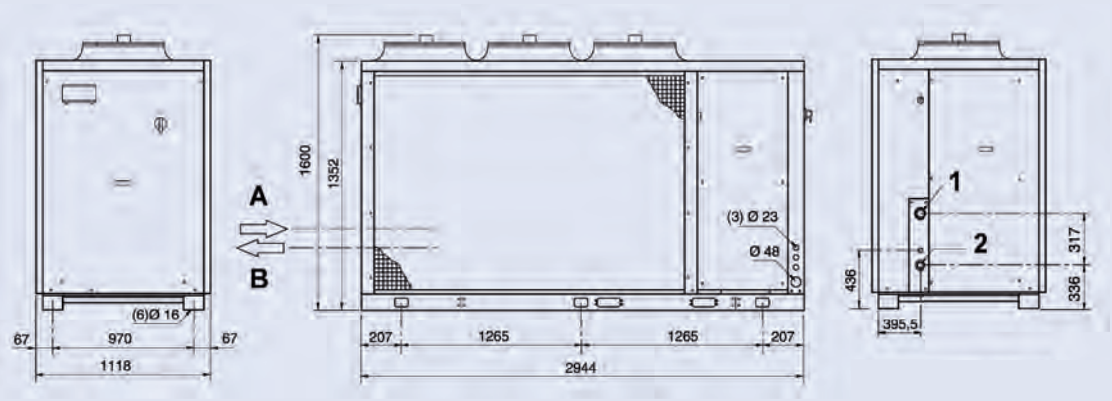


All dimensions in mm. Drawings not a scale.

Unit	A	B	1	2
YLCA/YLHA 0050-0060	Water inlet	Water outlet	2" GF (Inlet)	2" GF (Outlet)

YLCA / YLHA 0040 to 0150

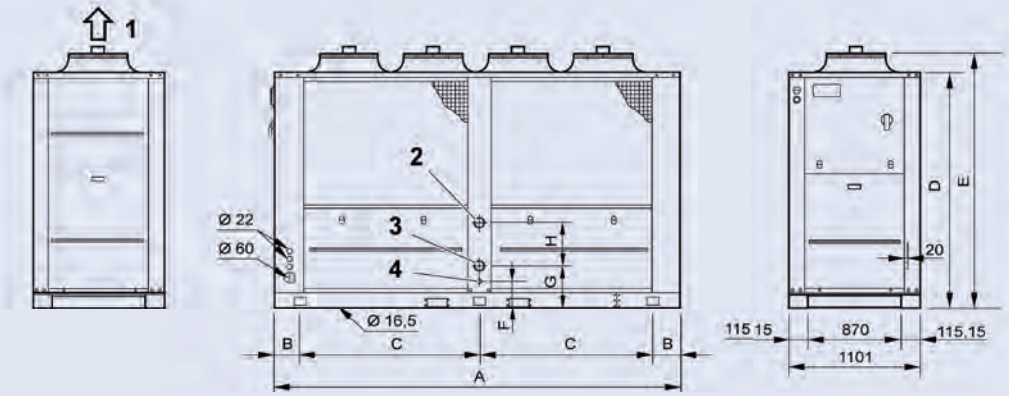
YLCA-YLHA 0080 T-TP



All dimensions in mm. Drawings not a scale.

Unit	A	B	1	2
YLCA/YLHA 0080	Water inlet	Water outlet	2" GF (Inlet)	2" GF (Outlet)

YLCA-YLHA 0100, 0120 and 0150 T-TP



Unit	1	2	3	4	A	B	C	D	E	F	G
YLCA/YLHA 0100-0120	Air outlet	Water outlet Ø2 1/2" G	Water inlet Ø2 1/2" G	Drain Ø 20 x 20	3 416	182	1 525	1 942	2 190	199	289
YLCA/YLHA 0150					3 770	255	1 630	1 993	2 263	145	211

All dimensions in mm. Drawings not a scale.

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YLCD-YLHD
Air cooled chiller / heat pump

YLCD-YLHD 0025 to 0150
A complete range from 24 kW up to 145 kW

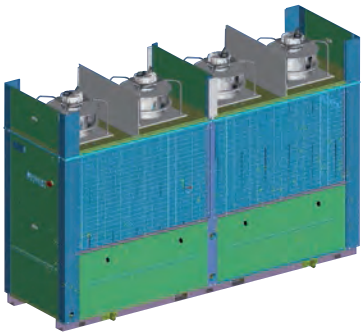
The new **YORK YLCD/YLHD** air-cooled chillers and heat pumps with powered fans are ideal solution for units to be installed in technical rooms or in louvered/hidden spaces on the roof.

Sharing the reliable and proven designed with YLCA/YLHA, these new units using R-410a aims to help the installer and the user to help to find solutions for special and difficult installations.

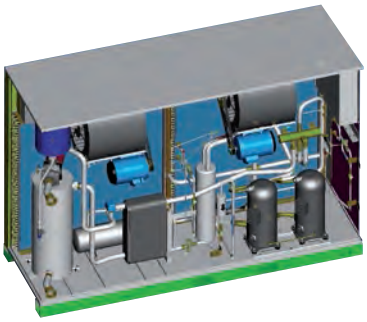
The bigger sizes (from 100 to 150 kW) utilize new EC Inverter radial fans, that will keep always the right performance for the unit at any outdoor condition.

Features
- Centrifugal or radial fans
- Scroll compressor
- Vertical and horizontal discharge
- Integrated Hydro kit (P versions)
- LAK (-18°C) standard (sizes 100-150)
- Flow switch standard

Options / Accessories
- Vertical Discharge kit (sizes 25 to 70)
- Low Noise (sizes 100 to 150)
- Dual Water Pumps (sizes 100 to 150)
- Water filter and water flow switch
- Antivibration mounting
- Remote control and remote terminal
- BMS communication (Carel and Modbus protocol)



EC Radial Fans (sizes 100 to 150), using new high efficiency ventilation technology to improve the overall performance.



Integrated Hydrokit, shared with YLCA/YLHA product platform, for a compact and quick installation.

Air cooled chiller & heat pump

YLCD-YLHD 0025 to 0150

Technical features

T Three phases supply **C/P** Hydro Pack **H** Heat pump

Models			YLCD / YLHD					
			0025 TC	0040 T-TP	0070 T-TP	0100 T-TP	0120 T-TP	0150 T-TP
Performance	Cooling capacity c/o units (1)	kW	24.6	39.8	69.5	98.4	118.5	144.5
	Total Input Power (1)	kW	8.45	15.13	27.36	37.41	44.72	56.67
	EER (1)		2.91	2.63	2.54	2.63	2.65	2.55
	Cooling capacity h/p units (1)	kW	23.6	39.8	67.5	95.4	116.5	142.5
	Heating capacity h/p units (1)	kW	23.4	43.2	72.5	104.6	120.1	159.5
	Total Input Power cool/heat mode (1)	kW	8.14 / 8.18	15.13 / 15.6	26.57 / 26.46	36.27 / 37.63	42.21 / 43.2	60.13 / 59.07
	EER / COP (1)		2.9 / 2.86	2.63 / 2.77	2.54 / 2.74	2.63 / 2.78	2.76 / 2.78	2.37 / 2.7
	Capacity steps	%	100	50-100		25-50-75-100		
	Sound power level	dB(A)	81	83	86	86	86	87
Compressor	Type		Scroll					
	Quantity		1	2	2	4	4	4
Air side heat exchanger	Fans quantity		1	2	2	4	4	4
	Nominal air flow	m^3/h	8 100	18 000	23 000	36 000		48 000
	Nominal static pressure	Pa	100		150	200		
	Working ambient temp. cool. / heat. mode		(4) (-18°C) ~ 46°C / -10°C ~ 20°C			-18°C ~ 46°C / -10°C ~ 20°C		
Water side heat exchanger	Type		Single plate heat exchanger			Dual plate heat exchanger		
	Unit water volume	Litres	32	84	92	193	195	214
	Pump Type		Multistage horizontal pump					
	Nominal water flow	l/h	4 300	6 880	12 040	17 030	20 470	24 940
	Available pressure (1) (2)	kPa	208	105	120	187	202	186
	Pressure drop (1) (3)	kPa	-	31	53	54	32	24.5
	Working range water leaving temperature cooling / heating (5)		-5°C ~ 15°C / 30°C ~ 50°C					
	Water connections	inch	1-1/4"	2"		2-1/2"		
Dimensions & Weight	Height	mm	1 526	1 794	1 794	2 460	2 460	2 480
	Width	mm	1 740	2 659	2 659	3 466	3 416	3 768
	Depth	mm	785	897	897	1 101	1 101	1 101
	Weight without pack / pack c/o	kg	- / 390	730 / 770	740 / 780	1 264 / 1 360	1 264 / 1 360	1 680 / 1 776
	Weight without pack / pack h/p	kg	- / 400	750 / 790	760 / 800	1 284 / 1 380	1 284 / 1 380	1 700 / 1 796
El. supply	Voltage / Phases / Frequency	V/ph/hz	400 / 3 / 50 + N + E					

YLCD: Cooling only units models. YLHD: Air to water heat pump models.
(1) net values at Eurovent nominal conditions (2) version P with hydro kit with filter (3) version without hydro kit (4) -18°C with LAK option (5) below 6°C with glycol
Nominal conditions: Cooling capacities in kW given for 7°C water leaving temperature Δt 5°C and 35°C ambient temperature
Heating capacities in kW given for 45°C water leaving temperature and 7°C ambient temperature

Compatibility table / Codes

Models	-	0040 T	0070 T	0100 T	0120 T	0150 T
Cooling only unit YLCD	-	S668594083	S668597083	S668591083	S668591283	S668591583
Heat pump unit YLHD	-	S668574083	S668577083	S668571083	S668571283	S668571583
Models	**0025 TC**	**0040 TP**	**0070 TP**	**0100 TP**	**0120 TP**	**0150 TP**
Cooling only unit YLCD	S668592580	S668594080	S668597080	S668591080	S668591280	S668591580
Heat pump unit YLHD	S668572580	S668574080	S668577080	S668571080	S668571280	S668571580

Use this unit code when a factory fitted option is NOT required

Accessories (Supplied loose)

AVM mounting	S613029002	S613028180	S613021580		
Flow switch	S611992021				
Remote control	S613802011				
Remote terminal	S613802231		-		
Cable for remote connection of the terminal	-		S613802241		
B.M.S. Communication	S613802041		S613802051		

Models	-	0040 T	0070 T	0100 T	0120 T	0150 T
Cooling only unit YLCD	-	S668000264	S668000268	S668000272	S668000276	S668000280
Heat pump unit YLHD	-	S668000266	S668000270	S668000274	S668000278	S668000282
Models	**0025 TC**	**0040 TP**	**0070 TP**	**0100 TP**	**0120 TP**	**0150 TP**
Cooling only unit YLCD	S668000262	S668000265	S668000269	S668000273	S668000277	S668000281
Heat pump unit YLHD	S668000263	S668000267	S668000271	S668000275	S668000279	S668000283

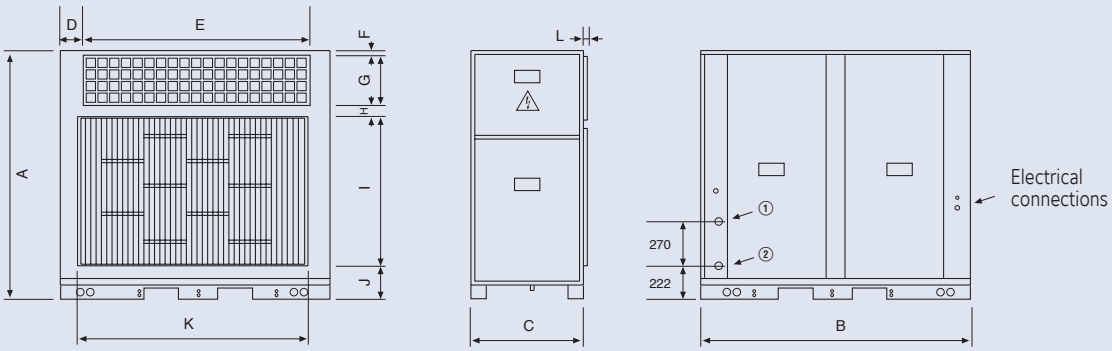
Use this unit code when a factory fitted option is required

Options (Factory fitted)

Low noise	NA	S613990550	NA	S613991050	S613991285	S613991584
Dual pump	NA	NA	NA	S613991040	S613991286	S613991585
Coil guard net	Standard			S613995093		S613995094
Low Ambient Kit	S613114085	S613111084		Standard		
Soft start	S606744692	S606744693		S606744694		
Vertical air discharge	S612828405	S612828205		Standard		
Copper/copper condenser	Contact Johnson Controls					

Dimensions and hydraulic connections

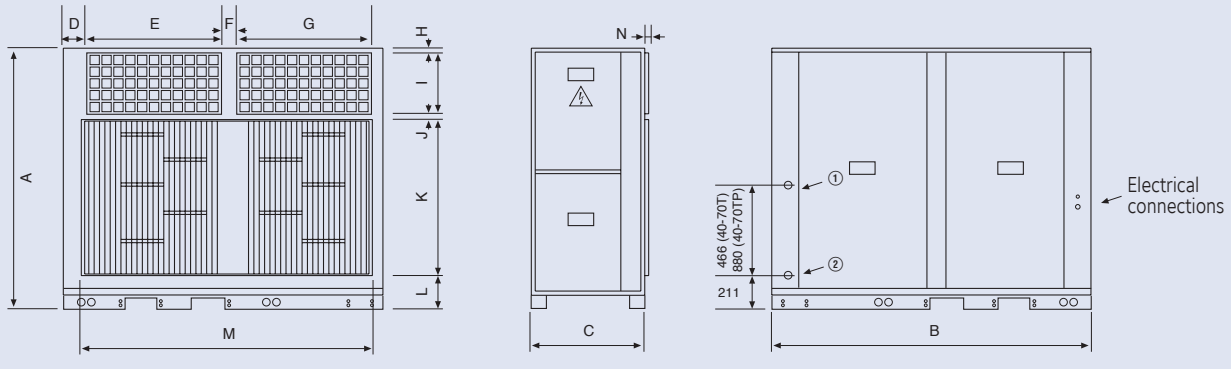
YLCD / YLHD 0025 TC



All dimensions in mm. Drawings not a scale.

Unit	A	B	C	D	E	F	G	H	I	J	K	L
YLCD/YLHD 0025 TC	1 526	1 740	785	151	1436	30	324	37	994	141	1476	24

YLCD / YLHD 0040-0070 T/TP

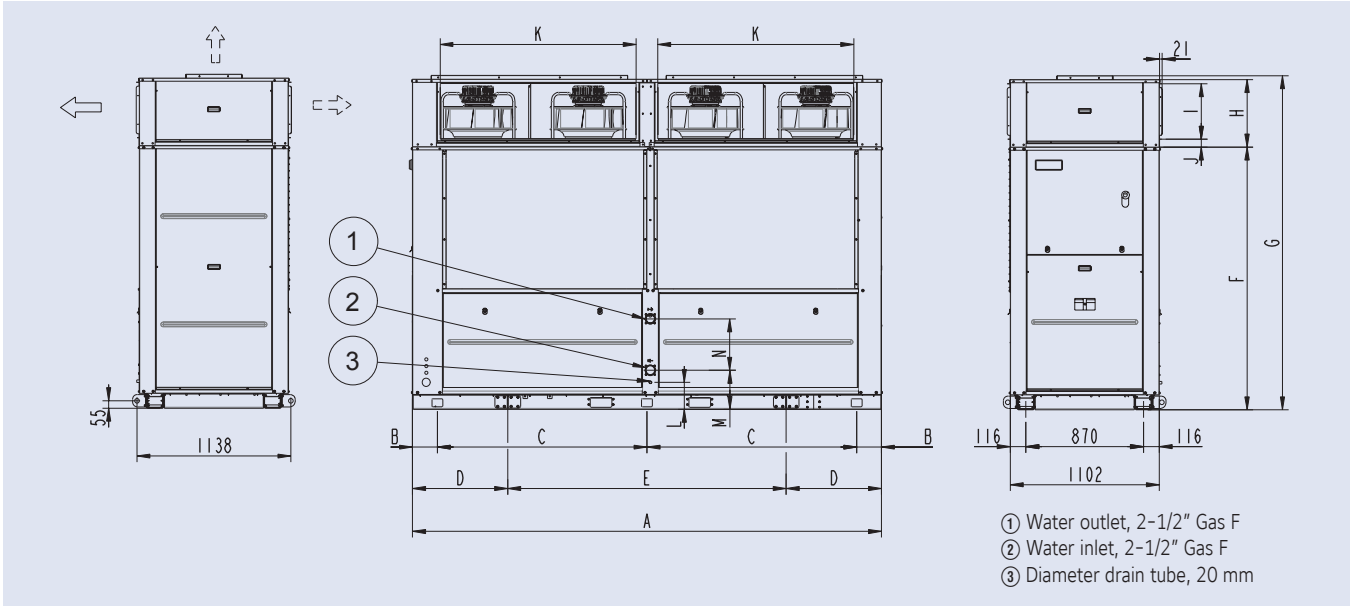


All dimensions in mm. Drawings not a scale.

Unit	A	B	C	D	E	F	G	H	I	J	K	L	M	N
YLCD/YLHD 0040 T/TP	1 794	2658	897	148	1155	95	1155	30	389	37	1 200	138	2479	23
YLCD/YLHD 0070 T/TP	1 794	2658	897	148	1155	95	1155	30	389	37	1 200	138	2479	23

YLCD-YLHD 0025 to 0150

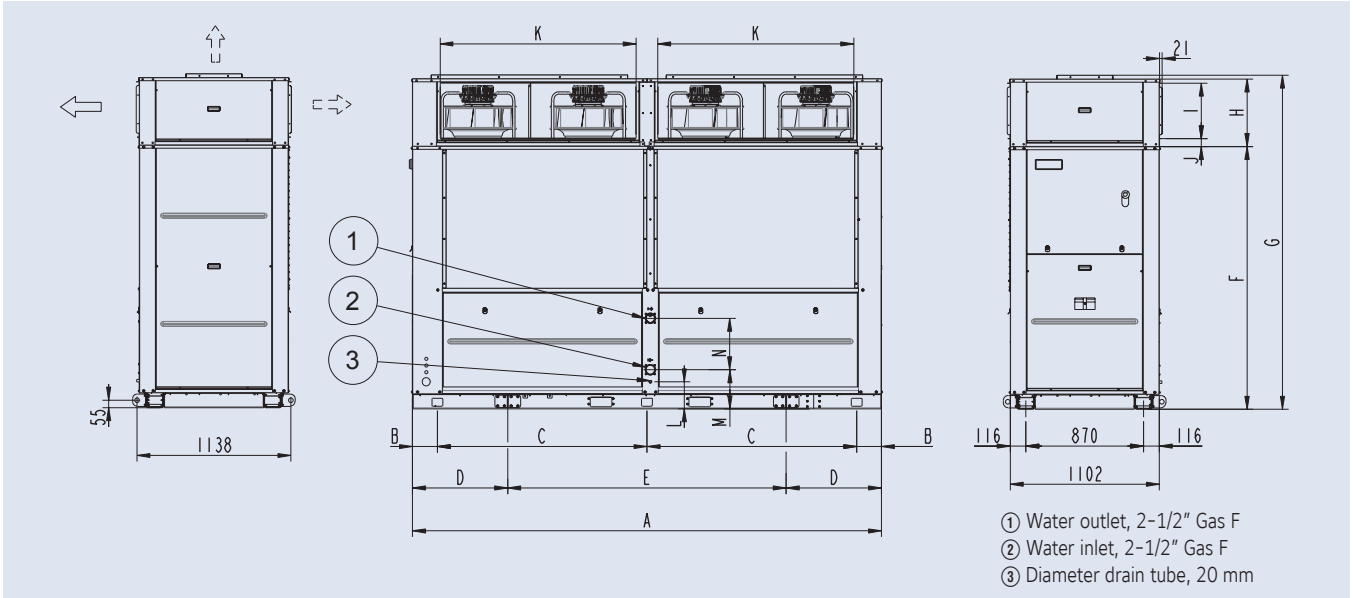
YLCD / YLHD 0100-0120 T/TP



All dimensions in mm. Drawings not a scale.

Unit	A	B	C	D	E	F	G	H	I	J	K	L	M	N
YLCD/YLHD 0100 T/TP	3 466	183	1 550	704	2 058	1 942	2 460	500	410	59	1 450	200	290	380
YLCD/YLHD 0120 T/TP	3 416	183	1 525	604	2 208	1 942	2 460	500	418	55	1 438	200	290	380

YLCD / YLHD 0150 T/TP



All dimensions in mm. Drawings not a scale.

Unit	A	B	C	D	E	F	G	H	I	J	K	L	M	N
YLCD/YLHD 0150 T/TP	3 768	254	1 630	605	2 558	1 992	2 480	470	386	55	1 617	410	210	458

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YCAE
Modular air cooled scroll chiller / heat pump

YCAE 065R/S to 0100R/S (CE version)

A complete range from 64 kW up to 99 kW

Features

Up to 8 modules in one water system; each module can be operated separately. Built-in main water pipe makes it easy to install in the field

Ability to configure modular chillers to fit the space
Installation flexibility for modular chillers will allow you to use all the available space. Many different possible configurations (linear, parallel, star, etc).

Ability to add more modular chillers in the future
Buildings being constructed or occupied in phases do not need the full cooling/heating capacity at the start. Modular chillers allow you to stage the investment by combining modules to obtain the required capacity.

Ability to stock a few models and cover large range
Modular chillers are your solution. Limited numbers of module configurations allow the distribution channel to keep modules in stock.

Quick and easy module combination
Connecting the water piping and cables, installing the sensors and bringing power to the modular(s) makes installation quick and easy.

Full redundancy – Easy parts management
Modularity and the central controller allows you to decide the quantity of modules active at anytime. In the event of maintenance other modules in the system will continue to operate ensuring minimal capacity loss.

Small modules, small components, low noise
Modularity design is based on low capacity modules installed together. Components are carefully selected based on its performance, reliability and low sound attributes. When comparing modular systems with standard chillers, modular chillers provide a lower noise level.

Very easy and intuitive central controller
Modular units, which can manage up to 8 modules per system, are controlled with a single central controller. Central controller sequence enables the units to even out the run hours and prolong the life of the chiller.

Intelligent defrost - For heat pumps
For our air to water heat pumps, defrost must occur. The central controller optimizes the sequencing of the defrost cycle allowing only one module to defrost at a time. This allows the remaining modules to continue to provide heating.

Modular air cooled scroll chiller / heat pump

YCAE 065R/S to 0100R/S

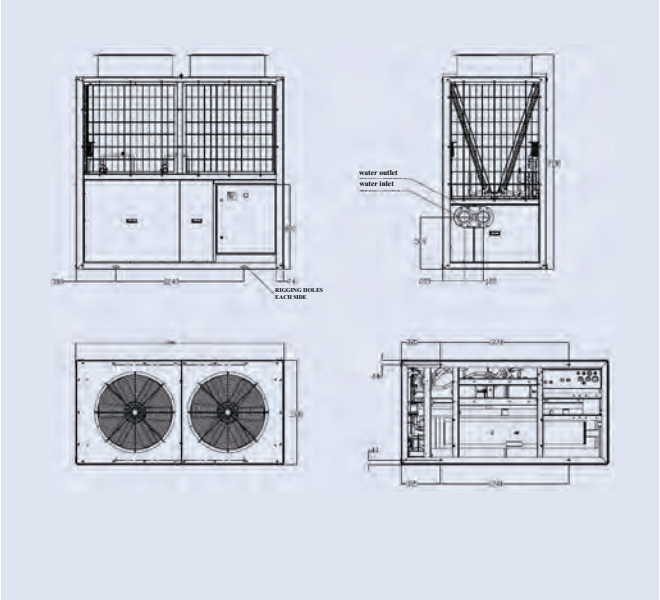
Technical features

Model			YCAE065SME53	YCAE065RME53	YCAE100SME53	YCAE100RME53
Cooling capacity		kW	64.1	64.1	99	99
Heating capacity		kW	-	70	-	103
EER / COP			3.05 / -	3.05 / 3.39	3.16 / -	3.16 / 3.2
ESEER			3.32	3.32	3.65	3.65
Refrigerant charge		kg	2 x 9	2 x 9	3 x 10.5	3 x 10.5
Sound power level		dB(A)	83	83	85	85
Capacity adjustment		%	0, 50, 100	0, 50, 100	0, 33, 66, 100	0, 33, 66, 100
Compressor	Type		Scroll	Scroll	Scroll	Scroll
	No.		2	2	3	3
Power input	Cooling	kW	21	21	31.3	31.3
	Heating	kW	-	20.8	-	33.9
Fan	Power input	kW	0.9 x 2	0.9 x 2	0.9 x 3	0.9 x 3
	Fan No.		2	2	3	3
	Air flow	m^3/h	13000 x 2	13000 x 2	13000 x 3	13000 x 3
Water-side heat exchanger	Water pressure drop	kPa	50	50	50	50
	Water pipe size	mm	114	114	89	89
	Pipe connection		Clamp	Clamp	Clamp	Clamp
	Water flow	m^3/h	11.1	11.1	17.2	17.2
Max. operating Current		A	49.3	49.3	74	74
Dimensions	Length	mm	2000	2000	2030	2030
	Width	mm	1000	1000	1930	1930
	Height	mm	2100	2100	2100	2100
Weight	Shipping weight	kg	800	840	1180	1240
	Operating weight	kg	880	920	1280	1350

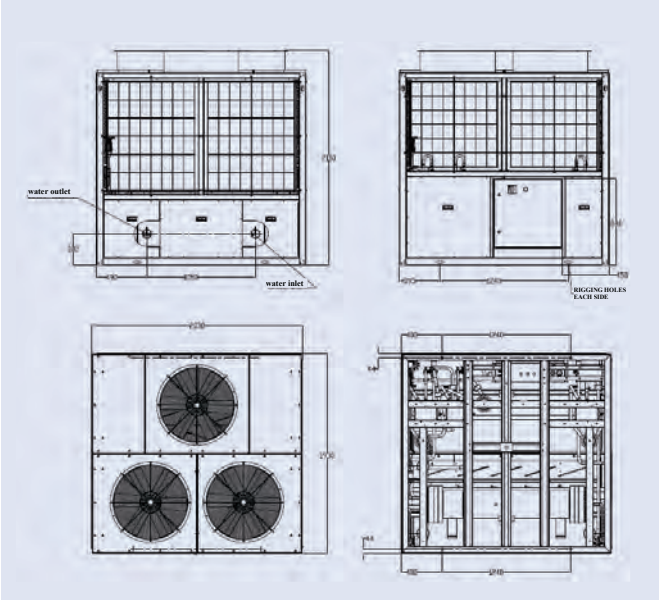
Nominal conditions: Cooling capacities in kW given for 7°C water leaving temperature Δt 5°C and 35°C ambient temperature
Heating capacities in kW given for 45°C water leaving temperature and 7°C ambient temperature

Dimensions and hydraulic connections

YCAE 065R/S



YCAE 100R/S



All dimensions in mm. Drawings not a scale.

Manufacturer reserves the rights to change specifications without prior notice.

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YLAA
Air-cooled scroll compressor chiller

Cooling capacities from 190 kW to 519 kW

There are 2 versions COOLING ONLY	
YLAA SE	Standard Efficiency
YLAA HE	High Efficiency

Features

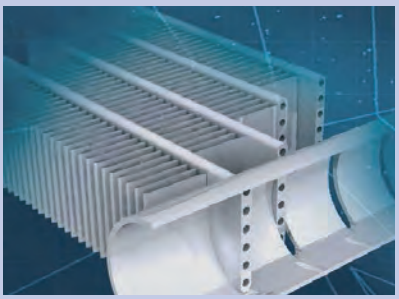
The **YORK YLAA TEMPO** air-cooled chiller is an environmental leader.

Utilising scroll type compressors and microchannel condenser coil technology the **YLAA** delivers premium efficiency for all air conditioning applications.

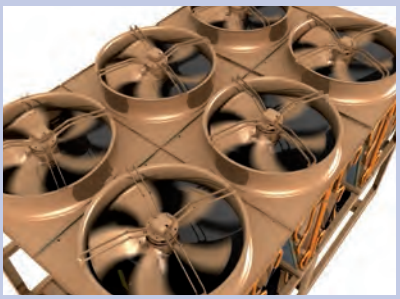
YLAA chillers are a self-contained cooling solution that is light-weight and compact for convenient installation on the ground or on building rooftops.

Options / Accessories

- Soft start
- Power Factor Correction Capacitors
- Low ambient kit
- BMS Interfacing options
- Dual pressure relief valves
- Victaulic coupling
- Flow switch
- Heat recovery option
- Enclosure options
- Sound attenuation options
- Anti-vibration mounts options
- Hydrokits with single and dual pump
- Epoxy Post-coated Dipped Microchannel Coils
- VSD Fans

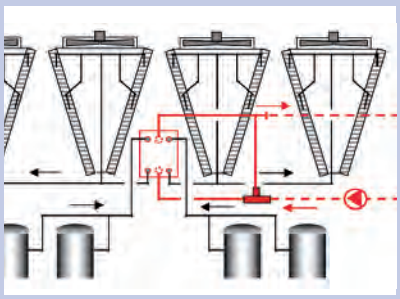


The TEMPO delivers energy efficiency levels that surpasses Eurovent A Class requirements. Aluminium microchannel condenser coil technology is one reason for this premium efficiencies.



Ultra quiet operation can be obtained through optional dual or low speed fans and a compressor accousitc enclosure.

A single point power connection and optional, factory packaged water pumps, water filter and flow switch provide fast and easy installation.



An optional heat recovery feature can be added to provide hot water to 50°C; which is useful for facility heating or hot water preheating.

Air-cooled scroll compressor chiller

YLAA 0180 to 0517

Nominal capacity

YLAA SE Standard	0180	0210	0241	0286	0320	0360	0400	0435	0485
Cooling capacity (kW)	190	205	218	272	310	349	388	423	473
EER	2.97	2.42	2.74	2.62	2.44	2.57	2.45	2.55	2.48
ESEER	3.97	3.43	3.6	3.84	3.63	3.84	3.71	3.75	3.74
ESEER with VSD	-	-	-	-	-	-	-	-	-
Sound power level dB(A)	89	89	86	90	94	94	95	96	96
Sound power level Low Noise Version dB(A)	82	83	84	87	87	87	87	89	89

YLAA HE High Efficiency	0195	0221	0261	0301	0350	0391	0442	0457	0517
Cooling capacity (kW)	198	212	248	295	344	380	426	455	519
EER	3.1	3.2	3.08	2.99	2.95	2.96	2.96	2.9	2.93
ESEER	4.25	4.15	4.08	3.98	3.92	4.12	4.1	3.98	4.16
ESEER with VSD	-	4.44	4.34	4.27	4.28	4.36	4.35	4.30	4.38
Sound power level dB(A)	89	91	90	93	94	95	95	96	96
Sound power level Low Noise Version dB(A)	82	84	87	86	87	88	88	89	89

At leaving chilled water temperature of 7°C, and ambient temperature of 35°C.

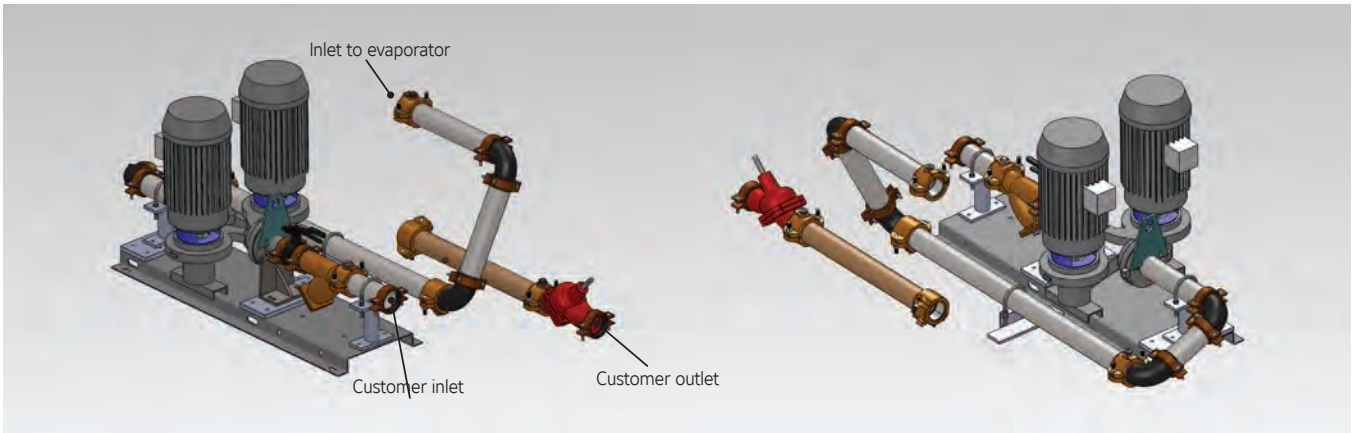
Technical data

YLAA SE Standard			0180	0210	0241	0286	0320	0360	0400	0435	0485
Dimensions	Length	mm	2911					3614			
	Width	mm	2242								
	Height	mm	2508								
Operating weight kg			1681	1725	1785	1853	1937	2814	2873	2642	2755

YLAA HE High Efficiency			0195	0221	0261	0301	0350	0391	0442	0457	0517
Dimensions	Length	mm	2911			3614			4769		
	Width	mm	2254								
	Height	mm	2507								
Operating weight kg			1706	1721	1851	2170	2339	2508	3343	3481	3615

YLAA Pump Kit

- Two option levels - basic and full featured - for maximum flexibility
- More impeller size options for better match to customer requirements
- New, smaller pump motors suitable for primary-secondary systems
- VSD option by SQ



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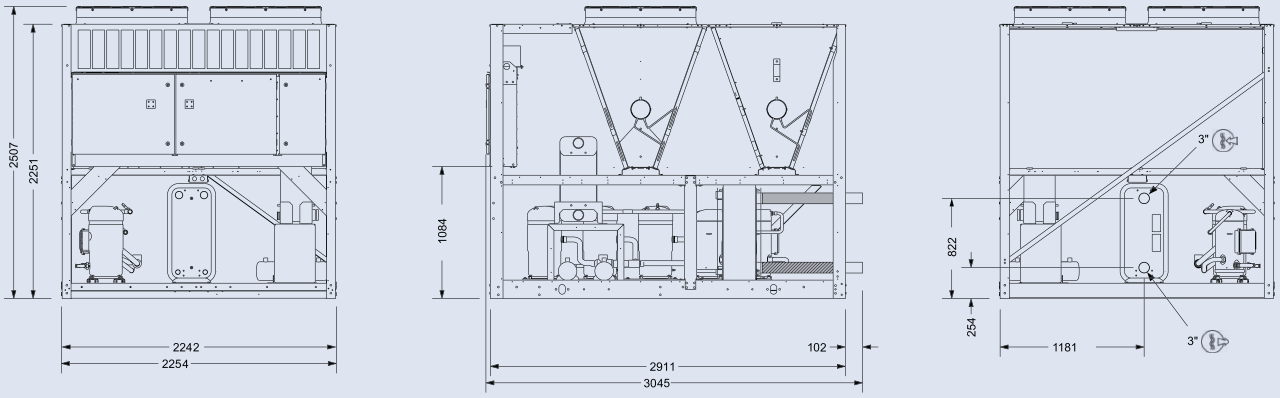
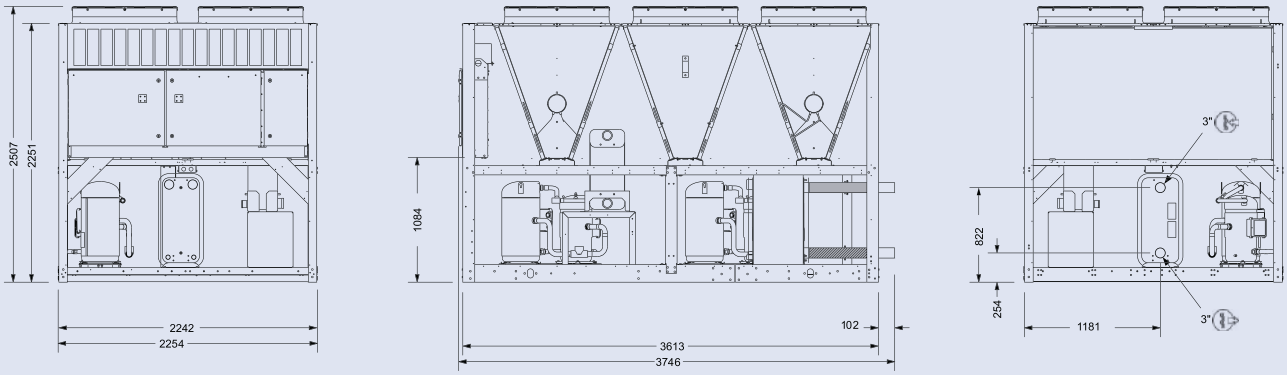
Dimensions and hydraulic connections

YLAA0180SE, 0210SE, 0241SE, 0286SE, 0320SE, 0195HE, 0221HE & 0261HE



All dimensions in mm. Drawings not a scale.

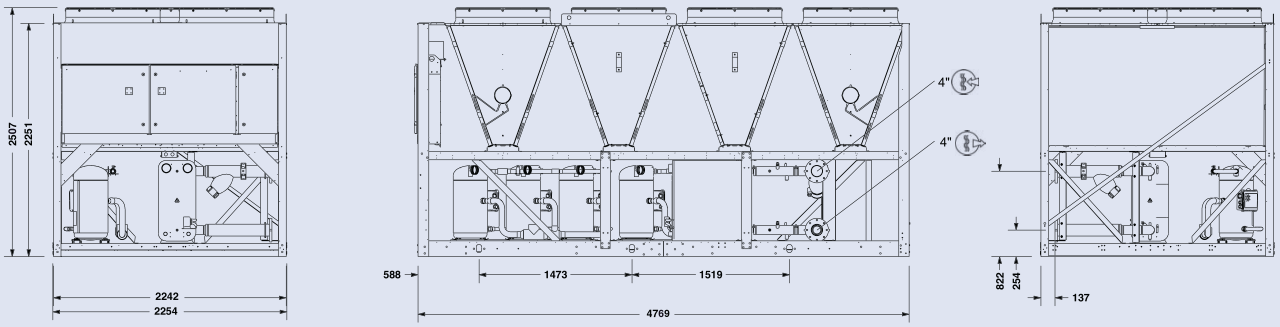
YLAA0360SE, 0400SE, 0435SE, 0485SE, 0301HE & 0391HE



All dimensions in mm. Drawings not a scale.

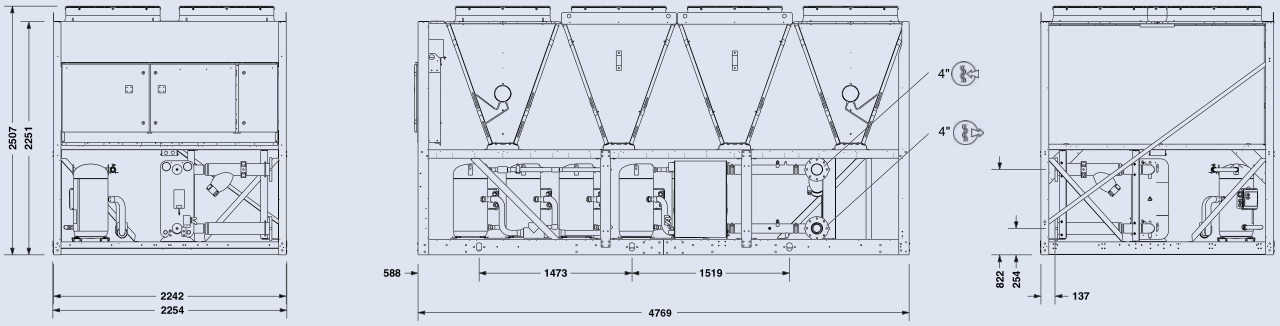
YLAA 0180 to 0517

YLAA0442HE



All dimensions in mm. Drawings not a scale.

YLAA0457HE & 0517HE



All dimensions in mm. Drawings not a scale.

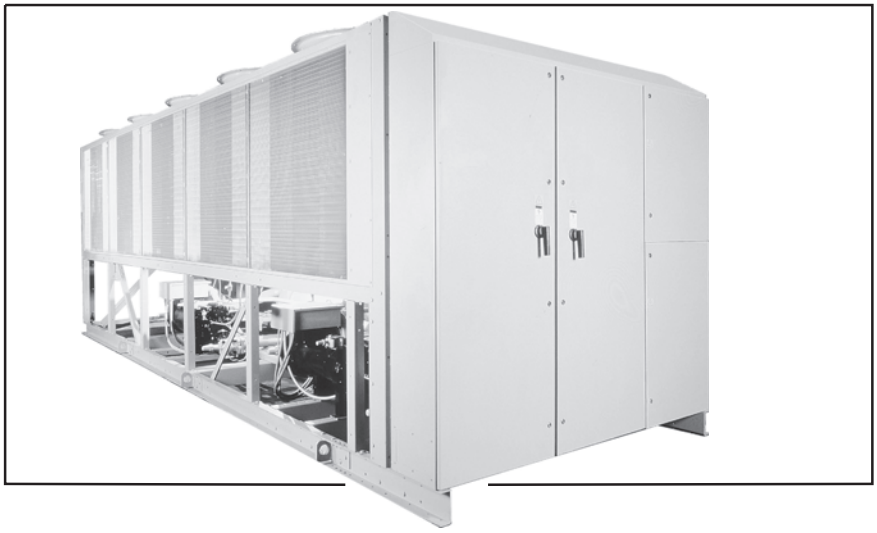
Catalogue of York YCAS 0835 EB

YCAS eco²

AIR COOLED SCREW CHILLER

R407C REFRIGERANT

COOLING CAPACITIES 260 kW to 1194 kW



The YCAS range of chillers are designed for water or water-glycol cooling. Models are available with 2, 3 and 4 refrigerant circuits.

Semi-hermetic twin helical screw compressors are provided to ensure high operational efficiencies and reliable performance.

Optional heat recovery condensers or desuperheaters are available on 2 and 4 refrigerant circuit models

All units are designed to be located outside on the roof of a building or at ground level.

AVAILABLE MODELS & NOMINAL COOLING CAPACITIES TABLE 1

Model	0295	0335	0375	0425	0475	0515	0555	0575	0605
Refrigerant Circuits	Two								
Cooling (kW)	260	308	364	397	446	495	527	558	584
Heat Recovery (kW)	253	306	365	383	435	488	527	566	574
DeSuperheater (kW)	22	26	32	33	38	42	46	49	50

Model	0685	0775	0835	0905	0965	1065	1135	1215
Refrigerant Circuits	Three					Four		
Cooling (kW)	692	782	829	898	923	1056	1125	1194
Heat Recovery (kW)	Not Available					1020	1100	1182
DeSuperheater (kW)	Not Available					82	87	100

Cooling capacities at 7°C leaving chilled liquid temperature and 35°C ambient air temperature.
Optional heat recovery capacities at 40°C leaving hot liquid temperature and 7°C leaving chilled liquid temperature.
Optional Desuperheater capacities at 60°C leaving hot liquid temperature, 7°C leaving chilled liquid temperature and 35°C ambient air temperature.

CONTENTS

FEATURES	BENEFITS
Manufactured to ISO 9001 EN 29001.	High standard of quality control.
Two, three and four refrigerant circuits.	System stand-by security.
Constructed from heavy gauge painted galvanised steel.	Durable and weather protected.
High efficiency industrial type semi-hermetic twin helical screw compressor.	Energy efficient, long life reliable compressor.
Full factory run test.	Operating quality control.
Optional acoustic kit.	Reduces operating sound levels.
Optional Star/Delta compressor starter.	Reduced starting current.
Separate power and control compartments with lockable doors and emergency stop device.	Operator safety considerations.
Power compartment optional door interlocked isolators.	Operator safety convenience.
Microprocessor control with visual display of temperatures, pressures, motor currents, operating hours and number of starts.	System data logging and temperature reset capability. Fault diagnostics. Energy management.
Unit remote alarm contacts.	Warning notification.
Remote water temperature reset.	Improved operating efficiency.
Building management system interface.	For central data logging and single point full system monitoring and control.
Fuzzy logic.	Maximise capacity control.
Suction line heat exchanger and counter flow cooler.	Maximises chiller capacity and efficiency.

SPECIFICATION

The YCAS Air Cooled chiller shall be completely assembled with all interconnecting refrigerant piping and internal wiring, ready for field installation. The unit shall be pressure tested, evacuated, and fully factory charged with refrigerant and oil in each of the independent refrigerant circuits.

After assembly, an operational test shall be performed with water flowing through the cooler to ensure that each refrigerant circuit operates correctly.

The unit structure shall be manufactured from heavy gauge, galvanised steel and coated with baked-on powder paint (Desert Sand (RAL 1019)). This provides a finish which, when subjected to 500 hour, 5% salt spray conditions, shows breakdown of less than 3mm either side of a scribed line.

All exposed power wiring shall be routed through liquid-tight, non-metallic conduit.

Compressors
Each compressor shall be direct drive, semi-hermetic, rotary twin screw type and include the following items:

- Two screw rotors, with asymmetric profiles, manufactured from forged steel.
- A cast iron compressor housing precision machined to provide optimal clearance for the rotors.
- The entire compressor, from suction to discharge shall have a design working pressure of 31 bar.
- Capacity Control: The compressors shall start at the minimum load position and provide a capacity control range from 100% to 10% of the full chiller load using a continuous function slide valve. A microprocessor controlled output pressure regulating capacity control valve shall be supplied to command compressor capacity independent of control valve input pressure and to balance the compressor capacity with the cooling load.
- An automatic spring return of capacity control valve to the minimum load position to ensure compressor starting at minimum motor load.
- An internal discharge check valve to prevent rotor backspin upon shutdown.
- An acoustically tuned, internal discharge muffler to minimise noise at the source, while optimising flow for maximum performance.
- Discharge and suction shut-off service valves.
- A rain tight terminal box.
- A reliable suction gas cooled high efficiency, accessible hermetic motor with redundant overload protection using both thermistor and current overload protection.
- A suction gas screen and serviceable, 0.5 micron full flow oil filter within the compressor housing.
- A 350 W compressor body heater.

Oil Separator
Oil separators with a design working pressure of 31 bar shall be the high efficiency, augmented gas impingement type to maximise oil extraction without fragile media to break down.

Oil Cooler
Oil cooling shall be provided by a dedicated air-cooled finned tube type heat exchanger located in the condenser section of the unit.

Refrigerant Circuits
An independent refrigerant circuit shall be provided per compressor. Each circuit will use copper refrigerant pipe formed on computer controlled bending machines to reduce the number of brazed joints resulting in a reliable and leak resistant system.

Liquid line components shall include: manual shut-off valve with charging port, high absorption removable core filter-drier, solenoid valve, sight glass with moisture indicator, and thermostatic expansion valves.

Suction lines shall be covered with closed-cell insulation.

Cooler
The cooler shall be a special optimised 'Counter-Flow' heat exchanger, which will take advantage of the "Glide" characteristic of R407C. It will employ technologically advanced (patent pending) high efficiency tube assemblies which make possible a single refrigerant pass, delivering refrigerant suction gas warmer than the leaving chilled water at full load. An independent circuit shall be provided for each compressor. The shell design working pressure shall be 10.3 bar, and 23.8 bar for the tubes.

The cooler shall have water baffles fabricated from galvanised steel to resist corrosion, removable heads for access to internally enhanced, seamless, copper tubes. The water nozzles shall be provided with grooves for mechanical couplings and be insulated by the contractor after pipe installation. Water vent and drain connections shall also be included.

The cooler shall be equipped with a thermostatically controlled heater for protection to -29°C ambient and insulated with 19 mm flexible closed-cell foam.

Suction Line Heat Exchanger
Each refrigerant circuit utilises a refrigerant to refrigerant, compact, shell and tube type suction line heat exchanger to maximise chiller capacity and efficiency by subcooling liquid refrigerant delivered to the expansion valve and superheating suction gas delivered to the compressor. The design working pressure shall be 31 bar. The exchanger shall be constructed in accordance with applicable pressure vessel safety code.

Condenser
Fans - The fans shall be dynamically and statically balanced, direct drive with corrosion resistant glass fibre reinforced composite blades moulded into low sound, full airfoil cross section, providing vertical air discharge from extended orifices for efficiency and low sound. Each fan shall be located in a separate compartment to prevent cross flow during fan cycling. Guards of heavy gauge, PVC (polyvinyl chloride) coated galvanised steel shall be provided.

Motors - The fan motors shall be the high efficiency, direct drive, 6 pole, 3 phase, Class-“F”, current overload protected, totally enclosed (TEAC) type with double sealed, permanently lubricated, ball bearings.

Coils - Fin and tube condenser coils shall be manufactured from seamless, internally enhanced, high condensing coefficient, corrosion resistant copper tubes arranged in staggered rows and mechanically expanded into corrosion resistant black fin aluminium alloy with full height fin collars. The design working pressure shall be 31 bar and each coil shall be pressure tested to 34 bar.

Power and Control Panel
All controls and motor starting equipment necessary for unit operation shall be factory wired and function tested.

The panel enclosure shall be designed to IP55 (rain/dust tight) and be manufactured from powder painted galvanised steel.

The Power and Control Panel shall be divided into a power section for each electrical system, a control section and an electrical options section.

Power and control sections shall have a separate hinged, latched, and gasket sealed door equipped with wind struts for safer servicing.

Each power compartment shall contain:

Compressor and fan starting contactors, fan motor external overloads, control circuit serving compressor capacity control, compressor and fan contactor coils and compressor motor overloads.

Compressor Motor Overloads: Current transformers sense each phase, as an input to the microprocessor, to protect compressor motors from damage due to: low input current, high input current, unbalanced current, single phasing, phase reversal, and compressor locked rotor.

The control section shall contain:

On/Off toggle switch, microcomputer keypad and display, microprocessor board, I/O expansion board, relay boards and power supply board.

The options section shall contain:

A control circuit transformer providing 115/1Ø power to the unit control system.

Electrical options as described in "Accessories and Options".

Microprocessor Controls

Fuzzy Logic control will be incorporated in the YCAS range of chillers. Fuzzy logic allows the control system to monitor several key variables to provide tighter, more stable, chilled water temperature control. The control system monitors the leaving chilled water temperature to track where it has been, where it is now, how fast it is moving, and accurately adjusts chiller operation in anticipation of expected performance to minimise hunting and save energy.

The microprocessor shall have the following functions and displays:

- A liquid crystal 40 character display with text provided on two lines and light emitting diode backlighting for outdoor viewing.
- A colour coded, 35 button, sealed keypad with sections for Display, Entry, Setpoints, Clock, Print, Program and Unit On/Off switch.
- The standard controls shall include: brine chilling or thermal storage, automatic pump down, run signal contacts, demand load limit from external building automation system input, remote reset liquid temperature reset input, unit alarm contacts, chilled liquid pump control, automatic reset after power failure, automatic system optimisation to match operating conditions, software stored in non-volatile memory (EPROM) to eliminate chiller failure due to AC power failure.
- Programmed Setpoint shall be retained in a lithium battery backed RTC memory for a minimum of 5 years.

DISPLAY **–** In Metric (°C and Bar) or English (°F and psi) units. For each circuit, the following items shall be displayed:

- Return and leaving chilled liquid, and ambient temperature.
- Day, date and time. Daily start/stop times. Holiday and Manual Override status.
- Compressor operating hours and starts. Automatic or manual lead/lag. Lead compressor identification.
- Run permissive status. No cooling load condition. Compressor run status.
- Anti-recycle timer and anti-coincident start timer status per compressor.
- System suction (and suction superheat), discharge, and oil pressures and temperatures.
- Percent full load compressor motor current. Compressor capacity control valve input steps.
- Cut-out status and set-points for: supply fluid temperature, low suction pressure, high discharge pressure and temperature, high oil temperature, low and high ambient, high and low current, and low leaving liquid temperature.
- Unloading limit setpoints for high discharge pressure and compressor motor current.
- Liquid pull-down rate sensitivity (0.3°C to 3°C/minute in 0.05°C increments).
- Status of: evaporator heater, condenser fans, load and unload timers, chilled liquid pump.
- "Out of range" message.
- Up to 6 fault shut down conditions.
- Standard Display Language is English, with other language options.

ENTRY **–** Enter set point changes, cancel inputs, advance day, and change AM/PM.

SET POINTS **–** Chilled liquid temperature, chilled liquid range, remote reset temperature range.

CLOCK **–** Time, daily or holiday start/stop schedule, manual override for servicing.

PRINT **–** Operating data or system fault shutdown history for last six faults, and software version. Printouts through an RS-232 port via a separate printer (by others).

PROGRAM **–** Low leaving liquid temperature cutout, 300 to 600 second anti-recycle timer, lag compressor start time delay, average motor current unload point, liquid temperature set-point reset signal from YORK ISN or building automation system (by others) via:

- Pulse width modulated (PWM) input for up to 22°C total reset as standard.
- *Optional* Building Automation System interface input card for up to 11°C reset using a 4 to 20 mA, 0 to 10 Vdc input, or discrete reset input.
- [**NOTE**: The Standard microprocessor can be directly connected to a YORK ISN Building Automation System via the standard on-board RS485 communication port. This Option also provides open system compatibility with other communications networks (BACNET™ & LONMARK™) via interface through standard onboard 485 or 232 port and an external YorkTalk Translator.]
- Additional functions (password protected) for programming by a qualified service technician:
- Cut-outs for low and high ambient, low suction pressure, high discharge pressure, high oil temperature.
- Refrigerant type.
- High discharge pressure unload setpoint.
- Fan control discharge pressure set point.
- Fan ON/OFF pressure differential.
- Compressor motor current percent limit.
- The Standard unit controls permit operation down to -18°C outdoors ambient temperature.

Motor Protection

The microprocessor motor protection provides high current protection to ensure that the motor is not damaged due to voltage, excess refrigerant or other problems that could cause excessive motor current.

The microprocessor also provides low motor current protection when it senses a motor current of less than 10% FLA.

A motor protector module provides thermal and current motor overload protection. The module also protects against phase to phase current imbalance, over current, under current and phase rotation.

ELECTRICAL OPTIONS

Power Supply Connection Options

Models	Option	Multi Point Power Supply: Options Panel – Terminal Block per Electrical System	Multi Point Power Supply: Options Panel – Non-Fused Switch Disconnect per Electrical System	Multi Point Power Supply: Power Panels 1 and 2 – Door Interlocked Circuit Breaker per Individual Compressor System	Multi Point Power Supply: Power Panels 1 and 2 – Door Interlocked Non-Fused Switch Disconnect & Fuses per Individual Compressor System
0295 to 0605	2.1			*	
	2.1x				*
0685 to 1215	2.2	*		*	
	2.2x	*			*
	2.3		*	*	
	2.3x		*		*

(1) Supply to Control System Non-Fused Switch Disconnect derived internally from Compressor 1 Power Supply.

Models	Option	Single Point Power Supply: Options Panel – Terminal Block	Single Point Power Supply: Options Panel – Non-Fused Switch Disconnect	Single Point Power Supply: Power Panels 1 and 2 – Door Interlocked Circuit Breaker per Individual Compressor System	Single Point Power Supply: Power Panels 1 and 2 – Door Interlocked Non-Fused Switch Disconnect & Fuses per Individual Compressor System
0295 to 1215	2.4	*		*	
	2.4x	*			*
	2.5		*	*	
	2.5x		*		*

(1) **Option 2.4/2.4x** Supply to Control System Non-Fused Switch Disconnect derived internally from Compressor 1 Power Supply.
Option 2.5/2.5x Supply to Control System Non-Fused Switch Disconnect derived internally from common electrical power.

Multi Point Power Supply Connection:
Two field provided 400 V, 3Ø, 50 Hz supplies to the unit with circuit protection.

Single Point Power Supply Connection:
One field provided 400 V, 3Ø, 50 Hz supply to the unit with circuit protection.

Power Factor Correction
Factory mounted passive (static) correction capacitors to correct unit compressor power factors to 0.95 (depending on operating conditions).

Star-Delta Compressor Motor Starter
Provides approximately 65% reduced inrush current compared to direct on-line starting (Factory Mounted).

Closed Transition Star/Delta Start
With the addition of closed transition contactors and resistors the change over spike during starting can be reduced to nearer the star inrush level thus reducing the risk of electrical interference during compressor start.

OptiView™ Control panel
Field mounted remote control panel, used to monitor and control remote York air cooled chillers from an indoor location. Each panel can control up to 8 chillers.

Remote Control Panel and Wall Adaptor
Field mounted remote control panel.
(Cannot be fitted when a (BAS) Interface or Multi-unit Sequence Control is fitted).

Multi-unit Sequence Control
A factory mounted Sequencing Control Centre to manage sequencing control of up to eight chillers in parallel based on mixed liquid temperature (interconnecting wiring by others).
(Cannot be fitted when a (BAS) Interface or Remote Control Panel is fitted).

Building Automation System (BAS) Interface
Provides a means to reset the leaving chilled liquid temperature and/or percent full load amps (current limiting) from the BAS (Factory Mounted):

Printed circuit board to accept 4 to 20 mA, 0 to 10 Vdc, or dry contact closure input from the BAS.
(Cannot be fitted when a Multi-unit Sequence Control or Remote Control Panel is fitted).

Note: A YORK ISN Building Automation System can provide a Pulse Width Modulated (PWM) signal direct to the standard control panel via the standard on-board RS485 port.

Flow Switch Accessory
Johnson Controls model F61MG-1C Vapour-proof SPDT, NEMA 4X switch, 10.3 bar DWP, -29°C to 121°C, with 1" NPT (IPS) connection for upright mounting in horizontal pipe. A flow switch must be field installed with each unit.

High Static Pressure Fans
Fans and motors suitable for high external static conditions to 150 Pa.

OTHER OPTIONS

Heat Recovery
(2 and 4 Refrigerant Circuit Models only)
Factory fitted plate heat exchanger(s) to provide warm water during cooling to satisfy heating and domestic hot water requirements.

Desuperheaters
(2 and 4 Refrigerant Circuit Models only)
Factory fitted desuperheaters on compressor discharge lines to provide hot water during cooling.

Alternative Condenser Coils:
Copper fin condenser coils – Condenser coils are constructed with corrosion resistant copper fins.

Blygold Protective Coating - is recommended for corrosive applications, such as coastal locations where salt spray may hit the condenser fins.

Un-coated aluminium fin stock is available as an option.

DX Cooler Options:
21 Bar Waterside Design Working Pressure – The DX cooler waterside is designed and constructed for 21 bar working pressure. (Factory Mounted)

Flange Accessory – Consists of raised face flanges to convert grooved water nozzles to flanged cooler connections. Includes companion flanges for field mounting.

Unit Enclosures
Wired guards – Heavy gauge welded wire mesh guards mounted over the exterior condenser coil faces and around the bottom of the unit (factory mounted).

Sound Reduction Options
Low sound fans – Reduced RPM fan motors and alternative fan selection for low sound applications.

Compressor sound enclosures – Acoustically treated flexible compressor enclosures.

Acoustic Kit I – Comprises low sound fans and compressor sound enclosures.

Acoustic Kit II – Comprises low sound fans, compressor sound enclosures and fan speed inverters.

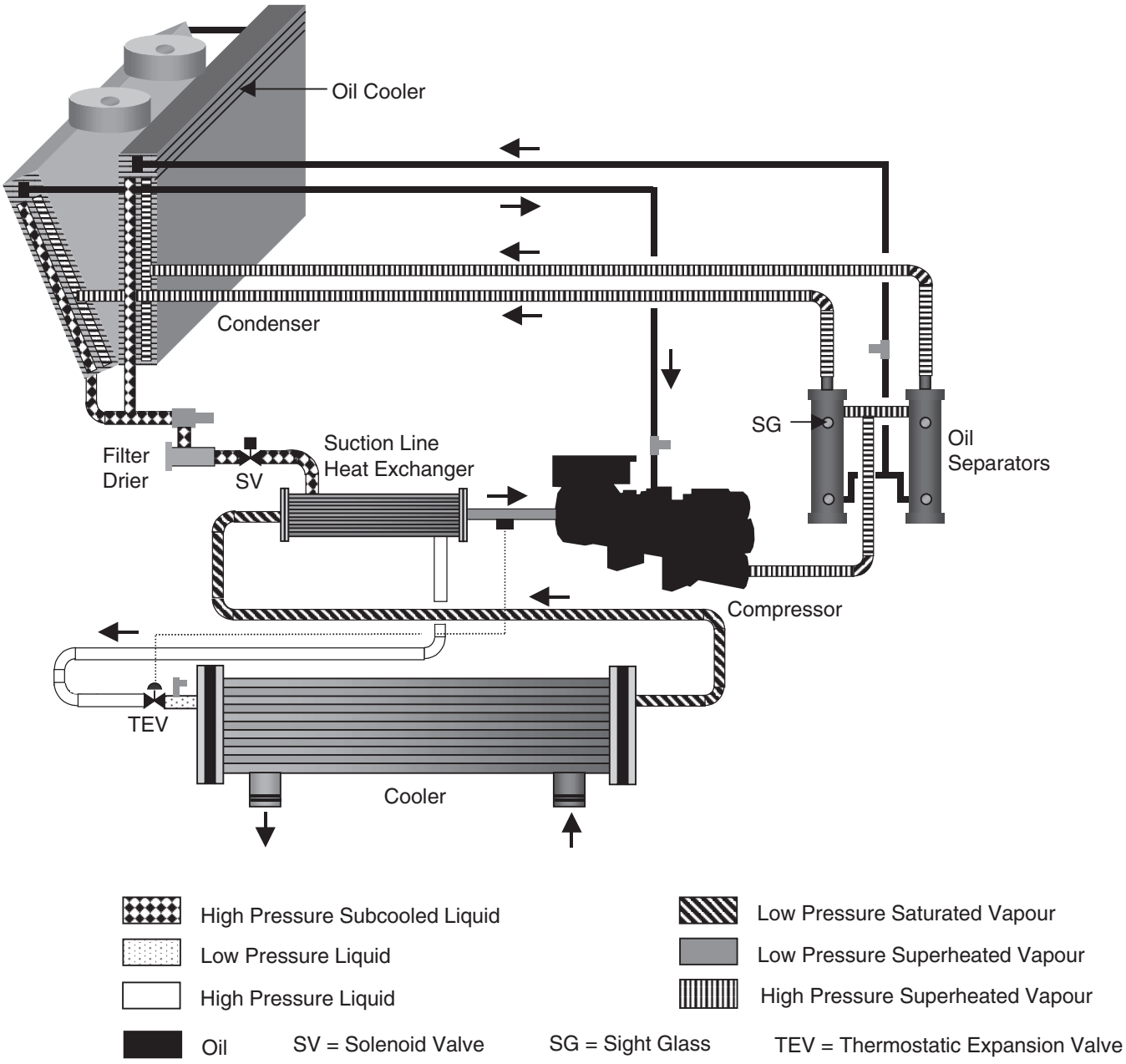
Acoustic Kit III – Comprises low sound fans, fan baffles and side and end intake silencers.

A**coustic Kit IV** (ELS) **–** Comprises low sound fans, fan baffles, side and end intake silencers, compressor sound enclosures and fan speed inverters.

Vibration Isolation
25 mm spring isolators – Level adjustable, spring and cage type isolators for mounting under the unit base rails (Field mounted).

50 mm seismic spring isolators – Restrained Spring-Flex Mountings incorporate welded steel housing with vertical and horizontal limit stops. Housings designed to withstand a minimum 1.0 g accelerated force in all directions to 50 mm. Level adjustable, deflection may vary slightly by application (Field mounted).

REFRIGERANT FLOW DIAGRAM FIGURE 1



Note: Only one refrigerant circuit shown.

Cooling (Figure 1)
Low pressure liquid refrigerant from the expansion valve (TEV) enters the counter-flow cooler tubes and is evaporated by the heat energy absorbed from the chilled water passing through the shell. The refrigerant leaves the cooler in a saturated vapour state.

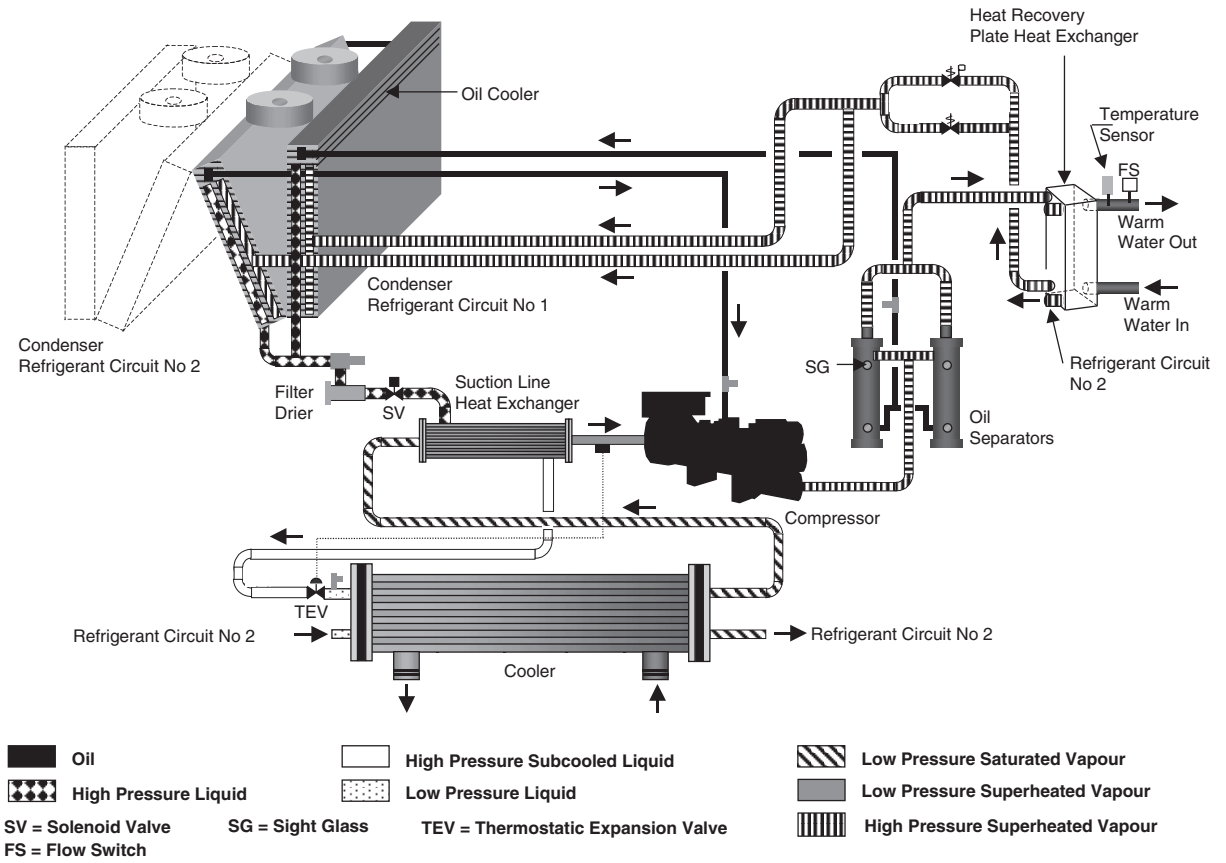
High pressure liquid refrigerant, from the condenser, enters the suction line heat exchanger shell and superheats the refrigerant vapour entering the tubes from the cooler. The low temperature liquid refrigerant, leaving the exchanger to the cooler, has been sub-cooled by the refrigerant vapour in the exchanger tubes.

Low-pressure superheated vapour enters the compressor where pressure and superheat are increased. High pressure vapour is passed through the oil separator where compressor oil is removed and recirculated to the compressor via the oil cooler. The high pressure oil-free vapour is fed to the air cooled condenser coil and fans where the heat is removed. The high pressure liquid refrigerant returns to the expansion valve via the suction line heat exchanger.

Optional Heat Recovery (Figure 1a)
If the warm water flow switch detects water flow the heat recovery pressure regulating valves are energised. The valves allow high-pressure superheated refrigerant, from the oil separators, to enter the twin circuit heat recovery plate heat exchanger. The refrigerant is partially condensed as the warm water absorbs heat energy.

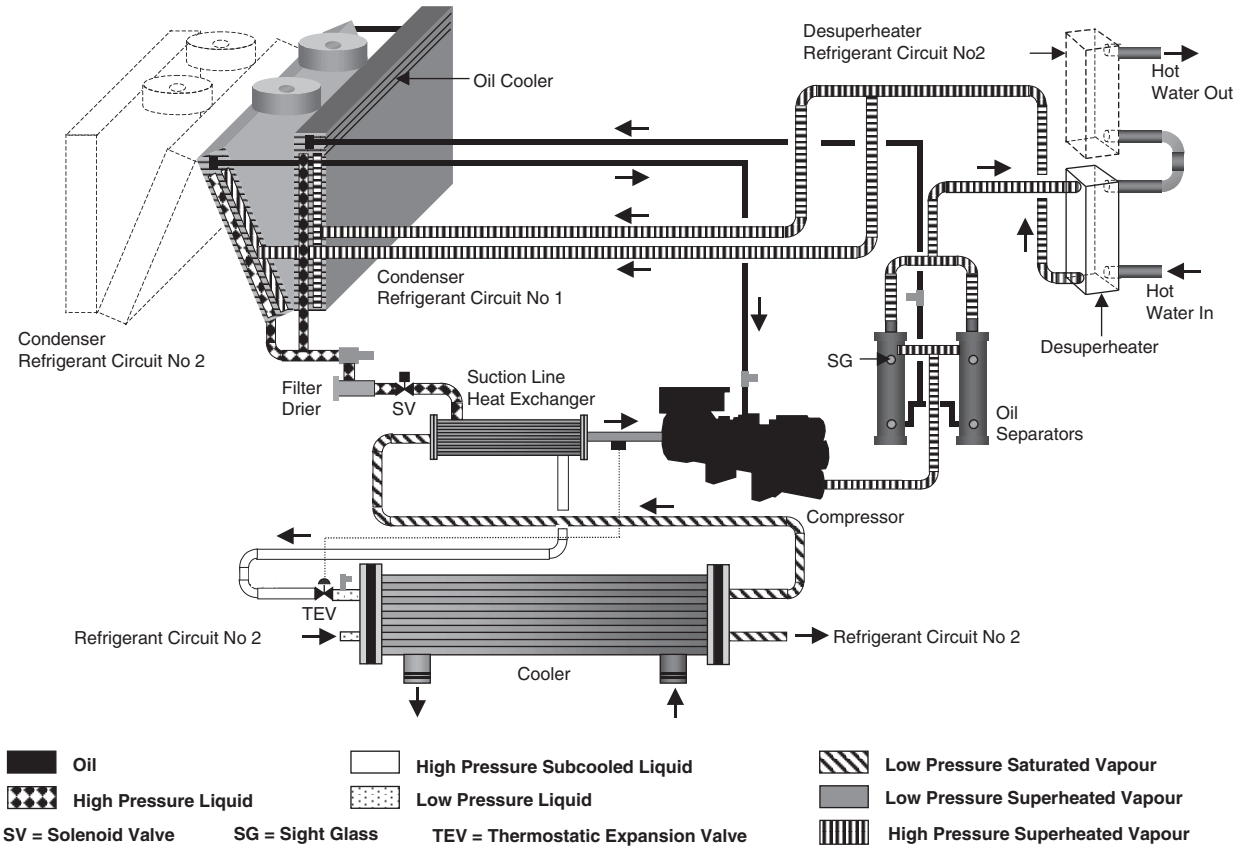
The valves are de-energised when the leaving warm water temperature sensor registers the high point of the set point dead band. If water flow is maintained the valves are re-energised if the temperature sensor registers the low point of the set point dead band.

FIGURE 1a REFRIGERANT FLOW DIAGRAM
2 and 4 REFRIGERANT CIRCUIT MODELS WITH OPTIONAL HEAT RECOVERY



Note: Only refrigerant circuits 1 and 2 shown.

FIGURE 1b REFRIGERANT FLOW DIAGRAM
2 and 4 REFRIGERANT CIRCUIT MODELS WITH OPTIONAL DESUPERHEATERS



Note: Only refrigerant circuits 1 and 2 shown.

OPERATING LIMITATIONS — TABLE 2

2 Refrigerant Circuit Models

Model YCAS-EB				0295		0335		0375		0425		0475	
				Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
Chilled Liquid	Liquid outlet temperature	Water outlet	°C	5 to 13									
		Glycol outlet	°C	-2 to 13 (1)									
		Temp. spread	°C	3 to 10									
	Flow rate		l/s	6.94	25.42	7.70	25.42	8.58	25.42	9.53	37.85	10.60	42.27
	Pressure drop		kPa	6.2	72.9	7.5	72.9	9.3	72.9	6.0	61.3	7.1	73.9
	Maximum working pressure		bar	10.3 (21.0 Optional)									
Ambient Air	Air Entering temperature	Standard units	°C	-18 to 50									
		Low sound fans	°C	-18 to 46									
		High pressure fans	°C	-18 to 50									
	Fan Available Static Pressure	Standard units	Pa	20									
		Low sound fans	Pa	10									
		High pressure fans	Pa	150									
Power supply voltage 400 V, 3 Ø, 50 Hz (nominal)			V	342 to 440									
Recommended system water volum (2)			l	835		985		1165		1275		1430	

2 Refrigerant Circuit Models

Model YCAS-EB				0515		0555		0575		0605	
				Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
Chilled Liquid	Liquid outlet temperature	Water outlet	°C	5 to 13							
		Glycol outlet	°C	-2 to 13 (1)							
		Temp. spread	°C	3 to 10							
	Flow rate		l/s	11.67	46.87	12.37	48.45	13.06	48.45	13.63	48.45
	Pressure drop		kPa	8.4	88.0	9.3	93.1	10.2	93.1	10.9	93.1
	Maximum working pressure		bar	10.3 (21.0 Optional)							
Ambient Air	Air Entering temperature	Standard units	°C	-18 to 50							
		Low sound fans	°C	-18 to 46							
		High pressure fans	°C	-18 to 50							
	Fan Available Static Pressure	Standard units	Pa	20							
		Low sound fans	Pa	10							
		High pressure fans	Pa	150							
Power supply voltage 400 V, 3 Ø, 50 Hz (nominal)			V	342 to 440							
Recommended system water volume (2)			l	1585		1685		1785		1865	

3 Refrigerant Circuit Models

Model YCAS-EB				0685		0775		0835		0905		0965	
				Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
Chilled Liquid	Liquid outlet temperature	Water outlet	°C	5 to 13									
		Glycol outlet	°C	-2 to 13 (1)									
		Temp. spread	°C	3 to 10									
	Flow rate		l/s	18.5	67.6	21.0	75.7	21.0	75.7	21.0	75.7	21.0	75.7
	Pressure drop		kPa	8.8	97.2	9.3	92.4	9.3	92.4	9.3	92.4	9.3	92.4
	Maximum working pressure		bar	10 (21.0 Optional)									
Ambient Air	Air Entering temperature	Standard units	°C	-18 to 50									
		Low sound fans	°C	-18 to 46									
		High pressure fans	°C	-18 to 50									
	Fan Available Static Pressure	Standard units	Pa	20									
		Low sound fans	Pa	10									
		High pressure fans	Pa	150									
Power supply voltage 400 V, 3 Ø, 50 Hz (nominal)			V	342 to 440									
Recommended system water volume (2)			l	2215		2500		2650		2875		2950	

Notes: (1) -2°C is the minimum leaving chilled liquid temp. (LCLT) for standard coded vessels. ASME coded vessels and other codes with special materials have a minimum LCLT of -9.7°C.
(2) Tables show minimum water / glycol volume of system.

TABLE 2 OPERATING LIMITATIONS

4 Refrigerant Circuit Models

Model YCAS-EB				1065		1135		1215	
				Min.	Max.	Min.	Max.	Min.	Max.
Chilled Liquid	Liquid outlet temperature	Water outlet	°C	5 to 13					
		Glycol outlet	°C	-2 to 13 (1)					
		Temp. spread	°C	3 to 10					
	Flow rate		l/s	27.2	100.9	27.2	100.9	27.2	100.9
	Pressure drop		kPa	10.3	93.7	10.3	93.7	10.3	93.7
	Maximum working pressure		bar	10 (21.0 Optional)					
Ambient Air	Air Entering temperature	Standard units	°C	-18 to 50					
		Low sound fans	°C	-18 to 46					
		High pressure fans	°C	-18 to 50					
	Fan Available Static Pressure	Standard units	Pa	20					
		Low sound fans	Pa	10					
		High pressure fans	Pa	150					
Power supply voltage 400 V, 3 Ø, 50 Hz (nominal)			V	342 to 440					
Recommended system water volume (2)			l	3375		3600		3825	

Notes: (1) -2°C is the minimum leaving chilled liquid temp. (LCLT) for standard coded vessels. ASME coded vessels and other codes with special materials have a minimum LCLT of -9.7°C.
(2) Table shows minimum water / glycol volume of system.

SELECTION GUIDE

DATA REQUIRED

To select a YORK YCAS chiller the following information is required:

1. Required cooling capacity.
2. Design chilled water entering and leaving temperatures.
3. Design water flow rate if one of the temperatures in item 3 are unknown.
4. Design condenser entering air temperature. This will normally be the design summer ambient air temperature unless location or other factors have an influence.
5. Altitude above sea level.
6. Design cooler fouling factor.
7. Static pressure resistance against condenser entering and leaving air flow (where ducts, louvres, attenuators, etc., are used) at full unit air volume.

Note: Items 1, 2 and 3 must be linked by the following formulae:

Cooling Capacity (kW) = Range (°C) x Flow (litres/sec) x 4.18

Where:
Range = Entering liquid temperature - Leaving liquid temperature.

CHILLER SELECTION METHOD

1. Determine the correct size of chiller by selecting the model which most closely matches the required capacity at the design conditions of leaving water temperature and entering air temperature (Table 7).
2. Apply correction factors for fouling factor (Table 3) and altitude & fan application (Tables 4 & 5) to the capacity and power values from the capacity tables (Table 7). Ensure the corrected capacity is still sufficient for requirements.
3. Using the corrected capacity of the selected chiller adjust the design temperature range, or flow rate, to balance the formulae shown in “Data Required”.
4. Physical and electrical data can now be determined from Tables 9 and 10.
5. Always re-check that selections fall within the design limitations specified in Table 2.

TABLE 3 FOULING FACTORS

COOLER		
Fouling Factor m² °C/kW	Capacity Factor	Comp. Input Factor
0.044	1.000	1.000
0.088	0.987	0.995
0.176	0.964	0.985
0.352	0.915	0.962

TABLE 4 ALTITUDE FACTORS

Altitude (m)	Capacity Factor	Comp. Input Factor
0	1.000	1.000
600	0.987	1.010
1200	0.973	1.020
1800	0.958	1.029
2400	0.943	1.038

TABLE 5 FAN APPLICATION FACTORS

Fan Type	External Static (Pa)	Capacity Factor	Comp. Input Factor
Low Sound Fans	0	1.00	1.00
	10	0.99	1.01
Standard Fans	0	1.00	1.00
	20	0.99	1.01
High Pressure Fans	150	1.00	1.00

COOLING ONLY CHILLER SAMPLE SELECTION

A chiller is required to cool water from 12°C to 7°C having a cooling capacity of 575 kW at a design flow rate of 28 l/s. Other design conditions applying are:

Ambient air entering condenser:	35°C
Fouling factor:	0.044 m² °C./kW
Altitude:	Sea level
Condenser air restriction:	None

From a cursory examination of Capacity Table 7, a model 0605EB gives approximately the required capacity:

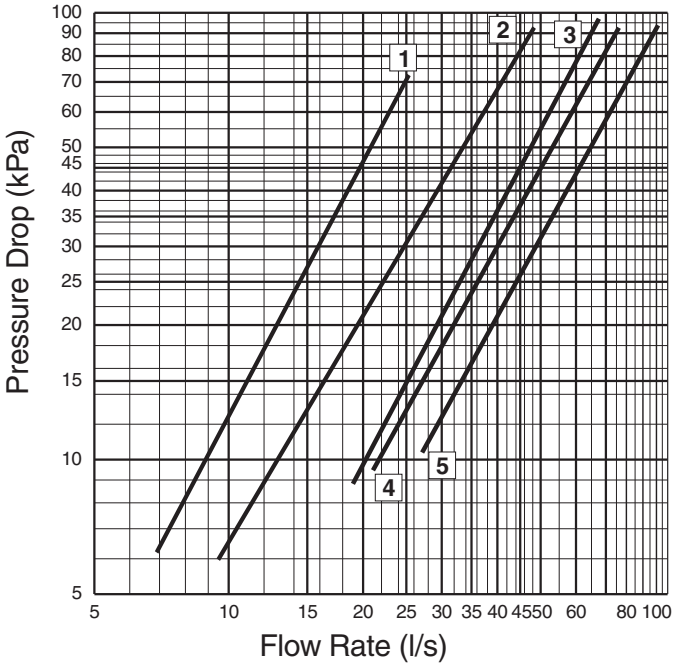
Capacity	= 584 kW
Compressor power	= 179.7 kW

No correction factors apply therefore, after calculating the flow rate, the conditions will be as follows:

Cooling capacity:	584 kW
Water temperature:	12°C to 7°C (Range = 5°C)
Water flow rate:	27.95 l/s
Compressor power:	179.7 kW

All values are within the operating limits in Table 2. From Pressure Drop Graph (Figure 2), YCAS0605EB cooler water pressure drop = 36.7 kPa at the calculated flow of 27.95 l/s.

COOLER WATER PRESSURE DROPS FIGURE 2



Model	Line	Pressure Drop Calculation
0295, 0335, 0375	1	Pressure Drop [kPa] = 0.1556 x (Flow Rate [l/s]$^{1.9004}$)
0425, 0475, 0515, 0555, 0575, 0605	2	Pressure Drop [kPa] = 0.1320 x (Flow Rate [l/s]$^{1.6901}$)
0685	3	Pressure Drop [kPa] = 0.0396 x (Flow Rate [l/s]$^{1.8523}$)
0775, 0835, 0905, 0965	4	Pressure Drop [kPa] = 0.0394 x (Flow Rate [l/s]$^{1.7935}$)
1065, 1135, 1215	5	Pressure Drop [kPa] = 0.0396 x (Flow Rate [l/s]$^{1.6837}$)

OPTIONAL HEAT RECOVERY SAMPLE SELECTION

A chiller is required to cool water from 12°C to 7°C having a cooling capacity of approximately 575 kW at a design flow rate of 28 l/s. Other design conditions applying are:

Ambient air entering condenser:	35°C
Fouling factor:	0.044 m² °C./kW
Altitude:	Sea level
Condenser air restriction:	None
Required leaving Temperature	50°C
Hot water temperature range	12°C

A model 0605EB meets the cooling requirements, see sample selection opposite.

From Table 8 a model 0605EB gives the following data when providing hot water at 50°C.

LWT	Cool (kW)	Power (kW)	Heat (kW)
7°C	510	226	393

The heating capacity should be corrected for the hot water temperature range Table 6: 393 kW x 1.02 = 400.8

Heat recovery water flow: $\frac{400.8}{12°C \times 4.18}$ = 7.99 l/s

Heat recovery pressure drop from graph (Figure 3) is 46 kPa at the calculated flow of 7.99 l/s.

TEMPERATURE RANGE FACTORS TABLE 6

Temperature Range	Capacity Factor	Temperature Range	Capacity Factor
8	0.98	11	1.01
9	0.99	12	1.02
10	1.00	13	1.03
		14	1.04

FIGURE 3 HEAT RECOVERY PRESSURE DROP

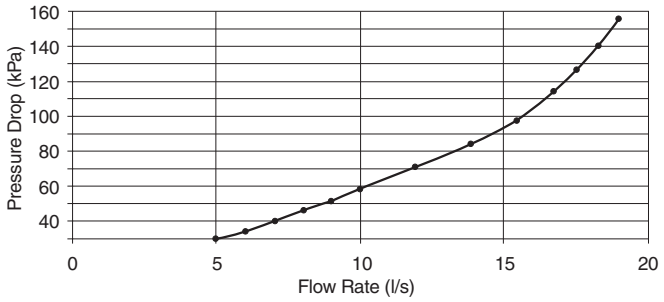
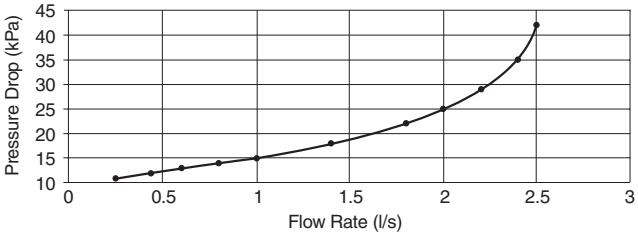


FIGURE 4 DESUPERHEATERS PRESSURE DROP



The water pressure drop values shown in figures 3 and 4 are for two refrigerant circuit models with flow rates based on 10°C hot water temperature range.

On four refrigerant circuit models two heat recovery condensers or two pairs of desuperheaters are fitted. Both options are to have their heat exchanger water circuits connected in parallel.

When connected in this configuration the water flow will be equally divided through the heat exchangers, therefore the total flow should be divided by 2 when calculating the pressure drop.

TABLE 7

2 REFRIGERANT CIRCUIT MODELS
COOLING CAPACITIES

Model	Leaving Water Temp. °C	Condenser Entering Air Temperature °C											
		25		30		35		40		45		50	
		Cool kW	Power kW	Cool kW	Power kW	Cool kW	Power kW	Cool kW	Power kW	Cool kW	Power kW	Cool kW	Power kW
YCAS 0295EB	5.0	274	60.4	260	67.8	244	76.6	229	86.4	214	97.4	200	109.4
	6.0	***283***	***60.1***	***269***	***67.6***	***252***	***76.2***	***236***	***86.0***	***221***	***96.9***	***208***	***108.7***
	7.0	292	59.9	277	67.3	260	75.9	244	85.7	229	96.4	215	108.1
	8.0	***301***	***59.7***	***285***	***67.1***	***269***	***75.7***	***252***	***85.3***	***236***	***96.0***	***222***	***107.6***
	9.0	310	59.5	293	66.9	277	75.5	260	85.1	244	95.7	230	107.2
	10.0	***319***	***59.2***	***301***	***66.7***	***285***	***75.3***	***268***	***84.9***	***252***	***95.4***	***237***	***106.8***
	11.0	328	59.1	309	66.6	294	75.2	276	84.8	260	95.3	243	105.8
	12.0	***337***	***58.9***	***317***	***66.5***	***302***	***75.1***	***285***	***84.7***	***268***	***95.2***	***245***	***103.7***
	13.0	346	58.7	326	66.4	311	75.1	293	84.7	276	95.2	249	102.2
YCAS 0335EB	5.0	327	77.6	309	87.4	289	98.7	271	111.4	253	125.4	212	125.9
	6.0	***338***	***77.7***	***318***	***87.5***	***299***	***98.8***	***282***	***111.5***	***262***	***125.4***	***217***	***124.4***
	7.0	348	77.8	328	87.6	308	98.8	289	111.3	271	125.2	222	123.1
	8.0	***358***	***77.9***	***338***	***87.7***	***318***	***98.9***	***298***	***111.4***	***280***	***125.1***	***227***	***121.7***
	9.0	368	78.0	348	87.8	327	99.0	308	111.4	289	125.1	233	120.1
	10.0	***379***	***78.0***	***357***	***87.9***	***337***	***99.1***	***317***	***111.5***	***298***	***125.1***	***237***	***119.5***
	11.0	389	78.1	367	88.0	347	99.2	327	111.7	307	125.2	241	118.0
	12.0	***399***	***78.2***	***377***	***88.2***	***357***	***99.4***	***336***	***111.8***	***317***	***125.4***	***244***	***116.1***
	13.0	410	78.2	388	88.3	367	99.5	346	112.0	326	125.6	247	114.5
YCAS 0375EB	5.0	389	94.9	365	107.1	342	121.0	320	136.4	299	153.6	227	142.3
	6.0	***400***	***95.4***	***376***	***107.6***	***353***	***121.4***	***330***	***136.7***	***309***	***153.9***	***230***	***140.0***
	7.0	412	95.8	387	108.1	364	121.8	341	137.1	320	154.1	234	138.1
	8.0	***424***	***96.2***	***399***	***108.5***	***375***	***122.2***	***352***	***137.5***	***330***	***154.3***	***236***	***135.7***
	9.0	435	96.6	411	108.8	386	122.6	363	137.9	341	154.6	240	134.0
	10.0	***447***	***96.9***	***422***	***109.2***	***398***	***122.9***	***374***	***138.3***	***352***	***154.9***	***242***	***132.1***
	11.0	459	97.2	434	109.6	409	123.3	385	138.7	363	155.3	245	130.2
	12.0	***471***	***97.5***	***446***	***109.9***	***421***	***123.7***	***396***	***139.0***	***373***	***155.6***	***248***	***128.5***
	13.0	483	97.8	459	110.3	432	124.1	408	139.3	385	156.0	250	126.8
YCAS 0425EB	5.0	425	87.2	399	98.4	373	111.2	349	125.5	326	141.4	305	158.8
	6.0	***437***	***87.4***	***412***	***98.6***	***385***	***111.3***	***360***	***125.5***	***337***	***141.4***	***316***	***158.7***
	7.0	450	87.5	424	98.7	397	111.5	372	125.7	348	141.4	327	158.6
	8.0	***463***	***87.7***	***437***	***98.9***	***410***	***111.6***	***384***	***125.7***	***359***	***141.4***	***338***	***158.5***
	9.0	477	87.8	450	99.0	422	111.6	396	125.8	371	141.4	346	157.5
	10.0	***490***	***87.9***	***463***	***99.1***	***435***	***111.7***	***408***	***125.9***	***383***	***141.4***	***349***	***154.3***
	11.0	505	87.8	476	99.1	448	111.8	420	125.9	395	141.4	355	152.2
	12.0	***518***	***87.8***	***489***	***99.2***	***461***	***111.9***	***433***	***126.0***	***407***	***141.5***	***361***	***150.0***
	13.0	533	87.8	502	99.2	474	112.0	445	126.1	419	141.6	365	147.6
YCAS 0475EB	5.0	478	103.6	449	116.9	420	131.8	392	148.6	367	167.3	318	174.1
	6.0	***492***	***104.0***	***462***	***117.2***	***433***	***132.2***	***405***	***148.9***	***379***	***167.5***	***326***	***172.5***
	7.0	507	104.3	476	117.6	446	132.5	418	149.2	391	167.6	333	170.9
	8.0	***521***	***104.6***	***491***	***117.9***	***460***	***132.8***	***431***	***149.4***	***404***	***167.8***	***341***	***169.4***
	9.0	536	104.9	505	118.1	474	133.1	444	149.7	417	168.0	347	167.5
	10.0	***551***	***105.1***	***542***	***118.5***	***488***	***133.3***	***458***	***150.0***	***430***	***168.2***	***351***	***164.6***
	11.0	598	105.4	534	118.7	502	133.6	471	150.3	443	168.4	356	162.2
	12.0	***581***	***105.6***	***577***	***118.9***	***516***	***133.9***	***485***	***150.5***	***456***	***168.7***	***361***	***159.9***
	13.0	596	105.8	563	119.1	530	134.2	499	150.8	470	169.0	364	157.5
YCAS 0515EB	5.0	532	120.1	498	135.3	466	152.5	436	171.8	408	193.2	331	189.3
	6.0	***547***	***120.6***	***513***	***135.9***	***481***	***153.1***	***450***	***172.2***	***421***	***193.6***	***336***	***186.2***
	7.0	563	121.1	529	136.4	495	153.6	464	172.7	435	193.9	340	183.3
	8.0	***579***	***121.6***	***544***	***136.9***	***510***	***154.0***	***478***	***173.2***	***449***	***194.2***	***344***	***180.4***
	9.0	596	122.0	560	137.4	526	154.5	493	173.7	463	194.6	349	177.6
	10.0	***612***	***122.5***	***576***	***137.8***	***541***	***155.0***	***507***	***174.2***	***477***	***195.0***	***353***	***174.9***
	11.0	628	123.0	592	138.3	556	155.5	522	174.6	491	195.5	356	172.3
	12.0	***644***	***123.4***	***608***	***138.7***	***572***	***156.0***	***538***	***175.0***	***506***	***195.9***	***360***	***169.8***
	13.0	660	123.8	624	139.1	587	156.5	553	175.5	521	196.4	364	167.4
YCAS 0555EB	5.0	566	136.1	530	153.4	496	172.8	463	194.5	418	209.6	326	199.4
	6.0	***582***	***136.8***	***546***	***154.1***	***511***	***173.5***	***478***	***195.2***	***432***	***209.8***	***331***	***196.3***
	7.0	599	137.6	562	154.9	527	174.2	493	195.8	445	209.9	335	193.4
	8.0	***616***	***138.3***	***578***	***155.5***	***542***	***174.9***	***508***	***196.5***	***459***	***210.1***	***339***	***190.5***
	9.0	633	138.9	595	156.1	558	175.5	524	197.1	472	210.3	343	187.8
	10.0	***650***	***139.5***	***611***	***156.8***	***574***	***176.2***	***539***	***197.8***	***486***	***210.5***	***347***	***185.1***
	11.0	667	140.2	628	157.5	591	176.9	555	198.5	500	210.7	350	182.5
	12.0	***684***	***140.8***	***645***	***158.2***	***607***	***177.6***	***571***	***199.1***	***514***	***211.0***	***354***	***180.1***
	13.0	701	141.3	662	158.8	623	178.3	587	199.8	528	211.1	357	177.7
YCAS 0575EB	5.0	599	152.1	561	171.4	525	193.0	491	217.3	429	226.0	322	209.5
	6.0	***617***	***153.1***	***578***	***172.3***	***541***	***193.9***	***507***	***218.2***	***442***	***226.0***	***326***	***206.4***
	7.0	634	154.1	595	173.4	558	194.8	523	219.0	455	226.0	330	203.5
	8.0	***652***	***155.0***	***613***	***174.0***	***574***	***195.7***	***539***	***219.8***	***468***	***226.0***	***334***	***200.7***
	9.0	670	155.8	630	174.9	591	196.6	555	220.6	482	226.0	338	197.9
	10.0	***688***	***156.6***	***647***	***175.7***	***608***	***197.4***	***571***	***221.5***	***495***	***226.0***	***341***	***195.3***
	11.0	706	157.5	664	176.9	625	198.3	588	222.3	509	226.0	345	192.7
	12.0	***724***	***158.2***	***682***	***177.7***	***642***	***199.2***	***604***	***223.2***	***523***	***226.0***	***348***	***190.3***
	13.0	743	158.9	700	178.6	660	200.1	621	224.1	536	225.7	351	187.9
YCAS 0605EB	5.0	625	140.8	586	158.5	549	178.6	513	201.2	479	226.0	398	226.0
	6.0	***643***	***141.5***	***604***	***159.3***	***566***	***179.1***	***530***	***201.7***	***495***	***226.0***	***411***	***226.0***
	7.0	662	142.0	622	159.8	584	179.7	546	202.2	510	226.0	425	226.0
	8.0	***681***	***142.6***	***640***	***160.4***	***606***	***180.5***	***563***	***202.7***	***525***	***226.0***	***438***	***226.0***
	9.0	700	143.1	658	160.9	618	180.9	581	203.0	541	226.0	450	225.0
	10.0	***719***	***143.5***	***677***	***161.4***	***636***	***181.5***	***598***	***203.6***	***556***	***226.0***	***456***	***221.5***
	11.0	738	143.9	696	161.9	654	182.0	615	204.3	572	226.0	461	217.9
	12.0	***757***	***144.3***	***715***	***162.4***	***673***	***182.5***	***633***	***204.8***	***588***	***226.0***	***466***	***214.4***
	13.0	776	144.7	734	162.8	691	183.0	651	205.4	603	226.0	471	211.1

3 REFRIGERANT CIRCUIT MODELS
COOLING CAPACITIES

TABLE 7

Model	Leaving Water Temp. °C	Condenser Entering Air Temperature °C											
		25		30		35		40		45		50	
		Cool kW	Power kW	Cool kW	Power kW	Cool kW	Power kW	Cool kW	Power kW	Cool kW	Power kW	Cool kW	Power kW
YCAS 0685EB	5.0	743	166.3	695	187.5	650	211.5	608	238.2	558	262.7	448	256.5
	6.0	***764***	***167.1***	***717***	***188.2***	***671***	***212.1***	***627***	***238.8***	***577***	***262.9***	***455***	***252.6***
	7.0	786	167.8	738	188.9	692	212.8	647	239.4	595	263.1	461	248.7
	8.0	***809***	***168.4***	***760***	***189.5***	***713***	***213.4***	***667***	***239.9***	***614***	***263.3***	***467***	***245.0***
	9.0	831	168.9	782	190.0	734	213.9	688	240.5	633	263.4	473	241.4
	10.0	***853***	***169.4***	***804***	***190.7***	***755***	***214.5***	***709***	***241.0***	***652***	***263.7***	***479***	***237.9***
	11.0	876	169.8	827	191.3	777	215.1	730	241.6	671	263.9	484	234.5
	12.0	***900***	***170.3***	***849***	***191.8***	***799***	***215.7***	***751***	***242.2***	***691***	***264.1***	***489***	***231.3***
	13.0	938	170.8	872	192.4	821	216.3	772	242.8	710	264.3	495	228.2
YCAS 0775EB	5.0	839	175.2	786	197.5	735	222.7	687	251.0	643	282.3	567	299.0
	6.0	***864***	***175.8***	***810***	***198.1***	***759***	***223.3***	***709***	***251.4***	***664***	***282.6***	***576***	***294.0***
	7.0	889	176.3	835	198.7	782	223.8	732	251.9	686	282.9	584	289.1
	8.0	***915***	***176.8***	***860***	***199.2***	***806***	***224.3***	***755***	***252.3***	***708***	***283.3***	***592***	***284.4***
	9.0	940	177.3	885	199.7	830	224.8	778	252.8	730	283.6	600	279.8
	10.0	***965***	***177.7***	***910***	***200.1***	***855***	***225.3***	***802***	***253.2***	***753***	***284.0***	***607***	***275.3***
	11.0	990	178.4	936	200.6	879	225.7	826	253.7	776	284.4	614	271.0
	12.0	***1015***	***178.7***	***961***	***201.0***	***904***	***226.2***	***850***	***254.2***	***799***	***284.8***	***621***	***266.9***
	13.0	1042	179.0	987	201.4	929	226.7	874	254.7	823	285.3	628	262.8
YCAS 0835EB	5.0	891	190.8	834	214.9	780	242.2	728	272.7	671	301.3	568	307.2
	6.0	***917***	***191.6***	***859***	***215.7***	***804***	***242.9***	***752***	***273.4***	***693***	***301.5***	***576***	***302.3***
	7.0	943	192.3	885	216.4	829	243.6	775	274.0	715	301.7	584	297.4
	8.0	***970***	***193.0***	***911***	***217.0***	***854***	***244.3***	***800***	***274.7***	***737***	***301.9***	***591***	***292.7***
	9.0	997	193.6	937	217.7	879	244.9	824	275.2	760	302.2	599	288.2
	10.0	***1023***	***194.3***	***964***	***218.4***	***905***	***245.6***	***849***	***275.8***	***782***	***302.5***	***606***	***283.8***
	11.0	1050	194.8	990	219.1	930	246.2	874	276.5	805	302.7	613	279.5
	12.0	***1078***	***195.3***	***1017***	***219.7***	***956***	***246.9***	***899***	***277.1***	***829***	***303.0***	***619***	***275.4***
	13.0	1106	195.8	1044	220.3	983	247.6	924	277.9	852	303.3	625	271.5
YCAS 0905EB	5.0	966	221.3	904	249.1	845	280.6	790	315.8	708	339.0	562	327.8
	6.0	***993***	***222.7***	***932***	***250.2***	***872***	***281.7***	***815***	***316.9***	***730***	***339.0***	***569***	***322.7***
	7.0	1022	223.7	959	251.3	898	282.7	841	318.0	752	339.0	576	317.9
	8.0	***1051***	***224.7***	***987***	***252.3***	***925***	***283.7***	***866***	***318.9***	***775***	***339.0***	***584***	***313.2***
	9.0	1080	225.6	1015	253.5	952	284.7	893	319.7	797	339.0	590	308.6
	10.0	***1109***	***226.5***	***1042***	***254.7***	***980***	***285.7***	***919***	***320.6***	***820***	***339.0***	***597***	***304.2***
	11.0	1139	227.4	1071	255.6	1007	286.7	946	321.6	843	339.0	603	300.0
	12.0	***1169***	***228.2***	***1100***	***256.6***	***1035***	***287.8***	***973***	***322.6***	***866***	***339.0***	***609***	***295.9***
	13.0	1198	229.0	1129	257.5	1063	288.9	1000	323.7	889	339.0	615	291.9
YCAS 0965EB	5.0	990	211.4	928	237.9	869	267.7	812	301.4	751	334.8	630	339.0
	6.0	***1020***	***212.3***	***956***	***238.8***	***896***	***268.5***	***838***	***302.2***	***775***	***334.8***	***652***	***339.0***
	7.0	1049	213.1	985	239.7	923	269.3	864	302.9	799	334.8	668	336.3
	8.0	***1090***	***214.1***	***1014***	***240.4***	***950***	***270.4***	***891***	***303.6***	***823***	***334.9***	***681***	***332.6***
	9.0	1108	214.5	1043	241.2	978	271.1	918	304.3	848	335.0	694	329.1
	10.0	***1173***	***216.1***	***1072***	***241.9***	***1007***	***271.9***	***945***	***305.2***	***873***	***335.0***	***707***	***325.7***
	11.0	1169	215.8	1101	242.6	1035	272.7	972	306.1	897	335.3	720	322.4
	12.0	***1199***	***216.4***	***1131***	***243.3***	***1064***	***273.5***	***1000***	***306.9***	***922***	***335.4***	***732***	***319.2***
	13.0	1230	216.9	1161	244.0	1093	274.2	1028	307.7	947	335.6	744	316.2

4 REFRIGERANT CIRCUIT MODELS
COOLING CAPACITIES

TABLE 7

Model	Leaving Water Temp. °C	Condenser Entering Air Temperature °C											
		25		30		35		40		45		50	
		Cool kW	Power kW	Cool kW	Power kW	Cool kW	Power kW	Cool kW	Power kW	Cool kW	Power kW	Cool kW	Power kW
YCAS 1065EB	5.0	1134	234.0	1062	263.7	993	297.3	927	334.9	867	376.6	760	396.5
	6.0	***1168***	***234.8***	***1094***	***264.5***	***1024***	***298.0***	***957***	***335.5***	***896***	***377.0***	***771***	***389.9***
	7.0	1202	235.4	1127	265.2	1056	299.1	988	336.1	925	377.4	782	383.4
	8.0	***1236***	***236.1***	***1161***	***265.8***	***1088***	***299.3***	***1019***	***336.6***	***955***	***377.9***	***793***	***377.2***
	9.0	1270	236.6	1194	266.5	1120	300.0	1050	337.2	985	378.3	803	371.1
	10.0	***1303***	***237.4***	***1229***	***267.1***	***1153***	***300.6***	***1082***	***337.9***	***1015***	***378.8***	***813***	***365.2***
	11.0	1337	238.0	1249	267.3	1186	301.3	1114	338.5	1046	379.4	822	359.6
	12.0	***1372***	***238.5***	***1298***	***268.2***	***1219***	***301.9***	***1146***	***339.2***	***1077***	***380.0***	***831***	***354.1***
	13.0	1409	238.9	1332	268.9	1253	302.6	1178	339.9	1109	380.6	840	348.8
YCAS 1135EB	5.0	1208	264.4	1132	297.8	1058	335.6	989	377.9	904	414.3	754	417.0
	6.0	***1244***	***265.8***	***1166***	***298.9***	***1091***	***336.7***	***1020***	***378.9***	***933***	***414.5***	***765***	***410.4***
	7.0	1280	266.8	1201	300.0	1125	337.7	1052	379.9	963	414.7	775	403.9
	8.0	***1316***	***267.7***	***1236***	***301.0***	***1159***	***338.8***	***1085***	***380.9***	***992***	***414.9***	***785***	***397.6***
	9.0	1352	268.6	1272	302.0	1193	339.7	1118	381.7	1022	415.2	795	391.5
	10.0	***1389***	***269.7***	***1307***	***303.2***	***1227***	***340.7***	***1152***	***382.6***	***1053***	***415.4***	***804***	***385.6***
	11.0	1425	270.5	1343	304.1	1262	341.7	1185	383.6	1083	415.7	813	380.0
	12.0	***1463***	***271.3***	***1380***	***305.1***	***1297***	***342.7***	***1220***	***384.6***	***1114***	***416.0***	***821***	***374.5***
	13.0	1501	272.1	1416	306.0	1333	343.8	1254	385.6	1145	416.3	830	369.2
YCAS 1215EB	5.0	1283	294.9	1202	332.0	1124	374.0	1050	421.0	941	452.0	748	437.6
	6.0	***1320***	***296.8***	***1238***	***333.5***	***1159***	***375.5***	***1084***	***422.3***	***971***	***452.0***	***758***	***430.8***
	7.0	1358	298.2	1275	334.9	1194	376.8	1117	423.8	1000	452.0	768	424.3
	8.0	***1396***	***299.5***	***1312***	***336.2***	***1230***	***378.2***	***1152***	***425.1***	***1030***	***452.0***	***777***	***418.0***
	9.0	1435	300.7	1349	337.6	1266	379.5	1187	426.2	1060	452.0	786	411.9
	10.0	***1474***	***301.9***	***1386***	***339.4***	***1302***	***380.8***	***1222***	***427.4***	***1090***	***452.0***	***795***	***406.1***
	11.0	1514	303.1	1424	340.7	1339	382.2	1257	428.7	1121	452.0	804	400.4
	12.0	***1553***	***304.2***	***1462***	***341.9***	***1376***	***383.6***	***1293***	***430.0***	***1151***	***452.0***	***812***	***394.9***
	13.0	1593	305.3	1501	343.2	1413	385.0	1329	431.5	1182	452.0	820	389.6

TABLE 8

2 REFRIGERANT CIRCUIT MODELS
HEAT RECOVERY CAPACITIES

Model	Leaving Chilled Water Temp. °C	Leaving Hot Water Temperature °C														
		30			35			40			45			50		
		Cool kW	Power kW	Heat kW	Cool kW	Power kW	Heat kW	Cool kW	Power kW	Heat kW	Cool kW	Power kW	Heat kW	Cool kW	Power kW	Heat kW
YCAS 0295EB	5.0	274	60.4	275	260	67.8	260	244	76.6	241	229	86.4	216	214	97.4	166
	6.0	***283***	***60.1***	***282***	***269***	***67.6***	***266***	***252***	***76.2***	***247***	***236***	***86.0***	***221***	***221***	***96.9***	***170***
	7.0	292	59.9	289	277	67.3	272	260	75.9	253	244	85.7	227	229	96.4	174
	8.0	***301***	***59.7***	***296***	***285***	***67.1***	***279***	***269***	***75.7***	***259***	***252***	***85.3***	***232***	***236***	***96.0***	***178***
	9.0	310	59.5	304	293	66.9	285	277	75.5	265	260	85.1	237	244	95.7	182
	10.0	***319***	***59.2***	***311***	***301***	***66.7***	***291***	***285***	***75.3***	***271***	***268***	***84.9***	***242***	***252***	***95.4***	***186***
	11.0	328	59.1	318	309	66.6	297	294	75.2	277	276	84.8	248	260	95.3	190
	12.0	***337***	***58.9***	***325***	***317***	***66.5***	***304***	***302***	***75.1***	***284***	***285***	***84.7***	***254***	***268***	***95.2***	***194***
	13.0	346	58.7	332	326	66.4	311	311	75.1	290	293	84.7	259	276	95.2	198
YCAS 0335EB	5.0	327	77.6	333	309	87.4	314	289	98.7	292	271	111.4	262	253	125.4	203
	6.0	***338***	***77.7***	***341***	***318***	***87.5***	***321***	***299***	***98.8***	***299***	***282***	***111.5***	***270***	***262***	***125.4***	***207***
	7.0	348	77.8	350	328	87.6	329	308	98.8	306	289	111.3	275	271	125.2	212
	8.0	***358***	***77.9***	***358***	***338***	***87.7***	***337***	***318***	***98.9***	***313***	***298***	***111.4***	***281***	***280***	***125.1***	***217***
	9.0	368	78.0	367	348	87.8	345	327	99.0	321	308	111.4	288	289	125.1	221
	10.0	***379***	***78.0***	***375***	***357***	***87.9***	***352***	***337***	***99.1***	***328***	***317***	***111.5***	***294***	***298***	***125.1***	***226***
	11.0	389	78.1	384	367	88.0	360	347	99.2	336	327	111.7	301	307	125.2	231
	12.0	***399***	***78.2***	***392***	***377***	***88.2***	***368***	***357***	***99.4***	***343***	***336***	***111.8***	***308***	***317***	***125.4***	***236***
	13.0	410	78.2	401	388	88.3	377	367	99.5	351	346	112.0	315	326	125.6	241
YCAS 0375EB	5.0	389	94.9	397	365	107.1	373	342	121.0	348	320	136.4	313	299	153.6	242
	6.0	***400***	***95.4***	***407***	***376***	***107.6***	***383***	***353***	***121.4***	***357***	***330***	***136.7***	***321***	***309***	***153.9***	***248***
	7.0	412	95.8	417	387	108.1	392	364	121.8	365	341	137.1	328	320	154.1	253
	8.0	***424***	***96.2***	***427***	***399***	***108.5***	***402***	***375***	***122.2***	***374***	***352***	***137.5***	***336***	***330***	***154.3***	***259***
	9.0	435	96.6	437	411	108.8	411	386	122.6	383	363	137.9	344	341	154.6	265
	10.0	***447***	***96.9***	***447***	***422***	***109.2***	***421***	***398***	***122.9***	***392***	***374***	***138.3***	***352***	***352***	***154.9***	***271***
	11.0	459	97.2	457	434	109.6	431	409	123.3	401	385	138.7	359	363	155.3	277
	12.0	***471***	***97.5***	***467***	***446***	***109.9***	***440***	***421***	***123.7***	***410***	***396***	***139.0***	***368***	***373***	***155.6***	***283***
	13.0	483	97.8	478	459	110.3	450	432	124.1	419	408	139.3	376	385	156.0	289
YCAS 0425EB	5.0	425	87.2	421	399	98.4	394	373	111.2	364	349	125.5	326	326	141.4	250
	6.0	***437***	***87.4***	***431***	***412***	***98.6***	***404***	***385***	***111.3***	***374***	***360***	***125.5***	***334***	***337***	***141.4***	***256***
	7.0	450	87.5	442	424	98.7	414	397	111.5	383	372	125.7	342	348	141.4	262
	8.0	***463***	***87.7***	***453***	***437***	***98.9***	***424***	***410***	***111.6***	***392***	***384***	***125.7***	***350***	***359***	***141.4***	***268***
	9.0	477	87.8	464	450	99.0	435	422	111.6	402	396	125.8	358	371	141.4	274
	10.0	***490***	***87.9***	***475***	***463***	***99.1***	***445***	***435***	***111.7***	***411***	***408***	***125.9***	***367***	***383***	***141.4***	***280***
	11.0	505	87.8	487	476	99.1	455	448	111.8	421	420	125.9	375	395	141.4	287
	12.0	***518***	***87.8***	***498***	***489***	***99.2***	***465***	***461***	***111.9***	***431***	***433***	***126.0***	***384***	***407***	***141.5***	***293***
	13.0	533	87.8	510	502	99.2	476	474	112.0	441	445	126.1	392	419	141.6	300
YCAS 0475EB	5.0	478	103.6	478	449	116.9	448	420	131.8	415	392	148.6	371	367	167.3	285
	6.0	***492***	***104.0***	***490***	***462***	***117.2***	***459***	***433***	***132.2***	***425***	***405***	***148.9***	***380***	***379***	***167.5***	***292***
	7.0	507	104.3	502	476	117.6	470	446	132.5	435	418	149.2	389	391	167.6	299
	8.0	***521***	***104.6***	***514***	***491***	***117.9***	***482***	***460***	***132.8***	***446***	***431***	***149.4***	***399***	***404***	***167.8***	***306***
	9.0	536	104.9	527	505	118.1	493	474	133.1	457	444	149.7	408	417	168.0	313
	10.0	***551***	***105.1***	***539***	***542***	***118.5***	***523***	***488***	***133.3***	***467***	***458***	***150.0***	***417***	***430***	***168.2***	***320***
	11.0	598	105.4	578	534	118.7	516	502	133.6	478	471	150.3	427	443	168.4	327
	12.0	***581***	***105.6***	***564***	***577***	***118.9***	***551***	***516***	***133.9***	***489***	***485***	***150.5***	***436***	***456***	***168.7***	***334***
	13.0	596	105.8	577	563	119.1	540	530	134.2	500	499	150.8	446	470	169.0	341
YCAS 0515EB	5.0	532	120.1	536	498	135.3	501	466	152.5	465	436	171.8	417	408	193.2	321
	6.0	***547***	***120.6***	***549***	***513***	***135.9***	***514***	***481***	***153.1***	***477***	***450***	***172.2***	***427***	***421***	***193.6***	***329***
	7.0	563	121.1	562	529	136.4	526	495	153.6	488	464	172.7	437	435	193.9	336
	8.0	***579***	***121.6***	***576***	***544***	***136.9***	***539***	***510***	***154.0***	***500***	***478***	***173.2***	***447***	***449***	***194.2***	***344***
	9.0	596	122.0	590	560	137.4	552	526	154.5	512	493	173.7	458	463	194.6	351
	10.0	***612***	***122.5***	***603***	***576***	***137.8***	***565***	***541***	***155.0***	***524***	***507***	***174.2***	***468***	***477***	***195.0***	***359***
	11.0	628	123.0	617	592	138.3	578	556	155.5	535	522	174.6	479	491	195.5	367
	12.0	***644***	***123.4***	***630***	***608***	***138.7***	***591***	***572***	***156.0***	***547***	***538***	***175.0***	***489***	***506***	***195.9***	***375***
	13.0	660	123.8	644	624	139.1	604	587	156.5	560	553	175.5	500	521	196.4	383
YCAS 0555EB	5.0	566	136.1	577	530	153.4	541	496	172.8	503	463	194.5	452	418	209.6	336
	6.0	***582***	***136.8***	***591***	***546***	***154.1***	***554***	***511***	***173.5***	***515***	***478***	***195.2***	***462***	***432***	***209.8***	***343***
	7.0	599	137.6	605	562	154.9	567	527	174.2	527	493	195.8	473	445	209.9	350
	8.0	***616***	***138.3***	***619***	***578***	***155.5***	***581***	***542***	***174.9***	***540***	***508***	***196.5***	***484***	***459***	***210.1***	***357***
	9.0	633	138.9	634	595	156.1	594	558	175.5	552	524	197.1	495	472	210.3	365
	10.0	***650***	***139.5***	***648***	***611***	***156.8***	***608***	***574***	***176.2***	***565***	***539***	***197.8***	***506***	***486***	***210.5***	***372***
	11.0	667	140.2	663	628	157.5	622	591	176.9	577	555	198.5	517	500	210.7	380
	12.0	***684***	***140.8***	***678***	***645***	***158.2***	***636***	***607***	***177.6***	***590***	***571***	***199.1***	***529***	***514***	***211.0***	***388***
	13.0	701	141.3	692	662	158.8	650	623	178.3	603	587	199.8	540	528	211.1	395
YCAS 0575EB	5.0	599	152.1	618	561	171.4	580	525	193.0	540	491	217.3	487	429	226.0	350
	6.0	***617***	***153.1***	***632***	***578***	***172.3***	***594***	***541***	***193.9***	***553***	***507***	***218.2***	***498***	***442***	***226.0***	***357***
	7.0	634	154.1	648	595	173.4	608	558	194.8	566	523	219.0	509	455	226.0	364
	8.0	***652***	***155.0***	***663***	***613***	***174.0***	***623***	***574***	***195.7***	***579***	***539***	***219.8***	***521***	***468***	***226.0***	***371***
	9.0	670	155.8	678	630	174.9	637	591	196.6	593	555	220.6	533	482	226.0	378
	10.0	***688***	***156.6***	***694***	***647***	***175.7***	***651***	***608***	***197.4***	***606***	***571***	***221.5***	***544***	***495***	***226.0***	***386***
	11.0	706	157.5	709	664	176.9	666	625	198.3	620	588	222.3	556	509	226.0	393
	12.0	***724***	***158.2***	***725***	***682***	***177.7***	***681***	***642***	***199.2***	***633***	***604***	***223.2***	***568***	***523***	***226.0***	***400***
	13.0	743	158.9	741	700	178.6	695	660	200.1	647	621	224.1	580	536	225.7	407
YCAS 0605EB	5.0	625	140.8	629	586	158.5	589	549	178.6	547	513	201.2	491	479	226.0	377
	6.0	***643***	***141.5***	***645***	***604***	***159.3***	***604***	***566***	***179.1***	***561***	***530***	***201.7***	***502***	***495***	***226.0***	***385***
	7.0	662	142.0	661	622	159.8	619	584	179.7	574	546	202.2	514	510	226.0	393
	8.0	***681***	***142.6***	***677***	***640***	***160.4***	***634***	***606***	***180.5***	***592***	***563***	***202.7***	***526***	***525***	***226.0***	***402***
	9.0	700	143.1	693	658	160.9	648	618	180.9	601	581	203.0	538	541	226.0	410
	10.0	***719***	***143.5***	***709***	***677***	***161.4***	***664***	***636***	***181.5***	***615***	***598***	***203.6***	***551***	***556***	***226.0***	***418***
	11.0	738	143.9	725	696	161.9	679	654	182.0	629	615	204.3	563	572	226.0	427
	12.0	***757***	***144.3***	***741***	***715***	***162.4***	***694***	***673***	***182.5***	***643***	***633***	***204.8***	***575***	***588***	***226.0***	***435***
	13.0	776	144.7	757	734	162.8	710	691	183.0	658	651	205.4	588	603	226.0	443

Heat recovery capacities (Heat) are for a leaving hot water temperature range of 10°C, where range = leaving liquid temperature - entering liquid temperature.

4 REFRIGERANT CIRCUIT MODELS
HEAT RECOVERY CAPACITIES

TABLE 8

Model	Leaving Chilled Water Temp. °C	Leaving Hot Water Temperature °C														
		30			35			40			45			50		
		Cool kW	Power kW	Heat kW	Cool kW	Power kW	Heat kW	Cool kW	Power kW	Heat kW	Cool kW	Power kW	Heat kW	Cool kW	Power kW	Heat kW
YCAS 1065EB	5.0	1134	234.0	1124	1062	263.7	1049	993	297.3	970	927	334.9	867	867	376.6	665
	6.0	***1168***	***234.8***	***1152***	***1094***	***264.5***	***1075***	***1024***	***298.0***	***995***	***957***	***335.5***	***888***	***896***	***377.0***	***680***
	7.0	1202	235.4	1181	1127	265.2	1102	1056	299.1	1020	988	336.1	909	925	377.4	696
	8.0	***1236***	***236.1***	***1209***	***1161***	***265.8***	***1129***	***1088***	***299.3***	***1044***	***1019***	***336.6***	***931***	***955***	***377.9***	***712***
	9.0	1270	236.6	1238	1194	266.5	1156	1120	300.0	1068	1050	337.2	953	985	378.3	729
	10.0	***1303***	***237.4***	***1266***	***1229***	***267.1***	***1184***	***1153***	***300.6***	***1094***	***1082***	***337.9***	***975***	***1015***	***378.8***	***745***
	11.0	1337	238.0	1294	1249	267.3	1200	1186	301.3	1119	1114	338.5	997	1046	379.4	762
	12.0	***1372***	***238.5***	***1323***	***1298***	***268.2***	***1239***	***1219***	***301.9***	***1145***	***1146***	***339.2***	***1020***	***1077***	***380.0***	***779***
	13.0	1409	238.9	1354	1332	268.9	1267	1253	302.6	1171	1178	339.9	1043	1109	380.6	796
YCAS 1135EB	5.0	1208	264.4	1210	1132	297.8	1131	1058	335.6	1049	989	377.9	938	904	414.3	705
	6.0	***1244***	***265.8***	***1240***	***1166***	***298.9***	***1159***	***1091***	***336.7***	***1074***	***1020***	***378.9***	***961***	***933***	***414.5***	***720***
	7.0	1280	266.8	1271	1201	300.0	1188	1125	337.7	1100	1052	379.9	984	963	414.7	736
	8.0	***1316***	***267.7***	***1301***	***1236***	***301.0***	***1217***	***1159***	***338.8***	***1127***	***1085***	***380.9***	***1007***	***992***	***414.9***	***752***
	9.0	1352	268.6	1332	1272	302.0	1245	1193	339.7	1153	1118	381.7	1030	1022	415.2	769
	10.0	***1389***	***269.7***	***1363***	***1307***	***303.2***	***1274***	***1227***	***340.7***	***1180***	***1152***	***382.6***	***1054***	***1053***	***415.4***	***785***
	11.0	1425	270.5	1393	1343	304.1	1304	1262	341.7	1207	1185	383.6	1078	1083	415.7	801
	12.0	***1463***	***271.3***	***1425***	***1380***	***305.1***	***1333***	***1297***	***342.7***	***1234***	***1220***	***384.6***	***1102***	***1114***	***416.0***	***818***
	13.0	1501	272.1	1457	1416	306.0	1363	1333	343.8	1262	1254	385.6	1126	1145	416.3	835
YCAS 1215EB	5.0	1283	294.9	1297	1202	332.0	1214	1124	374.0	1127	1050	421.0	1011	941	452.0	745
	6.0	***1320***	***296.8***	***1328***	***1238***	***333.5***	***1244***	***1159***	***375.5***	***1154***	***1084***	***422.3***	***1034***	***971***	***452.0***	***761***
	7.0	1358	298.2	1361	1275	334.9	1274	1194	376.8	1182	1117	423.8	1058	1000	452.0	776
	8.0	***1396***	***299.5***	***1393***	***1312***	***336.2***	***1304***	***1230***	***378.2***	***1210***	***1152***	***425.1***	***1083***	***1030***	***452.0***	***792***
	9.0	1435	300.7	1426	1349	337.6	1335	1266	379.5	1238	1187	426.2	1108	1060	452.0	808
	10.0	***1474***	***301.9***	***1459***	***1386***	***339.4***	***1365***	***1302***	***380.8***	***1266***	***1222***	***427.4***	***1133***	***1090***	***452.0***	***824***
	11.0	1514	303.1	1493	1424	340.7	1396	1339	382.2	1295	1257	428.7	1158	1121	452.0	841
	12.0	***1553***	***304.2***	***1526***	***1462***	***341.9***	***1428***	***1376***	***383.6***	***1324***	***1293***	***430.0***	***1184***	***1151***	***452.0***	***857***
	13.0	1593	305.3	1560	1501	343.2	1459	1413	385.0	1353	1329	431.5	1209	1182	452.0	873

Heat recovery capacities (Heat) are for a leaving hot water temperature range of 10°C, where range = leaving liquid temperature - entering liquid temperature.
Total heat recovery capacities shown are for both heat recovery condensers piped in parallel.

TABLE 9

2 REFRIGERANT CIRCUIT MODELS
PHYSICAL DATA

Model YCAS-EB				0295	0335	0375	0425	0475
Refrigerant circuits				2	2	2	2	2
Refrigerant Charge		Circuit 1	kg	55	65	65	79	85
		Circuit 2	kg	55	55	65	79	79
Oil Charge		Per circuit	l	19	19	19	19	19
Compressor		Number		2	2	2	2	2
		Type (circuit 1)		DXS12L	DXS24L	DXS24L	DXS24L	DXS36L
		Nominal cooling capacity	kW	145	190	190	190	250
		Type (circuit 2)		DXS12L	DXS12L	DXS24L	DXS24L	DXS24L
		Nominal cooling capacity	kW	145	145	190	190	190
		Capacity Control	%	10 - 100%	10 - 100%	10 - 100%	10 - 100%	10 - 100%
Evaporator		Number		1	1	1	1	1
		Type		1084	1084	1084	1160	1160
		Water volume	l	143	143	143	309	309
Air Cooled Condenser		Total coil face area	m²	17.84	17.84	17.84	23.78	23.78
		Number of tube rows		3	3	3	3	3
		Number of fans (cicuit 1)		3	3	3	4	4
		Number of fans (cicuit 2)		3	3	3	4	4
Fans	Standard	Nominal speed	rpm	950	950	950	950	950
		Total airflow	m³/s	37.6	37.6	37.6	50.2	50.2
	Low sound	Nominal speed	rpm	690	690	690	690	690
		Total airflow	m³/s	36.8	36.8	36.8	49.1	49.1
	High pressure	Nominal speed	rpm	965	965	965	965	965
		Total airflow (@ 150 Pa EXT.)	m³/s	37.6	37.6	37.6	50.2	50.2
Sound level to EN 292 1991 (1)		Standard fans	dBA	67	67	68	69	69
		Low sound fans	dBA	63	64	64	65	65
		Acoustic Kit I fitted	dBA	63	63	63	64	64
		Acoustic Kit II fitted	dBA	61	61	61	62	62
		Acoustic Kit III fitted	dBA	62	62	62	63	63
		Acoustic Kit IV fitted	dBA	58	58	58	59	59
		High pressure fans	dBA	72	72	72	73	73
Dimensions (3)		Length (2)	mm	4499	4499	4499	5718	5718
		Width	mm	2321	2321	2321	2321	2321
		Height	mm	2438	2438	2438	2438	2438
Operating Weight (4)	Units with aluminum fin coils		kg	4353	4555	4678	5938	6021
	Units with copper fin coils		kg	4762	4964	5087	6510	6593
	Heat recovery units with aluminum fin coils		kg	4826	5041	5176	6443	6538
	Heat recovery units with copper fin coils		kg	5235	5449	5584	7015	7110
	Aluminum fin coil units (Acoustic Kit III/IV fitted)		kg	4871	5073	5196	6592	6674
	Copper fin coils units (Acoustic Kit III/IV fitted)		kg	5279	5482	5605	7164	7246

(1) Sound Pressure levels are 10 m from the Control Panel, at a height of 1.6 m from the unit base. Levels may vary at different positions around the unit.

(2) Length excludes switch disconnect and/or circuit breaker handles.

(3) The unit length is incresed by 300 mm and the width is incresed by 600 mm with optional Acoustic Kit III or IV fitted.

(4) Shipping weights are Operating Weight - 140 kg (models 0295, 0335 and 0375) or Operating Weight - 300 kg (models 0425 and 0475). Weights with Acoustic Kits fitted include the intake silencers which are fitted on site.

2 REFRIGERANT CIRCUIT MODELS PHYSICAL DATA

TABLE 9

Model YCAS-EB				0515	0555	0575	0605
Refrigerant circuits				2	2	2	2
Refrigerant Charge		Circuit 1	kg	85	88	88	94
		Circuit 2	kg	85	85	88	94
Oil Charge		Per circuit	l	19	19	19	19
Compressor		Number		2	2	2	2
		Type (circuit 1)		DXS36L	DXS45L	DXS45L	DXS45L
		Nominal cooling capacity	kW	250	280	280	280
		Type (circuit 2)		DXS36L	DXS36L	DXS45L	DXS45L
		Nominal cooling capacity	kW	250	250	280	280
		Capacity Control	%	10 - 100%	10 - 100%	10 - 100%	10 - 100%
Evaporator		Number		1	1	1	1
		Type		1160	1160	1160	1160
		Water volume	l	309	309	309	309
Air Cooled Condenser		Total coil face area	m^2	23.78	23.78	23.78	29.73
		Number of tube rows		3	3	3	3
		Number of fans (cicuit 1)		4	4	4	5
		Number of fans (cicuit 2)		4	4	4	5
Fans	Standard	Nominal speed	rpm	950	950	950	950
		Total airflow	m^3/s	50.2	50.2	50.2	62.7
	Low sound	Nominal speed	rpm	690	690	690	690
		Total airflow	m^3/s	49.1	49.1	49.1	61.4
	High pressure	Nominal speed	rpm	965	965	965	965
		Total airflow (@ 150 Pa EXT.)	m^3/s	50.2	50.2	50.2	62.7
Sound level to EN 292 1991 (1)		Standard fans	dBA	69	70	71	71
		Low sound fans	dBA	66	67	68	69
		Acoustic Kit I fitted	dBA	64	64	64	65
		Acoustic Kit II fitted	dBA	62	62	62	63
		Acoustic Kit III fitted	dBA	63	63	63	64
		Acoustic Kit IV fitted	dBA	59	59	59	59
		High pressure fans	dBA	73	74	74	75
Dimensions (3)		Length (2)	mm	5718	5718	5718	6937
		Width	mm	2321	2321	2321	2321
		Height	mm	2438	2438	2438	2438
Operating Weight (4)	Units with aluminum fin coils		kg	6098	6121	6150	6570
	Units with copper fin coils		kg	6670	6693	6722	7261
	Heat recovery units with aluminum fin coils		kg	6626	6657	6699	7118
	Heat recovery units with copper fin coils		kg	7198	7229	7271	7810
	Aluminum fin coil units (Acoustic Kit III/IV fitted)		kg	6751	6775	6804	7359
	Copper fin coils units (Acoustic Kit III/IV fitted)		kg	7324	7347	7376	8051

(1) Sound Pressure levels are 10 m from the Control Panel, at a height of 1.6 m from the unit base. Levels may vary at different positions around the unit.

(2) Length excludes switch disconnect and/or circuit breaker handles.

(3) The unit length is incresed by 300 mm and the width is incresed by 600 mm with optional Acoustic Kit III or IV fitted.

(4) Shipping weights are Operating Weight - 300 kg (models 0515, 0555, 0575 and 0605). Weights with Acoustic Kits fitted include the intake silencers which are fitted on site.

TABLE 9 — 3 REFRIGERANT CIRCUIT MODELS PHYSICAL DATA

Model YCAS-EB				0685	0775	0835	0905	0965
Refrigerant circuits				3	3	3	3	3
Refrigerant Charge		Circuit 1	kg	78	88	91	91	99
		Circuit 2	kg	78	88	88	91	99
		Circuit 3	kg	91	88	88	91	99
Oil Charge		Per circuit	l	15	15	15	15	15
Compressor		Number		3	3	3	3	3
		Type (circuit 1)		DXS24L	DXS36L	DXS45L	DXS45L	DXS45L
		Nominal cooling capacity	kW	190	250	280	280	280
		Type (circuit 2)		DXS24L	DXS36L	DXS36L	DXS45L	DXS45L
		Nominal cooling capacity	kW	190	250	250	280	280
		Type (circuit 3)		DXS45L	DXS36L	DXS36L	DXS45L	DXS45L
		Nominal cooling capacity	kW	280	250	250	280	280
		Capacity Control	%	10 - 100%	10 - 100%	10 - 100%	10 - 100%	10 - 100%
Evaporator		Number		1	1	1	1	1
		Type		1224	1252	1252	1252	1252
		Water volume	l	762	914	914	914	914
Air Cooled Condenser		Total coil face area	m²	29.73	35.67	35.67	35.67	47.56
		Number of tube rows		3	3	3	3	3
		Number of fans (circuit 1)		3	4	4	4	5
		Number of fans (circuit 2)		3	4	4	4	5
		Number of fans (circuit 3)		4	4	4	4	6
Fans	Standard	Nominal speed	rpm	950	950	950	950	950
		Total airflow	m³/s	72.7	87.2	87.2	87.2	116.3
	Low sound	Nominal speed	rpm	690	690	690	690	690
		Total airflow	m³/s	71.2	85.5	85.5	85.5	113.9
	High pressure	Nominal speed	rpm	965	965	965	965	965
		Total airflow (@ 150 Pa EXT.)	m³/s	72.7	87.2	87.2	87.2	116.3
Sound level to EN 292 1991 (1)		Standard fans	dBA	70	70	70	71	72
		Low sound fans	dBA	67	67	68	69	70
		Acoustic Kit I fitted	dBA	64	65	65	65	66
		Acoustic Kit II fitted	dBA	62	63	63	63	64
		Acoustic Kit III fitted	dBA	63	64	64	64	65
		Acoustic Kit IV fitted	dBA	60	60	60	60	60
		High pressure fans	dBA	74	74	74	75	76
Dimensions (3)		Length (2)	mm	7474	8694	8694	8694	11132
		Width	mm	2331	2331	2331	2331	2331
		Height	mm	2438	2438	2438	2438	2438
Operating Weight (4)	Units with aluminum fin coils		kg	9089	9826	9915	9995	10746
	Units with copper fin coils		kg	9783	10683	10772	10852	11847
	Heat recovery units with aluminum fin coils		kg	N/A	N/A	N/A	N/A	N/A
	Heat recovery units with copper fin coils		kg	N/A	N/A	N/A	N/A	N/A
	Aluminum fin coil units (Acoustic Kit III/IV fitted)		kg	9879	10752	10841	10921	11952
	Copper fin coils units (Acoustic Kit III/IV fitted)		kg	10573	11609	11698	11778	13046

(1) Sound Pressure levels are 10 m from the Control Panel, at a height of 1.6 m from the unit base. Levels may vary at different positions around the unit.

(2) Length excludes switch disconnect and/or circuit breaker handles.

(3) The unit length is incresed by 300 mm and the width is incresed by 600 mm with optional Acoustic Kit III or IV fitted.

(4) Shipping weights are Operating Weight - 750 kg (model 0685) or Operating Weight - 900 kg (models 0775, 0835, 0905 and 0965). Weights with Acoustic Kits fitted include the intake silencers which are fitted on site.

4 REFRIGERANT CIRCUIT MODELS PHYSICAL DATA

TABLE 9

Model YCAS-EB				1065	1135	1215
Refrigerant circuits				4	4	4
Refrigerant Charge		Circuit 1	kg	88	91	91
		Circuit 2	kg	88	91	91
		Circuit 3	kg	88	88	91
		Circuit 4	kg	88	88	91
Oil Charge		Per circuit	l	15	15	15
Compressor		Number		4	4	4
		Type (circuit 1 & 2)		DXS36L	DXS45L	DXS45L
		Nominal cooling capacity	kW	250	280	280
		Type (circuit 3 & 4)		DXS36L	DXS36L	DXS45L
		Nominal cooling capacity	kW	250	250	280
		Capacity Control	%	10 - 100%	10 - 100%	10 - 100%
Evaporator		Number		1	1	1
		Type		1336	1336	1336
		Water volume	l	1013	1013	1013
Air Cooled Condenser		Total coil face area	m^2	47.56	47.56	47.56
		Number of tube rows		3	3	3
		Number of fans (circuit 1)		4	4	4
		Number of fans (circuit 2)		4	4	4
		Number of fans (circuit 3)		4	4	4
		Number of fans (circuit 4)		4	4	4
Fans	Standard	Nominal speed	rpm	950	950	950
		Total airflow	m^3/s	116.3	116.3	116.3
	Low sound	Nominal speed	rpm	690	690	690
		Total airflow	m^3/s	113.9	113.9	113.9
	High pressure	Nominal speed	rpm	965	965	965
		Total airflow (@ 150 Pa EXT.)	m^3/s	116.3	116.3	116.3
Sound level to EN 292 1991 (1)		Standard fans	dBA	71	72	73
		Low sound fans	dBA	68	69	70
		Acoustic Kit I fitted	dBA	66	66	66
		Acoustic Kit II fitted	dBA	64	64	64
		Acoustic Kit III fitted	dBA	65	65	65
		Acoustic Kit IV fitted	dBA	62	62	62
		High pressure fans	dBA	75	76	76
Dimensions (3)		Length (2)	mm	11132	11132	11132
		Width	mm	2331	2331	2331
		Height	mm	2438	2438	2438
Operating Weight (4)	Units with aluminum fin coils		kg	12889	12962	13011
	Units with copper fin coils		kg	14077	14140	14210
	Heat recovery units with aluminum fin coils		kg	13946	14094	14108
	Heat recovery units with copper fin coils		kg	15133	15269	15307
	Aluminum fin coil units (Acoustic Kit III/IV fitted)		kg	14094	14167	14217
	Copper fin coils units (Acoustic Kit III/IV fitted)		kg	15232	15305	15354

(1) Sound Pressure levels are 10 m from the Control Panel, at a height of 1.6 m from the unit base. Levels may vary at different positions around the unit.

(2) Length excludes switch disconnect and/or circuit breaker handles.

(3) The unit length is incresed by 300 mm and the width is incresed by 600 mm with optional Acoustic Kit III or IV fitted.

(4) Shipping weights are Operating Weight - 1000 kg (models 1065, 1135 and 1215)
Weights with Acoustic Kits fitted include the intake silencers which are fitted on site.

TABLE 10 2, 3 AND 4 REFRIGERANT CIRCUIT MODELS ELECTRICAL DATA

	Standard Fan Chillers									
	Nominal Running Amps			Maximum Running Amps			Largest Compressor Starting Amps		Starting Amps per Fan	Nominal Running Amps per Fan
Model YCAS EB	Total Unit Amps	System 1 Amps	System 2 Amps	Total Unit Amps	System 1 Amps	System 2 Amps	Star Delta Amps	Direct on Line Amps		
0295	152	76	76	228	114	114	175	523	17.1	4.4
0335	195	119	76	273	159	114	232	732	17.1	4.4
0375	238	119	119	318	159	159	232	732	17.1	4.4
0425	235	118	118	304	152	152	232	732	17.1	4.4
0475	267	150	118	357	205	152	283	907	17.1	4.4
0515	299	150	150	410	205	205	283	907	17.1	4.4
0555	330	181	150	460	255	205	283	907	17.1	4.4
0575	361	181	181	510	255	255	283	907	17.1	4.4
0605	344	172	172	482	241	241	283	907	17.1	4.4
0685	406	287	119	508	367	141	283	907	17.1	4.4
0775	440	293	147	549	366	183	283	907	17.1	4.4
0835	468	321	147	592	409	183	283	907	17.1	4.4
0905	524	349	175	678	452	226	283	907	17.1	4.4
0965	520	348	172	665	442	223	283	907	17.1	4.4
1065	586	293	293	732	366	366	283	907	17.1	4.4
1135	642	321	321	818	409	409	283	907	17.1	4.4
1215	698	349	349	904	452	452	283	907	17.1	4.4

	Low Sound Fan Chillers									
	Nominal Running Amps			Maximum Running Amps			Largest Compressor Starting Amps		Starting Amps per Fan	Nominal Running Amps per Fan
Model YCAS EB	Total Unit Amps	System 1 Amps	System 2 Amps	Total Unit Amps	System 1 Amps	System 2 Amps	Star Delta Amps	Direct on Line Amps		
0295	151	75	75	226	113	113	175	523	13.0	4.1
0335	194	118	75	271	158	113	232	732	13.0	4.1
0375	237	118	118	316	158	158	232	732	13.0	4.1
0425	233	116	116	302	151	151	232	732	13.0	4.1
0475	265	148	116	355	204	151	283	907	13.0	4.1
0515	297	148	148	408	204	204	283	907	13.0	4.1
0555	328	179	148	458	254	204	283	907	13.0	4.1
0575	359	179	179	508	254	254	283	907	13.0	4.1
0605	341	171	171	479	240	240	283	907	13.0	4.1
0685	403	285	118	505	365	140	283	907	13.0	4.1
0775	436	291	145	545	364	182	283	907	13.0	4.1
0835	464	319	145	588	407	182	283	907	13.0	4.1
0905	520	347	173	674	450	225	283	907	13.0	4.1
0965	516	345	171	660	439	222	283	907	13.0	4.1
1065	582	291	291	727	364	364	283	907	13.0	4.1
1135	638	319	319	813	407	407	283	907	13.0	4.1
1215	694	347	347	899	450	450	283	907	13.0	4.1

Electrical Data Notes

Nominal conditions are taken at 7°C leaving chilled liquid temperature and 35°C condenser air entering temperature.

Maximum NamePlate conditions allowed by compressor motor protection.

Total Unit values are for all compressors and fans running. That is, system 1 & 2.

System 1, are values for one or two compressors with respective condenser fans running.

System 2, are values for one or two compressors with respective condenser fans running.

Starting Amps is the maximum inrush current (per compressor) when Star Delta or Direct on Line starting is employed at 400 V.

	High Pressure Fan Chillers						Largest Compressor Starting Amps		Starting Amps per Fan	Nominal Running Amps per Fan
	Nominal Running Amps			Maximum Running Amps						
Model YCAS EB	Total Unit Amps	System 1 Amps	System 2 Amps	Total Unit Amps	System 1 Amps	System 2 Amps	Star Delta Amps	Direct on Line Amps		
0295	170	85	85	246	123	123	175	523	48.3	7.4
0335	213	128	85	291	168	123	232	732	48.3	7.4
0375	256	128	128	336	168	168	232	732	48.3	7.4
0425	259	130	130	328	164	164	232	732	48.3	7.4
0475	291	162	130	381	217	164	283	907	48.3	7.4
0515	323	162	162	434	217	217	283	907	48.3	7.4
0555	354	193	162	484	267	217	283	907	48.3	7.4
0575	385	193	193	534	267	267	283	907	48.3	7.4
0605	374	187	187	512	256	256	283	907	48.3	7.4
0685	436	308	128	538	388	150	283	907	48.3	7.4
0775	476	317	159	585	390	195	283	907	48.3	7.4
0835	504	345	159	628	433	195	283	907	48.3	7.4
0905	560	373	187	714	476	238	283	907	48.3	7.4
0965	568	381	187	713	475	238	283	907	48.3	7.4
1065	634	317	317	780	390	390	283	907	48.3	7.4
1135	690	345	345	866	433	433	283	907	48.3	7.4
1215	746	373	373	952	476	476	283	907	48.3	7.4

Electrical Data Notes

Nominal conditions are taken at 7°C leaving chilled liquid temperature and 35°C condenser air entering temperature.

Maximum NamePlate conditions allowed by compressor motor protection.

Total Unit values are for all compressors and fans running. That is, system 1 & 2.

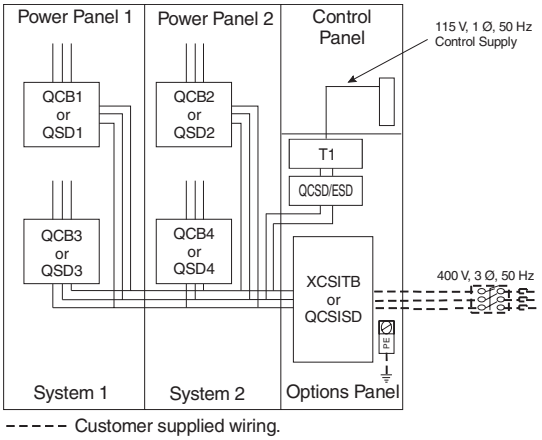
System 1, are values for one or two compressors with respective condenser fans running.

System 2, are values for one or two compressors with respective condenser fans running.

Starting Amps is the maximum inrush current (per compressor) when Star Delta or Direct on Line starting is employed at 400 V.

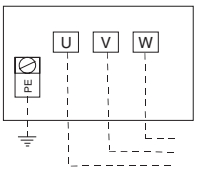
2, 3 AND 4 REFRIGERANT CIRCUIT MODELS CONNECTION DIAGRAMS

Single Point Power Supply Connection - All Models with Terminal Block or Non-Fused Switch Disconnect (Options 2.4, 2.4x, 2.5 or 2.5x)

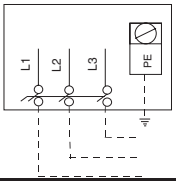


Model YCAS	Terminal Block Wire Range (mm²)	N-F Switch Disconnect Wire Range (mm²)
0295	70 - 240	25-150
0335	70 - 240	(2) 95-120
0375	(2) 50 - 150	(2) 95-120
0425	(2) 50 - 150	(2) 95-120
0475	(2) 70 - 240	(3) 95-185
0515	(2) 50 - 150	(2) 95-120
0555	(2) 70 - 240	(3) 95-185
0575	(2) 70 - 240	(3) 95-185
0605	(2) 70 - 240	(3) 95-185
0685	(2) 70 - 240	(2) 120 - 240
0775	(2) 70 - 240	(2) 120 - 240
0835	(2) 70 - 240	(2) 120 - 240
0905	(3) 50 - 150	(3) 95-185
0965	(3) 50 - 150	(3) 95-185
1065	(3) 70 - 240	(3) 95-185
1135	(3) 70 - 240	(4) 95-240
1215	(3) 70 - 240	(4) 95-240

Terminal Block Connection



Non-Fused Switch Disconnect Connection



Note: Figures in brackets denote the number of available connections per phase. For example (2) 95 - 120 mm² - can take 2 cables at the stated wire range.

One field provided 400 V, 3Ø, 50 Hz supply to the unit with circuit protection. Field connections to factory provided Terminal Block (XCSITB) or Non-Fused Switch Disconnect (QCSISD) in the Options Panel.

Options 2.4 and 2.5: Internal branch Circuit Breakers (QCB) for each circuit in the two Power Panels.

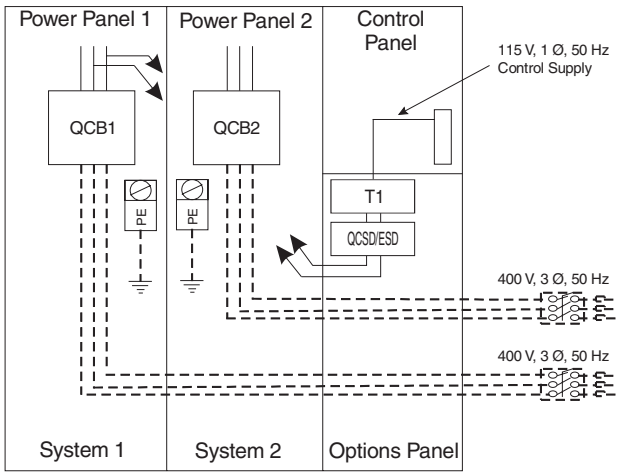
Options 2.4x and 2.5x: Internal branch Non-Fused Switch Disconnects (QSD) and Fuses for each circuit in the two Power Panels.

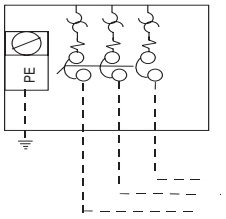
Options 2.4 and 2.4x: The control circuit supply is derived internally from Electrical System 1 (Circuit 1) which then feeds the Non-Fused Switch Disconnect (QCSD/ESD) and Control Transformer (T1) in the Options Panel.

Options 2.5 and 2.5x: The control circuit supply is derived internally from the common supply which then feeds the Non-Fused Switch Disconnect (QCSD/ESD) and Control Transformer (T1) in the Options Panel.

2, 3 AND 4 REFRIGERANT CIRCUIT MODELS
CONNECTION DIAGRAMS

Multi-Point Power Supply Connection - Models 0295 to 0605 with Door Interlocked Circuit Breakers (Option 2.1)



Model YCAS	System 1 Wire Range (mm²)	System 2 Wire Range (mm²)	Circuit Breaker Connection
0295	25 -150	25 -150	
0335	25 -150	25 -150	
0375	25 -150	25 -150	
0425	25 -150	25 -150	
0475	(2) 95 - 120	(2) 95 - 120	
0515	25 -150	25 -150	
0555	(2) 95 - 120	(2) 95 - 120	
0575	(2) 95 - 120	(2) 95 - 120	
0605	(2) 95 - 120	(2) 95 - 120	

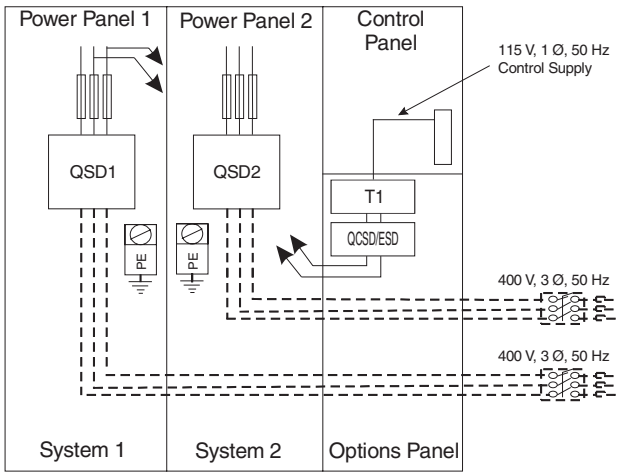
Note: Figures in brackets denote the number of available connections per phase. For example (2) 95 - 120 mm² - can take 2 cables at the stated wire range.

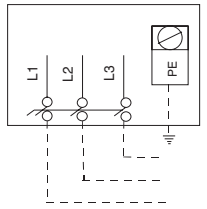
– – – – – Customer supplied wiring.

Two field provided 400 V, 3Ø, 50 Hz supplies to the unit with circuit protection. Field connections to factory provided Circuit Breakers (QCB) in each of the two Power Panels.

The control circuit supply is derived internally from Electrical System 1 which then feeds the Non-Fused Switch Disconnect (QCSD/ESD) and Control Transformer (T1) in the Options Panel.

Multi-Point Power Supply Connection - Models 0295 to 0605 with Door Interlocked Non-Fused Switch Disconnects and Fuses (Option 2.1x)



Model YCAS	System 1 Wire Range (mm²)	System 2 Wire Range (mm²)	Non-Fused Switch Disconnect Connection
0295	70 -120	70 -120	
0335	70 -120	70 -120	
0375	70 -120	70 -120	
0425	95 -185	95 -185	
0475	95 -185	95 -185	
0515	95 -185	95 -185	
0555	95 -185	95 -185	
0575	95 -185	95 -185	
0605	95 -185	95 -185	

Note: Figures in brackets denote the number of available connections per phase. For example (2) 95 - 120 mm² - can take 2 cables at the stated wire range.

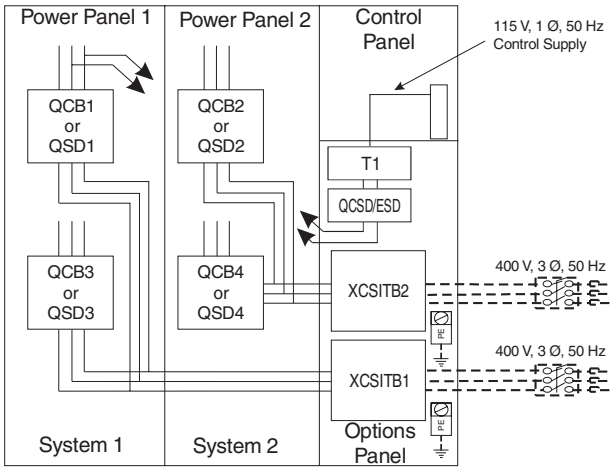
– – – – – Customer supplied wiring.

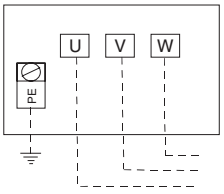
Two field provided 400 V, 3Ø, 50 Hz supplies to the unit with circuit protection. Field connections to factory provided Non-Fused Switch Disconnects (QSD) in the two Power Panels.

The control circuit supply is derived internally from Electrical System 1 which then feeds the Non-Fused Switch Disconnect (QCSD/ESD) and Control Transformer (T1) in the Options Panel.

2, 3 AND 4 REFRIGERANT CIRCUIT MODELS
CONNECTION DIAGRAMS

Multi-Point Power Supply Connection - Models 0685 to 1215 with Terminal Blocks (Options 2.2 and 2.2x)



Model YCAS	System 1 Wire Range (mm²)	System 2 Wire Range (mm²)	Terminal Block Connection
0685	(2) 35 - 95	35 - 95	
0775	(2) 35 - 95	35 - 95	
0835	(2) 50 - 150	35 - 95	
0905	(2) 50 - 150	50 - 150	
0965	(2) 50 - 150	50 - 150	
1065	(2) 35 - 95	(2) 35 - 95	
1135	(2) 50 - 150	(2) 50 - 150	
1215	(2) 50 - 150	(2) 50 - 150	

Note: Figures in brackets denote the number of available connections per phase. For example (2) 95 - 120 mm² - can take 2 cables at the stated wire range.

– – – – – Customer supplied wiring.

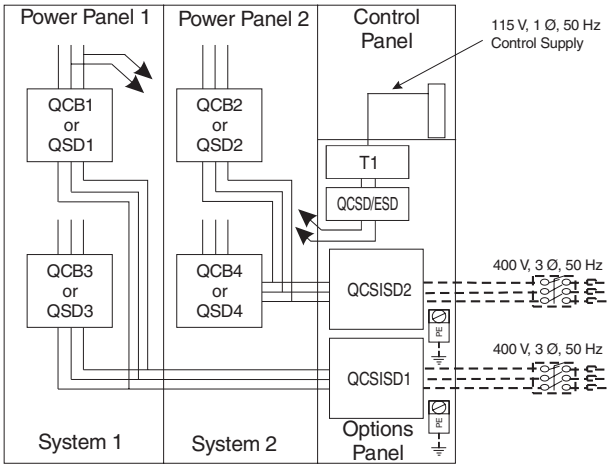
Two field provided 400 V, 3Ø, 50 Hz supplies to the unit with circuit protection. Field connections to factory provided Terminal Blocks (XCSITB) in the Options Panel.

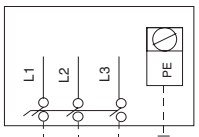
Option 2.2: Internal branch Circuit Breakers (QCB) for each circuit in the two Power Panels.

Option 2.2x: Internal branch Non-Fused Switch Disconnects (QSD) and Fuses for each circuit in the two Power Panels.

The control circuit supply is derived internally from Electrical System 1 (Circuit 1) which then feeds the Non-Fused Switch Disconnect (QCSD/ESD) and Control Transformer (T1) in the Options Panel.

Multi-Point Power Supply Connection - Models 0685 to 1215 with Non-Fused Switch Disconnects (Options 2.3 and 2.3x)



Model YCAS	System 1 Wire Range	System 2 Wire Range	Non-Fused Switch Disconnect Connection
0685	(2) 95-120	35 - 95	
0775	(2) 95-120	25 - 150	
0835	(2) 120 - 240	25 - 150	
0905	(2) 120 - 240	25 - 150	
0965	(2) 120 - 240	25 - 150	
1065	(2) 95-120	(2) 95-120	
1135	(2) 120 - 240	(2) 120 - 240	
1215	(2) 120 - 240	(2) 120 - 240	

Note: Figures in brackets denote the number of available connections per phase. For example (2) 95 - 120 mm² - can take 2 cables at the stated wire range.

– – – – – Customer supplied wiring.

Two field provided 400 V, 3Ø, 50 Hz supplies to the unit with circuit protection. Field connections to factory provided Non-Fused Switch Disconnects (QCSISD) in the Options Panel.

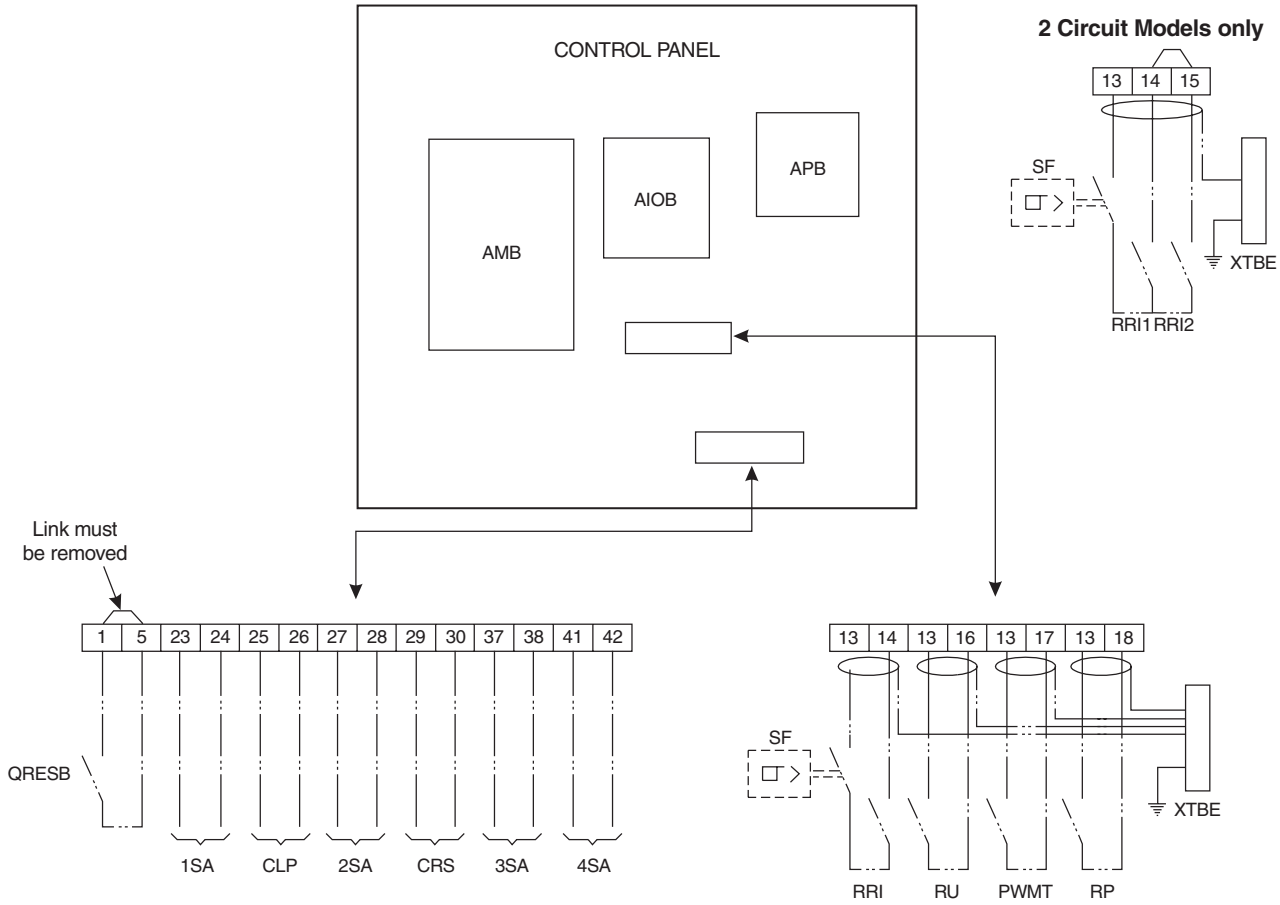
Option 2.3: Internal branch Circuit Breakers (QCB) for each circuit in the two Power Panels.

Option 2.3x: Internal branch Non-Fused Switch Disconnects (QSD) and Fuses for each circuit in the two Power Panels.

The control circuit supply is derived internally from Electrical System 1 (Circuit 1) which then feeds the Non-Fused Switch Disconnect (QCSD/ESD) and Control Transformer (T1) in the Options Panel.

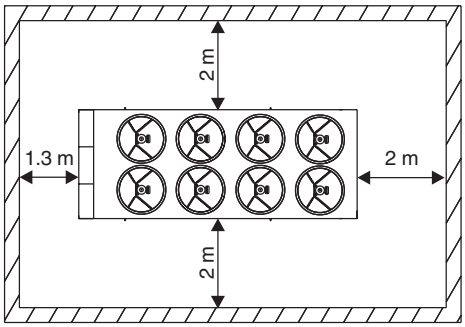
2, 3 AND 4 REFRIGERANT CIRCUIT MODELS
CONNECTION DIAGRAMS

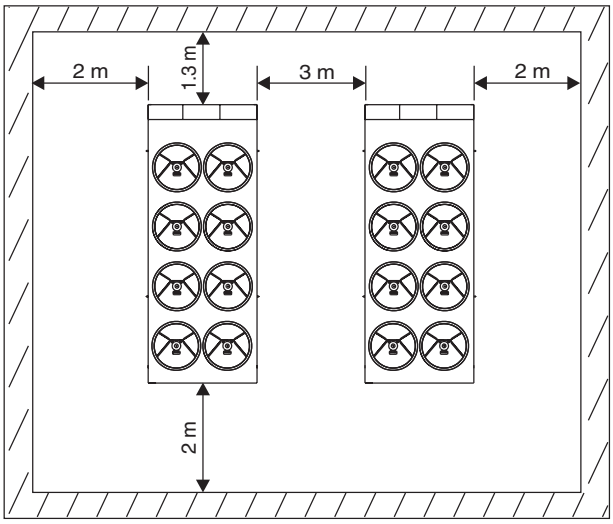
Customer Connection Diagram

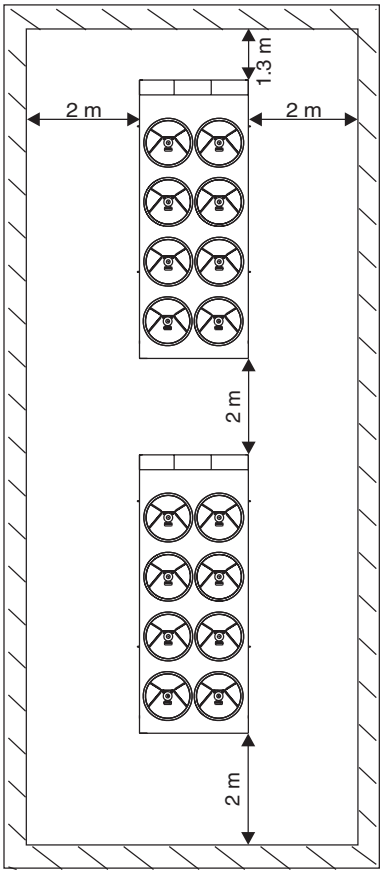


AMB	Microprocessor Board	**CLP**	Chilled Liquid Pump Start	**1SA**	System 1 Alarm Contacts
AIOB	Input/Output Board	**CRS**	Chiller Run	**2SA**	System 2 Alarm Contacts
APB	Power Board	**RU**	Current PWM	**3SA**	System 3 Alarm Contacts
QRESB	Remote Emergency Stop	**PWMT**	Temperature PWM	**4SA**	System 4 Alarm Contacts
RRI	Remote Run Interlock	**RRI1**	Remote Run Interlock (Circuit 1)	**RRI2**	Remote Run Interlock (Circuit 2)
SF	Flow Switch	**RP**	Remote Print	**XTBE**	Ground Terminal

CLEARANCES (All Models)

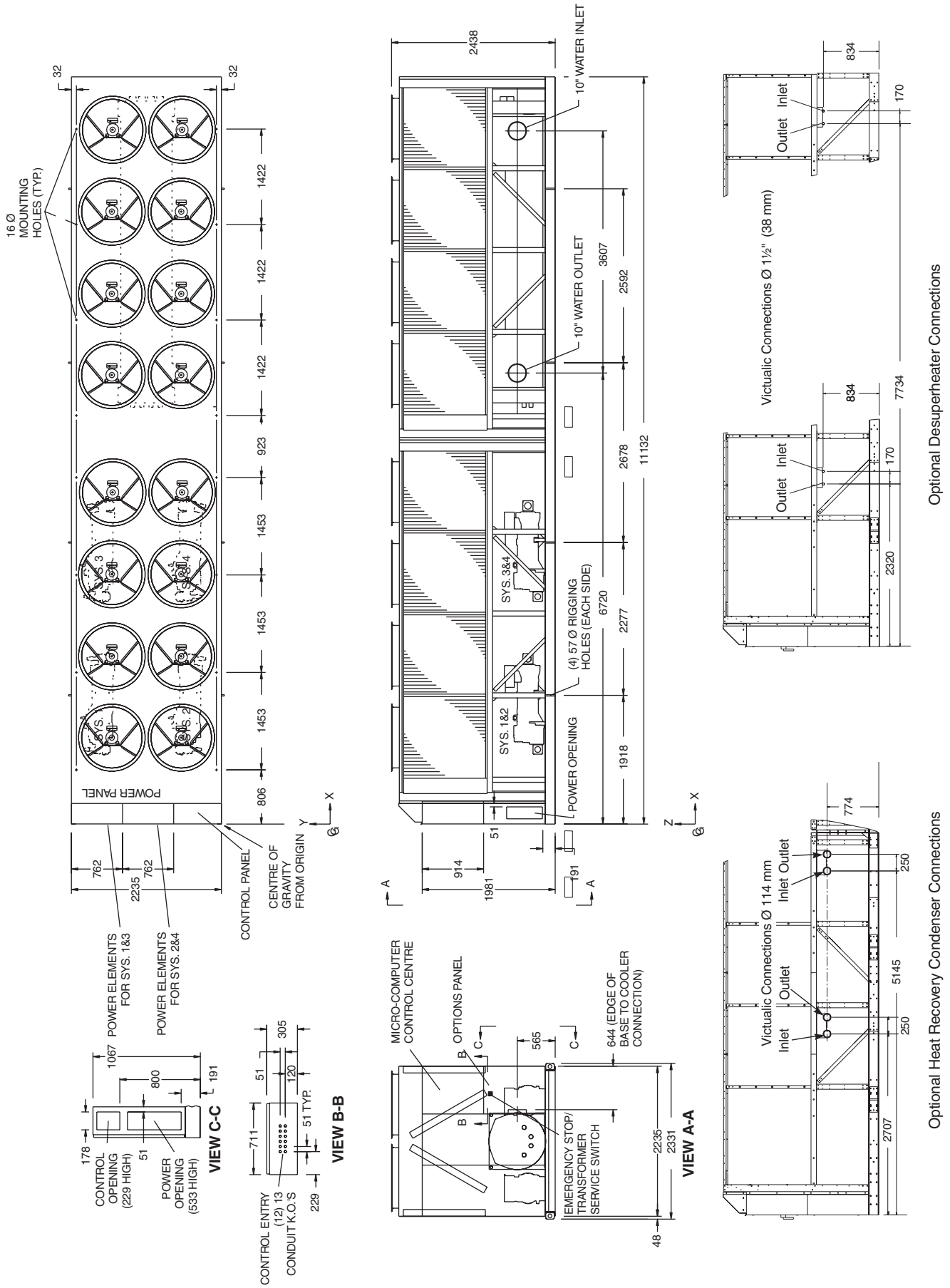






DIMENSIONS (continued)

Models 1065, 1135 and 1215



Catalogue of Carrier 30RB 090R

PRODUCT SELECTION DATA

AIR-COOLED SCROLL CHILLERS AND HEAT PUMPS WITH GREENSPEED® INTELLIGENCE

Low environmental impact

High full and part load efficiency

Compact and simple to install

Low refrigerant charge

Superior reliability

30RB/30RQ 040R-160R

Cooling capacity 40-160 kW
Heating capacity 40-160 kW

Aquasnap® heat pumps and liquid chillers are the best solution for commercial and industrial applications where installers, engineering and design departments and building owners require reduced installation costs, optimal performances and maximum quality.

- AquaSnap® (30RB-30RQ) is a compact all-in-one package optimised for applications which require reduced investment and installation costs (low CapEx).
- The large options panel allows for configurations that suit user requirements.
- Optional variable-speed fans and pumps with Carrier Greenspeed® intelligence control logic make this a product which is optimised for part load applications where a high SEER, SEPR, SCOP or IPLV value is required.

In this configuration, AquaSnap® provides premium part load efficiency to reduce maintenance costs over the lifespan of the chiller. In addition, the sound levels achieved under the part load conditions are particularly low. Besides operating efficiently and quietly, the AquaSnap® range with Greenspeed® intelligence operates from -20 °C up to +46 °C as standard.

* The availability of sizes and options depends on the country. Please contact your local commercial dealer for more information.

CARRIER participates in the ECP programme for LCP/HP
Check ongoing validity of certificate:
www.eurovent-certification.com

Translation of the original document

PHYSICAL DATA, SIZES 040R TO 160R

30RB				040R	045R	050R	055R	060R	070R	080R	090R	100R	120R	140R	160R
Standard unit															
Cooling Full load performances*	CA1	Nominal capacity	kW	41,7	47,3	52,9	56,1	63,6	71,2	81,1	93,4	107	124	140	160
		EER	kW/kW	2,95	2,94	2,93	2,97	2,89	2,90	2,78	2,97	2,83	2,85	2,87	2,76
	CA2	Nominal capacity	kW	54,6	62,7	69,4	74,3	84,6	93,0	103	126	142	162	183	203
		EER	kW/kW	3,60	3,60	3,51	3,61	3,63	3,49	3,22	3,72	3,48	3,40	3,48	3,21
Seasonal energy efficiency**		**SEER $_{12/7\,°C}$ Comfort low temp.**	**kWh/kWh**	**4,41**	**4,47**	**4,50**	**4,62**	**4,41**	**4,31**	**4,24**	**4,38**	**4,51**	**4,57**	**4,46**	**4,37**
		ηs cool $_{12/7°C}$	**%**	**173**	**176**	**177**	**182**	**174**	**169**	**167**	**172**	**177**	**180**	**176**	**172**
		SEER $_{23/18°C}$ Comfort medium temp.	**kWh/kWh**	**6,10**	**6,11**	**6,06**	**6,17**	**5,61**	**5,72**	**5,46**	**5,54**	**5,78**	**5,73**	**5,61**	**5,34**
		SEPR $_{12/7\,°C}$ Process high temp.	**kWh/kWh**	**6,30**	**6,23**	**6,23**	**6,21**	**5,92**	**5,46**	**5,21**	**5,45**	**5,19**	**5,24**	**5,37**	**5,15**
		SEPR $_{-2/-8°C}$ Process medium temp.	**kWh/kWh**	**3,59**	**3,65**	**3,79**	**3,89**	**3,65**	**3,61**	**3,67**	**3,54**	**3,54**	**3,74**	**3,61**	**3,68**
Part Load integrated values		IPLV.SI	kW/kW	4,945	5,025	5,182	5,270	5,369	4,630	4,630	4,904	4,953	4,997	4,707	4,680
Sound levels															
Standard unit															
Sound power(1)			dB(A)	81,5	82,0	83,5	83,5	89,0	89,0	89,0	91,5	91,5	92,0	92,0	92,0
Sound pressure at 10 m(2)			dB(A)	50,0	50,5	52,0	52,0	57,0	57,5	57,0	60,0	59,5	60,0	60,0	60,0
Unit + option 15LS															
Sound power(1)			dB(A)	78,5	79,0	80,0	80,0	80,0	80,0	80,0	83,0	83,0	83,0	83,0	83,0
Sound pressure at 10 m(2)			dB(A)	47,0	47,5	48,5	48,5	48,0	48,5	48,0	51,0	51,0	51,5	51,0	51,0
Dimensions															
Standard unit															
Length			mm	2109	2109	2109	2109	2109	2109	2109	2275	2275	2275	2275	2275
Width			mm	1090	1090	1090	1090	1090	1090	1090	2125	2125	2125	2125	2125
Height			mm	1330	1330	1330	1330	1330	1330	1330	1330	1330	1330	1330	1330
Unit height (option 12)			mm	1372	1372	1372	1372	1372	1372	1372	1372	1372	1372	1372	1372
Unit height (option 307)			mm	1931	1931	1931	1931	1931	1931	1931	1931	1931	1931	1931	1931
Unit height (option 12 + 307)			mm	1973	1973	1973	1973	1973	1973	1973	1973	1973	1973	1973	1973

* In accordance with standard EN14511-3:2018.

** In accordance with EN14825:2018, average climatic conditions.

CA1 Cooling mode conditions: evaporator water inlet/outlet temperature 12 °C/7 °C, outdoor air temperature 35 °C, evaporator fouling factor 0 m². k/W

CA2 Cooling mode conditions: evaporator water inlet/outlet temperature 23 °C/18 °C, outdoor air temperature 35 °C, evaporator fouling factor 0 m². k/W

ηs cool $_{12/7°C}$ & SEER $_{12/7°C}$ **Values in bold comply with Ecodesign Regulation (EU) No. 2016/2281 for Comfort applications**

SEER $_{23/18\,°C}$ **Values in bold comply with Ecodesign Regulation (EU) No. 2016/2281 for Comfort applications**

SEPR $_{-2/-8°C}$ **Values in bold comply with Ecodesign Regulation (EU) No. 2015/1095 for HT applications**

IPLV.SI Calculated as per AHRI standard 551-591.

(1) In dB ref=10^{-12} W, (A) weighting. Declared dual-number noise emission value in accordance with ISO 4871 with an uncertainty of +/-3 dB(A). Measured in accordance with ISO 9614-1 and certified by Eurovent.

(2) In dB ref 20 µPa, (A) weighting. Declared dual-number noise emission value in accordance with ISO 4871 with an uncertainty of +/-3 dB(A). For information, calculated from the sound power Lw(A).

EUROVENT CERTIFIED PERFORMANCE www.eurovent-certification.com

Eurovent certified values

* The availability of sizes and options depends on the country. Please contact your local commercial dealer for more information.

PHYSICAL DATA, SIZES 040R TO 160R

30RB		040R	045R	050R	055R	060R	070R	080R	090R	100R	120R	140R	160R
Operating weight (3)													
Standard unit	kg	408	409	428	428	435	446	454	672	734	743	861	877
Unit + single high-pressure pump option	kg	428	429	448	448	455	466	474	692	754	768	886	902
Unit + dual high-pressure pump option	kg	455	456	475	475	482	493	501	719	781	790	908	924
Unit + single high-pressure pump and buffer tank options	kg	763	765	784	784	791	801	810	1087	1149	1163	1281	1297
Unit + dual high-pressure pump and buffer tank options	kg	790	792	811	811	818	828	837	1114	1176	1185	1303	1319
Compressors		Hermetic Scroll 48,3 r/s											
Circuit A		2	2	2	2	2	2	2	2	3	3	2	2
Circuit B												2	2
No. of power stages		2	2	2	2	2	2	2	2	3	3	4	4
Refrigerant(3)		R-32 / A2L/ PRP= 675 in accordance with AR4											
Circuit A	kg	3,72	3,92	4,43	4,90	4,70	4,87	4,84	7,75	8,40	9,00	5,00	5,07
	tCO_2e	2,5	2,6	3,0	3,3	3,2	3,3	3,3	5,2	5,7	6,1	3,4	3,4
Circuit B	kg											5,00	5,07
	tCO_2e											3,4	3,4
Oil		POE											
Circuit A	l	6,00	6,00	6,60	6,60	6,60	7,20	7,20	7,20	10,80	10,80	7,20	7,20
Circuit B	l											7,20	7,20
Capacity control		SmartVu™											
Minimum capacity	%	50	50	50	50	50	50	50	50	33	33	25	25
PED category		III											
Condenser		All-aluminium micro-channel coils (MCHE)											
Fans		Axial Flying bird™ 6 with rotating shroud											
Standard unit													
Quantity		1	1	1	1	1	1	1	2	2	2	2	2
Maximum total air flow	l/s	3882	3802	4058	3900	5484	5452	5414	10568	10512	10974	10904	10827
Maximum rotation speed	r/s	12	12	12	12	16	16	16	16	16	16	16	16
Evaporator		Direct expansion brazed-plate heat exchanger											
Water volume	l	3,55	4	4,44	4,44	5,18	6,07	6,96	7,4	8,44	9,92	12,69	14,31
Max. water-side operating pressure without hydronic module	kPa	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Hydronic module (option)		Pump, Victaulic screen filter, relief valve, water and air vent valve, pressure sensors											
Pump		Centrifugal pump, monocell, 48,3 r/s, low- or high-pressure (as required), single or dual (as required)											
Expansion tank volume (Option 293)	l	12	12	12	12	12	12	12	35	35	35	35	35
Buffer tank volume (Option 307)	l	208	208	208	208	208	208	208	208	208	208	208	208
Max. water-side operating pressure with hydronic module	kPa	400	400	400	400	400	400	400	400	400	400	400	400
Water connections with or without hydronic module		Victaulic® type											
Connections	inches	2	2	2	2	2	2	2	2	2	2	2	2
External diameter	mm	60,3	60,3	60,3	60,3	60,3	60,3	60,3	60,3	60,3	60,3	60,3	60,3
Casing paint colour		Colour code RAL 7035											

(3) Values are guidelines only. Refer to the unit name plate.

* The availability of sizes and options depends on the country. Please contact your local commercial dealer for more information.

PHYSICAL DATA, SIZES 040R TO 160R

30RQ				040R	045R	050R	060R	070R	080R	090R	100R	120R	140R	160R
Standard unit														
Heating Full load performances*	HA1	**Nominal capacity**	**kW**	**44,1**	**47,9**	**54,3**	**61,6**	**68,2**	**61,8**	**93,3**	**106,6**	**119,1**	**136,8**	**123,1**
		COP	**kW/kW**	**3,91**	**3,97**	**3,89**	**3,80**	**3,81**	**3,03**	**3,80**	**3,80**	**3,80**	**3,80**	**3,03**
	HA2	**Nominal capacity**	**kW**	**42,7**	**47,0**	**53,5**	**59,5**	**67,2**	**75,7**	**91,7**	**104,5**	**117,6**	**134,9**	**150,2**
		COP	**kW/kW**	**3,07**	**3,16**	**3,12**	**3,01**	**3,08**	**3,01**	**3,10**	**3,09**	**3,09**	**3,08**	**3,00**
Seasonal energy efficiency**	HA1	**$SCOP_{30/35°C}$**	**kWh/kWh**	**3,82**	**3,85**	**3,81**	**3,58**	**3,67**	**3,65**	**3,61**	**3,56**	**3,79**	**3,76**	**3,78**
		$\eta s\ heat_{30/35°C}$	**%**	**150**	**151**	**149**	**140**	**144**	**143**	**141**	**139**	**149**	**147**	**148**
		P_{rated}	kW	31,6	33,5	36,4	42,7	49,8	55,0	59,9	68,4	87,0	99,6	109,3
Cooling Full load performances*	CA1	Nominal capacity	kW	41,0	43,1	50,3	60,2	65,2	74,3	87,0	99,9	114,2	131,6	147,2
		EER	kW/kW	2,89	2,69	2,66	2,97	2,90	2,66	2,88	2,84	2,93	2,85	2,66
Seasonal energy efficiency**		$SEER_{12/7\ °C}$ Comfort low temp.	kWh/kWh	4,19	4,23	4,18	4,34	4,25	4,03	4,48	4,86	4,88	4,20	4,09
		$SEPR_{12/7\ °C}$ Process high temp.	kWh/kWh	6,08	5,93	5,69	6,13	5,87	5,39	5,82	5,82	5,89	5,48	5,24
Unit with Heating Optimized option 119D														
Heating Full load performances*	HA1	**Nominal capacity**	**kW**	**44,4**	**48,2**	**54,6**	**62,2**	**68,9**	**62,3**	**94,4**	**107,8**	**120,5**	**137,4**	**123,3**
		COP	**kW/kW**	**4,02**	**4,09**	**3,99**	**3,93**	**3,92**	**3,15**	**3,94**	**3,87**	**3,88**	**3,90**	**3,13**
	HA2	**Nominal capacity**	**kW**	**43,1**	**47,4**	**53,9**	**60,2**	**67,9**	**76,3**	**92,9**	**105,8**	**119,0**	**135,6**	**151,1**
		COP	**kW/kW**	**3,18**	**3,29**	**3,23**	**3,15**	**3,20**	**3,17**	**3,25**	**3,18**	**3,18**	**3,20**	**3,15**
Seasonal energy efficiency**	HA1	**$SCOP_{30/35°C}$**	**kWh/kWh**	**3,97**	**4,00**	**3,96**	**3,78**	**3,88**	**3,89**	**3,77**	**3,71**	**3,95**	**3,98**	**4,00**
		$\eta s\ heat_{30/35°C}$	**%**	**156**	**157**	**155**	**148**	**152**	**153**	**148**	**145**	**155**	**156**	**157**
		P_{rated}	kW	31,7	33,6	36,4	42,9	50,0	55,1	60,3	68,8	87,5	99,8	109,4
Cooling Full load performances*	CA1	Nominal capacity	kW	38,9	41,1	48,1	57,5	62,7	71,8	83,4	96,0	109,6	127,1	142,7
		EER	kW/kW	2,75	2,57	2,56	2,85	2,80	2,59	2,77	2,74	2,83	2,76	2,58
Seasonal energy efficiency**		$SEER_{12/7\ °C}$ Comfort low temp.	kWh/kWh	3,95	4,00	3,98	4,15	4,06	3,89	4,29	4,63	4,66	4,10	4,02
		$SEPR_{12/7\ °C}$ Process high temp.	kWh/kWh	5,68	5,56	5,39	5,79	5,56	5,17	5,52	5,49	5,58	5,33	5,16
Sound levels														
Unit + option 16														
Sound power(1)			dB(A)	82	83	84	89	89,5	89,5	92	92	92	92,5	92
Sound pressure at 10 m(2)			dB(A)	50	52	53	58	58	58	60	61	60	61	60,0
Standard unit														
Sound power(1)			dB(A)	82	83	84	89	89,5	89,5	92	92	92	92,5	92
Sound pressure at 10 m(2)			dB(A)	50	52	53	58	58	58	60	61	60	61	60,0
Unit + option 15LS(3)														
Sound power(1)			dB(A)	78,5	79	80,5	80,5	80,5	80,5	83,5	83,5	83,5	83,5	83,5
Sound pressure at 10 m(2)			dB(A)	47	48	49	49	49	49	52	52	52	52	52

* In accordance with standard EN14511-3:2018.

** In accordance with EN14825:2018, average climatic conditions.

HA1 Heating mode conditions: Water type heat exchanger water inlet/outlet temperature 30 °C/35 °C, outdoor air temperature tdb/twb = 7 °C db/6 °C wb, evaporator fouling factor 0 m^2. k/W

HA2 Heating mode conditions: Water type heat exchanger water inlet/outlet temperature 40 °C/45 °C, outdoor air temperature tdb/twb = 7 °C db/6 °C wb, evaporator fouling factor 0 m^2. k/W

CA1 Cooling mode conditions: evaporator water inlet/outlet temperature 12 °C/7 °C, outdoor air temperature 35 °C, evaporator fouling factor 0 m^2. k/W

$\eta s\ heat_{30/35°C}$ & $SCOP_{30/35°C}$ **Values in bold comply with Ecodesign Regulation (EU) No. 813/2013 for Heating applications**

$SEER_{12/7\ °C}$ & $SEPR_{12/7\ °C}$ Applicable Ecodesign regulation (EU) No. 2016/2281

(1) In dB ref=10^{-12} W, (A) weighting. Declared dual-number noise emission value in accordance with ISO 4871 with an uncertainty of +/-3 dB(A). Measured in accordance with ISO 9614-1 and certified by Eurovent.

(2) In dB ref 20 µPa, (A) weighting. Declared dual-number noise emission value in accordance with ISO 4871 with an uncertainty of +/-3 dB(A). For information, calculated from the sound power Lw(A).

(3) Options: 15LS = Very low noise level, 116W = Variable-speed high pressure dual-pump hydraulic module, 307 = Water buffer tank module

EUROVENT CERTIFIED PERFORMANCE www.eurovent-certification.com

Eurovent certified values

* The availability of sizes and options depends on the country. Please contact your local commercial dealer for more information.

PHYSICAL DATA, SIZES 040R TO 160R

30RQ		040R	045R	050R	060R	070R	080R	090R	100R	120R	140R	160R
Dimensions												
Standard unit												
Length	mm	2109	2109	2109	2109	2109	2109	2275	2275	2275	2275	2275
Width	mm	1090	1090	1090	1090	1090	1090	2125	2125	2125	2125	2125
Height	mm	1330	1330	1330	1330	1330	1330	1330	1330	1330	1330	1330
Unit height (option 12)	mm	1372	1372	1372	1372	1372	1372	1372	1372	1372	1372	1372
Unit height (option 307)	mm	1931	1931	1931	1931	1931	1931	1931	1931	1931	1931	1931
Unit height (option 12 +307)	mm	1973	1973	1973	1973	1973	1973	1973	1973	1973	1973	1973
Operating weight(4)												
Standard unit	kg	444	446	469	496	506	515	759	818	866	996	1000
Unit + single high-pressure pump option	kg	464	466	489	516	526	535	779	838	891	1021	1025
Unit + dual high-pressure pump option	kg	491	493	516	543	553	562	805	864	923	1054	1058
Unit + single high-pressure pump and buffer tank options	kg	800	802	825	852	862	871	1174	1233	1286	1416	1420
Unit + dual high-pressure pump and buffer tank options	kg	827	829	852	879	889	898	1200	1259	1318	1449	1453
Compressors		Hermetic Scroll 48,3 r/s										
Circuit A		2	2	2	2	2	2	2	3	3	2	2
Circuit B											2	2
No. of power stages		2	2	2	2	2	2	2	3	3	4	4
Refrigerant(4)		R-32 / A2L/ PRP= 675 in accordance with AR4										
Circuit A	kg	7,30	7,30	7,80	8,70	8,95	9,20	15,20	15,70	19,60	8,95	9,15
	tCO_2e	4,9	4,9	5,3	5,9	6,0	6,2	10,3	10,6	13,3	6,0	6,2
Circuit B	kg										8,95	9,15
	tCO_2e										6,0	6,2
Oil		Oil type										
Circuit A	l	6,0	6,0	6,6	6,6	7,2	7,2	7,2	10,8	10,8	7,2	7,2
Circuit B	l										7,2	7,2
Capacity control		SmartVu™										
Minimum capacity	%	50	50	50	50	50	50	50	33	33	25	25
PED category		III										
Condenser		Grooved copper tubes and aluminium fins										
Fans		Axial Flying bird™ 6 with rotating shroud										
Standard unit												
Quantity		1	1	1	1	1	1	2	2	2	2	2
Maximum total air flow	l/s	4034	4034	4034	5613	5613	5613	10904	10904	10904	11226	11226
Maximum rotation speed	r/s	12	12	12	16	16	16	16	16	16	16	16
Evaporator		Dual-circuit plate heat exchanger										
Water volume	l	3,55	4	4,44	5,18	6,07	6,96	7,4	8,44	9,92	12,69	14,31
Max. water-side operating pressure without hydronic module	kPa	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Hydronic module (option)		Pump, Victaulic screen filter, relief valve, water and air vent valve, pressure sensors										
Pump		Centrifugal pump, monocell, 48,3 r/s, low- or high-pressure (as required), single or dual (as required)										
Expansion tank volume (Option 293)	l	12	12	12	12	12	12	35	35	35	35	35
Buffer tank volume (Option 307)	l	208	208	208	208	208	208	208	208	208	208	208
Max. water-side operating pressure with hydronic module	kPa	400	400	400	400	400	400	400	400	400	400	400
Water connections with or without hydronic module		Victaulic® type										
Connections	inches	2	2	2	2	2	2	2	2	2	2	2
External diameter	mm	60,3	60,3	60,3	60,3	60,3	60,3	60,3	60,3	60,3	60,3	60,3
Casing paint colour		Colour code RAL 7035 & 7024										

(3) Options: 15LS = Very low noise level, 116W = Variable-speed high pressure dual-pump hydraulic module, 307 = Water buffer tank module,
(4) Values are guidelines only. Refer to the unit name plate.

* The availability of sizes and options depends on the country. Please contact your local commercial dealer for more information.

ELECTRICAL SPECIFICATIONS

30RB/30RQ		040R	045R	050R	055R	060R	070R	080R	090R	100R	120R	140R	160R
Power circuit supply													
Nominal voltage	V-ph-Hz	400 - 3 - 50											
Voltage range	V	360 - 440											
Control circuit supply		24 V via internal transformer											
Maximum operating input power(1) or (2)													
Circuit A&B	kW	19	21	24	24	28	31	36	41	48	55	63	71
Power factor at maximum power(1) or (2)													
Displacement Power Factor (Cos Phi), standard unit		0,81	0,82	0,82	0,82	0,84	0,84	0,85	0,82	0,84	0,85	0,84	0,85
Nominal unit current draw(4)													
Standard unit	A	26	29	35	35	36	46	52	59	71	81	91	104
Maximum operating current draw (Un)(1) or (2)													
Standard unit	A	34	37	42	42	48	54	60	72	84	93	108	121
Maximum current (Un-10%)(1) or (2)													
Standard unit	A	37	39	44	44	51	58	65	77	89	99	115	129
Maximum start-up current (Un)(2) + (3)													
Standard unit	A	116	118	165	165	169	177	191	238	206	223	231	251

(1) Values at the unit's permanent maximum operating condition (as shown on the unit's nameplate).
(2) Values at the unit's maximum operating condition (as shown on the unit's nameplate).
(3) Maximum operating current of the smallest compressor(s) + fan current + locked rotor current of the largest compressor.
(4) Standardised EUROVENT conditions, water-cooled exchanger inlet/outlet = 12 °C/7 °C, outdoor air temperature = 35 °C.

Short-circuit withstand current (TN system)(1)

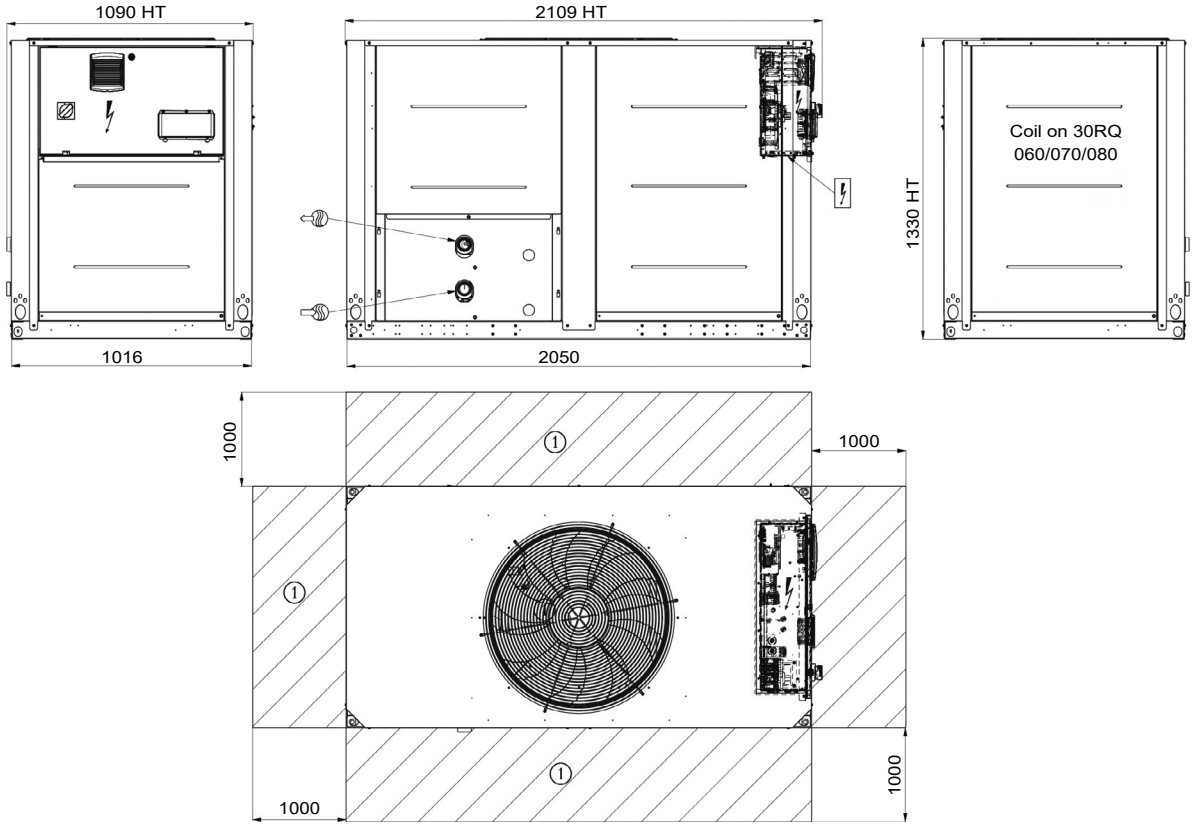
30RB/30RQ		040R	045R	050R	055R	060R	070R	080R	090R	100R	120R	140R	160R
Rated short-circuit withstand currents													
Rated short time (1s) current - Icw	kA eff	3,36	3,36	3,36	3,36	3,36	3,36	5,62	5,62	5,62	5,62	5,62	5,62
Rated peak current - Ipk	kA pk	20	20	20	20	20	20	15	20	20	15	20	15
Value with upstream electrical protection (1)													
Rated conditional short circuit current Icc	kA eff	40	40	40	40	40	40	40	40	40	40	30	30
Associated protection - type/supplier		Circuit breaker/Schneider											
Associated protection - rating/reference		NS100H	NS100H	NS100H	NS100H	NS100H	NS100H	NS100H	NS100H	NS160H	NS160H	NS250H	NS250H

(1) If another current limitation protection device is used, its time-current and thermal constraint (I^2t) trip characteristics must be at least equivalent to those of the recommended protection.
Note: The short circuit current withstand capability values above have been established for the TN system.

* The availability of sizes and options depends on the country. Please contact your local commercial dealer for more information.

DIMENSIONS/CLEARANCES

30RB/30RQ 040R-080R, units without water buffer tank module



Key:
All dimensions are given in mm.

① Clearances required for maintenance and air flow

② Clearance recommended for coil removal

Water inlet

Water outlet

Air outlet, do not obstruct

Control box

NOTE: Non-contractual drawings.

When designing a system, refer to the certified dimensional drawings provided with the unit or available on request.

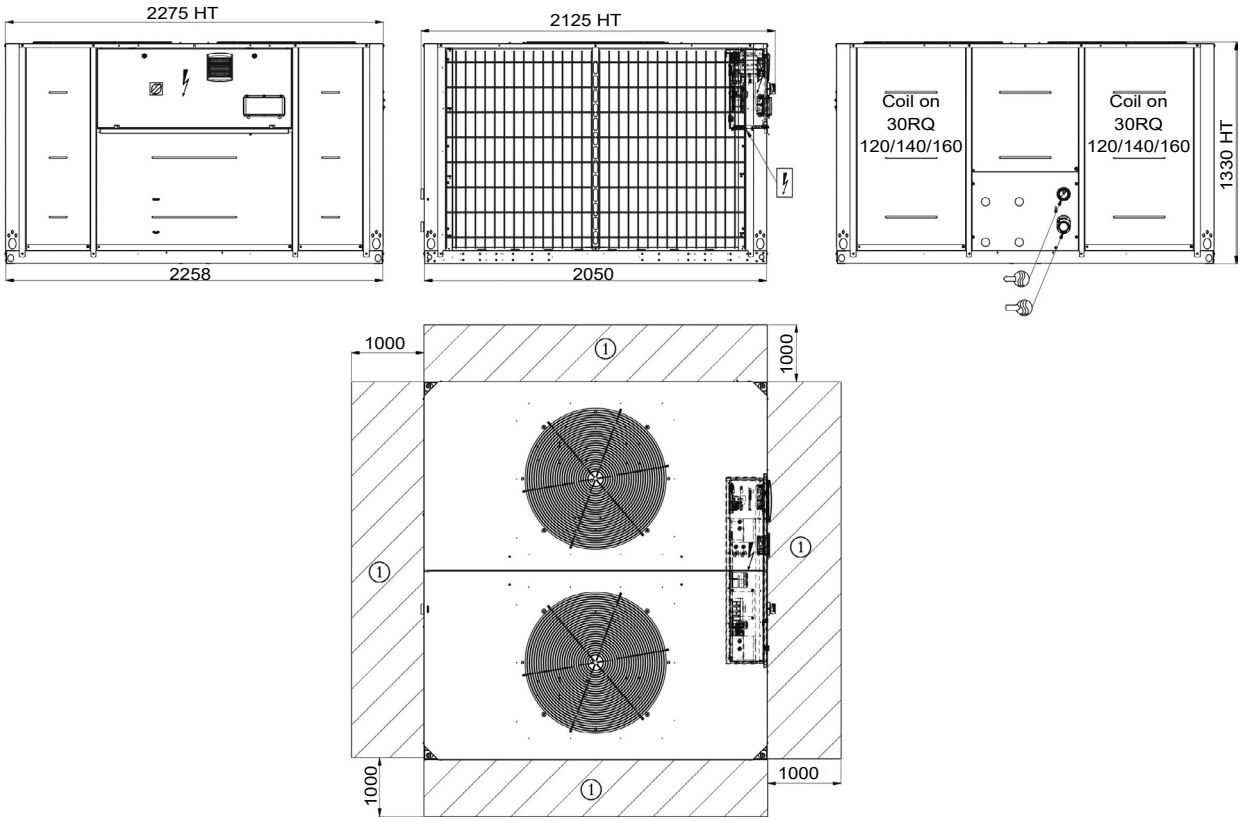
Refer to the certified dimensional drawings for:

- **The location of the fixing points,**
- **The weight distribution,**
- **The coordinates of the centre of gravity, hydraulic and electrical connections,**
- **Details of the 12/12A/23B option connections.**

* The availability of sizes and options depends on the country. Please contact your local commercial dealer for more information.

DIMENSIONS/CLEARANCES

30RB/30RQ 090R-160R, units without water buffer tank module



Key:
All dimensions are given in mm.

1 Clearances required for maintenance and air flow

2 Clearance recommended for coil removal

Water inlet

Water outlet

Air outlet, do not obstruct

Control box

NOTE: Non-contractual drawings.

When designing a system, refer to the certified dimensional drawings provided with the unit or available on request.

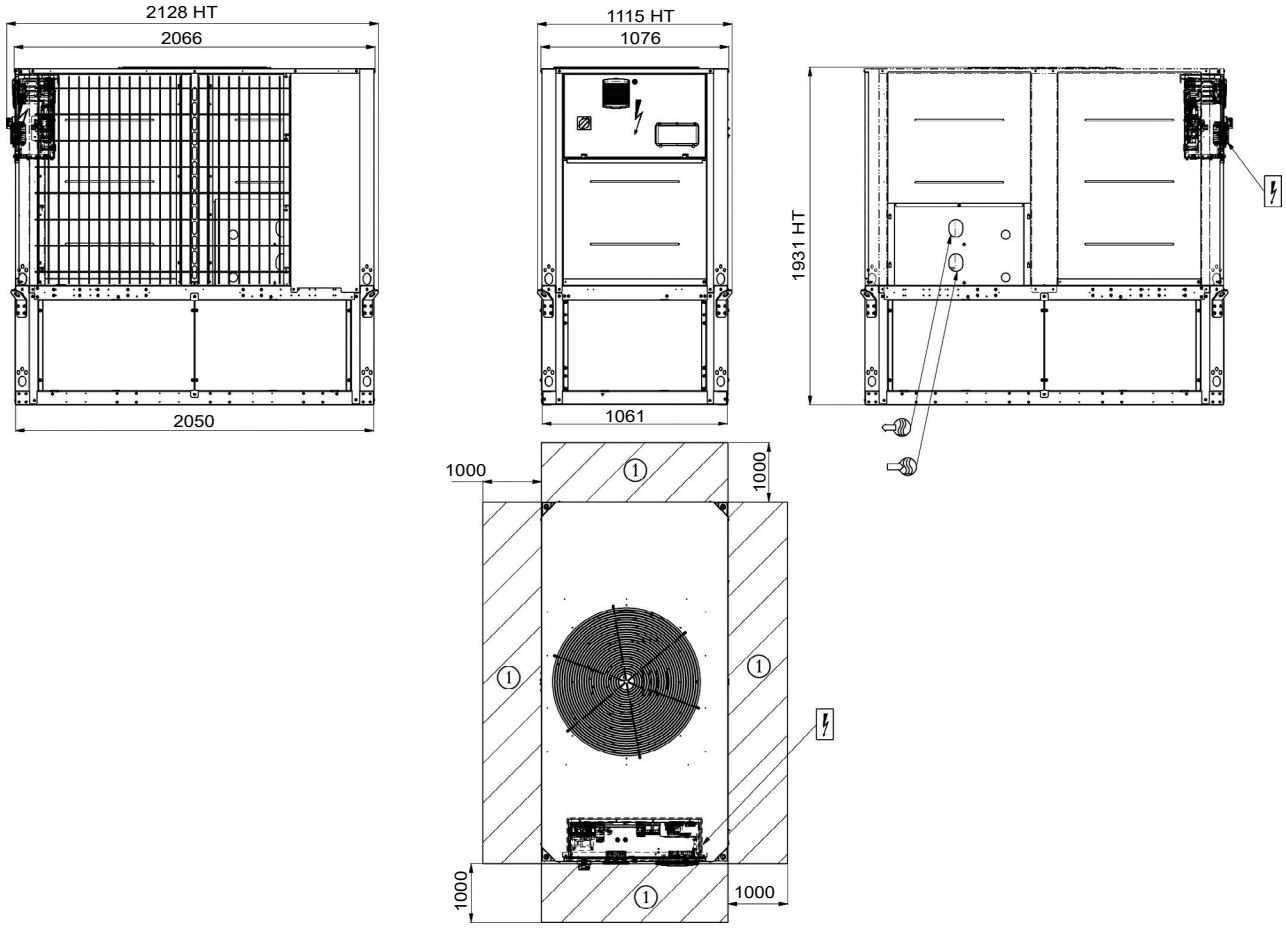
Refer to the certified dimensional drawings for:

- **The location of the fixing points,**
- **The weight distribution,**
- **The coordinates of the centre of gravity, hydraulic and electrical connections,**
- **Details of the 12/12A/23B option connections.**

* The availability of sizes and options depends on the country. Please contact your local commercial dealer for more information.

DIMENSIONS/CLEARANCES

30RB/30RQ 040R-080R, units with water buffer tank module



Key:
All dimensions are given in mm.

- (1) Clearances required for maintenance and air flow
- (2) Clearance recommended for coil removal
- Water inlet
- Water outlet
- Air outlet, do not obstruct
- Control box

NOTE: Non-contractual drawings.

When designing a system, refer to the certified dimensional drawings provided with the unit or available on request.

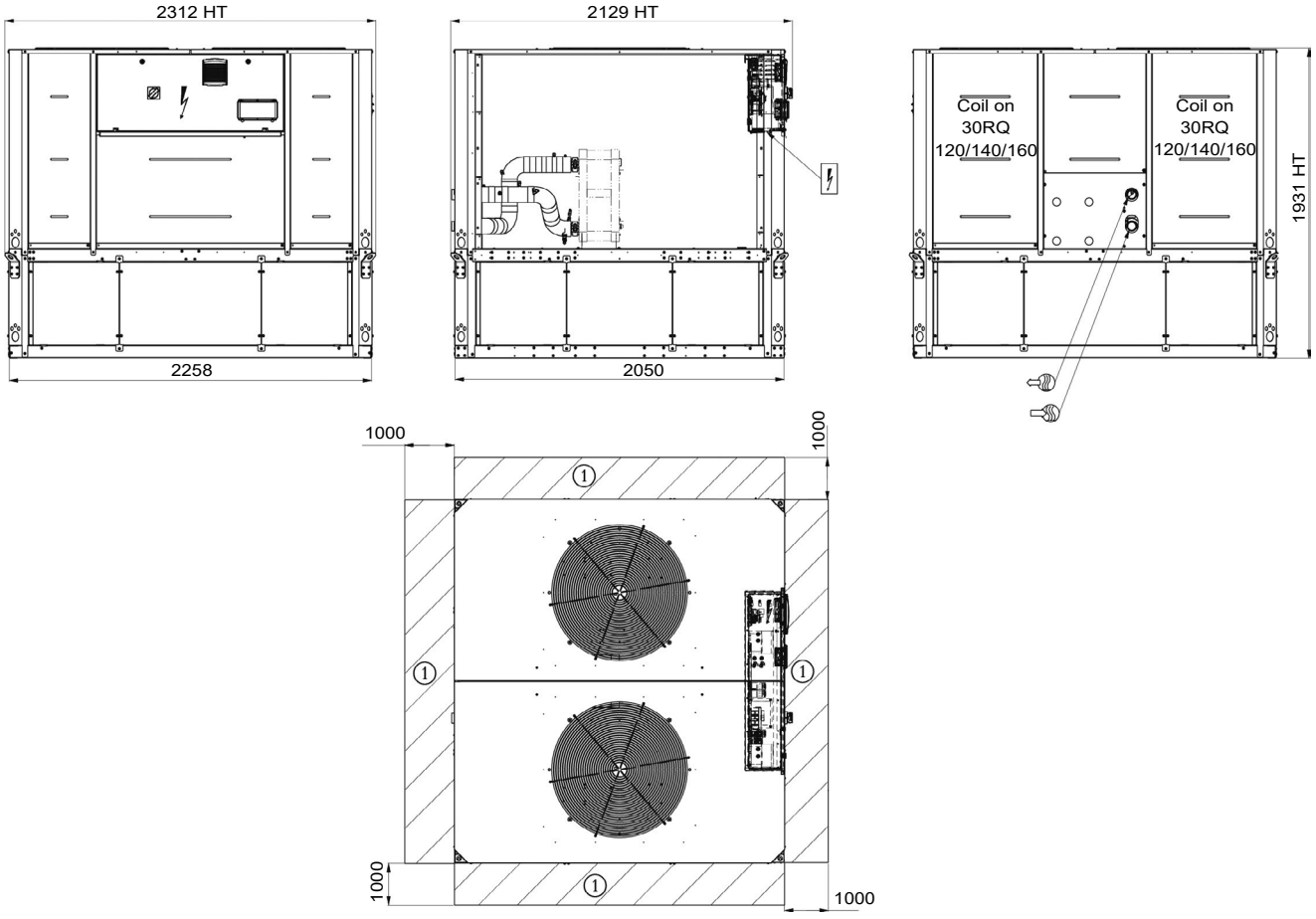
Refer to the certified dimensional drawings for:

- **The location of the fixing points,**
- **The weight distribution,**
- **The coordinates of the centre of gravity, hydraulic and electrical connections,**
- **Details of the 12/12A/23B option connections.**

* The availability of sizes and options depends on the country. Please contact your local commercial dealer for more information.

DIMENSIONS/CLEARANCES

30RB/30RQ 090R-160R, units with water buffer tank module



Key:
All dimensions are given in mm.

1. Clearances required for maintenance and air flow
2. Clearance recommended for coil removal

Water inlet

Water outlet

Air outlet, do not obstruct

Control box

NOTE: Non-contractual drawings.

When designing a system, refer to the certified dimensional drawings provided with the unit or available on request.

Refer to the certified dimensional drawings for:

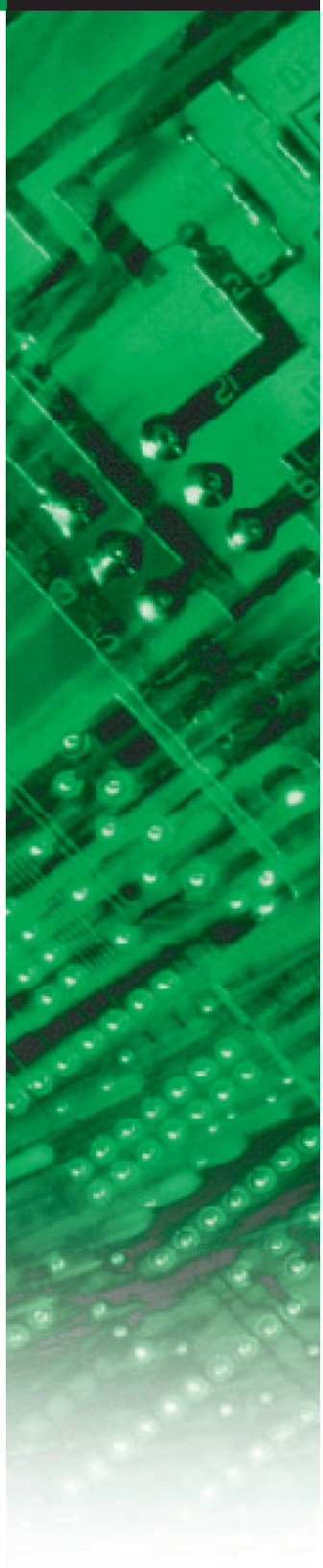
- **The location of the fixing points,**
- **The weight distribution,**
- **The coordinates of the centre of gravity, hydraulic and electrical connections,**
- **Details of the 12/12A/23B option connections.**

* The availability of sizes and options depends on the country. Please contact your local commercial dealer for more information.

Catalogue of McQuay MCS135.1

Air Cooled Single Screw Chiller

Models: MCS050.1-380.2F
Cooling Capacity: 161kW-1370kW
Refrigerant: R22/R407C



McQuay® Air Conditioning

Engineered for flexibility and performance.™

Model			MCS120.1	MCS135.1	MCS150.1	MCS170.1	MCS185.1
∗1 Normal cooling capacity		kW	422	455	525	625	654
		USRT	120	129	149	178	186
		kcal/h	362,900	391,300	451,500	537,500	562,400
		Btu/h	1,440,700	1,553,400	1,792,400	2,133,800	2,232,800
Casing/Color			Paintable Galvanized Steel Plate / Ivory White				
Capacity Steps			0,25 ~ 100%				
Power Supply			380~400V/3~50Hz				
Compressor	Type		Semi-hermetic Single-screw				
	No. × Model		1×3221	1×4221	1×4222	1×4223	1×4223
	Motor Input	kW	120	126	149	182	170
Refrigerant Oil	Model		LPT68				
	Charge	L	18	16	16	16	16
Evaporator	Type		High-efficiency Shell and Tube				
	Flow Rate	L/min.	1210	1304	1505	1792	1875
	Pressure Drop	kPa	37	37	37	32	46
Condenser	Type		Cross Fin Coil				
	Rows × Stages		3×44	3×44	3×44	3×44	3×44
	Fit Pitch	mm	1.8	1.8	1.8	1.8	1.8
	Face Area	m^2	16.09	16.09	20.12	20.12	24.14
Fan	Type		Propeller (Direct Drive)				
	No.		8	8	10	10	12
	Air Flow Rate	m^3/min.	2,933	2,933	3,667	3,667	4,400
		cfm	103,547	103,547	129,433	129,433	155,320
	Motor Input	kW	16	16	20	20	24
Refrigerant	Type		R22				
	No. of Circuits		1	1	1	1	1
	Control		Electronic Expansion Valve				
Water Piping Connection		inch	8				
Compressor Acoustic Insulation Material			Polyurethane Foaming				
Unit Input		kW	136	142	169	202	194
Unit Dimensions	D	mm	4100	4100	5000	5000	5900
	W	mm	2260	2260	2260	2260	2260
	H	mm	2360	2360	2360	2360	2360
Weight		kg	4290	4290	4795	4795	5370
Operation Weight		kg	4440	4440	4975	4975	5560
Standard Accessories			Unit Operation Instructions, Conformity Certificate, Warranty Application Form, Spring Damper, Water Flow Switch.				

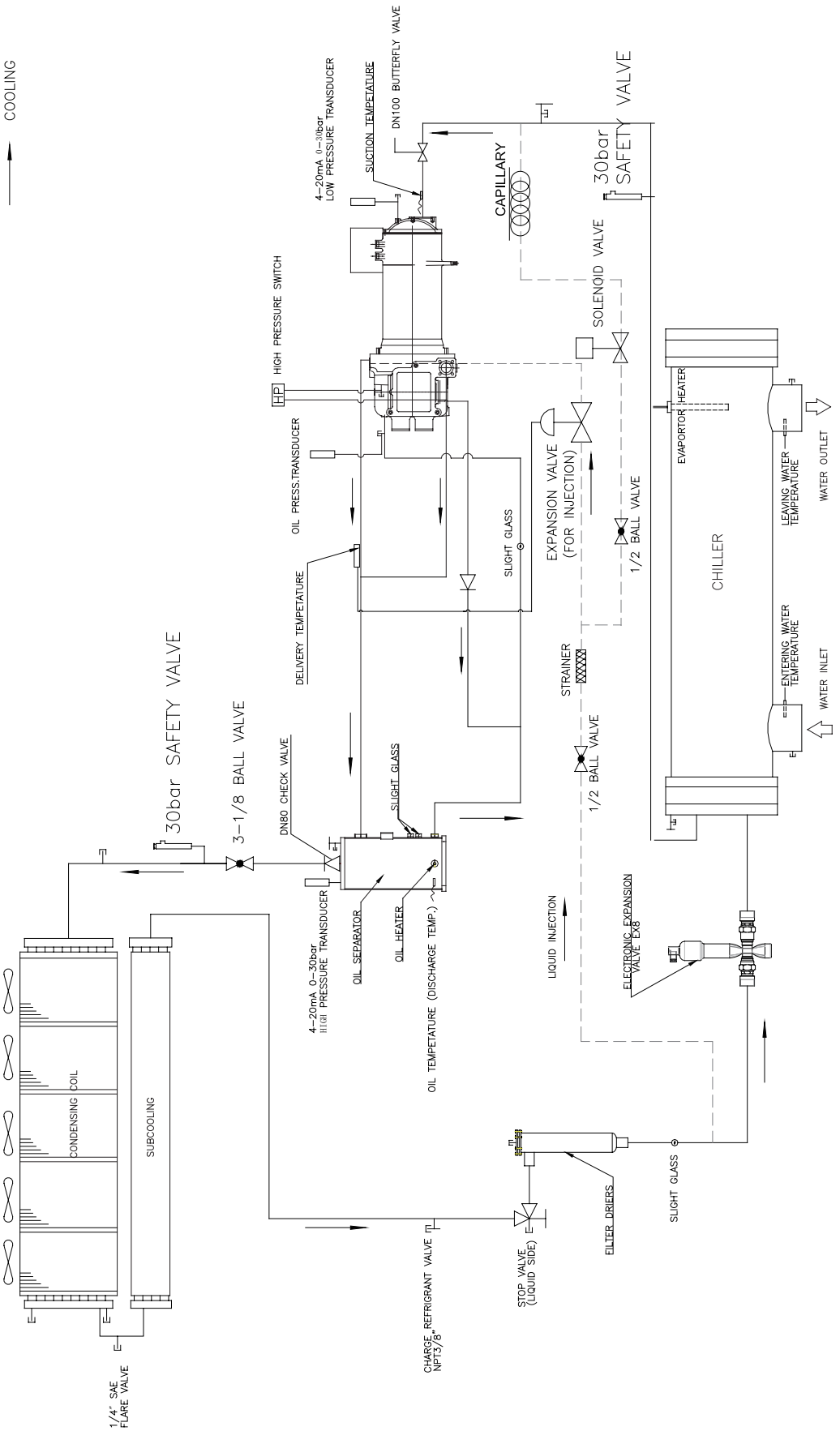
Notes:

∗1. Cooling capacity is based on the following conditions:
Entering chilled water temp. 12°C, Leaving chilled water temp. 7°C, ambient temp. 35°C DB

2. The following safity devices are equipped as standard.
   - High pressure (pressure switch)
   - Low pressure (pressure sensor)
   - Compressor thermal
   - Condensation fan thermal
   - High discharge temperature on the compressor
   - Phase monitor
   - Star/Delta transition failed
   - Low-pressure ratio
   - High oil pressure drop
   - Low oil pressure
   - Freeze protection
   - Load stepless adjust
   - Trouble record

Conversion Formulae
kcal/h=kW×860
Btu/h=kW×3414
cfm=m^3/min×35.3

MCS135.1~185.1,MCS260.2~380.2F



11. Sound Level

11.1 ST Overall Sound Level and Octave Band Level

Model / Hz	Octave band level								Overall dBA
	63	125	250	500	1000	2000	4000	8000	
MCS050.1FST	46.4	65.5	71.6	76.2	75.3	71.3	64.9	56.4	74.0
MCS060.1FST	43.5	56.6	63.3	69.4	70.0	65.6	60.2	56.0	74.0
MCS070.1FST	53.7	64.6	70.3	71.0	69.7	65.2	57.4	49.3	76.0
MCS080.1FST	48.0	63.6	69.2	71.0	69.6	68.0	61.4	53.9	76.0
MCS100.1FST	53.9	66.4	72.4	71.2	70.9	65.5	59.6	53.3	77.0
MCS120.1FST	40.5	58.2	65.8	71.8	73.5	68.2	60.6	54.1	77.0
MCS135.1FST	46.5	58.5	68.3	71.0	72.8	69.4	62.3	54.9	77.0
MCS150.1FST	51.9	69.1	72.4	72.9	72.2	64.5	57.4	50.6	78.0
MCS170.1FST	51.8	66.7	69.9	73.3	73.6	68.2	60.3	51.4	78.0
MCS185.1FST	46.7	65.2	70.8	74.6	74.0	69.5	62.0	52.1	79.0
MCS200.2FST	45.8	65.9	69.8	73.6	74.1	71.7	63.0	56.7	79.0
MCS220.2FST	49.3	66.7	71.7	74.3	75.2	72.2	65.5	58.5	80.0
MCS235.2FST	54.2	66.6	75.0	74.0	74.5	70.1	63.7	57.2	80.5
MCS260.2FST	46.4	65.5	71.6	76.2	75.3	71.3	64.9	56.4	80.5
MCS285.2FST	53.7	68.1	73.3	77.3	76.5	72.9	67.0	59.1	81.0
MCS310.2FST	58.8	68.1	71.9	74.9	76.6	73.7	66.9	60.0	81.0
MCS330.2FST	46.4	65.5	71.6	76.2	75.3	71.3	64.9	56.4	81.0
MCS350.2FST	45.4	60.5	72.1	76.0	75.5	71.6	65.4	56.8	81.0
MCS380.2FST	54.6	67.6	73.2	76.6	76.6	72.7	66.4	59.2	81.5

Notes:

Average sound pressure level is according to ISO 3744, semispheric free field conditions.
Sound pressure levels are referred to units furnished without hydronic kit.
Measuring location is at 1m from the unit in semispheric free field (rif. 2×10^{-5} Pa).

Catalogue of Mitsubishi FDC125VS

Manual No. '11 • PAC-T-160

MHI

THCHNICAL MANUAL

HYPER INVERTER PACKAGED AIR-CONDITIONERS

(Split system, Air to air heat pump type)

FLOOR STANDING TYPE

Single type

- Single phase use
  - FDF71VNXVD
  - 100VNXVD
  - 125VNXVD
  - 140VNXVD
- 3 phase use
  - FDF100VSXVD
  - 125VSXVD
  - 140VSXVD

Twin type

- Single phase use
  - FDF140VNXPVD
- 3 phase use
  - FDF140VSXPVD

MICRO INVERTER PACKAGED AIR-CONDITIONERS

(Split system, Air to air heat pump type)

FLOOR STANDING TYPE

Single type

- Single phase use
  - FDF100VNVD
  - 125VNVD
  - 140VNVD
- 3 phase use
  - FDF100VSVD
  - 125VSVD
  - 140VSVD

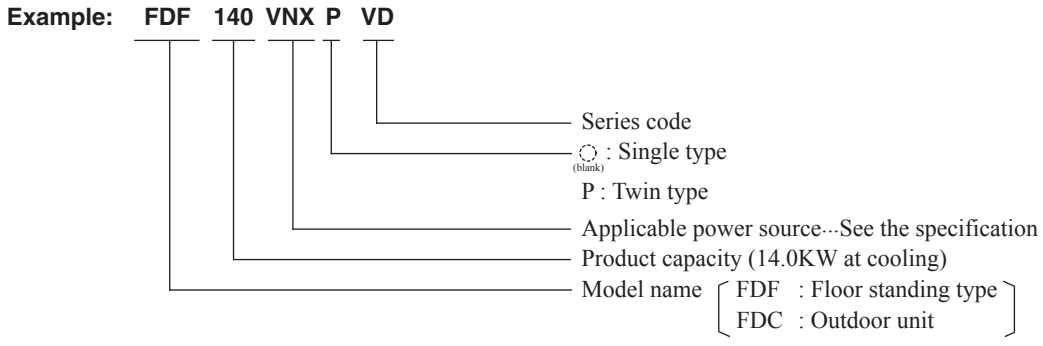
Twin type

- Single phase use
  - FDF140VNPVD
- 3 phase use
  - FDF140VSPVD
  - 200VSPVD
  - 250VSPVD

MITSUBISHI HEAVY INDUSTRIES, LTD.

CONTENTS

How to read the model name



Adapted to **RoHS** directive

Item \ Model		FDF125VSVD	
		Indoor unit **FDF125VD**	Outdoor unit **FDC125VS**
Power source			380-415V 3N~50Hz / 380V 3N~60Hz
Operation data		Cooling	Heating
Nominal capacity	kW	12.5 [5.0 (Min.)~14.0 (Max.)]	14.0 [4.0 (Min.)~16.0 (Max.)]
Power consumption	kW	4.4	4.36
Running current	A	6.5 / 6.8	6.5 / 6.8
Power factor	%	98	97
Inrush current	A	5 < Max.running current 15 >	
Sound Pressure Level	dB(A)	P-Hi : 54 Hi : 50 Me : 48 Lo : 44	Cooling : 50 Heating : 51
Exterior dimensions Height x Width x Depth	mm	1,850 × 600 × 320	845 × 970 × 370
Exterior appearance (Munsell color)		Ceramic White (N8.0) near equivalent	Stucco White (4.2Y7.5/1.1) near equivalent
Net weight	kg	52	83
Refrigerant equipment			
Compressor type & Q'ty		—	RMT5126MDE3 × 1
Starting method		—	Direct line start
Refrigerant oil	·	—	0.9 M-MA68
Heat exchanger		Louver fine & inner grooved tubing	M shape fin & inner grooved tubing
Refrigerant control		—	Electronic expansion valve
Air handling equipment			
Fan type & Q'ty		Centrifugal fan × 1	Propeller fan × 1
Motor <Starting method>	W	157 < Direct line start >	86 < Direct line start >
Air flow (Standard)	CMM	P-Hi : 29 Hi : 26 Me : 23 Lo : 19	Cooling : 75, Heating : 73
External static pressure	Pa	0	—
Outside air intake		Not possible	—
Air filter, Q'ty		Plastic net × 1 (Washable)	—
Shock & vibration absorber		Rubber sleeve (for fan motor)	Rubber sleeve (for Compressor)
Insulation (noise & heat)		Polyurethane form	—
Electric heater	W	—	20 (Crank case heater)
Remote controller		RC-E4 Installed / wireless : RCN-KIT3-E (option)	
Room temperature control		Thermostat by electronics	—
Safety equipment		Overload protection for fan motor Frost protection thermostat	Internal thermostat for fan motor Abnormal discharge temperature protection.
Installation data	mm	Liquid line: I/U ϕ9.52 (3/8") Pipe ϕ9.52 (3/8") × 0.8 O/U ϕ9.52 (3/8")	
Refrigerant piping size		Gas line: ϕ 15.88 (5/8") ϕ 15.88 (5/8") × 1.0 ϕ15.88 (5/8")	
Connecting method		Flare piping	Flare piping
Refrigerant line (one way) length		Max.50m	See page 43
Vertical height difference between outdoor unit and indoor unit		Max.30m (Outdoor unit is higher) Max.15m (Outdoor unit is lower)	
Refrigerant Quantity		R410A 3.8kg in outdoor unit (incl. the amount for the piping of : 30m)	
Drain pump		—	—
Drain		Hose Connectable with VP20	Holes size ϕ20 × 3pcs
Insulation for piping		Necessary (both Liquid & Gas lines)	
Standard Accessories		Mounting kit	Edging

Notes (1) The data are measured at the following conditions.

Item	Indoor air temperature		Outdoor air temperature	
Operation	DB	WB	DB	WB
Cooling	27°C	19°C	35°C	24°C
Heating	20°C		7°C	6°C

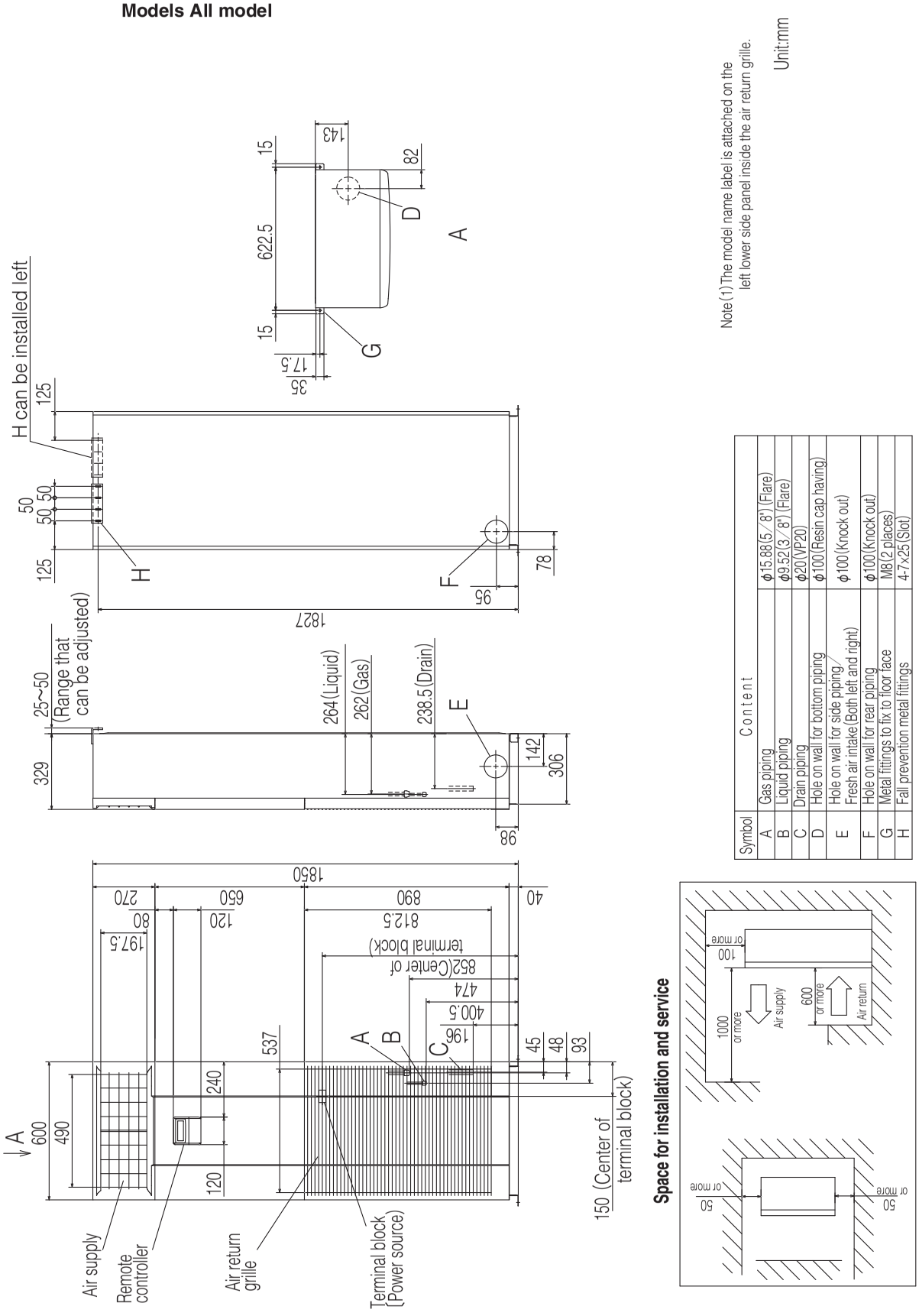
(2) This packaged air-conditioner is manufactured and tested in conformity with the ISO.
(3) Sound pressure level indicates the value in an anechoic chamber. During operation these value are somewhat higher due to ambient temperature.
(4) The operation data indicates when the air-conditioner is operated at 400V50Hz or 380V60Hz.
(5) If wireless remote controller is used, only 3-speed fan setting (Hi-Me-Lo) is available.

PGA000Z780

2. EXTERIOR DIMENSIONS

(1) Indoor units

Models All model



Note (1) The model name label is attached on the left lower side panel inside the air return grille.

Unit:mm

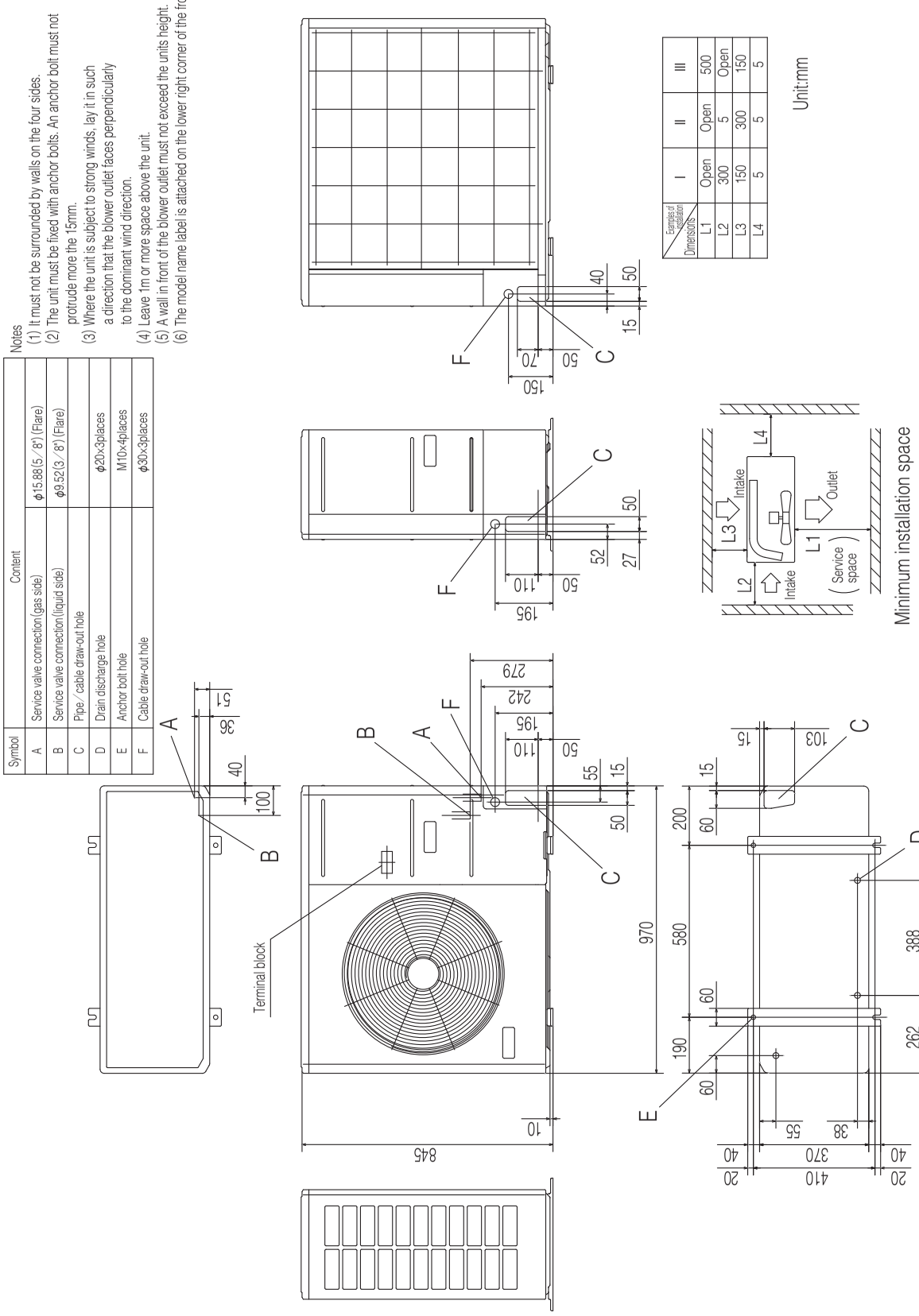
Symbol	Content	
A	Gas piping	φ15.88 (5/8") (Flare)
B	Liquid piping	φ9.52 (3/8") (Flare)
C	Drain piping	φ20 (VP20)
D	Hole on wall for bottom piping	φ100 (Resin cap having)
E	Hole on wall for side piping / Fresh air intake (Both left and right)	φ100 (Knock out)
F	Hole on wall for rear piping	φ100 (Knock out)
G	Metal fittings to fix to floor face	M8 (2 places)
H	Fall prevention metal fittings	4-7x25 (Slot)

PGA000Z781

(b) Micro inverter

Models FDC100VN, 125VN, 140VN

FDC100VS, 125VS, 140VS

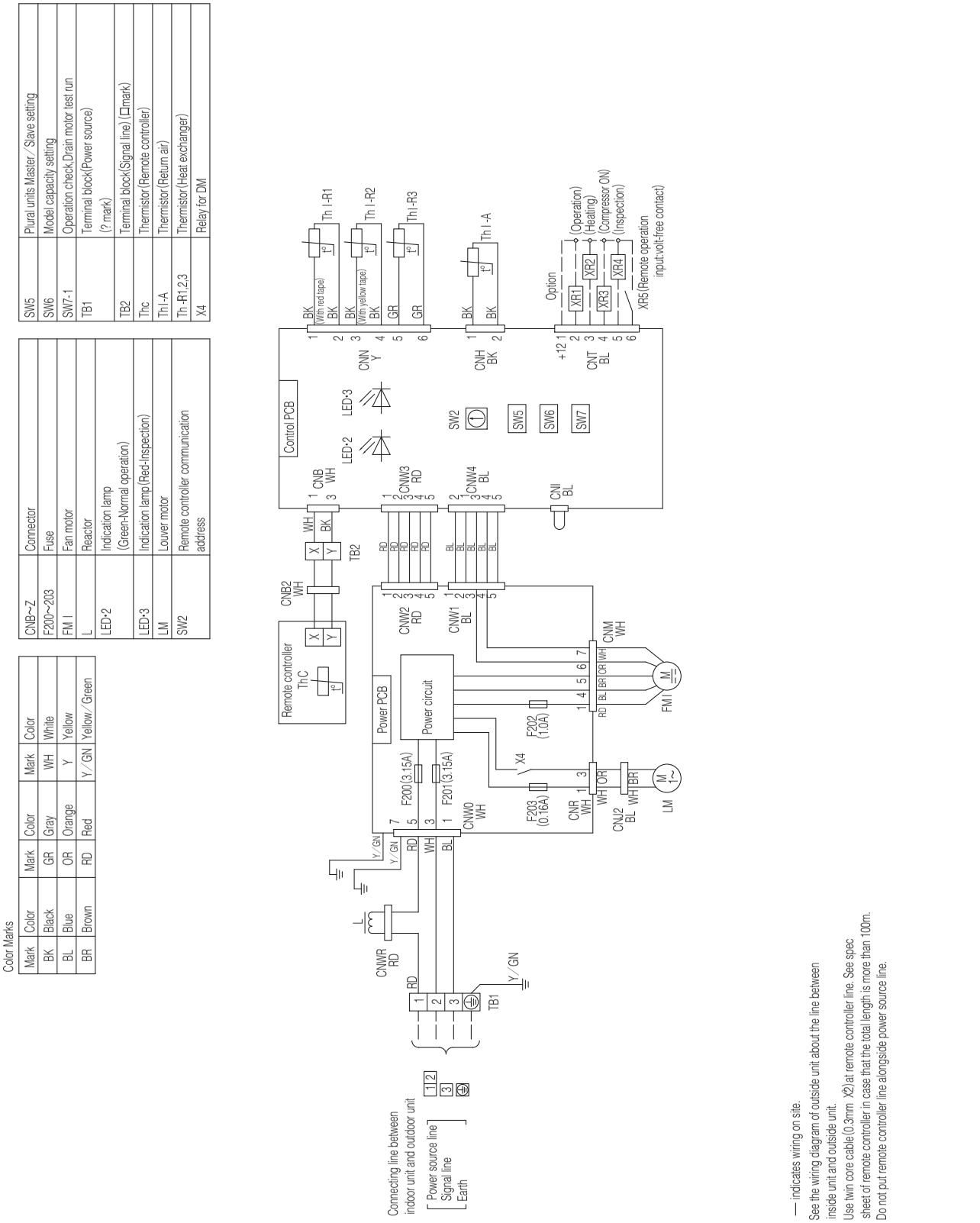


PCA001Z535

3. ELECTRICAL WIRING

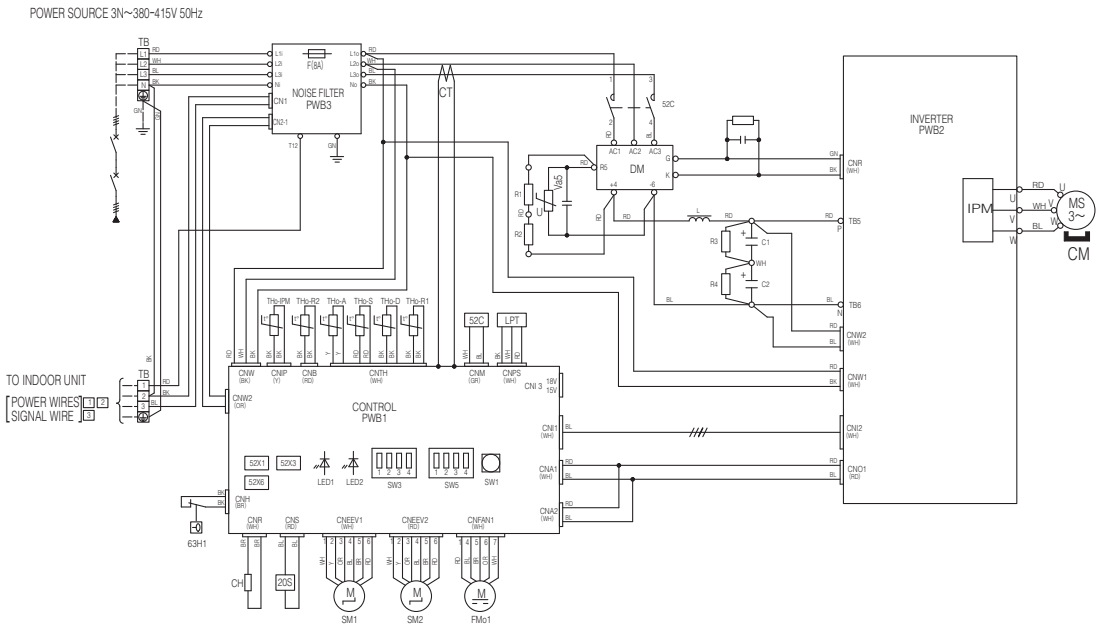
(1) Indoor units

Models All model



Notes 1. — indicates wiring on site.
2. See the wiring diagram of outside unit about the line between inside unit and outside unit.
3. Use twin core cable(0.3mm X2) at remote controller line. See spec sheet of remote controller in case that the total length is more than 100m.
4. Do not put remote controller line alongside power source line.

PGA000Z783



Item	Description
CnA~Z	Connector
CH	Crankcase heater
CM	Compressor motor
CT	Current sensor
DM	Diode module
F	Fuse
FM01	Fan motor
IPM	Intelligent power module
L	Reactor
LED1	Indication lamp(GREEN)
LED2	Indication lamp(RED)
LPT	Low pressure sensor
SM1	Expansion valve for cooling
SM2	Expansion valve for heating
SW1	Pump down switch
SW3,5	Local setting switch
TB	Terminal block
THo-A	Thermistor(Outdoor air temp.)
THo-D	Thermistor(Discharger pipe temp.)
THo-IPM	Thermistor(IPM)
THo-R1,2	Thermistor(Heat exchanger pipe temp.)
THo-S	Thermistor(Suction pipe temp.)
20S	Solenoid valve for 4 way valve
52X1	Auxilliary relay(for CH)
52X3	Auxilliary relay(for 20S)
52X6	Auxilliary relay(for 52C)
63H1	High pressure switch

Mark	Color
BK	Black
BL	Blue
BR	Brown
GR	Gray
P	Pink
OR	Orange
RD	Red
WH	White
Y	Yellow
Y／GN	Yellow／Green

Power cable, indoor-outdoor connecting wires

Model	MAX over current (A)	Power cable size (mm^2)	Power cable length (m)	indoor-outdoor wire size x number (mm^2)	Earth wire size (mm^2)
100	15	3.5	27	Ø1.6mm x 3	Ø1.6mm
125					
140					

At the connection with the duct type indoor unit.

Model	MAX over current (A)	Power cable size (mm^2)	Power cable length (m)	indoor-outdoor wire size x number (mm^2)	Earth wire size (mm^2)
100	16	3.5	26	Ø1.6mm x 3	Ø1.6mm
125	18		23		
140	19		21		

- The specifications shown in the above table are for units without heaters. For units with heaters, refer to the installation instructions or the construction instructions of the indoor unit.
- Switchgear of Circuit breaker capacity which is calculated from MAX. over current should be chosen along the regulations in each country.
- The cable specifications are based on the assumption that a metal or plastic conduit is used with no more than three cables contained in a conduit and a voltage drop is 2%. For an installation falling outside of these conditions, please follow the internal cabling regulations. Adapt it to the regulation in effect in each country.

Local setting switch SW3(Set up at shipment OFF)

SW3-1	Defrost control change	The defrosting operation interval becomes shorter by turning ON this switch. This switch should be turned ON in the area where outside temperature becomes below the freezing point.
SW3-2	Snow guard fan control	When this switch is turned ON, the outdoor unit fan will run for 30 seconds in every 10 minutes, when outdoor temperature falls to 3 or lower and the compressor is not runnning when the unit is used in a very snowy country, set this switch to ON.
SW3-3,4	Trial operation	Method of trial operation ①Trial operation can be performed by using SW3-3,4. ②Compressor will be in the operation when SW3-3 is ON. ③Cooling trial operation will be performed when SW3-4 is OFF, and heating trial operation when SW3-4 is ON. ④Be sure to turn OFF SW3-3 after the trial operation is finished.

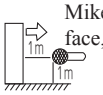
PCA001Z540

4. NOISE LEVEL

Notes (1) The data are based on the following conditions.
Ambient air temperature: Indoor unit 27℃WB. Outdoor unit 35℃DB.
(2) The data in the chart are measured in an anechoic room.
(3) The noise levels measured in the field are usually higher than the data because of reflection.

(1) Indoor units

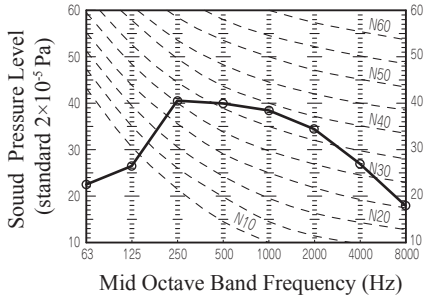
Measured based on JIS B 8616
Mike position as right



Mike (1 m each at front face, forward & height)

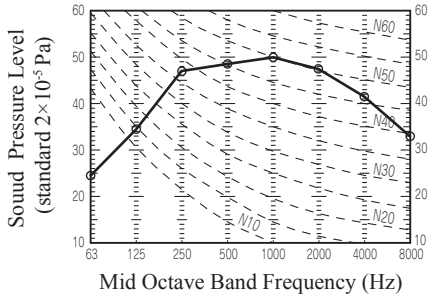
Model FDF71VD

Noise level 42 dB (A) at P-HIGH
39 dB (A) at HIGH
35 dB (A) at MEDIUM
33 dB (A) at LOW



Models FDF100VD, 125VD, 140VD

Noise level 54 dB (A) at P-HIGH
50 dB (A) at HIGH
48 dB (A) at MEDIUM
44 dB (A) at LOW



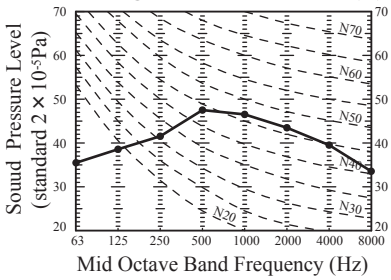
(2) Outdoor units

Measured based on JIS B 8616
Mike position: at highest noise level in position as mentined below
Distance from front side 1m
Height 1m

(a) Hyper inverter

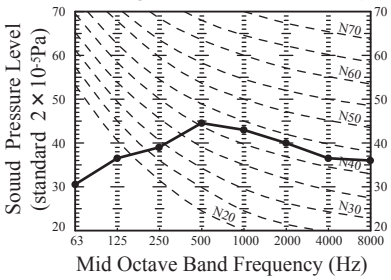
Model FDC71VNX

Cooling noise level 51 dB (A)



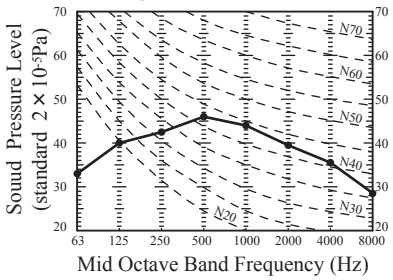
Model FDC71VNX

Heating noise level 48 dB (A)



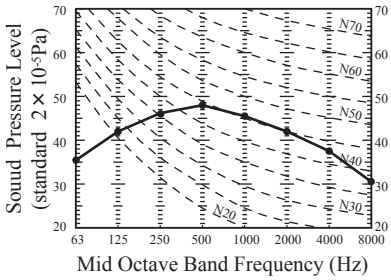
Model FDC100VNX,100VSX

Cooling noise level 48 dB (A)



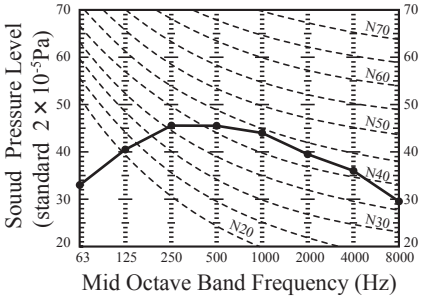
Model FDC100VNX,100VSX

Heating noise level 50 dB (A)



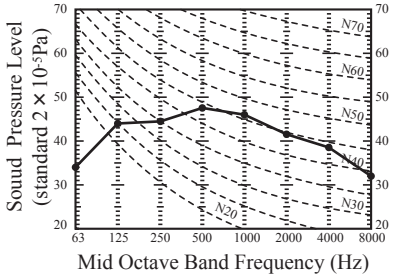
Models FDC125VNX,125VSX

Cooling noise level 48 dB (A)



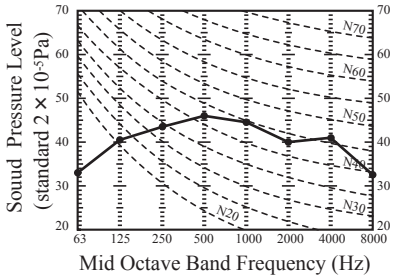
Models FDC125VNX,125VSX

Heating noise level 50 dB (A)



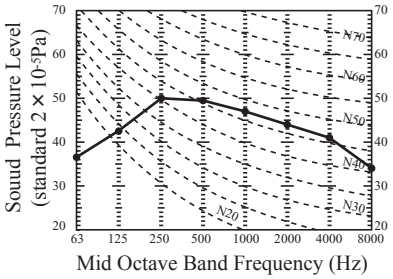
Models FDC140VNX,140VSX

Heating noise level 49 dB (A)



Models FDC140VNX,140VSX

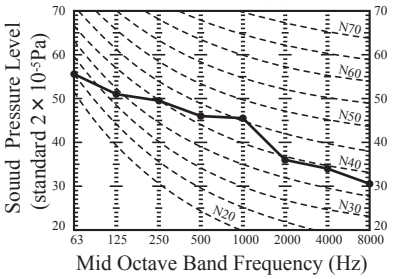
Heating noise level 52 dB (A)



(b) Micro inverter

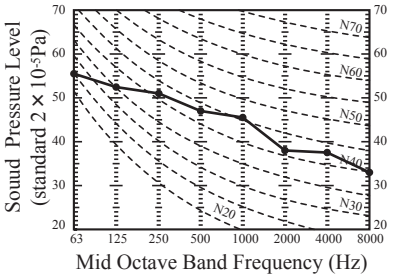
Models FDC100VN,100VS

Noise level 49 dB (A)



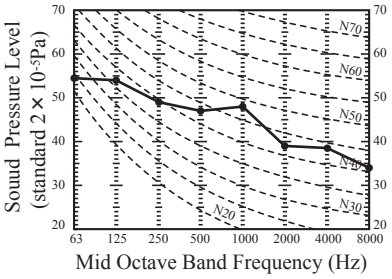
Models FDC125VN,125VS

Cooling noise level 50 dB (A)



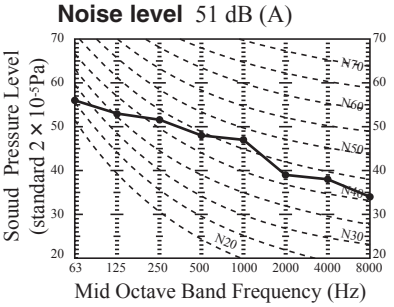
Models FDC125VN,125VS

Heating noise level 51 dB (A)



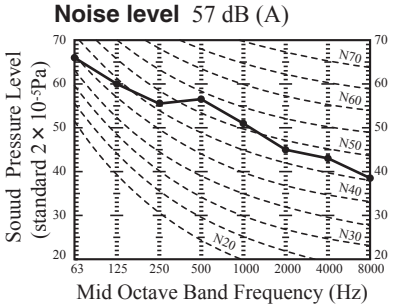
Models FDC140VN,140VS

Noise level 51 dB (A)



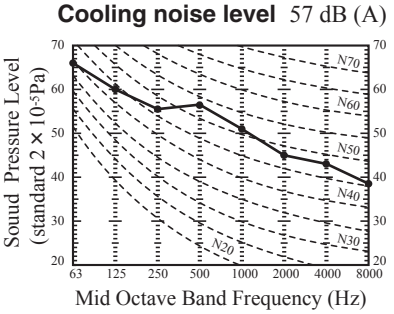
Model FDC200VS

Noise level 57 dB (A)



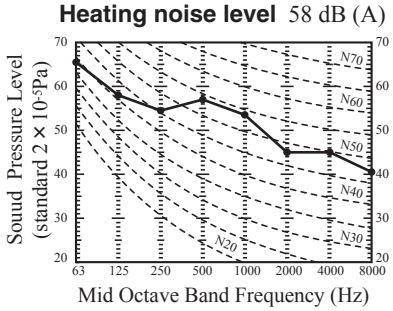
Model FDC250VS

Cooling noise level 57 dB (A)



Model FDC250VS

Heating noise level 58 dB (A)



Catalogue of Mitsubishi FDC400KXE6, FDC450KXE6, FDC504KXE6, FDC560KXE6

MHI

DATA BOOK

DRAFT

Manual No. '08•KX-DB-127

INVERTER DRIVEN MULTI-INDOOR UNIT CLIMATE CONTROL SYSTEM

Alternative refrigerant R410A use models

(OUTDOOR UNIT)

KX6 series (Heat pump type)

- **All-in-one type (Used also for combination)**
  FDC335KXE6-K, 400KXE6, 450KXE6, 504KXE6, 560KXE6, 560KXE6-K, 615KXE6, 680KXE6
- **Combined type**
  FDC735KXE6, 800KXE6, 850KXE6, 900KXE6, 960KXE6, 1010HKXE6, 1065KXE6, 1130KXE6, 1180KXE6, 1235KXE6, 1300KXE6, 1360KXE6

This DATA BOOK described relating to an outdoor unit.Regarding the Indoor unit, see Manual No. '08•KX-DB-124.

MITSUBISHI HEAVY INDUSTRIES, LTD.

PREFACE

Combination table for KX4 series and KX6 series

( ) Date of launching in the market

Category	Outdoor unit		Indoor unit: Connectable remote controller		Same series	Same series	Same series	Mixed series	Mixed series	Mixed series	Same or Mixed series	Mixed series	Same series
			3-wire type	RC-E1	KXE4 (2004.4-)	KXE4(A) (2004.6-)	KXE4A (2004.11-)	KXE4A (2004.11-)	KXE4A (2004.11-)	KXE4A (2004.11-)			
			3-wire type	RC-E1R				KXE4R (2006.3-) KXE4BR (2007.4-) KXE5R (2007.4-)	KXE4R (2006.3-) KXE4BR (2007.4-) KXE5R (2007.4-)		KXE4R (2006.3-) KXE4BR (2007.4-) KXE5R (2007.4-)	KXE4R (2006.3-) KXE4BR (2007.4-) KXE5R (2007.4-)	
			2-wire type	RC-E3					KXE6 (2008.3-)	KXE6 (2008.3-)		KXE6 (2008.3-)	KXE6 (2008.3-)
Heat pump (2-pipe) systems	FDCA-HKXE4 5HP	(2004.4-)			YES [C]	YES [C]	YES [C]	NO	NO	NO	NO	NO	NO
	FDCA-HKXE4 8-48HP	(2004.4-)			NO	YES [C]	YES [C]	NO	NO	NO	NO	NO	NO
	FDCA-HKXE4A 5HP	(2006.2-)			NO	YES [C]	YES [C]	YES [C]*1	NO	NO	YES [C]*1	NO	NO
	FDCA-HKXE4R 5,6HP	(2006.5-)											
	FDCA-HKXE4A 8-48HP	(2006.2-)			NO	YES [C]	YES [C]	YES [C]	YES [C]	YES [C]	YES [C]	YES [C]	YES [C]
	FDCA-HKXE4R 8-48HP	(2006.5-)											
	FDCA-HKXE4BR 8-48HP	(2007.4-)											
	FDC-KXE6 4,5,6HP	(2008.3-)			NO	NO	NO	NO	NO	NO	NO	NO	YES [A]*6
	FDC-KXE6 8-12HP	(not yet)			NO	NO	NO	NO	NO	NO	YES [B]	YES [B]	YES [A]
	FDC-KXE6 14-48HP	(not yet)			NO	NO	NO	NO	NO	NO	YES [B]	YES [B]	YES [A]
Heat recovery (3-pipe) systems [Note(3)]	FDCA-HKXRE4 8-48HP	(2004.11-)			NO	NO	YES [C]	NO	NO	NO	NO	NO	NO
	FDCA-HKXRE4A 8-48HP	(2006.2-)			NO	NO	YES [C]	YES [C]	YES [C]	YES [C]	YES [C]	YES [C]	YES [C]
	FDCA-HKXRE4R 8-48HP	(2006.6-)											
	FDCA-HKXRE4BR 8-48HP	(2007.4-)											
	FDC-KXRE6 8-48HP	(not yet)			NO	NO	NO	NO	NO	NO	YES [B]	YES [B]	YES [A]

*1 except FDKA71KXE5R

Note (1) YES: Connectable (See following table in detail), NO: Not connectable

	Outdoor unit	Connected Indoor unit: Same series	Connected Indoor unit: Mixed series	Dip switch setting of outdoor unit KXE6	Superlink Protocol	Limitation
YES [A]*2	KXE6	KXE6		Ⅱ(New)	New (for KX6)	New (for KX6)
YES [B]		KXE4 series	KXE6 & KXE4 series	Ⅰ(Previous)	Previous (for KX4)	Previous (for KX4)
YES [C]	KXE4 series	KXE4 series	KXE4 series		Previous (for KX4)	Previous (for KX4)

*2 If Outdoor unit system (YES [A]) is connected to other outdoor unit systems (YES [B] and/or YES [C]) in one superlink network, the dip switch of outdoor unit KXE6 of (YES [A]) should be set from Ⅱ(New) to Ⅰ(Previous). In this case the superlink protocol and limitation of outdoor unit system (YES [A]) are switched to Previous (for KX4).

(2) Combination with new Central control, PC windows central control and BMS interface unit

		Central control, PC windows central control and BMS interface unit: SC-SL1N-E	SC-SL2N-E	SC-SL3N-AE/BE	SC-WGWN-A/B	SC-LGWN-A	SC-BGWN-A/B
YES [A]	Connectable I/U	16	64	128 (128x1)	128 (64x2)*3	96 (48x2)	128 (64x2)*3
	Superlink protocol	New	New	New	New	New	New
	Connectable network	1	1	1	2	2	2
YES[B] & YES[C]	Connectable I/U	16	48	144 (48x3)	96 *4 (48x2)	96 *4 (48x2)	96 *4 (48x2)
	Superlink*5 protocol	Previous	Previous	Previous	Previous	Previous	Previous
	Connectable network	1	1	3	2	2	2

*3 Maximum number of AC Cell is limited up to 96.
In case the number of connected indoor units are more than 96, some AC Cells should hold 2 or more indoor units.
*4 In case of other Central control like SC-SLxN-E is connected in the same network, the connectable indoor unit is limited up to 64 (32x2).
*5 In case of previous superlink protcol, the superlink mode of new central control should be set "Previous".
*6 In case of YES[A], previous central control is available to use. But the limitation of connectable indoor unit and so on is complied with the rule of previous superlink.

(3) The compatibility of PFD refrigerant flow branch controller is mentioned in following table.

Connectable PFD controller		Indoor unit: KXE4 & KXE5 series	KXE6 series
Outdoor unit	KXRE4 series	Current one only PFD-E PFD-ER	Current*7& New (Not yet)
	KXRE4 series	Current one only PFD-E PFD-ER	New one only (Not yet)

*7 When the current PFD controller is connected, the connector of relay kit must be connected to CnT connector (NOT CnT 2).

CONTENTS

1 GENERAL INFORMATION

1.1 Specific features

(1) The new R410A refrigerant is used

The new refrigerant R410A, with an ozone destruction coefficient of zero, is used and the CO_2 discharge volume is reduced, In addition, R410A is a pseudo-azeotropic refrigerant, so there is little change in its consistency that would cause it to divide into the gas and liquid phases, or undergo temperature slide, and it is also possible to add refrigerant on-site.

(2) Connectable indoor capacity

Capacity from 50% to 200% is possible.

Note (1) When connecting the indoor unit type FDK, FDFL or FDFU Series, limit the connectable capacity not higher than 130%.

Item / Model	Number of connectable	Connectable capacity (1)
FDC400KXE6	1 to 36 units	200 ~ 800
FDC450KXE6	1 to 40 units	225 ~ 900
FDC504KXE6	1 to 36 units	252 ~ 806

Capacity from 50% to 160% is possible.

Note (1) When connecting the indoor unit type FDK, FDFL or FDFU Series, limit the connectable capacity not higher than 130%.

Item / Model	Number of connectable	Connectable capacity(1)
FDC560KXE6	1 to 40 units	280 ~ 896
FDC615KXE6	2 to 44 units	308 ~ 984
FDC680KXE6	2 to 49 units	340 ~ 1088
FDC735KXE6	2 to 53 units	368 ~ 1176
FDC800KXE6	2 to 58 units	400 ~ 1280
FDC850KXE6	2 to 61 units	425 ~ 1360
FDC900KXE6	2 to 65 units	450 ~ 1440
FDC960KXE6	2 to 69 units	477 ~ 1526

Capacity from 50% to 130% is possible.

Item / Model	Number of connectable	Connectable capacity
FDC1010KXE6	2 to 59 units	504 ~ 1311
FDC1065KXE6	2 to 62 units	532 ~ 1384
FDC1130KXE6	2 to 66 units	560 ~ 1456
FDC1180KXE6	3 to 69 units	588 ~ 1528
FDC1235KXE6	3 to 72 units	615 ~ 1599
FDC1300KXE6	3 to 76 units	650 ~ 1690
FDC1360KXE6	3 to 80 units	680 ~ 1768

1.2 How to read the model name

Outdoor unit

Example: FDC 735 KX E 6

- 6 — Series No.
- E — Application power source...See the specifications
- KX — Multi KX series
- 735 — Nominal capacity (nominal cooling capacity : 73.5kW)
- FDC — Model name (Outdoor unit)

Note

For outdoor unit, EN60552-2 and EN60555-3 are not applicable as consent by the utility company or notification to the utility company is given before usage.

1.3 Table of models

Model \ Capacity	22	28	36	45	56	71	90	112	140	160	224	280
Ceiling cassette-4 way type (FDT)		○	○	○	○	○	○	○	○	○		
Ceiling cassette-4 way compact type (FDTC)	○	○	○	○	○							
Ceiling cassette-2 way type (FDTW)		○		○	○	○	○	○	○			
Ceiling cassette-1 way type (FDTS)				○		○						
Ceiling cassette-1 way compact type (FDTQ)	○	○	○									
Duct connected-High static pressure type (FDU)						○	○	○	○		○	○
Duct connected-Middle static preessure type (FDUM)	○	○	○	○	○	○	○	○	○			
Duct connected (Ultra thin)-Low static preessure type (FDQS)	○	○	○	○	○							
Wall mounted type (FDK)	○	○	○	○	○	○						
Ceiling suspen ded type (FDE)			○	○	○	○		○	○			
Floor standing (with casing) type (FDFL)		○		○		○						
Floor standing (without casing) type (FDFU)		○		○	○	○						
Duct connected-compact and Flexible type (FDUH)	○	○	○									
Outdoor units to be combined (FDC)	FDC335KXE6-K, FDC400KXE6 ～ 560KXE6, FDC560KXE6-K, FDC615KXE6 ～ 1360KXE6											

1.4 Table of indoor units panel (Optional)

Model		Parts Model
FDTC	Capacity:22,28,36,45,56	TC-PSA-24W-ER
FDT	Capacity:28,36,45,56,71, 90,112,140,160	T-PSA-36W-E
FDTW	Capacity:28,45,56	TW-PSA-24W-E
	Capacity:71,90	TW-PSA-34W-E
	Capacity:112,140	TW-PSA-44W-E
FDTQ (Direct blow panel)	Capacity:22,28,36	TQ-PSA-15W-E
		TQ-PSB-15W-E
FDTQ (Duct panel)	Capacity:22,28,36	QR-PNA-14W-ER
		QR-PNB-14W-ER
FDTS	Capacity: 45	TS-PSA-29W-E
	Capacity:71	TS-PSA-39W-E

1.5 Outdoor units combination table

(a) Models FDC735, 800, 850, 900KXE6

Item / Models	Combination outdoor unit models			Indoor unit	
	FDC335KXE6-K	FDC400KXE6	FDC450KXE6	Connectable (1) capacity	Number of connectable units
FDC735KXE6	1	1	—	368 ~ 1176	2 to 53 unit
FDC800KXE6	—	2	—	400 ~ 1280	2 to 58 unit
FDC850KXE6	—	1	1	425 ~ 1360	2 to 61 unit
FDC900KXE6	—	—	2	450 ~ 1440	2 to 65 unit

Note (1) When connecting the indoor unit type FDK, FDFL or FDFU Series, limit the connectable capacity not higher than 130%.

(b) Models FDC960, 1010, 1065, 1130, 1180, 1235, 1300, 1360KXE6

Item / Models	Combination outdoor unit models						Indoor unit	
	FDC450 KXE6	FDC504 KXE6	FDC560 KXE6	FDC560 KXE6-K	FDC615 KXE6	FDC680 KXE6	Connectable capacity	Number of connectable units
FDC960KXE6 (1)	1	1	—	—	—	—	477 ~ 1526	2 to 69 unit
FDC1010KXE6	—	2	—	—	—	—	504 ~ 1311	2 to 59 unit
FDC1065KXE6	—	1	1	—	—	—	532 ~ 1384	2 to 62 unit
FDC1130KXE6	—	—	2	—	—	—	560 ~ 1456	2 to 66 unit
FDC1180KXE6	—	—	—	1	1	—	588 ~ 1528	3 to 69 unit
FDC1235KXE6	—	—	—	—	2	—	615 ~ 1599	3 to 72 unit
FDC1300KXE6	—	—	—	—	1	1	650 ~ 1690	3 to 76 unit
FDC1360KXE6	—	—	—	—	—	2	680 ~ 1768	3 to 80 unit

Note (1) When connecting the indoor unit type FDK, FDFL or FDFU Series to FDC960KXE6, limit the connectable capacity not higher than 130%.

(c) Outdoor unit side branch pipe set (Option)

Outdoor unit	Branch pipe set
For two units (for 735 ~ 1360)	DOS-2A-1

Note (1) Be sure to use this when combining units.

(d) Branch pipe set (Option)

Total capacity downstream	Branching pipe set
Less than 180	DIS-22-1
180 or more but less than 371	DIS-180-1
371 or more but less than 540	DIS-371-1
540 or more	DIS-540-2

(e) Header pipe set (Option)

Total capacity downstream	Header set model type	Number of branches
Less than 180	HEAD4-22-1	4 branches at the most
180 or more but less than 371	HEAD6-180-1	6 branches at the most
371 or more but less than 540	HEAD8-371-1	8 branches at the most
540 or more	HEAD8-540-2	8 branches at the most

2 OUTDOOR UNIT

2.1 Specifications

• All-in-one type (Used also for combination)

Models			FDC335KXE6-K	FDC400KXE6	FDC450KXE6	FDC504KXE6	FDC560KXE6	FDC560KXE6-K	FDC615KXE6	FDC680KXE6
Nominal cooling capacity*1		kW	33.5	40.0	45.0	50.4	56.0	56.0	61.5	68.0
Nominal heating capacity*2			37.5	45.0	50.0	56.5	63.0	63.0	69.0	73.0
Power source			3 Phase 380-415V 50Hz／380V 60Hz							
Power consumption	Cool	kW	8.94	11.27	12.97	14.73	16.79	16.79	20.37	24.98
	Heat		8.93	11.73	13.10	15.12	16.79	16.79	18.48	19.08
Running current	Cool	A	14.5／13.3	18.4／16.9	21.1／19.3	24.1／22.0	27.4／25.1	27.4／25.1	33.1／30.3	40.3／36.9
	Heat		14.8／13.5	19.6／17.9	21.7／19.9	25.2／23.1	28.0／25.7	28.0／25.7	30.7／28.1	31.6／29.0
Sound Pressure Level		dB（A）	59／59	59.5／60	62.5／62.5	61.5／62	63／63.5	63／63.5	64.5／64	65／65
Exterior dimensions Height × Width × Depth		mm	1690×1350×720			2048×1350×720				
Net weight		kg	317			341		355		
Refrigerant equipment compressor type & Q'ty			GTC5150NH48L×2					GTD5160NH48L×2		
Motor		kW	2.99×2	3.71×2	4.29×2	4.87×2	5.78×2		6.66×2	7.15×2
Starting method			Direct line starting							
capacity control		%	19-130	15-114	13-112	11-100	10-113	12-113	11-110	10-108
Crankcase heater		W	33×2							
Refrigerant equipment Heat exchanger			Straight fin & inner grooved tubing							
Refrigerant control			Electronic expansion valve							
Refrigerant			R410A							
Quantity		kg	11.5							
Refrigerant oil		l	4.2（M-MA32R）							
Defrost control			Microcomputer controlled De-Icer							
Air handling equipment fan type & Q'ty			Propeller fan × 2							
Motor		W	386×2							
Starting method			Direct start							
Air flow（Standard）		CMM	220／180	250／220	260／240	270／250				
Shock & vibration absorber			Rubber mount（for compressor）							
safety equipment			Compressor overheat protection ／ overcurrent protection ／ power transistor overheating protection ／ abnormal high pressure protection							
Installation data Refrigerant piping size		mm（in）	Liquid line : φ12.7（1／2"）							
			Gas line : φ25.4（1"）（φ28.58（11／8"））		Gas line : φ28.58（11／8"）					
Connecting method			Gas line : Brazing ／ Liquid line : Flare							
Drain			Hole for drain（φ20 × 6pcs , φ45 × 3pcs）							
Insullation for piping			Necessary（both Liquid & Gas lines）							
Accessories			-	-	-	-	-	-	-	-
Exterior dimensions			PCB003Z041	PCB003Z041	PCB003Z041	PCB003Z044	PCB003Z044	PCB003Z044	PCB003Z044	PCB003Z044
Electrical wiring			PCB003Z060	PCB003Z060	PCB003Z060	PCB003Z060	PCB003Z060	PCB003Z060	PCB003Z060	PCB003Z060

Notes (1) The data are measured at the following conditions.

Item	Indoor air temperature		Outdoor air temperature		Standards
Operation	DB	WB	DB	WB	
Cooling*1	27℃	19℃	35℃	24℃	ISO-T1
Heating*2	20℃	–	7℃	6℃	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1 "UNITARY AIR-CONDITIONERS"

(3) Refrigerant piping size applicable to European installations are shown in parentheses.

Adapted to RoHS directive

PCB003Z040

Models			FDC735KXE6	FDC800KXE6	FDC850KXE6	FDC900KXE6	FDC960KXE6	FDC1010KXE6
Combination unit			FDC335KXE6-K	FDC400KXE6	FDC400KXE6	FDC450KXE6	FDC450KXE6	FDC504KXE6
			FDC400KXE6	FDC400KXE6	FDC450KXE6	FDC450KXE6	FDC504KXE6	FDC504KXE6
Power source			3 Phase 380-415V 50Hz／380V 60Hz					
Nominal cooling capacity*1		kW	73.5	80.0	85.0	90.0	96.0	101.0
Nominal heating capacity*2			82.5	90.0	95.0	100.0	108.0	113.0
Power consumption	Cool	kW	20.21	22.54	24.24	25.94	27.7	29.46
	Heat		20.66	23.46	24.83	26.2	28.22	30.24
Running current	Cool	A	32.9／30.2	36.8／33.8	39.5／36.2	42.2／38.6	45.2／41.3	48.2／44
	Heat		34.4／31.4	39.2／35.8	41.3／37.8	43.4／39.8	46.9／43	50.4／46.2
Net weight		kg	634	634	634	634	658	682
Refrigerant piping size	Liquid line	ϕmm	ϕ15.88					
	Gas line		ϕ31.75（ϕ34.92）					
	Oil equalization		ϕ9.52					

Models			FDC1065KXE6	FDC1130KXE6	FDC1180KXE6	FDC1235KXE6	FDC1300KXE6	FDC1360KXE6
Combination unit			FDC504KXE6	FDC560KXE6	FDC560KXE6-K	FDC615KXE6	FDC615KXE6	FDC680KXE6
			FDC560KXE6	FDC560KXE6	FDC615KXE6	FDC615KXE6	FDC680KXE6	FDC680KXE6
Power source			3 Phase 380-415V 50Hz／380V 60Hz					
Nominal cooling capacity*1		kW	106.5	113.0	118.0	123.5	130.0	136.0
Nominal heating capacity*2			119.5	127.0	132.0	138.0	142.0	146.0
Power consumption	Cool	kW	31.52	33.58	37.16	40.74	45.35	49.96
	Heat		31.91	33.58	35.27	36.96	37.56	38.16
Running current	Cool	A	51.5／47.1	54.8／50.2	60.5／55.4	66.2／60.6	73.4／67.2	80.6／73.8
	Heat		53.2／48.8	56／51.4	58.7／53.8	61.4／56.2	62.3／57.1	63.2／58
Net weight		kg	682	682	710	710	710	710
Refrigerant piping size	Liquid line	ϕmm	ϕ19.05					
	Gas line		ϕ38.1（ϕ34.92）					
	Oil equalization		ϕ9.52					

Notes (1) The data are measured at the following conditions.

Item	Indoor air temperature		Outdoor air temperature		Standards
Operation	DB	WB	DB	WB	
Cooling*1	27℃	19℃	35℃	24℃	ISO-T1
Heating*2	20℃	–	7℃	6℃	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1 "UNITARY AIR-CONDITIONERS"

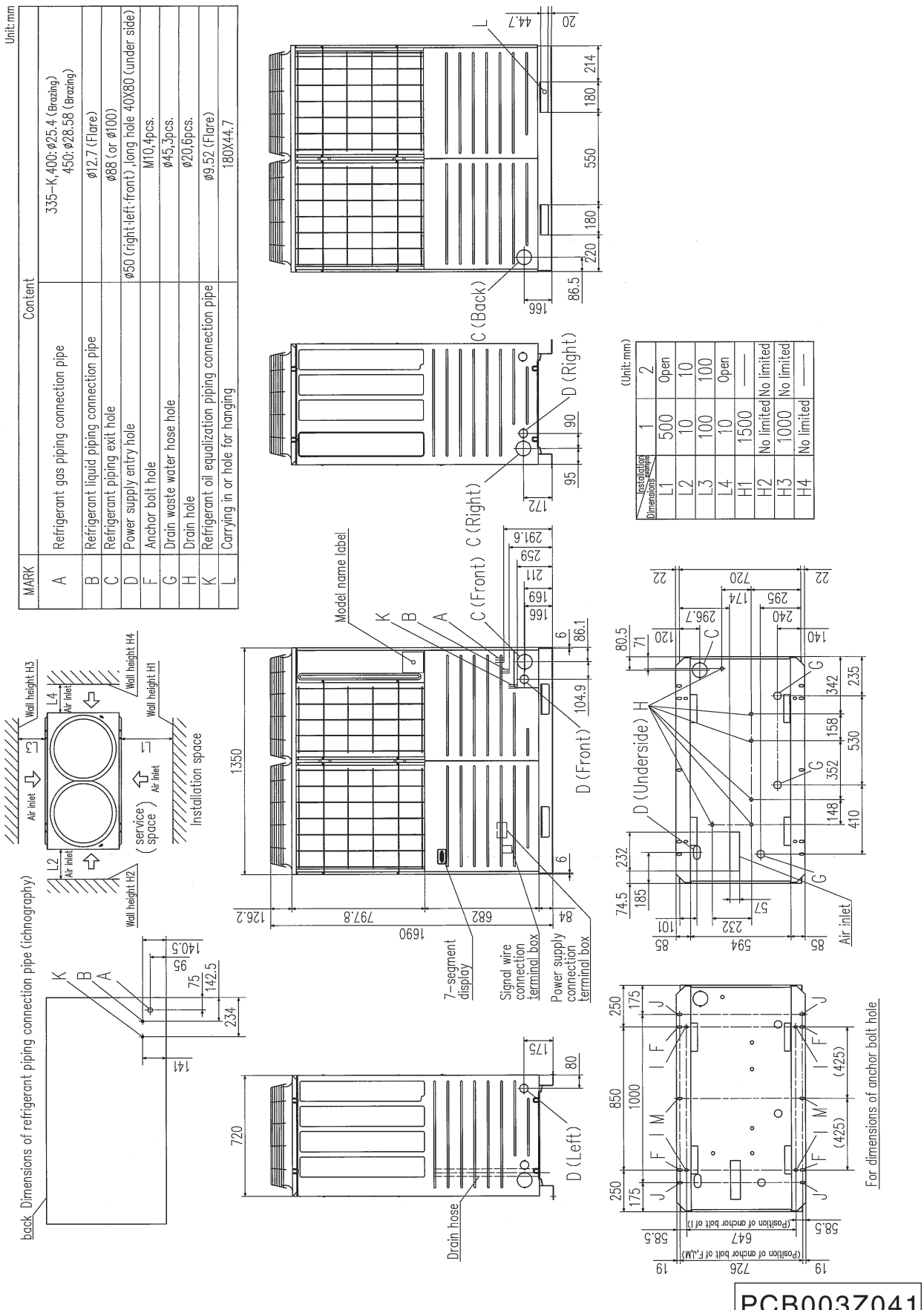
(3) Refrigerant piping size applicable to European installations are shown in parentheses.

Adapted to RoHS directive

PCB003Z040

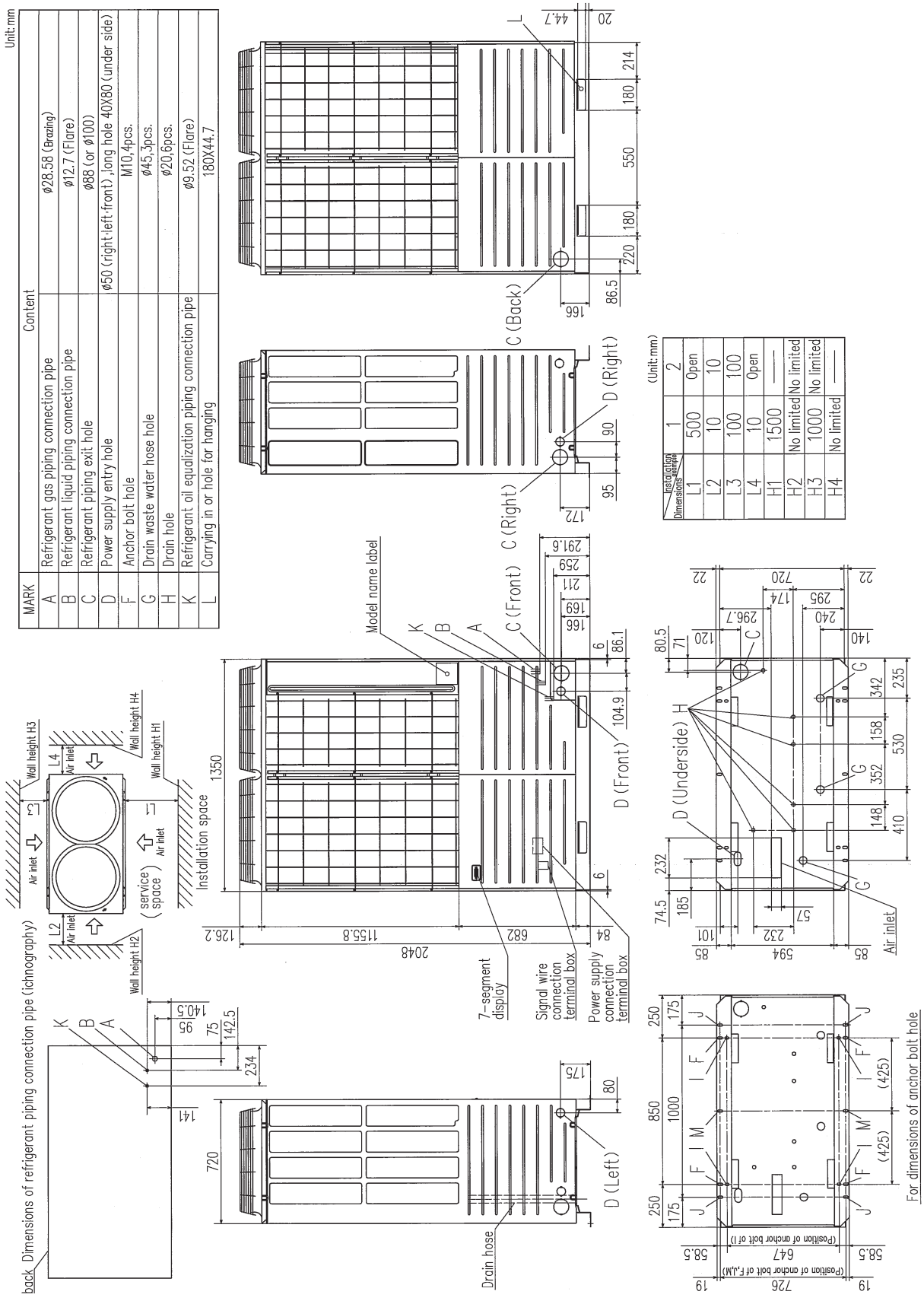
2.2 Exterior dimensions

Models FDC335KXE6-K, 400KXE6, 450KXE6



PCB003Z041

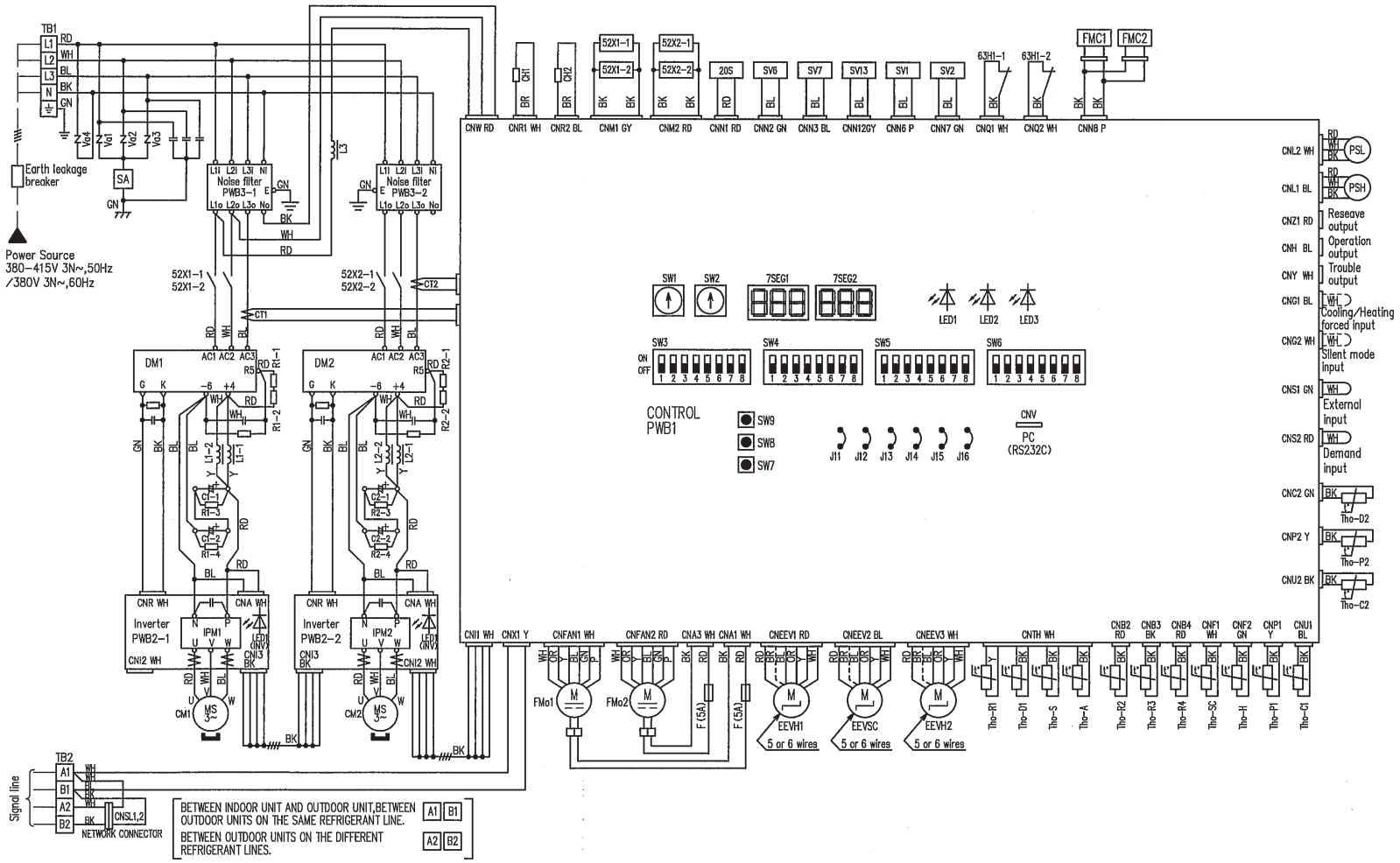
Models FDC504KXE6, 560KXE6, 560KXE6-K, 615KXE6, 680KXE6



PCB003Z044

2.3 Electrical wiring

Models All model



CH1,2	Crankcase heater
CM1,2	Compressor motor
CNA~Z	Connector
CT1,CT2	Current sensor
C1~1,2,C2~1,2	Electrolytic capacitor
DM	Diode module
EEVH1,2	Expansion valve for heating
EEVSC	Expansion valve for SC
F	Fuse
FMC1,2	Fan for IPM
FMo1,2	Blower motor
IPM	Intelligent power module
J11,12	Set up model (volt)
J13	External input select level/pulse
J14	Defrost recover temp
J15	Defrost start temp
J16	Heat recovery unit
LED1	Inspection (Red)
LED1 (INV)	Normal (Yellow) ~Flashing
LED2	Normal (Green)
LED3	Service (green for service)
L1~1,2,L2~1,2	D.C.reactor
L3	D.C.reactor

PSH	High pressure sensor
PSL	Low pressure sensor
PWB1~3	Printed wiring board (PCB)
R1,2	Rush current suppression resistor
SA	Arrestor
SV1	Solenoid valve (CM1: bypass)
SV2	Solenoid valve (CM2: bypass)
SV6	Solenoid valve (oil separator CM1)
SV7	Solenoid valve (oil separator CM2)
SV13	Solenoid valve (gas bypass)
SW1	Address setting SW outdoor unit No. (2 digits)
SW2	Address setting SW outdoor unit No. (1 digit)
SW3~1	inspection LED reset
SW3~2 ON	Auto backup operation
OFF	Regular operation
SW3~3	Spare
SW3~4 ON	Refrigerant quantity check
OFF	Regular operation
SW3~5 ON	Check operation
OFF	Regular operation
SW3~6	Spare
SW3~7 ON	Forced cooling/heating
OFF	Regular operation

SW3~8	ON	Test mode
	OFF	Regular operation
SW4~1~4		Model setting
SW4~5		Demand
SW4~6		Demand
SW4~7		Address setting switch (master・slave)
SW4~8		Address setting switch (master・slave)
SW5~1	ON	Trial operation
	OFF	Regular operation
SW5~2	ON	Trial operation mode/cooling
	OFF	Trial operation mode/heating
SW5~3	ON	Pump down operation
	OFF	Regular operation
SW5~4		Spare
SW5~5	ON	Super Link communication
	OFF	Super Link Ⅱ communication
SW5~6~8		Spare
SW6~1~8		Spare
SW7		Data clear/insert
SW8		7seg indicate (unit's place)
SW9		7seg indicate (ten's place)
SW10		Reset
TB1,2		Terminal block

Tho~A	External air thermistor
Tho~C1,2	Under~dome thermistor
Tho~D1,2	Discharge pipe thermistor
Tho~H	Sub~cooling coil thermistor 2
Tho~P1,2	Power transistor thermistor
Tho~R1	Heat exchanger thermistor (exhaust)
Tho~R2	Heat exchanger thermistor (exhaust)
Tho~R3	Heat exchanger thermistor (inlet)
Tho~R4	Heat exchanger thermistor (inlet)
Tho~S	Suction pipe thermistor
Tho~SC	Sub~cooling coil thermistor 1
Va1~4	Varistor
20S	4way valve
52X1~1,2	Solenoid for CM1
52X2~1,2	Solenoid for CM2
63H1~1,2	High pressure switch (for protection)
7SEG1	7seg L.E.D. (function indication)
7SEG2	7seg L.E.D. (data indication)

Color symbol

BK	Black
BL	Blue
BR	Brawn
GN	Green
GR	Gray
OR	Orange
RD	Red
WH	White
Y	Yellow
P	Pink

PCB003Z060

2.4 Noise level

Measured based on JIS B 8616

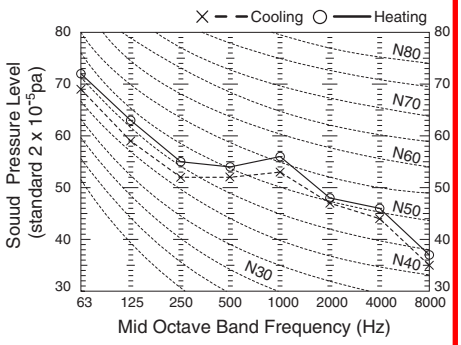
Mike position as highest noise level in position as below

Distance from front side 1m

Height 1m

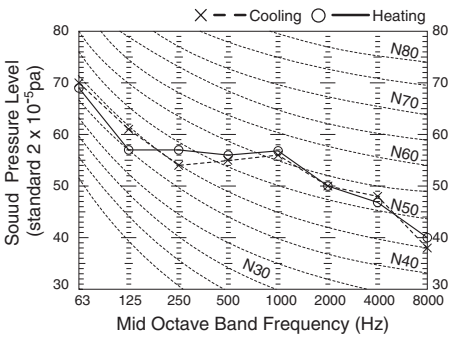
Model FDC335KXE6-k

Noise level 59 dB (A) at cooling
59 dB (A) at heating



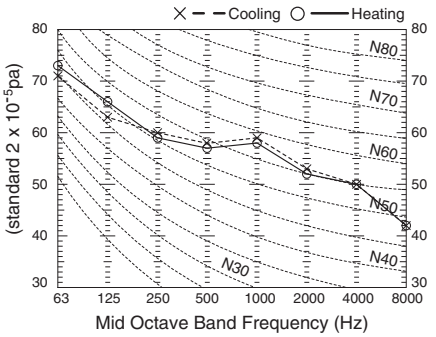
Model FDC400KXE6

Noise level 59.5 dB (A) at cooling
60 dB (A) at heating



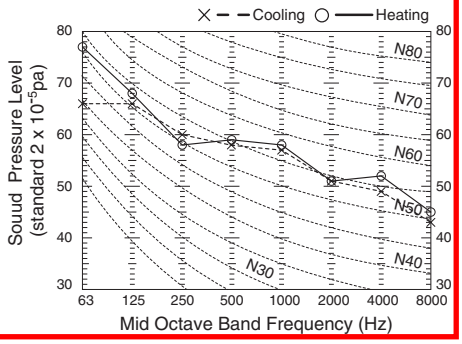
Model FDC450KXE6

Noise level 62.5 dB (A) at cooling
62.5 dB (A) at heating



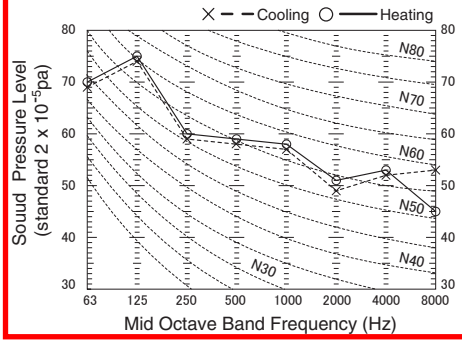
Model FDC504KXE6

Noise level 61.5 dB (A) at cooling
62 dB (A) at heating



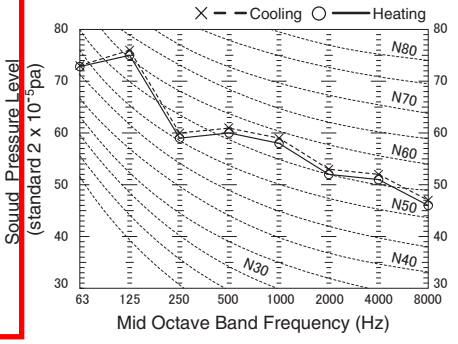
Models FDC560KXE6
560KXE6-K

Noise level 63 dB (A) at cooling
63.5 dB (A) at heating



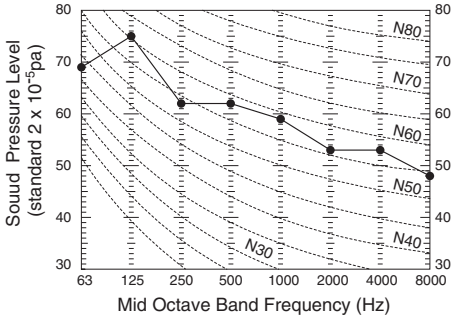
Model FDC615KXE6

Noise level 64.5 dB (A) at cooling
64 dB (A) at heating



Model FDC680KXE6

Noise level 65 dB (A) at cooling
65 dB (A) at heating



Catalogue of Daikin RU08K

DAIKIN

ED 42 - 019A

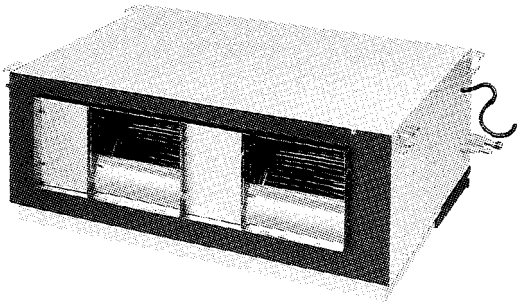
Engineering Data

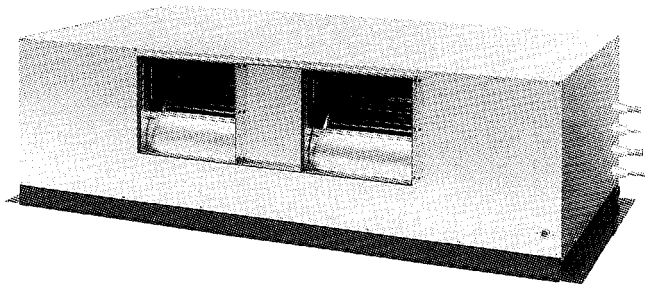
Packaged Air Conditioners
Duct Connection Type

(High Static Pressure Application)

FD-K Series

— Cooling Only —





DAIKIN INDUSTRIES, LTD.

Duct Connection Type High Static Pressure Application FD-K Series

1. Power Supply and Nomenclature

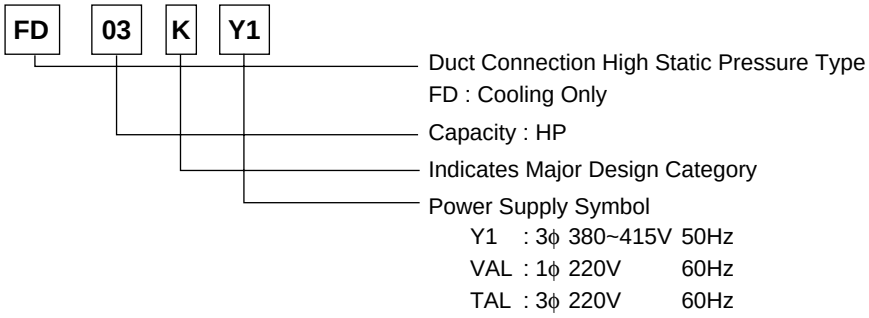
1.1 Power Supply

Symbol	Indoor Unit	Outdoor Unit	Power Supply
Y1	FD03KY1	R71FUY1	3ϕ 380~415V 50Hz (4 wires)
	FD04KY1	R100FUY1	
	FD05KY1	R125FUY1	
	FD06KY1	RU06KY1	
	FD08KY1	RU08KY1	
	FD08KY1	RU08KUY1 *	
	FD10KY1	RU10KY1	
	FD10KY1	RU10KUY1 *	
	FD15KY1	RU08KY1×2	
	FD15KY1	RU08KUY1×2 *	
	FD20KY1	RU10KY1×2	
	FD20KY1	RU10KUY1×2 *	
VAL	FD03KVAL	R71FUVAL	1ϕ 220V 60Hz
	FD04KVAL	R100FUVAL	
TAL	FD05KTAL	R125FUTAL	3ϕ 220V 60Hz
	FD06KTAL	RU06KTAL	
	FD08KTAL	RU08KTAL	
	FD08KTAL	RU08KUTAL *	
	FD10KTAL	RU10KTAL	
	FD10KTAL	RU10KUTAL *	
	FD15KTAL	RU08KTAL×2	
	FD15KTAL	RU08KUTAL×2 *	
	FD20KTAL	RU10KTAL×2	
	FD20KTAL	RU10KUTAL×2 *	

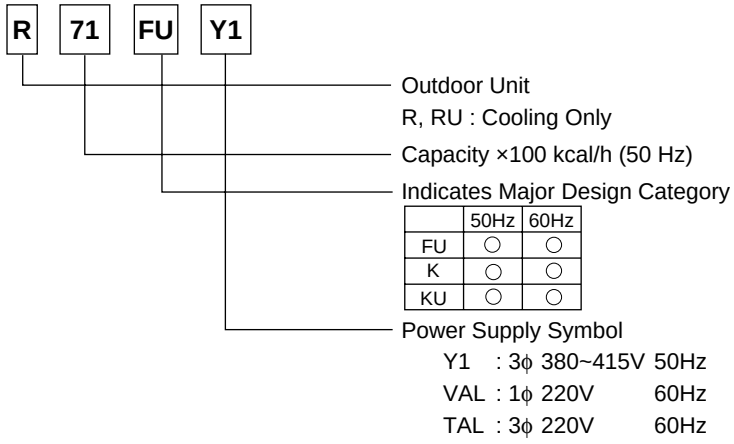
Note: 1. * : New Model or Changed Model
2. Power Supply Intake; Outdoor Unit

1.2 Nomenclature

Indoor Unit



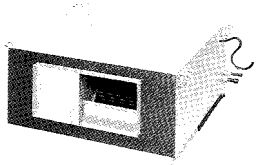
Outdoor Unit



2. External Appearance

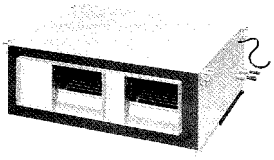
2.1 Indoor Unit

FD03K



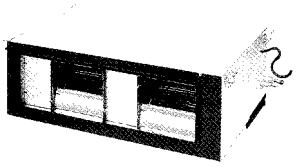
FD04K

FD05K

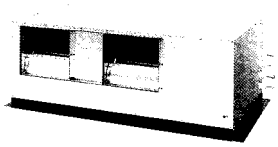


FD06K

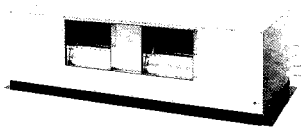
FD08K



FD10K



FD15K

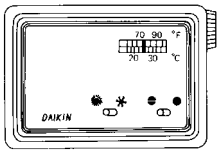


FD20K

2.2 Remote Controller

KRC47-3

KRC47-5



KRC17-2B

2.3 Outdoor Unit

R71FU

R100FU
R125FU

RU06K

RU08K
RU08KU

RU10K
RU10KU

3. Functions

3.1 FD-K Series

Points and Functions	Duct Connection High Static Pressure Type FD-K
Auto Restart	○
Central Remote Control	○ (Adaptor Kit is needed. Refer to P. 90)
PE fin	○
Adjustable External Static Pressure	○ (Required to change the pulley)

○ : Existing Functions

Cautions

1. Air conditioners should not be installed in areas where corrosive gases, such as acid gas or alkaline gas, are produced.
2. If the outdoor unit is to be installed close to the sea shore, direct exposure to the sea breeze should be avoided and choose an outdoor unit with anti-corrosion treatment.

4. Specifications

4.1 50Hz

R-FU Series <50Hz>

Model	Indoor Unit			FD03KY1	FD04KY1	FD05KY1
	Outdoor Unit			R71FUY1	R100FUY1	R125FUY1
∗1 Cooling Capacity (1)/(2)/(3)			kW	8.1 / 7.9 / 6.7	11.0 / 10.8 / 9.5	14.0 / 13.8 / 11.8
			Btu/h	27,800 / 27,000 / 22,900	37,700 / 36,900 / 32,400	47,600 / 46,800 / 40,300
			kcal/h	7,000 / 6,800 / 5,800	9,500 / 9,300 / 8,200	12,000 / 11,800 / 10,100
Indoor Unit				**FD03KY1**	**FD04KY1**	**FD05KY1**
Dimensions		H×W×D	mm	450×650×850	450×900×850	450×900×850
Coil	Type			Cross Fin Coil (Waffle Louver Fins and Hi-XA Tubes)		
	Row×Stages×Fin Pitch			2×24×2.0	2×24×2.0	2×24×2.0
	Face Area		m²	0.238	0.370	0.370
Fan	Type			Sirocco Fan		
	Drive			Belt Drive		
	Motor Output		kW	0.4	0.4	0.75
	Air Flow Rate		m³/min	26	30	46
			cfm	918	1,059	1,620
	Ext. Static Pressure		mmH2O	7	9	9
Weight			kg	51	59	72
Piping Connections		Liquid	mm	ϕ 9.5 (Brazing)	ϕ 9.5 (Brazing)	ϕ 9.5 (Brazing)
		Gas	mm	ϕ 15.9 (Brazing)	ϕ 19.1 (Brazing)	ϕ 19.1 (Brazing)
		Drain	mm	FPS3/4B	FPS3/4B	FPS3/4B
Remote Controller		Wired		KRC47-3	KRC47-3	KRC47-3
		Wireless		—	—	—
Outdoor Unit				**R71FUY1**	**R100FUY1**	**R125FUY1**
Color				Ivory		
Dimensions		H×W×D	mm	816×880×370	1,215×880×370	1,215×880×370
Coil	Type			Cross Fin Coil		
	Row×Stages×Fin Pitch			2×36×2.0	2×54×2.0	2×54×2.0
	Face Area		m²	0.653	0.979	0.979
Comp.	Model			H23A35QDBNA	H23A46QDBNA	H23A56QDBNA
	Type			Hermetically Sealed Type		
	Motor Output		kW	3.0	3.8	4.5
Fan	Model			P45J11SM	P45J11SM×2	P45J11SM×2
	Type			Propeller		
	Motor Output		W	50	75+35	75+60
	Air Flow Rate		m³/min	46	80	87
			cfm	1,620	2,824	3,071
Weight			kg	84	109	110
Piping Connections		Liquid	mm	ϕ 9.5 (Flare)	ϕ 9.5 (Flare)	ϕ 9.5 (Flare)
		Gas	mm	ϕ 15.9 (Flare)	ϕ 19.1 (Flare)	ϕ 19.1 (Flare)
		Drain	mm	ϕ 26.0 (Hole)	ϕ 26.0 (Hole)	ϕ 26.0 (Hole)
Safety Devices				Thermal Protector for Outdoor Fan Motor. Internal Pressure Relief Valve (Compressor). Motor Protector (Compressor). Over Current Relay for Indoor Fan Motor.		
Capacity Step			%	100 – 0	100 – 0	100 – 0
Refrigerant Control				Capillary Tube		
Ref. Piping	Standard Length		m	5	5	5
	Max. Length		m	50 (Equivalent Length 70m)	50 (Equivalent Length 70m)	50 (Equivalent Length 70m)
	Max. Height Difference		m	30	30	30
Refrigerant	Model			R22	R22	R22
	Charge		kg	2.1 (Factory Charge for 5m)	2.4 (Factory Charge for 5m)	2.8 (Factory Charge for 5m)
Ref. Oil	Model			SUNISO 3GS		
	Charge		L	1.48	1.63	1.63
Drawing No.				C : 4D004103A		

Note: 1. ∗1 The above data are based on the following conditions.

	Cooling	Piping Length	Hz–Volts	Standard
(1)	Indoor: 27°C(81°F)DB, 19.5°C(67°F)WB Outdoor: 35°C(95°F)DB	5m (Horizontal)	50Hz–380V	—
(2)	Indoor: 27°C(81°F)DB, 19.0°C(66°F)WB Outdoor: 35°C(95°F)DB	5m (Horizontal)	50Hz–380V	—
(3)	Indoor: 29°C(84°F)DB, 19.0°C(66°F)WB Outdoor: 46°C(115°F)DB, 24°C(75°F)WB	7.5m (Horizontal)	50Hz–380V	SSA 385/386

Capacities are gross capacities which do not include a deduction for indoor fan motor heat.

Conversion Formulae
kcal/h=kW×860 Btu/h=kW×3414 cfm=m³/min×35.3

RU-K Series <50Hz>

Model	Indoor Unit			FD06KY1	FD08KY1	FD10KY1	FD15KY1	FD20KY1
	Outdoor Unit			RU06KY1	RU08KY1	RU10KY1	RU08KY1×2	RU10KY1×2
∗1 Cooling Capacity (1)/(2)/(3)			kW	17.4 / 17.2 / 15.0	24.3 / 24.0 / 21.6	29.7 / 29.2 / 26.3	48.6 / 47.9 / 43.2	59.3 / 58.4 / 42.7
			Btu/h	59,500 / 58,800 / 51,200	83,000 / 81,800 / 73,700	101,200 / 99,600 / 89,800	166,000 / 163,500 / 147,500	202,400 / 199,400 / 145,800
			kcal/h	15,000 / 14,800 / 12,900	20,900 / 20,600 / 18,600	25,500 / 25,100 / 22,600	41,800 / 41,200 / 37,200	51,000 / 50,200 / 36,700
Indoor Unit				**FD06KY1**	**FD08KY1**	**FD10KY1**	**FD15KY1**	**FD20KY1**
Dimensions		H×W×D	mm	450×1,130×850	500×1,130×850	500×1,330×850	625×1,620×850	625×1,980×850
Coil	Type			Cross Fin Coil (Waffle Louver Fins and Hi-XA Tubes)				
	Row×Stages×Fin Pitch			2×24×2.0	3×22×2.0	3×22×2.0	3×26×2.0	3×26×2.0
	Face Area		m²	0.491	0.443	0.540	0.784	0.990
Fan	Type			Sirocco Fan				
	Drive			Belt Drive				
	Motor Output		kW	0.75	1.5	1.5	2.2	3.7
	Air Flow Rate		m³/min	52	68	83	136	166
			cfm	1,836	2,400	2,930	4,800	5,860
	Ext. Static Pressure		mmH2O	9	10	10	15	15
Weight			kg	79	93	104	161	187
Piping Connections		Liquid	mm	ϕ 9.5 (Brazing)	ϕ 12.7 (Brazing)	ϕ 15.9 (Brazing)	2× ϕ 12.7 (Brazing)	2× ϕ 15.9 (Brazing)
		Gas	mm	ϕ 19.1 (Brazing)	ϕ 25.4 (Brazing)	ϕ 31.8 (Brazing)	2× ϕ 25.4 (Brazing)	2× ϕ 31.8 (Brazing)
		Drain	mm	FPS3/4B	FPS3/4B	FPS3/4B	FPS1B	FPS1B
Remote Controller		Wired		KRC47-3	KRC47-3	KRC47-3	KRC17-2B | KRC47-3	KRC17-2B | KRC47-3
		Wireless		—	—	—	—	—
Outdoor Unit				**RU06KY1**	**RU08KY1**	**RU10KY1**	**RU08KY1×2**	**RU10KY1×2**
Color				Ivory White				
Dimensions		H×W×D	mm	1,345×880×320	1,220×1,280×690	1,440×1,280×690	2×(1,220×1,280×690)	2×(1,440×1,280×690)
Coil	Type			Cross Fin Coil (Waffle Louver Fins and Hi-XA Tubes)				
	Row×Stages×Fin Pitch			2×60×2.0	2×40×2.0	2×50×2.0	2×(2×40×2.0)	2×(2×50×2.0)
	Face Area		m²	1.16	1.57	1.97	2×1.57	2×1.97
Comp.	Model			JT200B-YE	JT265DYE-P1	JT335DYE-P1	2×(JT265DYE-P1)	2×(JT335DYE-P1)
	Type			Hermetically Sealed Scroll Type				
	Motor Output		kW	4.5	7.5	9.0	2×7.5	2×9.0
Fan	Model			P45J11SM	P52H11S	P52H11S	2×P52H11S	2×P52H11S
	Type			Propeller				
	Motor Output		W	85+65	230+190	230+190	2×(230+190)	2×(230+190)
	Air Flow Rate		m³/min	108	150	175	2×150	2×175
			cfm	3,812	5,295	6,177	2×5,295	2×6,177
Weight			kg	112	177	190	2×177	2×190
Piping Connections		Liquid	mm	ϕ 9.5 (Flare)	ϕ 12.7 (Brazing)	ϕ 15.9 (Brazing)	2× ϕ 12.7 (Brazing)	2× ϕ 15.9 (Brazing)
		Gas	mm	ϕ 19.1 (Flare)	ϕ 25.4 (Brazing)	ϕ 31.8 (Brazing)	2× ϕ 25.4 (Brazing)	2× ϕ 31.8 (Brazing)
		Drain	mm	—	—	—	—	—
Safety Devices				Thermal Protector for Compressor and Outdoor Fan Motor. High Pressure Switch. Low Pressure Switch. Over Current Relay (Compressor and Indoor Fan Motor). Reverse Phase Protector. Fuse.	Thermal Protector for Compressor and Outdoor Fan Motor. High Pressure Switch. Over Current Relay (Compressor and Indoor Fan Motor). Reverse Phase Protector. Fuse.			
Capacity Step			%	100 – 0	100 – 0	100 – 0	100 – 50 – 0	100 – 50 – 0
Refrigerant Control				Capillary Tube				
Ref. Piping	Standard Length		m	5	5	5	5	5
	Max. Length		m	50 (Equivalent Length 70m)	50 (Equivalent Length 70m)	50 (Equivalent Length 70m)	50 (Equivalent Length 70m)	50 (Equivalent Length 70m)
	Max. Height Difference		m	30	30	30	30	30
Refrigerant	Model			R22	R22	R22	R22	R22
	Charge		kg	3.0 (Factory Charge for 5m)	5.0 (Field Charge for 5m)	6.1 (Field Charge for 5m)	2×5.0 (Field Charge for 5m)	2×6.1 (Field Charge for 5m)
Ref. Oil	Model			SUNISO 4GSDID-K				
	Charge		L	1.6	4.0	4.0	2×4.0	2×4.0
Drawing No.				C : 4D006819A			C : 4D008677	

Note: 1. ∗1 The above data are based on the following conditions.

	Cooling	Piping Length	Hz–Volts	Standard
(1)	Indoor: 27°C(81°F)DB, 19.5°C(67°F)WB Outdoor: 35°C(95°F)DB	5m (Horizontal)	50Hz–380V	—
(2)	Indoor: 27°C(81°F)DB, 19.0°C(66°F)WB Outdoor: 35°C(95°F)DB	5m (Horizontal)	50Hz–380V	—
(3)	Indoor: 29°C(84°F)DB, 19.0°C(66°F)WB Outdoor: 46°C(115°F)DB, 24°C(75°F)WB	7.5m (Horizontal)	50Hz–380V	SSA 385/386

Capacities are gross capacities which do not include a deduction for indoor fan motor heat.

Conversion Formulae
kcal/h=kW×860 Btu/h=kW×3414 cfm=m³/min×35.3

RU-KU Series <50Hz>

Model	Indoor Unit			FD08KY1	FD10KY1	FD15KY1	FD20KY1
	Outdoor Unit			RU08KUY1	RU10KUY1	RU08KUY1×2	RU10KUY1×2
∗1 Cooling Capacity (1)/(2)/(3)			kW	24.3 / 24.0 / 21.6	29.7 / 29.2 / 26.3	48.6 / 47.9 / 43.2	59.3 / 58.4 / 42.7
			Btu/h	83,000 / 81,800 / 73,700	101,200 / 99,600 / 89,800	166,000 / 163,500 / 147,500	202,400 / 199,400 / 145,800
			kcal/h	20,900 / 20,600 / 18,600	25,500 / 25,100 / 22,600	41,800 / 41,200 / 37,200	51,000 / 50,200 / 36,700
Indoor Unit				**FD08KY1**	**FD10KY1**	**FD15KY1**	**FD20KY1**
Dimensions		H×W×D	mm	500×1,130×850	500×1,330×850	625×1,620×850	625×1,980×850
Coil	Type			Cross Fin Coil (Waffle Louver Fins and Hi-XA Tubes)			
	Row×Stages×Fin Pitch			3×22×2.0	3×22×2.0	3×26×2.0	3×26×2.0
	Face Area		m²	0.443	0.540	0.784	0.990
Fan	Type			Sirocco Fan			
	Drive			Belt Drive			
	Motor Output		kW	1.5	1.5	2.2	3.7
	Air Flow Rate		m³/min	68	83	136	166
			cfm	2,400	2,930	4,800	5,860
	Ext. Static Pressure		mmH2O	10	10	15	15
Weight			kg	93	104	161	187
Piping Connections		Liquid	mm	ϕ 12.7 (Brazing)	ϕ 15.9 (Brazing)	2× ϕ 12.7 (Brazing)	2× ϕ 15.9 (Brazing)
		Gas	mm	ϕ 25.4 (Brazing)	ϕ 31.8 (Brazing)	2× ϕ 25.4 (Brazing)	2× ϕ 31.8 (Brazing)
		Drain	mm	FPS3/4B	FPS3/4B	FPS1B	FPS1B
Remote Controller		Wired		KRC47-3	KRC47-3	KRC17-2B / KRC47-3	KRC17-2B / KRC47-3
		Wireless		—	—	—	—
Outdoor Unit				**RU08KUY1**	**RU10KUY1**	**RU08KUY1×2**	**RU10KUY1×2**
Color				Ivory White			
Dimensions		H×W×D	mm	1,220×1,280×690	1,440×1,280×690	2×(1,220×1,280×690)	2×(1,440×1,280×690)
Coil	Type			Cross Fin Coil (Waffle Louver Fins and Hi-XA Tubes)			
	Row×Stages×Fin Pitch			2×40×2.0	2×50×2.0	2×(2×40×2.0)	2×(2×50×2.0)
	Face Area		m²	1.57	1.97	2×1.57	2×1.97
Comp.	Model			JT265D-P1YE	JT335D-P1YE	2×(JT265D-P1YE)	2×(JT335D-P1YE)
	Type			Hermetically Sealed Scroll Type			
	Motor Output		kW	7.5	9.0	2×7.5	2×9.0
Fan	Model			P52H11S	P52H11S	2×P52H11S	2×P52H11S
	Type			Propeller			
	Motor Output		W	230+190	230+190	2×(230+190)	2×(230+190)
	Air Flow Rate		m³/min	150	175	2×150	2×175
			cfm	5,295	6,177	2×5,295	2×6,177
Weight			kg	185	200	2×185	2×200
Piping Connections		Liquid	mm	ϕ 12.7 (Flare)	ϕ 15.9 (Flare)	2× ϕ 12.7 (Flare)	2× ϕ 15.9 (Flare)
		Gas	mm	ϕ 25.4 (Brazing)	ϕ 31.8 (Brazing)	2× ϕ 25.4 (Brazing)	2× ϕ 31.8 (Brazing)
		Drain	mm	—	—	—	—
Safety Devices				Thermal Protector for Compressor and Outdoor Fan Motor. High Pressure Switch. Low Pressure Switch. Over Current Relay (Compressor and Indoor Fan Motor). Reverse Phase Protector. Fuse.			
Capacity Step			%	100 – 0	100 – 0	100 – 50 – 0	100 – 50 – 0
Refrigerant Control				Capillary Tube			
Ref. Piping	Standard Length		m	5	5	5	5
	Max. Length		m	50 (Equivalent Length 70m)	50 (Equivalent Length 70m)	50 (Equivalent Length 70m)	50 (Equivalent Length 70m)
	Max. Height Difference		m	30	30	30	30
Refrigerant	Model			R22	R22	R22	R22
	Charge		kg	5.0 (Factory Charge for 5m)	6.1 (Factory Charge for 5m)	2×5.0 (Factory Charge for 5m)	2×6.1 (Factory Charge for 5m)
Ref. Oil	Model			SUNISO 4GSDID-K			
	Charge		L	4.0	4.0	2×4.0	2×4.0
Drawing No.				C : 4D045868		C : 4D045870	

Note: 1. ∗1 The above data are based on the following conditions.

	Cooling	Piping Length	Hz–Volts	Standard
(1)	Indoor: 27°C(81°F)DB, 19.5°C(67°F)WB Outdoor: 35°C(95°F)DB	5m (Horizontal)	50Hz–380V	—
(2)	Indoor: 27°C(81°F)DB, 19.0°C(66°F)WB Outdoor: 35°C(95°F)DB	5m (Horizontal)	50Hz–380V	—
(3)	Indoor: 29°C(84°F)DB, 19.0°C(66°F)WB Outdoor: 46°C(115°F)DB, 24°C(75°F)WB	7.5m (Horizontal)	50Hz–380V	SSA 385/386

Capacities are gross capacities which do not include a deduction for indoor fan motor heat.

Conversion Formulae
kcal/h=kW×860 Btu/h=kW×3414 cfm=m³/min×35.3

4.2 60Hz

R-FU Series <60Hz>

Model	Indoor Unit			FD03KVAL	FD04KVAL	FD05KTAL
	Outdoor Unit			R71FUVAL	R100FUVAL	R125FUTAL
∗1 Cooling Capacity (1)/(2)/(3)			kW	8.6 / 8.5 / 7.1	12.1 / 11.9 / 9.0	15.5 / 15.2 / 14.1
			Btu/h	29,400 / 29,000 / 24,200	41,300 / 40,600 / 30,700	52,800 / 52,000 / 48,100
			kcal/h	7,400 / 7,300 / 6,100	10,400 / 10,200 / 7,700	13,300 / 13,100 / 12,100
Indoor Unit				**FD03KVAL**	**FD04KVAL**	**FD05KTAL**
Dimensions		H×W×D	mm	450×650×850	450×900×850	450×900×850
Coil	Type			Cross Fin Coil (Waffle Louver Fins and Hi-XA Tubes)		
	Row×Stages×Fin Pitch			2×24×2.0	2×24×2.0	2×24×2.0
	Face Area		m²	0.238	0.370	0.370
Fan	Type			Sirocco Fan		
	Drive			Belt Drive		
	Motor Output		kW	0.4	0.4	0.75
	Air Flow Rate		m³/min	26	30	46
			cfm	917	1,059	1,623
	Ext. Static Pressure		mmH2O	7	9	9
Weight			kg	54	62	72
Piping Connections		Liquid	mm	ϕ 9.5 (Brazing)	ϕ 9.5 (Brazing)	ϕ 9.5 (Brazing)
		Gas	mm	ϕ 15.9 (Brazing)	ϕ 19.1 (Brazing)	ϕ 19.1 (Brazing)
		Drain	mm	FPS3/4B	FPS3/4B	FPS3/4B
Remote Controller		Wired		KRC47-3	KRC47-3	KRC47-3
		Wireless		—	—	—
Outdoor Unit				**R71FUVAL**	**R100FUVAL**	**R125FUTAL**
Color				Ivory		
Dimensions		H×W×D	mm	816×880×370	1,215×880×370	1,215×880×370
Coil	Type			Cross Fin Coil		
	Row×Stages×Fin Pitch			2×36×2.0	2×54×2.0	2×54×2.0
	Face Area		m²	0.653	0.979	0.979
Comp.	Model			H23A35QABCA	H23A46QABCA	H23A62QDBLA
	Type			Hermetically Sealed Type		
	Motor Output		kW	3.4	4.5	6.0
Fan	Model			P45J11SM	P45J11SM×2	P45J11SM×2
	Type			Propeller		
	Motor Output		W	80	90+60	90+80
	Air Flow Rate		m³/min	55	92	98
			cfm	1,941	3,247	3,459
Weight			kg	87	117	110
Piping Connections		Liquid	mm	ϕ 9.5 (Flare)	ϕ 9.5 (Flare)	ϕ 9.5 (Flare)
		Gas	mm	ϕ 15.9 (Flare)	ϕ 19.1 (Flare)	ϕ 19.1 (Flare)
		Drain	mm	ϕ 26.0 (Hole)	ϕ 26.0 (Hole)	ϕ 26.0 (Hole)
Safety Devices				Thermal Protector for Outdoor Fan Motor. Internal Pressure Relief Valve (Compressor). Motor Protector (Compressor). Over Current Relay for Indoor Fan Motor.		
Capacity Step			%	100 – 0	100 – 0	100 – 0
Refrigerant Control				Capillary Tube		
Ref. Piping	Standard Length		m	5	5	5
	Max. Length		m	50 (Equivalent Length 70m)	50 (Equivalent Length 70m)	50 (Equivalent Length 70m)
	Max. Height Difference		m	30	30	30
Refrigerant	Model			R22	R22	R22
	Charge		kg	2.2 (Factory Charge for 5m)	2.9 (Factory Charge for 5m)	3.1 (Factory Charge for 5m)
Ref. Oil	Model			SUNISO 3GS		
	Charge		L	1.48	1.63	1.63
Drawing No.				C : 4D008260A		

Note: 1. ∗1 The above data are based on the following conditions.

	Cooling	Piping Length	Standard
(1)	Indoor: 27°C(81°F)DB, 19.5°C(67°F)WB Outdoor: 35°C(95°F)DB	5m (Horizontal)	—
(2)	Indoor: 27°C(81°F)DB, 19.0°C(66°F)WB Outdoor: 35°C(95°F)DB	5m (Horizontal)	—
(3)	Indoor: 29°C(84°F)DB, 19.0°C(66°F)WB Outdoor: 46°C(115°F)DB, 24°C(75°F)WB	7.5m (Horizontal)	SSA 385/386

Capacities are gross capacities which do not include a deduction for indoor fan motor heat.

Conversion Formulae
kcal/h=kW×860 Btu/h=kW×3414 cfm=m³/min×35.3

RU-K Series <60Hz>

Model	Indoor Unit			FD06KTAL	FD08KTAL	FD10KTAL	FD15KTAL	FD20KTAL
	Outdoor Unit			RU06KTAL	RU08KTAL	RU10KTAL	RU08KTAL×2	RU10KTAL×2
∗1 Cooling Capacity (1)/(2)/(3)			kW	17.4 / 17.3 / 15.7	24.3 / 24.0 / 21.9	29.7 / 29.2 / 26.7	48.6 / 47.9 / 43.8	59.3 / 58.4 / 53.3
			Btu/h	59,500 / 59,100 / 53,600	83,000 / 81,800 / 74,600	101,200 / 99,600 / 91,300	166,000 / 163,500 / 149,500	202,400 / 199,400 / 182,000
			kcal/h	15,000 / 14,900 / 13,500	20,900 / 20,600 / 18,800	25,500 / 25,100 / 23,000	41,800 / 41,200 / 37,700	51,000 / 50,200 / 45,800
Indoor Unit				**FD06KTAL**	**FD08KTAL**	**FD10KTAL**	**FD15KTAL**	**FD20KTAL**
Dimensions		H×W×D	mm	450×1,130×850	500×1,130×850	500×1,330×850	625×1,620×850	625×1,980×850
Coil	Type			Cross Fin Coil (Waffle Louver Fins and Hi-XA Tubes)				
	Row×Stages×Fin Pitch			2×24×2.0	3×22×2.0	3×22×2.0	3×26×2.0	3×26×2.0
	Face Area		m²	0.491	0.443	0.540	0.784	0.990
Fan	Type			Sirocco Fan				
	Drive			Belt Drive				
	Motor Output		kW	0.75	1.5	1.5	2.2	3.7
	Air Flow Rate		m³/min	52	68	83	136	166
			cfm	1,835	2,400	2,930	4,800	5,860
	Ext. Static Pressure		mmH2O	9	10	10	15	15
Weight			kg	79	93	104	161	187
Piping Connections		Liquid	mm	ϕ 9.5 (Brazing)	ϕ 12.7 (Brazing)	ϕ 15.9 (Brazing)	2× ϕ 12.7 (Brazing)	2× ϕ 15.9 (Brazing)
		Gas	mm	ϕ 19.1 (Brazing)	ϕ 25.4 (Brazing)	ϕ 31.8 (Brazing)	2× ϕ 25.4 (Brazing)	2× ϕ 31.8 (Brazing)
		Drain	mm	FPS3/4B	FPS3/4B	FPS3/4B	FPS1B	FPS1B
Remote Controller		Wired		KRC47-3	KRC47-3	KRC47-3	KRC17-2B | KRC47-3	KRC17-2B | KRC47-3
		Wireless		—	—	—	—	—
Outdoor Unit				**RU06KTAL**	**RU08KTAL**	**RU10KTAL**	**RU08KTAL×2**	**RU10KTAL×2**
Color				Ivory White				
Dimensions		H×W×D	mm	1,345×880×320	1,220×1,280×690	1,440×1,280×690	2×(1,220×1,280×690)	2×(1,440×1,280×690)
Coil	Type			Cross Fin Coil (Waffle Louver Fins and Hi-XA Tubes)				
	Row×Stages×Fin Pitch			2×26×2.0	2×40×2.0	2×50×2.0	2×(2×40×2.0)	2×(2×50×2.0)
	Face Area		m²	1.16	1.57	1.97	2×1.57	2×1.97
Comp.	Model			JT190B	JT236D-P1	JT300D-P1	2×(JT236D-P1)	2×(JT300D-P1)
	Type			Hermetically Sealed Scroll Type				
	Motor Output		kW	4.5	5.5	7.5	2×5.5	2×7.5
Fan	Model			P45J11SM	P52H11S	P52H11S	2×P52H11S	2×P52H11S
	Type			Propeller				
	Motor Output		W	100+100	230+190	230+190	2×(230+190)	2×(230+190)
	Air Flow Rate		m³/min	108	160	190	2×160	2×190
			cfm	3,812	5,648	6,707	2×5,648	2×6,707
Weight			kg	112	176	188	2×176	2×188
Piping Connections		Liquid	mm	ϕ 9.5 (Flare)	ϕ 12.7 (Brazing)	ϕ 15.9 (Brazing)	2× ϕ 12.7 (Brazing)	2× ϕ 15.9 (Brazing)
		Gas	mm	ϕ 19.1 (Flare)	ϕ 25.4 (Brazing)	ϕ 31.8 (Brazing)	2× ϕ 25.4 (Brazing)	2× ϕ 31.8 (Brazing)
		Drain	mm	—	—	—	—	—
Safety Devices				Thermal Protector for Compressor and Outdoor Fan Motor. High Pressure Switch. Low Pressure Switch. Over Current Relay (Compressor and Indoor Fan Motor). Reverse Phase Protector. Fuse.	Thermal Protector for Compressor and Outdoor Fan Motor. High Pressure Switch. Over Current Relay (Compressor and Indoor Fan Motor). Reverse Phase Protector. Fuse.			
Capacity Step			%	100 – 0	100 – 0	100 – 0	100 – 50 – 0	100 – 50 – 0
Refrigerant Control				Capillary Tube				
Ref. Piping	Standard Length		m	5	5	5	5	5
	Max. Length		m	50 (Equivalent Length 70m)	50 (Equivalent Length 70m)	50 (Equivalent Length 70m)	50 (Equivalent Length 70m)	50 (Equivalent Length 70m)
	Max. Height Difference		m	30	30	30	30	30
Refrigerant	Model			R22	R22	R22	R22	R22
	Charge		kg	3.0 (Factory Charge for 5m)	5.0 (Field Charge for 5m)	6.1 (Field Charge for 5m)	2×5.0 (Field Charge for 5m)	2×6.1 (Field Charge for 5m)
Ref. Oil	Model			SUNISO 4GSDID-K				
	Charge		L	1.6	4.0	4.0	2×4.0	2×4.0
Drawing No.				C : 4D006820A			C : 4D008678	

Note: 1. ∗1 The above data are based on the following conditions.

	Cooling	Piping Length	Standard
(1)	Indoor: 27°C(81°F)DB, 19.5°C(67°F)WB Outdoor: 35°C(95°F)DB	5m (Horizontal)	—
(2)	Indoor: 27°C(81°F)DB, 19.0°C(66°F)WB Outdoor: 35°C(95°F)DB	5m (Horizontal)	—
(3)	Indoor: 29°C(84°F)DB, 19.0°C(66°F)WB Outdoor: 46°C(115°F)DB, 24°C(75°F)WB	7.5m (Horizontal)	SSA 385/386

Capacities are gross capacities which do not include a deduction for indoor fan motor heat.

Conversion Formulae
kcal/h=kW×860 Btu/h=kW×3414 cfm=m³/min×35.3

RU-KU Series <60Hz>

Model	Indoor Unit			FD08KTAL	FD10KTAL	FD15KTAL	FD20KTAL
	Outdoor Unit			RU08KUTAL	RU10KUTAL	RU08KUTAL×2	RU10KUTAL×2
∗1 Cooling Capacity (1)/(2)/(3)			kW	24.3 / 24.0 / 21.9	29.7 / 29.2 / 26.7	48.6 / 47.9 / 43.8	59.3 / 58.4 / 53.3
			Btu/h	83,000 / 81,800 / 74,600	101,200 / 99,600 / 91,300	166,000 / 163,500 / 149,500	202,400 / 199,400 / 182,000
			kcal/h	20,900 / 20,600 / 18,800	25,500 / 25,100 / 23,000	41,800 / 41,200 / 37,700	51,000 / 50,200 / 45,800
Indoor Unit				**FD08KTAL**	**FD10KTAL**	**FD15KTAL**	**FD20KTAL**
Dimensions		H×W×D	mm	500×1,130×850	500×1,330×850	625×1,620×850	625×1,980×850
Coil	Type			Cross Fin Coil (Waffle Louver Fins and Hi-XA Tubes)			
	Row×Stages×Fin Pitch			3×22×2.0	3×22×2.0	3×26×2.0	3×26×2.0
	Face Area		m²	0.443	0.540	0.784	0.990
Fan	Type			Sirocco Fan			
	Drive			Belt Drive			
	Motor Output		kW	1.5	1.5	2.2	3.7
	Air Flow Rate		m³/min	68	83	136	166
			cfm	2,400	2,930	4,800	5,860
	Ext. Static Pressure		mmH2O	10	10	15	15
Weight			kg	93	104	161	187
Piping Connections		Liquid	mm	ϕ 12.7 (Brazing)	ϕ 15.9 (Brazing)	2× ϕ 12.7 (Brazing)	2× ϕ 15.9 (Brazing)
		Gas	mm	ϕ 25.4 (Brazing)	ϕ 31.8 (Brazing)	2× ϕ 25.4 (Brazing)	2× ϕ 31.8 (Brazing)
		Drain	mm	FPS3/4B	FPS3/4B	FPS1B	FPS1B
Remote Controller		Wired		KRC47-3	KRC47-3	KRC17-2B / KRC47-3	KRC17-2B / KRC47-3
		Wireless		—	—	—	—
Outdoor Unit				**RU08KUTAL**	**RU10KUTAL**	**RU08KUTAL×2**	**RU10KUTAL×2**
Color				Ivory White			
Dimensions		H×W×D	mm	1,220×1,280×690	1,440×1,280×690	2×(1,220×1,280×690)	2×(1,440×1,280×690)
Coil	Type			Cross Fin Coil (Waffle Louver Fins and Hi-XA Tubes)			
	Row×Stages×Fin Pitch			2×40×2.0	2×50×2.0	2×(2×40×2.0)	2×(2×50×2.0)
	Face Area		m²	1.57	1.97	2×1.57	2×1.97
Comp.	Model			JT236D-P1	JT300D-P1	2×(JT236D-P1)	2×(JT300D-P1)
	Type			Hermetically Sealed Scroll Type			
	Motor Output		kW	5.5	7.5	2×5.5	2×7.5
Fan	Model			P52H11S	P52H11S	2×P52H11S	2×P52H11S
	Type			Propeller			
	Motor Output		W	230+190	230+190	2×(230+190)	2×(230+190)
	Air Flow Rate		m³/min	160	190	2×160	2×190
			cfm	5,648	6,707	2×5,648	2×6,707
Weight			kg	185	200	2×185	2×200
Piping Connections		Liquid	mm	ϕ 12.7 (Flare)	ϕ 15.9 (Flare)	2× ϕ 12.7 (Flare)	2× ϕ 15.9 (Flare)
		Gas	mm	ϕ 25.4 (Brazing)	ϕ 31.8 (Brazing)	2× ϕ 25.4 (Brazing)	2× ϕ 31.8 (Brazing)
		Drain	mm	—	—	—	—
Safety Devices				Thermal Protector for Compressor and Outdoor Fan Motor. High Pressure Switch. Low Pressure Switch. Over Current Relay (Compressor and Indoor Fan Motor). Reverse Phase Protector. Fuse.			
Capacity Step			%	100 – 0	100 – 0	100 – 50 – 0	100 – 50 – 0
Refrigerant Control				Capillary Tube			
Ref. Piping	Standard Length		m	5	5	5	5
	Max. Length		m	50 (Equivalent Length 70m)	50 (Equivalent Length 70m)	50 (Equivalent Length 70m)	50 (Equivalent Length 70m)
	Max. Height Difference		m	30	30	30	30
Refrigerant	Model			R22	R22	R22	R22
	Charge		kg	5.0 (Factory Charge for 5m)	6.1 (Factory Charge for 5m)	2×5.0 (Factory Charge for 5m)	2×6.1 (Factory Charge for 5m)
Ref. Oil	Model			SUNISO 4GSDID-K			
	Charge		L	4.0	4.0	2×4.0	2×4.0
Drawing No.				C : 4D045869		C : 4D045871	

Note: 1. ∗1 The above data are based on the following conditions.

	Cooling	Piping Length	Standard
(1)	Indoor: 27°C(81°F)DB, 19.5°C(67°F)WB Outdoor: 35°C(95°F)DB	5m (Horizontal)	—
(2)	Indoor: 27°C(81°F)DB, 19.0°C(66°F)WB Outdoor: 35°C(95°F)DB	5m (Horizontal)	—
(3)	Indoor: 29°C(84°F)DB, 19.0°C(66°F)WB Outdoor: 46°C(115°F)DB, 24°C(75°F)WB	7.5m (Horizontal)	SSA 385/386

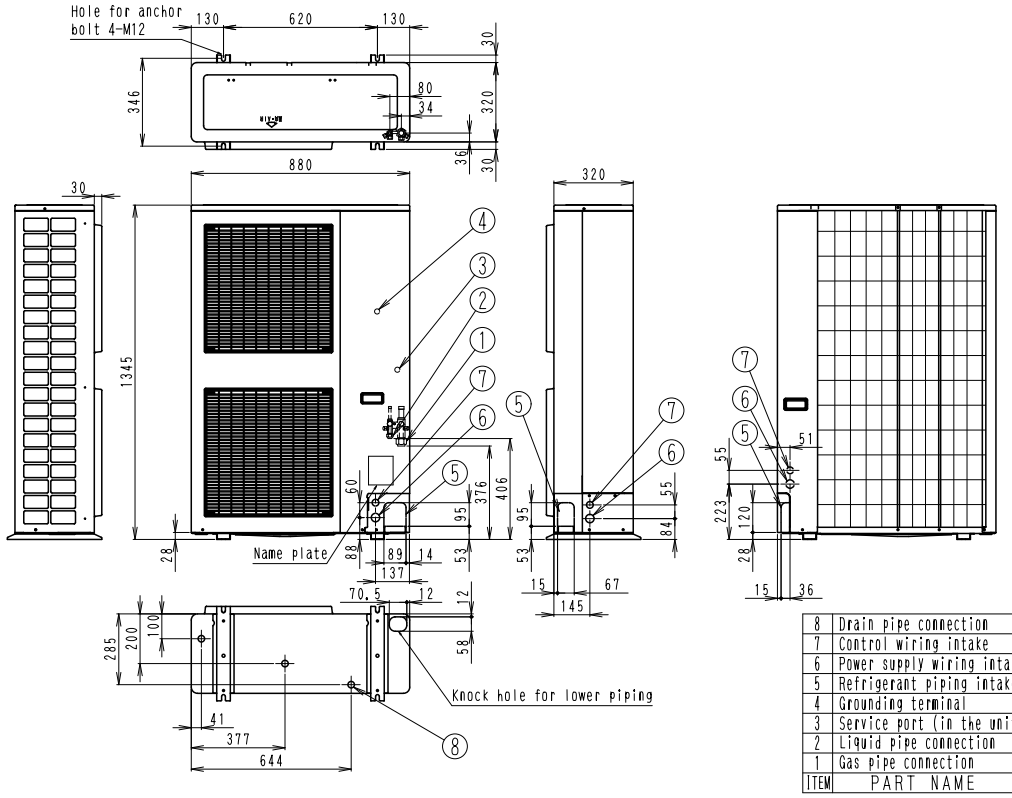
Capacities are gross capacities which do not include a deduction for indoor fan motor heat.

Conversion Formulae
kcal/h=kW×860 Btu/h=kW×3414 cfm=m³/min×35.3

5.2.2 RU-K Series

RU06K

Unit (mm)

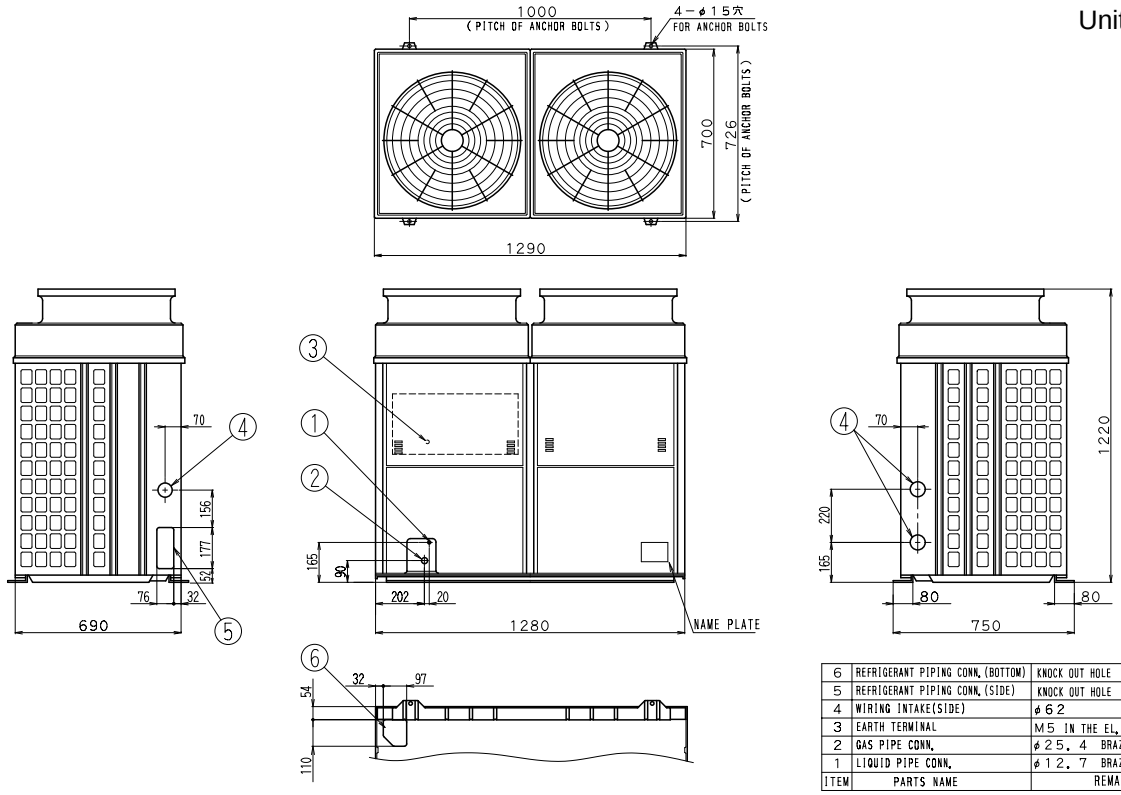


ITEM	PART NAME	REMARK
8	Drain pipe connection	O.D. φ26 3place
7	Control wiring intake	φ27 knock hole
6	Power supply wiring intake	φ34 knock hole
5	Refrigerant piping intake	
4	Grounding terminal	M5 (in switch box)
3	Service port (in the unit)	
2	Liquid pipe connection	φ9.5 Flare
1	Gas pipe connection	φ19.1 Flare

C : 3D007481

RU08K

Unit (mm)



ITEM	PARTS NAME	REMARK
6	REFRIGERANT PIPING CONN. (BOTTOM)	KNOCK OUT HOLE
5	REFRIGERANT PIPING CONN. (SIDE)	KNOCK OUT HOLE
4	WIRING INTAKE(SIDE)	φ62
3	EARTH TERMINAL	M5 IN THE EL. COMPO. BOX ASSY
2	GAS PIPE CONN.	φ25.4 BRAZING
1	LIQUID PIPE CONN.	φ12.7 BRAZING

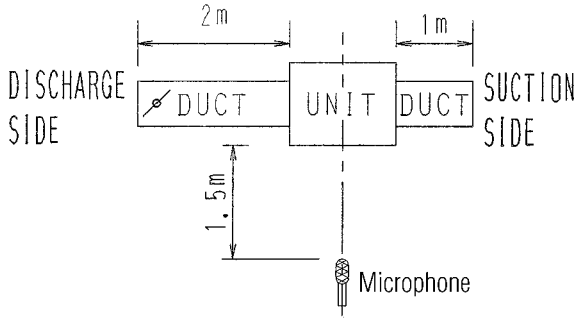
3D004870

10. Sound Level

10.1 Overall Sound Level

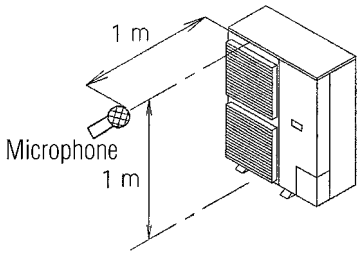
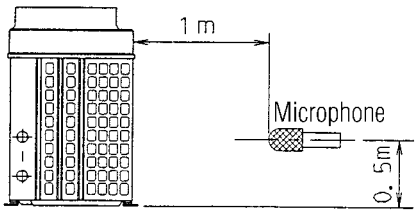
■ **Indoor Unit**

dB(A)

Model	50/60Hz	Measuring Location
FD03K	46	
FD04K	49	
FD05K	49	
FD06K	51	
FD08K	51	
FD10K	53	
FD15K	58	
FD20K	60	

■ **Outdoor Unit**

dB(A)

Model	50/60Hz	Measuring Location
R71FU	52/53	
R100FU	56/57	
R125FU	57/59	
RU06K	59	
RU08K RU08KU	60 60	
RU10K RU10KU	61 61	

Note : Operation noise differes with operation and ambient conditions.

Catalogue of Daikin R50GV1

DAIKIN

Si01-202

Service Manual

SPLIT
GA Series

[Applied Models]

●**Non-Inverter Pair : Cooling Only**

Non Inverter Pair

●Cooling Only

Indoor Unit

FT50GAVE	FT50GAVEA	FT50GAVAL
FT60GAVE	FT60GAVEA	FT60GAVAL

Outdoor Unit

R50GV1	R50GV19	R50GAV1A	R50GVAL
R60GV1	R60GV19	R60GAV1A	R60GVAL
R50GV1K	R50GV1K9	R50GAV1A9	R50GVAL9
R60GV1K	R60GV1K9	R60GAV1A9	R60GVAL9

1. Introduction

1.1 Safety Cautions

Cautions and Warnings

- Be sure to read the following safety cautions before conducting repair work.
- The caution items are classified into " ⚠ **Warning**" and " ⚠ **Caution**". The " ⚠ **Warning**" items are especially important since they can lead to death or serious injury if they are not followed closely. The " ⚠ **Caution**" items can also lead to serious accidents under some conditions if they are not followed. Therefore, be sure to observe all the safety caution items described below.
- About the pictograms

△ This symbol indicates an item for which caution must be exercised.
The pictogram shows the item to which attention must be paid.

◯ This symbol indicates a prohibited action.
The prohibited item or action is shown inside or near the symbol.

● This symbol indicates an action that must be taken, or an instruction.
The instruction is shown inside or near the symbol.

- After the repair work is complete, be sure to conduct a test operation to ensure that the equipment operates normally, and explain the cautions for operating the product to the customer

1.1.1 Caution in Repair

⚠ Warning	
Be sure to disconnect the power cable plug from the plug socket before disassembling the equipment for a repair. Working on the equipment that is connected to a power supply can cause an electrical shook. If it is necessary to supply power to the equipment to conduct the repair or inspecting the circuits, do not touch any electrically charged sections of the equipment.	
If the refrigerant gas discharges during the repair work, do not touch the discharging refrigerant gas. The refrigerant gas can cause frostbite.	
When disconnecting the suction or discharge pipe of the compressor at the welded section, release the refrigerant gas completely at a well-ventilated place first. If there is a gas remaining inside the compressor, the refrigerant gas or refrigerating machine oil discharges when the pipe is disconnected, and it can cause injury.	
If the refrigerant gas leaks during the repair work, ventilate the area. The refrigerant gas can generate toxic gases when it contacts flames.	
The step-up capacitor supplies high-voltage electricity to the electrical components of the outdoor unit. Be sure to discharge the capacitor completely before conducting repair work. A charged capacitor can cause an electrical shock.	
Do not start or stop the air conditioner operation by plugging or unplugging the power cable plug. Plugging or unplugging the power cable plug to operate the equipment can cause an electrical shock or fire.	

Caution	
Do not repair the electrical components with wet hands. Working on the equipment with wet hands can cause an electrical shock.	
Do not clean the air conditioner by splashing water. Washing the unit with water can cause an electrical shock.	
Be sure to provide the grounding when repairing the equipment in a humid or wet place, to avoid electrical shocks.	
Be sure to turn off the power switch and unplug the power cable when cleaning the equipment. The internal fan rotates at a high speed, and cause injury.	
Do not tilt the unit when removing it. The water inside the unit can spill and wet the furniture and floor.	
Be sure to check that the refrigerating cycle section has cooled down sufficiently before conducting repair work. Working on the unit when the refrigerating cycle section is hot can cause burns.	
Use the welder in a well-ventilated place. Using the welder in an enclosed room can cause oxygen deficiency.	

1.1.2 Cautions Regarding Products after Repair

Warning	
Be sure to use parts listed in the service parts list of the applicable model and appropriate tools to conduct repair work. Never attempt to modify the equipment. The use of inappropriate parts or tools can cause an electrical shock, excessive heat generation or fire.	
When relocating the equipment, make sure that the new installation site has sufficient strength to withstand the weight of the equipment. If the installation site does not have sufficient strength and if the installation work is not conducted securely, the equipment can fall and cause injury.	
Be sure to install the product correctly by using the provided standard installation frame. Incorrect use of the installation frame and improper installation can cause the equipment to fall, resulting in injury.	For integral units only
Be sure to install the product securely in the installation frame mounted on a window frame. If the unit is not securely mounted, it can fall and cause injury.	For integral units only
Be sure to use an exclusive power circuit for the equipment, and follow the technical standards related to the electrical equipment, the internal wiring regulations and the instruction manual for installation when conducting electrical work. Insufficient power circuit capacity and improper electrical work can cause an electrical shock or fire.	

Warning	
Be sure to use the specified cable to connect between the indoor and outdoor units. Make the connections securely and route the cable properly so that there is no force pulling the cable at the connection terminals. Improper connections can cause excessive heat generation or fire.	
When connecting the cable between the indoor and outdoor units, make sure that the terminal cover does not lift off or dismount because of the cable. If the cover is not mounted properly, the terminal connection section can cause an electrical shock, excessive heat generation or fire.	
Do not damage or modify the power cable. Damaged or modified power cable can cause an electrical shock or fire. Placing heavy items on the power cable, and heating or pulling the power cable can damage the cable.	
Do not mix air or gas other than the specified refrigerant (R22) in the refrigerant system. If air enters the refrigerating system, an excessively high pressure results, causing equipment damage and injury.	
If the refrigerant gas leaks, be sure to locate the leak and repair it before charging the refrigerant. After charging refrigerant, make sure that there is no refrigerant leak. If the leak cannot be located and the repair work must be stopped, be sure to perform pump-down and close the service valve, to prevent the refrigerant gas from leaking into the room. The refrigerant gas itself is harmless, but it can generate toxic gases when it contacts flames, such as fan and other heaters, stoves and ranges.	
When replacing the coin battery in the remote controller, be sure to disposed of the old battery to prevent children from swallowing it. If a child swallows the coin battery, see a doctor immediately.	

Caution	
Installation of a leakage breaker is necessary in some cases depending on the conditions of the installation site, to prevent electrical shocks.	
Do not install the equipment in a place where there is a possibility of combustible gas leaks. If a combustible gas leaks and remains around the unit, it can cause a fire.	
Be sure to install the packing and seal on the installation frame properly. If the packing and seal are not installed properly, water can enter the room and wet the furniture and floor.	For integral units only

1.1.3 Inspection after Repair

Warning	
Check to make sure that the power cable plug is not dirty or loose, then insert the plug into a power outlet all the way. If the plug has dust or loose connection, it can cause an electrical shock or fire.	
If the power cable and lead wires have scratches or deteriorated, be sure to replace them. Damaged cable and wires can cause an electrical shock, excessive heat generation or fire.	
Do not use a joined power cable or extension cable, or share the same power outlet with other electrical appliances, since it can cause an electrical shock, excessive heat generation or fire.	

Caution	
Check to see if the parts and wires are mounted and connected properly, and if the connections at the soldered or crimped terminals are secure. Improper installation and connections can cause excessive heat generation, fire or an electrical shock.	
If the installation platform or frame has corroded, replace it. Corroded installation platform or frame can cause the unit to fall, resulting in injury.	
Check the grounding, and repair it if the equipment is not properly grounded. Improper grounding can cause an electrical shock.	
Be sure to measure the insulation resistance after the repair, and make sure that the resistance is 1 Mohm or higher. Faulty insulation can cause an electrical shock.	
Be sure to check the drainage of the indoor unit after the repair. Faulty drainage can cause the water to enter the room and wet the furniture and floor.	

1.1.4 Using Icons

Icons are used to attract the attention of the reader to specific information. The meaning of each icon is described in the table below:

1.1.5 Using Icons List

Icon	Type of Information	Description
 Note:	Note	A “note” provides information that is not indispensable, but may nevertheless be valuable to the reader, such as tips and tricks.
 Caution	Caution	A “caution” is used when there is danger that the reader, through incorrect manipulation, may damage equipment, loose data, get an unexpected result or has to restart (part of) a procedure.
 Warning	Warning	A “warning” is used when there is danger of personal injury.
	Reference	A “reference” guides the reader to other places in this binder or in this manual, where he/she will find additional information on a specific topic.

Part 1
List of Function

1. Functions

1.1 List of Functions

Category	Functions	FT50·60GAVE(A)/GAVAL R50·60GV1/GAV1A/GVAL(K)(9)	Category	Functions	FT50·60GAVE(A)/GAVAL R50·60GV1/GAV1A/GVAL(K)(9)
Basic Function	Inverter (with Inverter Power Control)	—	Health Health & Clean	Air Purifying Filter with Bacteriostatic, Virustatic & Deodorizing Functions	○
	Operation Limit for Cooling (°C)★1	19.4 ~54		Longlife Filter	—
	Microprocessor Control	○		Ultra-Longlife Filter (Option)	—
	PAM Control	—		Photocatalytic Deodorizing Filter	—
Compressor	Oval Scroll Compressor (DAIKIN SCROLL)	—		Photocatalytic Filter with UV Lamp	—
	Swing Compressor(DAIKIN ROTARY)	—		Mold Proof Air Filter	○
	Rotary Compressor	○		Washable Grille	○
	Reluctance DC Motor	—		Filter Cleaning Indicator	○
Comfortable Airflow	Power-Airflow Flap	○		Good-Sleep Cooling Operation	—
	Power-Airflow Dual Flaps	—	Timer	72-Hour On/Off Timer	—
	Power-Airflow Diffuser	○		24-Hour On/Off Timer	○
	Wide-Angle Louvers	○		Night Set Mode	○
	Vertical Auto-Swing (Up and Down)	○		Just Fit Thermostatic Timer	—
	Horizontal Auto-Swing (Right and Left)	★2	Worry Free “Reliability & Durability”	Auto-Restart (after Power Failure)	○
	3-D Airflow	—		Self-Diagnosis (Digital, LED) Display	○
	3-Step Airflow (H/P Only)	—		The Remote Controller Loss Prevention with the Chain (Option)	○
“Comfortable Control” Comfort Control	Auto Fan Speed	○		Wiring-Error Check	—
	Silent Operation Control (Automatic)	—		Anticorrosion Treatment of Outdoor Heat Exchanger	○
	Outdoor Unit Silent Operation (Manual)	—	Flexibility	Multi-Split / Split Type Compatible Indoor Unit ★3	○
	Intelligent Eye	—		Flexible Voltage Correspondence	—
	Quick Warming Function	—		High Ceiling Application	—
	Hot-Start Function	—		Chargeless	10m
	Automatic Defrosting	—	Remote Control	5-Rooms Centralized Controller (Option)	○
Operation	Automatic Operation	—		Remote Control Adaptor (Option) (Normal Open-Pulse)	○
	Programme Dry Function	○		Remote Control Adaptor (Normal Open Contact)	○
	Fan Only	○		DIII-NET Compatible (Adaptor)	—
Lifestyle Convenience	New Powerful Operation (Non-Inverter)	○	Remote Controller	Wireless	○
	Inverter Powerful Operation	—		Wired	—
	Priority-Room Setting	—			
	Laundry Programme Operation	—			
	Home Leave Operation	—			
	Power Selection	—			
	Indoor Unit On/Off Switch	○			
	Signal Reception Indicator	○			
	Temperature Display	—			

Note: ○ : Holding Functions
— : No Functions

★1 R50·60GAV1A : 19.4°C~46°C
★2 Apply only for FT50·60GAVAL
★3 For FT50·60GAVAL : [—]

Part 2
Specifications

1. Specifications

1.1 Cooling Only

V1 : 50Hz, 220-240V V1A : 50Hz, 220-230-240V

Model	Indoor Units		FT50GAVE	FT50GAVEA		FT60GAVE	FT60GAVEA	
	Outdoor Units		R50GV1(9)	R50GAV1A(9)	R50GV1K(9)	R60GV1(9)	R60GAV1A(9)	R60GV1K(9)
Capacity Rated		kW	5.3			6.4		
		Btu/h	18,100			21,800		
		kcal/h	4,560			5,500		
Moisture Removal		L/h	2.9			5.2		
Running Current (Rated)		A	10.1-11.0	10.1-11.2-11.2	10.1-11.0	11.8-11.4	11.8-11.3-11.3	11.8-11.4
Power Consumption (Rated)		W	2,000-2,180	2,000-2,120-2,120	2,000-2,180	2,410-2,500-2,500		
Power Factor		%	90.0-82.6	90.0-82.3-81.1	90.0-82.6	92.8-91.4	92.8-96.2-92.2	92.8-91.4
COP		W/W	2.65-2.43	2.65-2.50-2.50	2.65-2.43	2.66-2.56-2.56		
Piping Connections	Liquid	mm	ϕ6.4			ϕ6.4		
	Gas	mm	ϕ15.9			ϕ15.9		
	Drain	mm	ϕ18.0			ϕ18.0		
Heat Insulation			Both Liquid and Gas Pipes			Both Liquid and Gas Pipes		
Indoor Unit			**FT50GAVE**	**FT50GAVEA**		**FT60GAVE**	**FT60GAVEA**	
Front Panel Color			Almond White			Almond White		
Air Flow Rate	m³/min (cfm)	H	14.0 (494)			14.0 (494)		
		M	12.0 (424)			12.4 (438)		
		L	10.0 (353)			10.8 (381)		
Fan	Type		Cross Flow Fan			Cross Flow Fan		
	Motor Output	W	54			54		
	Speed	Steps	5 Steps and Auto			5 Steps and Auto		
Air Direction Control			Right, Left, Horizontal and Downward			Right, Left, Horizontal and Downward		
Air Filter			Removal-Washable-Mildew Proof			Removal-Washable-Mildew Proof		
Running Current (Rated)		A	0.19-0.18-0.17			0.19-0.18-0.17		
Power Consumption (Rated)		W	40			40		
Power Factor		%	95.7-96.6-98.0			95.7-96.6-98.0		
Temperature Control			Microcomputer Control			Microcomputer Control		
Dimension (H×W×D)		mm	298×1,050×190			298×1,050×190		
Packaged Dimension		mm	1,183×367×289			1,183×367×289		
Weight		kg	12			12		
Gross Weight		kg	16			16		
Operation Sound	H/M/L	dBA	43/39/35			46/42/38		
Outdoor Unit			**R50GV1**	**R50GAV1A**	**R50GV1K(9)**	**R60GV1**	**R60GAV1A**	**R60GV1K(9)**
Casing Color			Ivory White			Ivory White		
Compressor	Type		Hermetically Sealed Rotary Type			Hermetically Sealed Rotary Type		
	Model		RC70AV1TRT			NH41VMDT		
	Motor Output	W	1,700			2,200		
Refrigerant Oil	Type		SUNISO 4GSD.I.			MS-32		
	Charge	L	0.85			1.20		
Refrigerant	Type		R22			R22		
	Charge	kg	1.10	1.20	1.10	1.50		
Air Flow Rate	m³/min (cfm)	H	29-29.5-30 (1,024-1,041-1,059)			40-40.5-41 (1,412-1,430-1,447)		
		L	—			23-24-25 (812-847-883)		
Fan	Type		Propeller			Propeller		
	Motor Output	W	45			53		
Running Current (Rated)		A	9.91-10.83	9.91-11.02-11.03	9.91-10.83	11.61-11.23	11.61-11.12-11.13	11.61-11.23
Power Consumption (Rated)		W	1,960-2,140	1,960-2,080-2,080	1,960-2,140	2,370-2,460-2,460		
Power Factor		%	89.9-82.3	90.0-82.1-78.6	90.0-82.3	92.8-91.3	92.8-96.2-92.1	92.8-91.3
Starting Current		A	43-47	43-44-45	43-45	55-58-60		
Dimensions (H×W×D)		mm	540×750×270			685×800×300		
Packaged Dimension		mm	940×360×609			955×390×732		
Weight		kg	42			61		
Gross Weight		kg	45			66		
Operation Sound		dBA	49-50-50			54-55-55		
Drawing No.			3D029060	3D028525	3D029102	3D029061	3D028526	3D029103

Notes:

- MAX. interunit piping length: 30m
- MAX. interunit height difference: 15m
- Amount of additional charge of refrigerant 20g/m for piping length exceeding 10m
- The data are based on the conditions shows in the table below.

Conversion Formulae
kcal/h=kW×860 Btu/h=kW×3414 cfm=m³/min×35.3

FT50/60GAVE (220V)

Standard	Cooling	Piping Length
JIS C 9612	Indoor ; 27°CDB/19°CWB Outdoor ; 35°CDB/24°CWB	5m

FT50/60GAVEA (230/240V)

Standard	Cooling	Piping Length	Power Source
AS/NZS3823, 1	Indoor ; 27°CDB/19°CWB Outdoor ; 35°CDB/24°CWB	7.5m	50Hz 230/240V

Catalogue of Daikin R125FU

DAIKIN

ED 42 - 019A

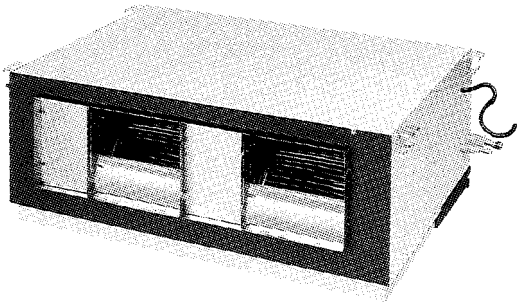
Engineering Data

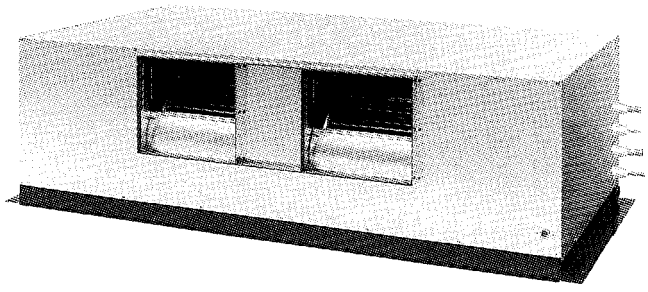
Packaged Air Conditioners
Duct Connection Type

(High Static Pressure Application)

FD-K Series

— Cooling Only —





DAIKIN INDUSTRIES, LTD.

Duct Connection Type High Static Pressure Application FD-K Series

1. Power Supply and Nomenclature

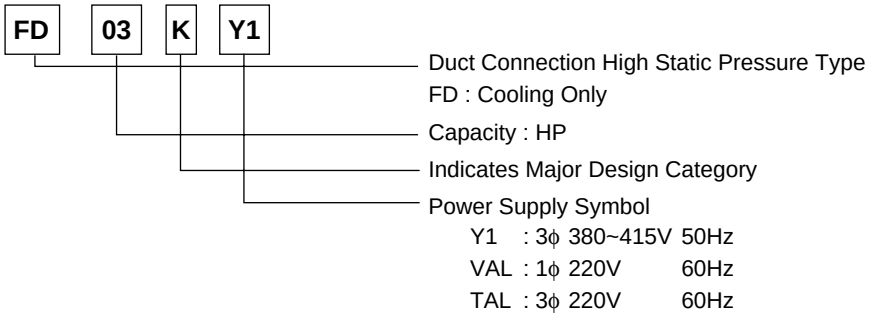
1.1 Power Supply

Symbol	Indoor Unit	Outdoor Unit	Power Supply
Y1	FD03KY1	R71FUY1	3ϕ 380~415V 50Hz (4 wires)
	FD04KY1	R100FUY1	
	FD05KY1	R125FUY1	
	FD06KY1	RU06KY1	
	FD08KY1	RU08KY1	
	FD08KY1	RU08KUY1 *	
	FD10KY1	RU10KY1	
	FD10KY1	RU10KUY1 *	
	FD15KY1	RU08KY1×2	
	FD15KY1	RU08KUY1×2 *	
	FD20KY1	RU10KY1×2	
	FD20KY1	RU10KUY1×2 *	
VAL	FD03KVAL	R71FUVAL	1ϕ 220V 60Hz
	FD04KVAL	R100FUVAL	
TAL	FD05KTAL	R125FUTAL	3ϕ 220V 60Hz
	FD06KTAL	RU06KTAL	
	FD08KTAL	RU08KTAL	
	FD08KTAL	RU08KUTAL *	
	FD10KTAL	RU10KTAL	
	FD10KTAL	RU10KUTAL *	
	FD15KTAL	RU08KTAL×2	
	FD15KTAL	RU08KUTAL×2 *	
	FD20KTAL	RU10KTAL×2	
	FD20KTAL	RU10KUTAL×2 *	

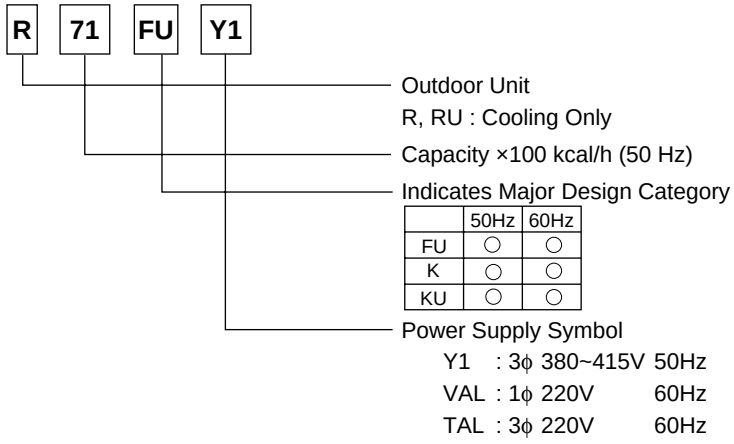
Note: 1. * : New Model or Changed Model
2. Power Supply Intake; Outdoor Unit

1.2 Nomenclature

Indoor Unit



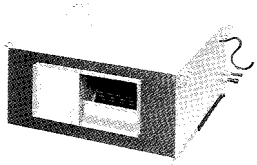
Outdoor Unit



2. External Appearance

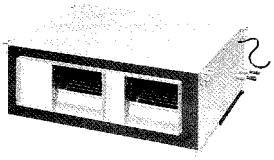
2.1 Indoor Unit

FD03K



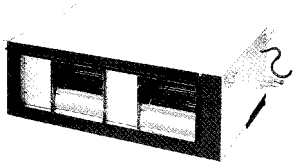
FD04K

FD05K



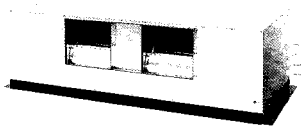
FD06K

FD08K



FD10K

FD15K

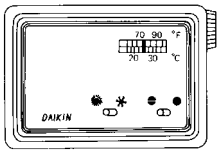


FD20K

2.2 Remote Controller

KRC47-3

KRC47-5



KRC17-2B

2.3 Outdoor Unit

R71FU

R100FU
R125FU

RU06K

RU08K
RU08KU

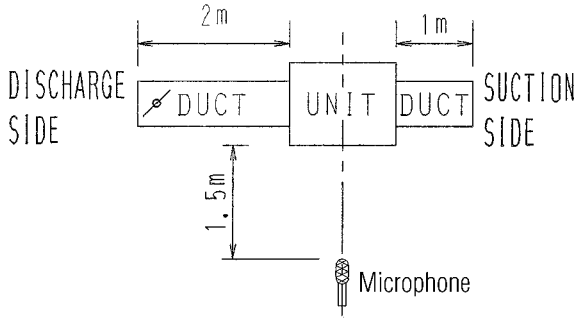
RU10K
RU10KU

10. Sound Level

10.1 Overall Sound Level

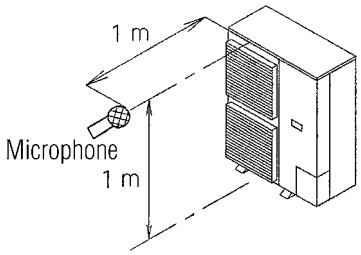
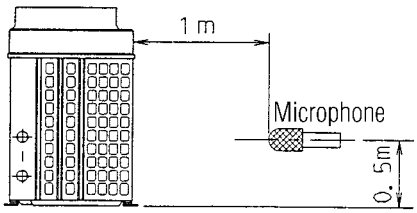
■ **Indoor Unit**

dB(A)

Model	50/60Hz	Measuring Location
FD03K	46	
FD04K	49	
FD05K	49	
FD06K	51	
FD08K	51	
FD10K	53	
FD15K	58	
FD20K	60	

■ **Outdoor Unit**

dB(A)

Model	50/60Hz	Measuring Location
R71FU	52/53	
R100FU	56/57	
R125FU	57/59	
RU06K	59	
RU08K RU08KU	60 60	
RU10K RU10KU	61 61	

Note : Operation noise differes with operation and ambient conditions.

Catalogue of Daikin RUXYQ12AB

DAIKIN

VRVOHK2015-1

VRV X SERIES

Heat Pump 50Hz
R-410A

DAIKIN

VRV X SERIES

Next Generation VRV X SERIES System

VRV X SERIES

*First launched in Japan in 1982, the Daikin **VRV** system has been embraced by world markets for over 30 years. Now, Daikin proudly introduces the next-generation VRV X SERIES system. It now offers improved energy savings, comfort, and ease of installation to meet an ever wider variety of needs.*

* *VRV* is a tradémark of Daikin Industries, Ltd.

INDEX

Outdoor Unit

VRV X SERIES

Outdoor Units

The latest technology is implemented in the VRVX system and responds to the needs of our customers that require air-conditioning solutions for large-sized building.

Outdoor units
Offering a higher capacity of up to 66HP, responding to the needs of large-sized buildings.

The previous outdoor unit had a maximum output of 48 HP. The VRVX has a top output of 66 HP. By connecting main units (up to 22HP each), a high capacity system (up to 66HP) that is compact yet flexible can be achieved.

8HP RUXYQ8AB
10HP RUXYQ10AB
12HP RUXYQ12AB

14HP RUXYQ14AB
16HP RUXYQ16AB
18HP RUXYQ18AB
20HP RUXYQ20AB
22HP RUXYQ22AB

24HP RUXYQ24AB

26HP RUXYQ26AB
28HP RUXYQ28AB
30HP RUXYQ30AB
32HP RUXYQ32AB
34HP RUXYQ34AB

36HP RUXYQ36AB
38HP RUXYQ38AB
40HP RUXYQ40AB
42HP RUXYQ42AB
44HP RUXYQ44AB

46HP RUXYQ46AB
48HP RUXYQ48AB
50HP RUXYQ50AB
52HP RUXYQ52AB
54HP RUXYQ54AB
56HP RUXYQ56AB

58HP RUXYQ58AB
60HP RUXYQ60AB
62HP RUXYQ62AB
64HP RUXYQ64AB
66HP RUXYQ66AB

Outdoor Series Combinations

Model	RUXYQ8AB	RUXYQ10AB	RUXYQ12AB	RUXYQ14AB	RUXYQ16AB	RUXYQ18AB	RUXYQ20AB	RUXYQ22AB			
Model	RUXYQ24AB	RUXYQ26AB	RUXYQ28AB	RUXYQ30AB	RUXYQ32AB	RUXYQ34AB	RUXYQ36AB	RUXYQ38AB	RUXYQ40AB	RUXYQ42AB	RUXYQ44AB
Combination	RUXYQ12AB	RUXYQ10AB	RUXYQ12AB	RUXYQ8AB	RUXYQ10AB	RUXYQ12AB	RUXYQ14AB	RUXYQ16AB	RUXYQ18AB	RUXYQ20AB	RUXYQ22AB
	RUXYQ12AB	RUXYQ16AB	RUXYQ16AB	RUXYQ22AB	RUXYQ22AB	RUXYQ22AB	RUXYQ22AB	RUXYQ22AB	RUXYQ22AB	RUXYQ22AB	RUXYQ22AB
Model	RUXYQ46AB	RUXYQ48AB	RUXYQ50AB	RUXYQ52AB	RUXYQ54AB	RUXYQ56AB	RUXYQ58AB	RUXYQ60AB	RUXYQ62AB	RUXYQ64AB	RUXYQ66AB
Combination	RUXYQ8AB	RUXYQ10AB	RUXYQ12AB	RUXYQ10AB	RUXYQ10AB	RUXYQ12AB	RUXYQ14AB	RUXYQ16AB	RUXYQ18AB	RUXYQ20AB	RUXYQ22AB
	RUXYQ16AB	RUXYQ16AB	RUXYQ16AB	RUXYQ20AB	RUXYQ22AB	RUXYQ22AB	RUXYQ22AB	RUXYQ22AB	RUXYQ22AB	RUXYQ22AB	RUXYQ22AB
	RUXYQ22AB	RUXYQ22AB	RUXYQ22AB	RUXYQ22AB	RUXYQ22AB	RUXYQ22AB	RUXYQ22AB	RUXYQ22AB	RUXYQ22AB	RUXYQ22AB	RUXYQ22AB

Outdoor Unit Combination

HP	Model	Combination	Outdoor unit multi connection piping kit	Capacity (kW)	Total Capacity of connectable indoor units	Maximum number of connectable indoor units
8	RUXYQ8AB	-	-	22.4	11.20 - 29.12	13
10	RUXYQ10AB	-	-	28.0	14.00 - 36.40	16
12	RUXYQ12AB	-	-	33.5	16.75 - 43.55	19
14	RUXYQ14AB	-	-	40.0	20.00 - 52.00	23
16	RUXYQ16AB	-	-	45.0	22.50 - 58.50	26
18	RUXYQ18AB	-	-	50.0	25.00 - 65.00	29
20	RUXYQ20AB	-	-	56.0	28.00 - 72.80	33
22	RUXYQ22AB	-	-	61.5	30.75 - 79.95	36
24	RUXYQ24AB	RUXYQ12AB + RUXYQ12AB	BHFP22MC90	67.0	33.50 - 87.10	39
26	RUXYQ26AB	RUXYQ10AB + RUXYQ16AB	BHFP22MC90	73.0	36.50 - 94.90	43
28	RUXYQ28AB	RUXYQ12AB + RUXYQ16AB	BHFP22MC90	78.5	39.25 - 102.05	46
30	RUXYQ30AB	RUXYQ8AB + RUXYQ22AB	BHFP22MC90	83.9	41.95 - 109.07	49
32	RUXYQ32AB	RUXYQ10AB + RUXYQ22AB	BHFP22MC90	89.5	44.75 - 116.35	52
34	RUXYQ34AB	RUXYQ12AB + RUXYQ22AB	BHFP22MC90	95.0	47.50 - 123.50	56
36	RUXYQ36AB	RUXYQ14AB + RUXYQ22AB	BHFP22MC90	101.5	50.75 - 131.95	59
38	RUXYQ38AB	RUXYQ16AB + RUXYQ22AB	BHFP22MC90	106.5	53.25 - 138.45	62
40	RUXYQ40AB	RUXYQ18AB + RUXYQ22AB	BHFP22MC90	111.5	55.75 - 144.95	64
42	RUXYQ42AB	RUXYQ20AB + RUXYQ22AB	BHFP22MC90	117.5	58.75 - 152.75	64
44	RUXYQ44AB	RUXYQ22AB + RUXYQ22AB	BHFP22MC90	123.0	61.50 - 159.90	64
46	RUXYQ46AB	RUXYQ8AB + RUXYQ16AB + RUXYQ22AB	BHFP22MC135	128.9	64.45 - 167.57	64
48	RUXYQ48AB	RUXYQ10AB + RUXYQ16AB + RUXYQ22AB	BHFP22MC135	134.5	67.25 - 174.85	64
50	RUXYQ50AB	RUXYQ12AB + RUXYQ16AB + RUXYQ22AB	BHFP22MC135	140.0	70.00 - 182.00	64
52	RUXYQ52AB	RUXYQ10AB + RUXYQ20AB + RUXYQ22AB	BHFP22MC135	145.5	72.75 - 189.15	64
54	RUXYQ54AB	RUXYQ10AB + RUXYQ22AB + RUXYQ22AB	BHFP22MC135	151.0	75.50 - 196.30	64
56	RUXYQ56AB	RUXYQ12AB + RUXYQ22AB + RUXYQ22AB	BHFP22MC135	156.5	78.25 - 203.45	64
58	RUXYQ58AB	RUXYQ14AB + RUXYQ22AB + RUXYQ22AB	BHFP22MC135	163.0	81.50 - 211.90	64
60	RUXYQ60AB	RUXYQ16AB + RUXYQ22AB + RUXYQ22AB	BHFP22MC135	168.0	84.00 - 218.40	64
62	RUXYQ62AB	RUXYQ18AB + RUXYQ22AB + RUXYQ22AB	BHFP22MC135	173.0	86.50 - 224.90	64
64	RUXYQ64AB	RUXYQ20AB + RUXYQ22AB + RUXYQ22AB	BHFP22MC135	179.0	89.50 - 232.70	64
66	RUXYQ66AB	RUXYQ22AB + RUXYQ22AB + RUXYQ22AB	BHFP22MC135	184.5	92.25 - 239.85	64

VRV X SERIES Outdoor Lineup

Outdoor Unit																		
Model			RUXYQ8AB	RUXYQ10AB	RUXYQ12AB	RUXYQ14AB	RUXYQ16AB	RUXYQ18AB	RUXYQ20AB	RUXYQ22AB	RUXYQ24AB	RUXYQ26AB	RUXYQ28AB	RUXYQ30AB	RUXYQ32AB	RUXYQ34AB	RUXYQ36AB	RUXYQ38AB
Horse Power		HP	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38
Combination			——	——	——	——	——	——	——	——	12+12	10+16	12+16	8+22	10+22	12+22	14+22	16+22
Power Supply			3 - Phase 50Hz 380V															
★1 Cooling Capacity		kW	22.4	28.0	33.5	40.0	45.0	50.4	56.0	61.5	67.0	73.0	78.5	83.9	89.5	95.0	101.5	106.5
★2 Heating Capacity		kW	25.0	31.5	37.5	45.0	50.0	56.5	63.0	69.0	75.0	81.5	87.5	94.0	100.5	106.5	114.0	119.0
Power Consumption	Cooling	kW	5.05	7.00	8.70	10.70	12.70	14.30	16.50	18.6	17.40	19.70	21.40	23.7	25.6	27.3	29.3	31.3
	Heating	kW	5.34	7.15	8.81	10.90	12.40	14.00	16.50	18.70	17.60	19.55	21.20	24.00	25.85	27.51	29.60	31.10
Airflow Rate		m³/min	162	175	185	223	260	251	261	271	185+185	175+260	185+260	162+271	175+271	185+271	223+271	260+271
Dimensions (HxWxD)		mm	1657×930×765			1657×1240×765					1657×930×765+ 1657×930×765	1657×930×765+1657×1240×765					1657×1240×765+1657×1240×765	
External Static Pressure		Pa	81															
★3 Sound Level	Fount Sound Level	dB(A)	57	58	60			61	62	63		62	63	64			65	
	Surround Sound Level	dB(A)	60	61	63			64	65	66		65	66	67			68	
Night Quiet Mode		dB(A)	40								43							
Piping Connections	Liquid	mm	Φ9.5		Φ12.7					Φ15.9		Φ19.1						
	Gas	mm	Φ19.1	Φ22.2	Φ25.4		Φ28.6					Φ31.8					Φ38.1	
Weight		kg	186	193	215	288		322			430	481	503	508	515	537	610	
Refrigerant	Type		R410A															
	Charge	kg	7.9	8.2	9.3	10.5	10.6	13.6			18.6	18.80	19.9	21.5	21.80	22.90	24.10	24.20
Operation Range	Cooling	℃DB	-5~50℃DB															
	Heating	℃WB	-20~15.5℃WB															
★4 Max. Fuse Amps	MFA	A	25			30	35			50		55		60			80	
★4 Min. Circuit Amps	MCA	A	16.1	18.0	20.1	24.4	26.0	34.8	39.6	43.6	40.2	44.0	46.1	59.7	61.6	63.7	68.0	69.6

Outdoor Unit																
Model			RUXYQ40AB	RUXYQ42AB	RUXYQ44AB	RUXYQ46AB	RUXYQ48AB	RUXYQ50AB	RUXYQ52AB	RUXYQ54AB	RUXYQ56AB	RUXYQ58AB	RUXYQ60AB	RUXYQ62AB	RUXYQ64AB	RUXYQ66AB
Horse Power		HP	40	42	44	46	48	50	52	54	56	58	60	62	64	66
Combination			18+22	20+22	22+22	8+16+22	10+16+22	12+16+22	10+20+22	10+22+22	12+22+22	14+22+22	16+22+22	18+22+22	20+22+22	22+22+22
Power Supply			3 - Phase 50Hz 380V						3 - Phase 50Hz 380V							
★1 Cooling Capacity		kW	111.9	117.5	123.0	128.9	134.5	140.0	145.5	151.0	156.5	163.0	168.0	173.4	179.0	184.5
★2 Heating Capacity		kW	125.5	132.0	138.0	144.0	150.5	156.5	163.5	169.5	175.5	183.0	188.0	194.5	201.0	207.0
Power Consumption	Cooling	kW	32.9	35.1	37.2	36.4	38.3	40.0	42.1	44.2	45.9	47.9	49.9	51.5	53.7	55.8
	Heating	kW	32.70	35.20	37.40	36.40	38.30	39.90	42.40	44.60	46.20	48.30	49.80	51.40	53.90	56.10
Airflow Rate		m³/min	251+271	261+271	271+271	162+260+271	175+260+271	185+260+271	175+261+271	175+271+271	185+271+271	223+271+271	260+271+271	251+271+271	261+271+271	271+271+271
Dimensions (HxWxD)		mm	1657×1240×765+1657×1240×765			1657×930×765+1657×1240×765+1657×1240×765			1657×930×765+1657×1240×765+1657×1240×765			1657×1240×765+1657×1240×765+1657×1240×765				
External Static Pressure		Pa	81													
★3 Sound Level	Fount Sound Level	dB(A)	65	66						67					68	
	Surround Sound Level	dB(A)	68	69						70					71	
Night Quiet Mode		dB(A)	43			45										
Piping Connections	Liquid	mm	Φ19.1													
	Gas	mm	Φ38.1							Φ41.3						
Weight		kg	644			796	803	825	837.0		859.0	932			966	
Refrigerant	Type		R410A													
	Charge	kg	27.20			32.10	32.40	33.5	35.4		36.5	37.70	37.80		40.80	
Operation Range	Cooling	℃DB	-5~50℃DB													
	Heating	℃WB	-20~15.5℃WB													
★4 Max. Fuse Amps	MFA	A	95	100					120	130	135	140		150	155	160
★4 Min. Circuit Amps	MCA	A	78.4	83.2	87.2	85.7	87.6	89.7	101.2	105.2	107.3	111.6	113.2	122.0	126.8	130.8

★1 Indoor Temp. of 27°CDB, 19°CWB; Outdoor Temp. of 35°CDB

★2 Indoor Temp. of 20°CDB; Outdoor Temp. of 7°CDB, 6°CWB

★3 Sound level: The operation sound levels are conversion values in anechoic chamber. In practice, sound levels tend to be higher than the specified values due to ambient noise or reflection. Frond sound level measured at a point 1m in front of the unit. Surround sound measured at 4 points (front, rear, left and right) of 1m in front of the unit.

★4 MFA is used to select the circuit breaker and the ground fault circuit interrupter (earth leakage circuit breaker). MCA is used to select wire size.

Remark: 1. System Connection Ratio: 50%-130%

2. Additional refrigerant to be charged : R (kg)

R = Total length(m) of liquid piping size at 22.2mm x 0.36 + Total length(m) of liquid piping size at 19.1mm x 0.26 + Total length(m) of liquid piping size at 15.9mm x 0.17 + Total length(m) of liquid piping size at 12.7mm x 0.11+ Total length(m) of liquid piping size at 9.5mm x 0.057 + Total length(m) of liquid piping size at 6.4mm x 0.022.

Catalogue of Daikin RXYQ216PBYD, RXYQ72PBYD, RXYQ96PBYD,

DAIKIN

EDUS 391005 - R1

R-410A

Engineering Data

VRV III®

RXYQ-PBYD
3 phase
460V, 60Hz

DAIKIN AC (AMERICAS), INC.

RXYQ-PBYD
Heat Pump
3 phase
460V, 60Hz

1. Specifications

Model Name			RXYQ72PBYD	RXYQ96PBYD	RXYQ120PBYD
Power Supply			3 phase, 460V, 60Hz	3 phase, 460V, 60Hz	3 phase, 460V, 60Hz
★1 Cooling Capacity	Nominal	Btu / h	72,000	96,000	120,000
	Rated		69,000	92,000	114,000
★2 Heating Capacity	Nominal	Btu / h	81,000	108,000	135,000
	Rated		77,000	103,000	129,000
Casing Color			Ivory White (5Y7.5/1)	Ivory White (5Y7.5/1)	Ivory White (5Y7.5/1)
Dimensions: (H×W×D)		in. (mm)	66-1/8 × 36-5/8 × 30-1/8 (1680 x 930 x765)	66-1/8 × 48-7/8 × 30-1/8 1680 x 1241 x 765	66-1/8 × 48-7/8 × 30-1/8 1680 x 1241 x 765
Heat Exchanger			Cross Fin Coil	Cross Fin Coil	Cross Fin Coil
Comp.	Type		Hermetically Sealed Scroll Type	Hermetically Sealed Scroll Type	Hermetically Sealed Scroll Type
	Displacement	m^3/h	16.90	10.53+13.34	10.53+13.34
	Number of Revolutions	r/min	7980	2900, 6300	2900, 6300
	Motor Output×Number of Units	kW	4.7 × 1	(2.2+4.5) × 1	(3.5+4.5) × 1
	Starting Method		Soft Start	Soft Start	Soft Start
Fan	Type		Propellor Fan	Propellor Fan	Propellor Fan
	Motor Output	kW	0.75 × 1	0.35 × 2	0.35 × 2
	Airflow Rate	cfm	6,350	8,230	8,230
	Drive		Direct Drive	Direct Drive	Direct Drive
Connecting Pipes	Liquid Pipe	in. (mm)	ϕ 3/8 (9.5) C1220T (Brazing Connection)	ϕ 3/8 (9.5) C1220T (Brazing Connection)	ϕ 1/2 (12.7) C1220T (Brazing Connection)
	Gas Pipe	in. (mm)	ϕ 3/4 (19.1) C1220T (Brazing Connection)	ϕ 7/8 (22.2) C1220T (Brazing Connection)	ϕ 1-1/8 (28.6) C1220T (Brazing Connection)
Mass		Lbs (kg)	433 (196)	633 (287)	633 (287)
★3 Sound Level (Reference Value)		dBA	57	60	60
Safety Devices			High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector	High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector	High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector
Defrost Method			Deicer	Deicer	Deicer
Capacity Control		%	20~100	14~100	14~100
Refrigerant	Refrigerant Name		R-410A	R-410A	R-410A
	Charge	Lbs (kg)	16.5 (7.5)	21.4 (9.7)	22.1 (10)
	Control		Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve
Standard Accessories			Installation Manual, Operation Manual, Connection Pipes, Clamps	Installation Manual, Operation Manual, Connection Pipes, Clamps	Installation Manual, Operation Manual, Connection Pipes, Clamps
Drawing No.			C: 4D070504	C: 4D070505	C: 4D070506

Notes:

★1 Indoor temp. : 80°FDB (27°CDB), 67°FWB(19.4°CWB) / outdoor temp. : 95°FDB (35°CDB) / Equivalent piping length : 25ft (7.5 m), level difference : 0 ft.

★2 Indoor temp. : 70°FDB (21°CDB) / outdoor temp. : 47°FDB, 43°FWB (8.3° CDB, 6° CWB) / Equivalent piping length : 25ft (7.5 m), difference : 0 ft.

★3 Anechoic chamber conversion value, measure under JISB8616 conditions. During actual operation, these values are normally somewhat higher as a result of ambient conditions.

Model Name (Combination Unit)			**RXYQ144PBYD**	**RXYQ168PBYD**	**RXYQ192PBYD**
Model Name (Independent Unit)			**RXYQ72PBYD RXYQ72PBYD**	**RXYQ72PBYD RXYQ96PBYD**	**RXYQ72PBYD RXYQ120PBYD**
Power Supply			3 phase, 460V, 60Hz	3 phase, 460V, 60Hz	3 phase, 460V, 60Hz
★1 Cooling Capacity	Nominal	Btu / h	144,000	168,000	192,000
	Rated		138,000	160,000	184,000
★2 Heating Capacity	Nominal	Btu / h	162,000	188,000	216,000
	Rated		154,000	180,000	206,000
Casing Color			Ivory White (5Y7.5/1)	Ivory White (5Y7.5/1)	Ivory White (5Y7.5/1)
Dimensions: (H×W×D)		in. (mm)	66-1/8 × 36-5/8 × 30-1/8 + 66-1/8 × 36-5/8 × 30-1/8 (1680 x 930 x 765 + 1680 x 930 x765)	66-1/8 × 36-5/8 × 30-1/8 + 66-1/8 × 48-7/8 × 30-1/8 (1680 x 930 x 765 + 1680 x 1241 x 765)	66-1/8 × 36-5/8 × 30-1/8 + 66-1/8 × 48-7/8 × 30-1/8 (1680 x 930 x 765 + 1680 x 1241 x 765)
Heat Exchanger			Cross Fin Coil	Cross Fin Coil	Cross Fin Coil
Comp.	Type		Hermetically Sealed Scroll Type	Hermetically Sealed Scroll Type	Hermetically Sealed Scroll Type
	Displacement	m^3/h	(16.90) × 2	16.90 + (10.53+13.34)	16.90 + (10.53+13.34)
	Number of Revolutions	r/min	(7980) × 2	7980, (2900, 6300)	7980, (2900, 6300)
	Motor Output×Number of Units	kW	(4.7) × 2	(4.7) × 1 + (2.2+4.5) × 1	(4.7) × 1 + (3.5+4.5) × 1
	Starting Method		Soft Start	Soft Start	Soft Start
Fan	Type		Propellor Fan	Propellor Fan	Propellor Fan
	Motor Output	kW	(0.75) × 1 + (0.75) × 1	(0.75) × 1 + (0.35) × 2	(0.75) × 1 + (0.35) × 2
	Airflow Rate	cfm	6,350+6,350	6,350+8,230	6,350+8,230
	Drive		Direct Drive	Direct Drive	Direct Drive
Connecting Pipes	Liquid Pipe	in. (mm)	ϕ1/2 (12.7) C1220T (Brazing Connection)	ϕ5/8 (15.8) C1220T (Brazing Connection)	ϕ5/8 (15.8) C1220T (Brazing Connection)
	Gas Pipe	in. (mm)	ϕ1-1/8 (28.6 C1220T (Brazing Connection)	ϕ1-1/8 (28.6 C1220T (Brazing Connection)	ϕ1-1/8 (28.6 C1220T (Brazing Connection)
Mass		Lbs (kg)	433 + 433 (196.4 + 196.4)	433 + 633 (196.4 + 287)	433 + 633 (196.4 + 287)
★3 Sound Level (Reference Value)		dBA	60	62	62
Safety Devices			High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector	High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector	High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector
Defrost Method			Deicer	Deicer	Deicer
Capacity Control		%	10~100	9~100	8~100
Refrigerant	Refrigerant Name		R-410A	R-410A	R-410A
	Charge	Lbs (kg)	16.5+16.5 (7.5 + 7.5)	16.5+21.4 (7.5 + 9.7)	16.5 + 22.1 (7.5 + 10)
	Control		Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve
Standard Accessories			Installation Manual, Operation Manual, Connection Pipes, Clamps	Installation Manual, Operation Manual, Connection Pipes, Clamps	Installation Manual, Operation Manual, Connection Pipes, Clamps
Drawing No.			C: 4D070909	C: 4D070910	C: 4D070911

Notes:

★1 Indoor temp. : 80°FDB(27°CDB), 67°FWB(19.4°CWB) / outdoor temp. : 95°FDB (35°CDB) / Equivalent piping length : 25ft (7.5 m), level difference : 0 ft.
★2 Indoor temp. : 70°FDB(21°CDB) / outdoor temp. : 47°FDB, 43°FWB (8.3° CDB, 6° CWB) / Equivalent piping length : 25ft (7.5 m), difference : 0 ft.
★3 Anechoic chamber conversion value, measure under JISB8616 conditions. During actual operation, these values are normally somewhat higher as a result of ambient conditions.

Model Name (Combination Unit)			RXYQ216PBYD	RXYQ240PBYD	RXYQ264PBYD
Model Name (Independent Unit)			RXYQ96PBYD RXYQ120PBYD	RXYQ120PBYD RXYQ120PBYD	RXYQ72PBYD RXYQ96PBYD RXYQ96PBYD
Power Supply			3 phase, 460V, 60Hz	3 phase, 460V, 60Hz	3 phase, 460V, 60Hz
★1 Cooling Capacity	Nominal	Btu / h	216,000	240,000	264,000
	Rated		206,000	228,000	251,000
★2 Heating Capacity	Nominal	Btu / h	243,000	270,000	297,000
	Rated		231,000	257,000	283,000
Casing Color			Ivory White (5Y7.5/1)	Ivory White (5Y7.5/1)	Ivory White (5Y7.5/1)
Dimensions: (H×W×D)		in. (mm)	66-1/8 × 48-7/8 × 30-1/8 + 66-1/8 × 48-7/8 × 30-1/8 (1680 x 1241 x 765 + 1680 x 1241 x 765)	66-1/8 × 48-7/8 × 30-1/8 + 66-1/8 × 48-7/8 × 30-1/8 (1680 x 1241 x 765 + 1680 x 1241 x 765)	66-1/8 × 36-5/8 × 30-1/8 + 66-1/8 × 48-7/8 × 30-1/8 + 66-1/8 × 48-7/8 × 30-1/8 (1680 x 930 x 765 +1680 x 1241 x 765 + 1680 x 1241 x 765)
Heat Exchanger			Cross Fin Coil	Cross Fin Coil	Cross Fin Coil
Comp.	Type		Hermetically Sealed Scroll Type	Hermetically Sealed Scroll Type	Hermetically Sealed Scroll Type
	Displacement	m^3/h	(10.53+13.34) × 2	(10.53+13.34) × 2	16.90 + (10.53+13.34) × 2
	Number of Revolutions	r/min	(2900, 6300) × 2	(2900, 6300) × 2	7980, (2900, 6300) × 2
	Motor Output×Number of Units	kW	(2.2+4.5) × 1 + (3.5+4.5) × 1	(3.5+4.5) × 2	(4.7) × 1 + (2.2+4.5) × 2
	Starting Method		Soft Start	Soft Start	Soft Start
Fan	Type		Propellor Fan	Propellor Fan	Propellor Fan
	Motor Output	kW	(0.35) × 2 + (0.35) × 2	(0.35) × 2 + (0.35) × 2	(0.75) × 1 + (0.35) × 2 + (0.35) × 2
	Airflow Rate	cfm	8,230+8,230	8,230+8,230	6,350+8,230+8,230
	Drive		Direct Drive	Direct Drive	Direct Drive
Connecting Pipes	Liquid Pipe	in. (mm)	ϕ5/8 (15.8) C1220T (Brazing Connection)	ϕ5/8 (15.8) C1220T (Brazing Connection)	ϕ3/4 (19.1)C1220T (Brazing Connection)
	Gas Pipe	in. (mm)	ϕ1-1/8 (28.6 C1220T (Brazing Connection)	ϕ1-3/8 (35) C1220T (Brazing Connection)	ϕ1-3/8 (35) C1220T (Brazing Connection)
Mass		Lbs (kg)	633 + 633 (287 + 287)	633 + 633 (287 + 287)	433 + 633 + 633 (196 + 287 + 287)
★3 Sound Level (Reference Value)		dBA	63	63	64
Safety Devices			High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector	High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector	High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector
Defrost Method			Deicer	Deicer	Deicer
Capacity Control		%	7~100	7~100	6~100
Refrigerant	Refrigerant Name		R-410A	R-410A	R-410A
	Charge	Lbs (kg)	21.4 + 22.1 (9.7 + 10)	22.1 + 22.1 (10 + 10)	16.5+21.4+21.4 (7.5 + 9.7 + 9.7)
	Control		Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve
Standard Accessories			Installation Manual, Operation Manual, Connection Pipes, Clamps	Installation Manual, Operation Manual, Connection Pipes, Clamps	Installation Manual, Operation Manual, Connection Pipes, Clamps
Drawing No.			C: 4D070912	C: 4D070913	C: 4D070914

Notes:

★1 Indoor temp. : 80°FDB(27°CDB), 67°FWB(19.4°CWB) / outdoor temp. : 95°FDB (35°CDB) / Equivalent piping length : 25ft (7.5 m), level difference : 0 ft.
★2 Indoor temp. : 70°FDB(21°CDB) / outdoor temp. : 47°FDB, 43°FWB (8.3° CDB, 6° CWB) / Equivalent piping length : 25ft (7.5 m), difference : 0 ft.
★3 Anechoic chamber conversion value, measure under JISB8616 conditions. During actual operation, these values are normally somewhat higher as a result of ambient conditions.

Model Name (Combination Unit)			**RXYQ288PBYD**	**RXYQ312PBYD**	**RXYQ336PBYD**
Model Name (Independent Unit)			**RXYQ72PBYD RXYQ96PBYD RXYQ120PBYD**	**RXYQ72PBYD RXYQ120PBYD RXYQ120PBYD**	**RXYQ96PBYD RXYQ120PBYD RXYQ120PBYD**
Power Supply			3 phase, 460V, 60Hz	3 phase, 460V, 60Hz	3 phase, 460V, 60Hz
★1 Cooling Capacity	Nominal	Btu / h	288,000	312,000	336,000
	Rated		274,000	297,000	320,000
★2 Heating Capacity	Nominal	Btu / h	324,000	351,000	378,000
	Rated		308,000	334,000	360,000
Casing Color			Ivory White (5Y7.5/1)	Ivory White (5Y7.5/1)	Ivory White (5Y7.5/1)
Dimensions: (H×W×D)		in. (mm)	66-1/8 × 36-5/8 × 30-1/8 + 66-1/8 × 48-7/8 × 30-1/8 + 66-1/8 × 48-7/8 × 30-1/8 (1680 x 930 x 765 + 1680 x 1241 x 765 + 1680 x 1241 x 765)	66-1/8 × 36-5/8 × 30-1/8 + 66-1/8 × 48-7/8 × 30-1/8 + 66-1/8 × 48-7/8 × 30-1/8 (1680 x 930 x 765 + 1680 x 1241 x 765 + 1680 x 1241 x 765)	66-1/8 × 48-7/8 × 30-1/8 + 66-1/8 × 48-7/8 × 30-1/8 + 66-1/8 × 48-7/8 × 30-1/8 (1680 x 1241 x 765 + 1680 x 1241 x 765 + 1680 x 1241 x 765)
Heat Exchanger			Cross Fin Coil	Cross Fin Coil	Cross Fin Coil
Comp.	Type		Hermetically Sealed Scroll Type	Hermetically Sealed Scroll Type	Hermetically Sealed Scroll Type
	Displacement	m^3/h	16.90 + (10.53+13.34) × 2	16.90 + (10.53+13.34) × 2	(10.53+13.34) × 3
	Number of Revolutions	r/min	7980, (2900, 6300) × 2	7980, (2900, 6300) × 2	(2900, 6300) × 3
	Motor Output×Number of Units	kW	(4.7) × 1 + (2.2+4.5) × 1 + (3.5+4.5) × 1	(4.7) × 1 + (3.5+4.5) × 2	(2.2+4.5) × 1 + (3.5+4.5) × 2
	Starting Method		Soft Start	Soft Start	Soft Start
Fan	Type		Propellor Fan	Propellor Fan	Propellor Fan
	Motor Output	kW	(0.75) × 1 + (0.35) × 2 + (0.35) × 2	(0.75) × 1 + (0.35) × 2 + (0.35) × 2	(0.35) × 2 + (0.35) × 2 + (0.35) × 2
	Airflow Rate	cfm	6,350+8,230+8,230	6,350+8,230+8,230	8,230+8,230+8,230
	Drive		Direct Drive	Direct Drive	Direct Drive
Connecting Pipes	Liquid Pipe	in. (mm)	ϕ3/4 (19.1) C1220T (Brazing Connection)	ϕ3/4 (19.1)C1220T (Brazing Connection)	ϕ3/4 (19.1) C1220T (Brazing Connection)
	Gas Pipe	in. (mm)	ϕ1-3/8 (35) C1220T (Brazing Connection)	ϕ1-3/8 (35) C1220T (Brazing Connection)	ϕ1-3/8 (35) C1220T (Brazing Connection)
Mass		Lbs (kg)	433 + 633 + 633 (196 + 28 7+ 287)	433 + 633 + 633 (196 + 28 7+ 287)	633 + 633+ 633 (196 + 28 7+ 287)
★3 Sound Level (Reference Value)		dBA	64	64	65
Safety Devices			High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector	High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector	High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector
Defrost Method			Deicer	Deicer	Deicer
Capacity Control		%	5~100	5~100	4~100
Refrigerant	Refrigerant Name		R-410A	R-410A	R-410A
	Charge	Lbs (kg)	16.5 + 21.4 + 22.1 (7.5 + 9.7 + 10)	16.5 + 22.1 + 22.1 (7.5 + 10 + 10)	21.4 + 22.1 + 22.1 (9.7 + 10 + 10)
	Control		Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve
Standard Accessories			Installation Manual, Operation Manual, Connection Pipes, Clamps	Installation Manual, Operation Manual, Connection Pipes, Clamps	Installation Manual, Operation Manual, Connection Pipes, Clamps
Drawing No.			C: 4D070915	C: 4D070916	C: 4D070917

Notes:

★1 Indoor temp. : 80°FDB(27°CDB), 67°FWB(19.4°CWB) / outdoor temp. : 95°FDB (35°CDB) / Equivalent piping length : 25ft (7.5 m), level difference : 0 ft.

★2 Indoor temp. : 70°FDB(21°CDB) / outdoor temp. : 47°FDB, 43°FWB (8.3° CDB, 6° CWB) / Equivalent piping length : 25ft (7.5 m), difference : 0 ft.

★3 Anechoic chamber conversion value, measure under JISB8616 conditions. During actual operation, these values are normally somewhat higher as a result of ambient conditions.

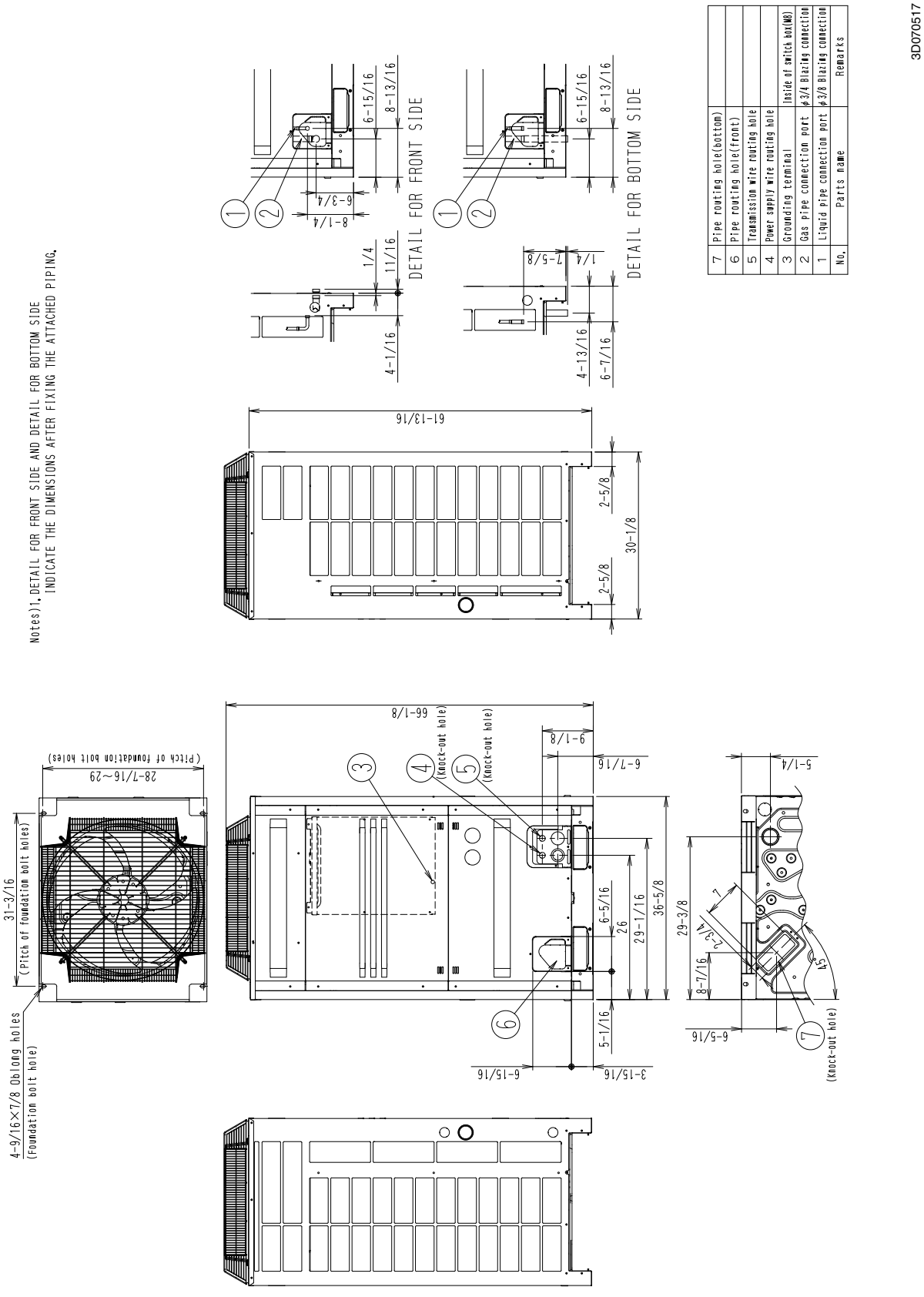
Model Name (Combination Unit)			**RXYQ360PBYD**
Model Name (Independent Unit)			**RXYQ120PBYD RXYQ120PBYD RXYQ120PBYD**
Power Supply			3 phase, 460V, 60Hz
★1 Cooling Capacity	Nominal	Btu / h	360,000
	Rated		342,000
★2 Heating Capacity	Nominal	Btu / h	405,000
	Rated		385,000
Casing Color			Ivory White (5Y7.5/1)
Dimensions: (H×W×D)		in. (mm)	66-1/8 × 48-7/8 × 30-1/8 + 66-1/8 × 48-7/8 × 30-1/8 + 66-1/8 × 48-7/8 × 30-1/8 (1680 x 1241 x 765 + 1680 x 1241 x 765 + 1680 x 1241 x 765)
Heat Exchanger			Cross Fin Coil
Comp.	Type		Hermetically Sealed Scroll Type
	Displacement	m^3/h	(10.53+13.34) × 3
	Number of Revolutions	r/min	(2900, 6300) × 3
	Motor Output×Number of Units	kW	(3.5+4.5) × 3
	Starting Method		Soft Start
Fan	Type		Propellor Fan
	Motor Output	kW	(0.35) × 2 + (0.35) × 2 + (0.35) × 2
	Airflow Rate	cfm	8,230+8,230+8,230
	Drive		Direct Drive
Connecting Pipes	Liquid Pipe	in. (mm)	ϕ3/4 (19.1) C1220T (Brazing Connection)
	Gas Pipe	in. (mm)	ϕ1-5/8 (41.3) C1220T (Brazing Connection)
Mass		Lbs (kg)	633 + 633 + 633 (287 + 287 + 287)
★3 Sound Level (Reference Value)		dBA	65
Safety Devices			High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector
Defrost Method			Deicer
Capacity Control		%	5~100
Refrigerant	Refrigerant Name		R-410A
	Charge	Lbs (kg)	22.1+22.1+22.1 (10 + 10 + 10)
	Control		Electronic Expansion Valve
Standard Accessories			Installation Manual, Operation Manual, Connection Pipes, Clamps
Drawing No.			C: 4D070918

Notes:

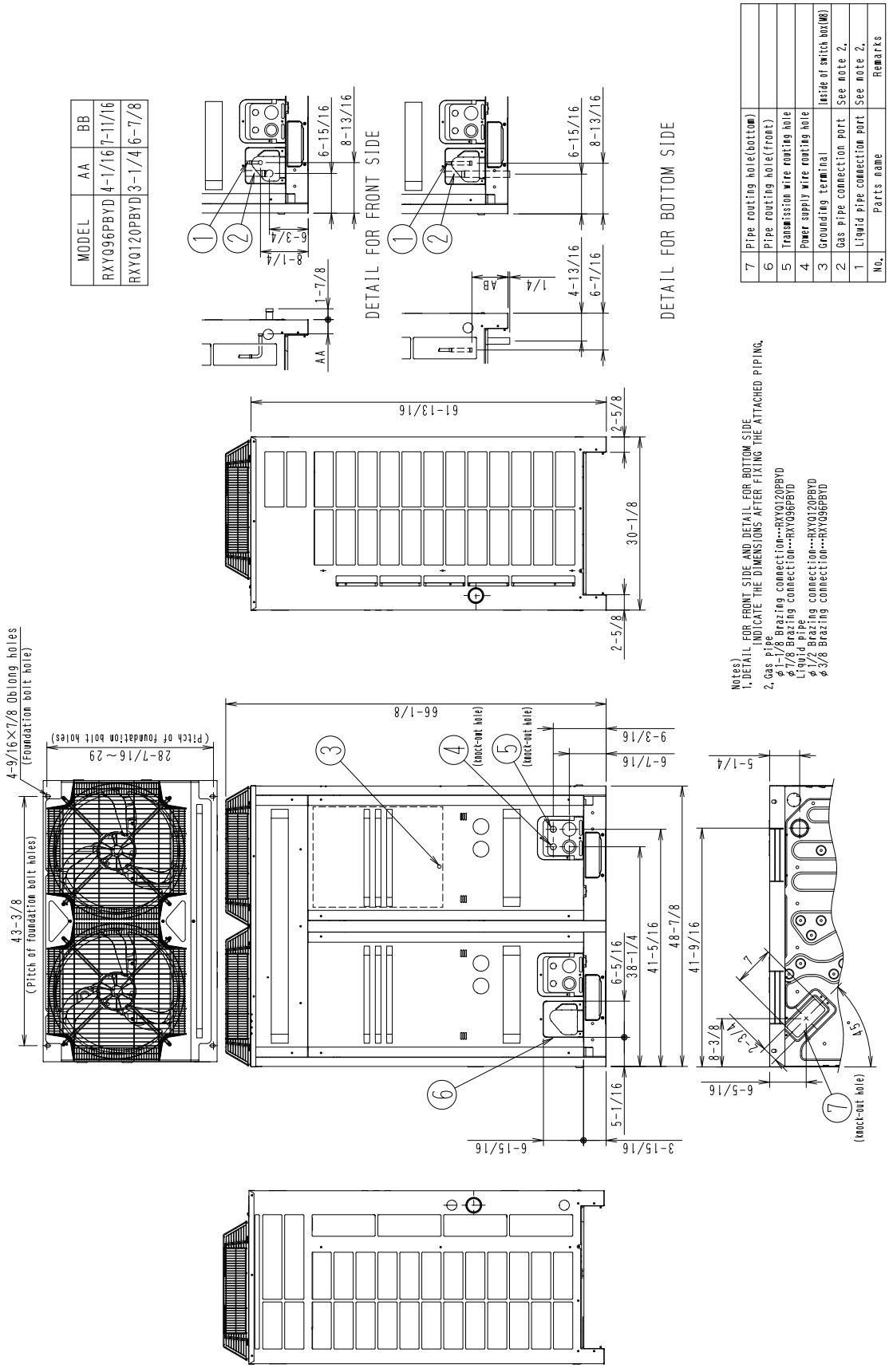
★1 Indoor temp. : 80°FDB(27°CDB), 67°FWB(19.4°CWB) / outdoor temp. : 95°FDB (35°CDB) / Equivalent piping length : 25ft (7.5 m), level difference : 0 ft.
★2 Indoor temp. : 70°FDB(21°CDB) / outdoor temp. : 47°FDB, 43°FWB (8.3° CDB, 6° CWB) / Equivalent piping length : 25ft (7.5 m), difference : 0 ft.
★3 Anechoic chamber conversion value, measure under JISB8616 conditions. During actual operation, these values are normally somewhat higher as a result of ambient conditions.

2. Dimensions

RXYQ72PBYD



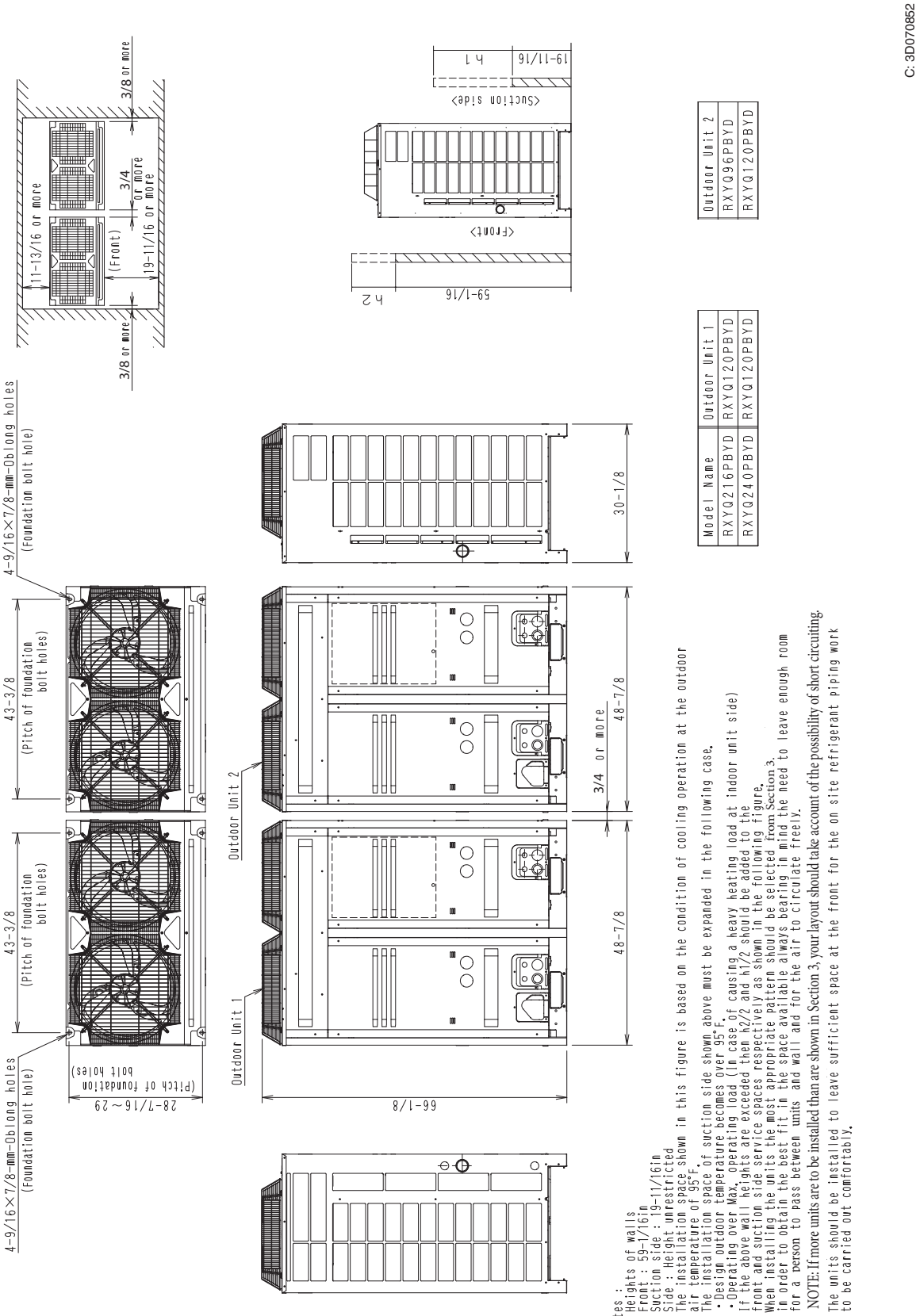
RXYQ96PBYD / RXYQ120PBYD



MODEL	AA	BB
RXYQ96PBYD	4-1/16	7-11/16
RXYQ120PBYD	3-1/4	6-7/8

No.	Parts name	Remarks
7	Pipe routing hole(bottom)	
6	Pipe routing hole(front)	
5	Transmission wire routing hole	
4	Power supply wire routing hole	
3	Grounding terminal	Inside of switch box(M8)
2	Gas pipe connection port	See note 2.
1	Liquid pipe connection port	See note 2.

RXYQ216PBYD / RXYQ240PBYD



Notes :
1. Heights of walls
   Front : 59-1/16in
   Suction side : 19-11/16in
   Side : Height unrestricted
   The installation space shown in this figure is based on the condition of cooling operation at the outdoor air temperature of 95°F.
   The installation space of suction side shown above must be expanded in the following case.
   • Design outdoor temperature becomes over 95°F.
   • Operating over Max. operating load (In case of causing a heavy heating load at indoor unit side)
2. If the above wall heights are exceeded then h2/2 and h1/2 should be added to the front and suction side service spaces respectively as shown in the following figure.
3. When installing the units the most appropriate pattern should be selected from Section 3. in order to obtain the best fit in the space available always bearing in mind the need to leave enough room for a person to pass between units and wall and for the air to circulate freely.
   NOTE: If more units are to be installed than are shown in Section 3, your layout should take account of the possibility of short circuiting.
4. The units should be installed to leave sufficient space at the front for the on site refrigerant piping work to be carried out comfortably.

Appendix 3.2

Fixed Noise Impact Assessment Results

Prediction of Fixed Noise Source Impact on Planned NSR

NSR Labels	Nature of Use	Existing/ Planned Uses	Location		ASR	Noise Criteria (ANL), L_{eq} (30 min)		Noise Source ID	Description of Noise Sources	SWL, dB(A), L_{eq} (30 min)		Source Location			Directivity Factor (Q)	No. of Plant	% on-time within 30min (Daytime Peak)	% on-time within 30min (Night-time Peak)	Distance to NSR, d (m)	Correction for, dB(A)								Noise Impact at NSR, dB(A)	
			X	Y		Daytime & Evening Time (0700-2300)	Nighttime (2300-0700)			Daytime & Evening Time (0700-2300)	Nighttime (2300-0700)	X	Y	Z, mPD						Distance	No.	% on time (Daytime)	% on time (Night-time)	Screening by Features [1]	Silencer	Tonality	Facade	Daytime & Evening Period	Night-time
FN01	Residential	Planned	837270	820877	B	65	55	F01	VRV at the roof of Kowloon Ling Liang Church	71	OFF	837213	820947	0.0	2	1	100.0%	N.A.	90	-47.1	0	0	N.A.	0	0	3	3	29.9	N.A.
								F02	VRV at the roof of Kowloon Ling Liang Church	71	OFF	837215	820947	0.0	2	1	100.0%	N.A.	89	-47.0	0	0	N.A.	0	0	3	3	30.0	N.A.
								F03	VRV at the roof of Kowloon Ling Liang Church	71	OFF	837217	820947	0.0	2	1	100.0%	N.A.	88	-46.9	0	0	N.A.	0	0	3	3	30.1	N.A.
								F04	VRV at the roof of Kowloon Ling Liang Church	71	OFF	837215	820945	0.0	2	1	100.0%	N.A.	88	-46.9	0	0	N.A.	0	0	3	3	30.1	N.A.
								F05	VRV at the roof of Kowloon Ling Liang Church	71	OFF	837217	820945	0.0	2	1	100.0%	N.A.	86	-46.7	0	0	N.A.	0	0	3	3	30.3	N.A.
								F06	VRV at the roof of Kowloon Ling Liang Church	71	OFF	837216	820943	0.0	2	1	100.0%	N.A.	85	-46.6	0	0	N.A.	0	0	3	3	30.4	N.A.
								F07	VRV at the roof of Kowloon Ling Liang Church	66	OFF	837212	820945	0.0	2	1	100.0%	N.A.	89	-47.0	0	0	N.A.	0	0	3	3	25.0	N.A.
								F08	VRV at the roof of Kowloon Ling Liang Church	66	OFF	837212	820943	0.0	2	1	100.0%	N.A.	88	-46.9	0	0	N.A.	0	0	3	3	25.1	N.A.
								F09	Condensing Unit at the roof of Kowloon Ling Liang Church	57	OFF	837211	820940	0.0	2	1	100.0%	N.A.	86	-46.7	0	0	N.A.	0	0	3	3	16.3	N.A.
								F10	Condensing Unit at the roof of Kowloon Ling Liang Church	57	OFF	837213	820940	0.0	2	1	100.0%	N.A.	85	-46.6	0	0	N.A.	0	0	3	3	16.4	N.A.
								F11	VRV at the roof of Kowloon Ling Liang Church	68	OFF	837214	820940	0.0	2	1	100.0%	N.A.	84	-46.5	0	0	N.A.	0	0	3	3	27.5	N.A.
								F12	VRV at the roof of Kowloon Ling Liang Church	58	OFF	837219	820937	0.0	2	1	100.0%	N.A.	79	-46.0	0	0	N.A.	0	0	3	3	18.0	N.A.
								F13	Condensing Unit at the roof of Kowloon Ling Liang Church	57	OFF	837224	820942	0.0	2	1	100.0%	N.A.	79	-46.0	0	0	N.A.	0	0	3	3	17.0	N.A.
								F14	Condensing Unit at the roof of Kowloon Ling Liang Church	57	OFF	837226	820941	0.0	2	1	100.0%	N.A.	78	-45.9	0	0	N.A.	0	0	3	3	17.1	N.A.
								F15	Air Conditioner at the roof of Kowloon Ling Liang Church	67	OFF	837234	820941	0.0	2	1	100.0%	N.A.	74	-45.4	0	0	N.A.	0	0	3	3	27.6	N.A.
								F16	VRV at the roof of Kowloon Ling Liang Church	68	OFF	837239	820944	0.0	2	1	100.0%	N.A.	74	-45.4	0	0	N.A.	0	0	3	3	28.6	N.A.
								F17	VRV at the roof of Kowloon Ling Liang Church	68	OFF	837239	820947	0.0	2	1	100.0%	N.A.	76	-45.6	0	0	N.A.	0	0	3	3	28.4	N.A.
								F18	VRV at the roof of Kowloon Ling Liang Church	68	OFF	837237	820947	0.0	2	1	100.0%	N.A.	77	-45.7	0	0	N.A.	0	0	3	3	28.3	N.A.
								F19	Chiller at the roof of The Grandeur (Block 1)	68	OFF	837231	821184	0.0	2	1	100.0%	N.A.	310	-57.8	0	0	N.A.	0	0	3	3	16.2	N.A.
								F20	Chiller at the roof of The Grandeur (Block 1)	68	OFF	837233	821184	0.0	2	1	100.0%	N.A.	309	-57.8	0	0	N.A.	0	0	3	3	16.2	N.A.
								F21	Chiller at the roof of The Grandeur (Block 1)	68	OFF	837236	821184	0.0	2	1	100.0%	N.A.	309	-57.8	0	0	N.A.	0	0	3	3	16.2	N.A.
								F22	Chiller at the roof of The Grandeur (Block 1)	68	OFF	837236	821186	0.0	2	1	100.0%	N.A.	311	-57.9	0	0	N.A.	0	0	3	3	16.1	N.A.
								F23	Chiller at the roof of The Grandeur (Block 1)	68	OFF	837236	821188	0.0	2	1	100.0%	N.A.	313	-57.9	0	0	N.A.	0	0	3	3	16.1	N.A.
								F24	Chiller at the roof of The Grandeur (Block 1)	68	OFF	837233	821188	0.0	2	1	100.0%	N.A.	313	-57.9	0	0	N.A.	0	0	3	3	16.1	N.A.
								F25	Chiller at the roof of The Grandeur (Block 1)	68	OFF	837231	821188	0.0	2	1	100.0%	N.A.	314	-57.9	0	0	N.A.	0	0	3	3	16.1	N.A.
								F26	Cooling Tower at the roof of Smart A	82	OFF	837332	820958	0.0	2	1	100.0%	N.A.	102	-48.1	0	0	N.A.	-10	0	3	3	29.9	N.A.
								F27	Chiller at the roof of Smart A	83	OFF	837331	820956	0.0	2	1	100.0%	N.A.	100	-48.0	0	0	N.A.	-10	0	3	3	31.0	N.A.
								F28	Chiller at the roof of Smart A	83	OFF	837329	820955	0.0	2	1	100.0%	N.A.	98	-47.9	0	0	N.A.	-10	0	3	3	31.1	N.A.
								F29	Chiller at the roof of Smart A	83	OFF	837328	820957	0.0	2	1	100.0%	N.A.	99	-47.9	0	0	N.A.	-10	0	3	3	31.1	N.A.
								F30	Chiller at the roof of Smart A	83	OFF	837330	820958	0.0	2	1	100.0%	N.A.	101	-48.0	0	0	N.A.	-10	0	3	3	31.0	N.A.
								F31	Chiller at the roof of Hang Seng Kowloon City Building	92	OFF	837347	820950	0.0	2	1	100.0%	N.A.	106	-48.5	0	0	N.A.	-10	0	3	3	39.0	N.A.
								F32	Chiller at the roof of Hang Seng Kowloon City Building	92	OFF	837347	820948	0.0	2	1	100.0%	N.A.	105	-48.4	0	0	N.A.	-10	0	3	3	39.1	N.A.
								F33	Cooling Tower at the roof of 404-410 Nga Tsin Long Road	82	OFF	837555	820986	0.0	2	1	100.0%	N.A.	305	-57.7	0	0	N.A.	-10	0	3	3	20.3	N.A.
								F34	Cooling Tower at the roof of 404-410 Nga Tsin Long Road	84	OFF	837557	820986	0.0	2	1	100.0%	N.A.	307	-57.7	0	0	N.A.	-10	0	3	3	22.3	N.A.
								F35	Cooling Tower at the roof of 404-410 Nga Tsin Long Road	91	OFF	837557	820984	0.0	2	1	100.0%	N.A.	306	-57.7	0	0	N.A.	-10	0	3	3	29.3	N.A.
								F36	Cooling Tower at the roof of St.Teresa Hospital (North Wing)	OFF	OFF	837057	820850	0.0	2	1	N.A.	N.A.	214	-54.6	0	N.A.	N.A.	-10	0	3	3	N.A.	N.A.
								F37	Cooling Tower at the roof of St.Teresa Hospital (North Wing)	86	OFF	837065	820851	0.0	2	1	100.0%	N.A.	207	-54.3	0	0	N.A.	-10	0	3	3	27.7	N.A.
								F38	Cooling Tower at the roof of St.Teresa Hospital (North Wing)	86	86	837075	820851	0.0	2	1	100.0%	100.0%	196	-53.9	0	0	0	-10	0	3	3	28.1	28.1
								F39	Cooling Tower at the roof of St.Teresa Hospital (North Wing)	86	86	837082	820853	0.0	2	1	100.0%	100.0%	190	-53.6	0	0	0	-10	0	3	3	28.4	28.4
								F40	Chiller at the roof of St.Teresa Hospital (East Wing)	98	OFF	837114	820858	0.0	2	1	100.0%	N.A.	157	-51.9	0	0	N.A.	-10	0	3	3	42.1	N.A.
								F41	Chiller at the roof of St.Teresa Hospital (East Wing)	98	98	837117	820859	0.0	2	1	100.0%	100.0%	154	-51.7	0	0	0	-10	0	3	3	42.3	42.3
								F42	Chiller at the roof of St.Teresa Hospital (East Wing)	OFF	OFF	837116	820854	0.0	2	1	N.A.	N.A.	155	-51.8	0	N.A.	N.A.	-10	0	3	3	N.A.	N.A.
								F43	Chiller at the roof of St.Teresa Hospital (Extension Building)	85	85	837109	820783	0.0	2	1	100.0%	100.0%	186	-53.4	0	0	0	-10	0	3	3	27.6	27.6
								F44	Chiller at the roof of St.Teresa Hospital (Extension Building)	85	85	837110	820778	0.0	2	1	100.0%	100.0%	188	-53.5	0	0	0	-10	0	3	3	27.5	27.5
								F45	Chiller at the roof of St.Teresa Hospital (Extension Building)	85	85	837071	820775	0.0	2	1	100.0%	100.0%	223	-55.0	0	0	0	-10	0	3	3	26.0	26.0
								F46	Chiller at the roof of St.Teresa Hospital (Extension Building)	85	85	837072	820770	0.0	2	1	100.0%	100.0%	225	-55.0	0	0	0	-10	0	3	3	26.0	26.0
								F47	Chiller at the roof of St.Teresa Hospital (Extension Building)	98	98	837074	820743	0.0	2	1	100.0%	100.0%	237	-55.5	0	0	0	-10	0	3	3	38.5	38.5
								F48	Chiller at the roof of St.Teresa Hospital (Extension Building)	98	98	837066	820741	0.0	2	1	100.0%	100.0%	245	-55.8	0	0	0	-10	0	3	3	38.2	38.2
								F49	VRV at the roof of St. Teresa Hospital (Staff Quarter)	72	72	837170	820827	0.0	2	1	100.0%	100.0%	112	-49.0	0	0	0	0	0	3	3	28.5	28.5
								F50	VRV at the roof of St. Teresa Hospital (Staff Quarter)	70	70	837172	820827	0.0	2	1	100.0%	100.0%	110	-48.8	0	0	0	0	0	3	3	27.2	27.2
								F51	VRV at the roof of St. Teresa Hospital (Staff Quarter)	70	70	837173	820823	0.0	2	1	100.0%	100.0%	111	-48.9	0	0	0	0	0	3	3	27.1	27.1
								F52	VRV at the roof of St. Teresa Hospital (Staff Quarter)	70	70	837171	820823	0.0	2	1	100.0%	100.0%	113	-49.0	0	0	0	0	0	3	3	27.0	27.0
								F53	VRV at the roof of St. Teresa Hospital (Staff Quarter)	70	70	837169	820822	0.0	2	1	100.0%	100.0%	114	-49.2	0	0	0	0	0	3	3	26.8	26.8
								F54	VRV at the roof of St. Teresa Hospital (Staff Quarter)	72	72	837170	820820	0.0	2	1	100.0%	100.0%	115	-49.2	0	0	0	0	0	3	3	28.3	28.3
								F55	VRV at the roof of St. Teresa Hospital (Staff Quarter)	72	72	837170	820818	0.0	2	1	100.0%	100.0%	116	-49.3	0	0	0	0	0	3	3	28.2	28.2
								F56	VRV at the roof of St. Teresa Hospital (Staff Quarter)	68	68	837167	820816	0.0	2	1	100.0%	100.0%	120	-49.6	0	0	0	0	0	3	3	24.4	24.4
								F57	VRV at the roof of St. Teresa Hospital (Staff Quarter)	71	71	837164	820816	0.0	2	1	100.0%	100.0%	122	-49.7	0	0	0	0	0	3	3	26.8	26.8
								F58	VRV at the roof of St. Teresa Hospital (Staff Quarter)	72	72	837162	820815	0.0	2	1	100.0%	100.0%	125	-49.9	0	0	0	0	0	3	3	27.6	27.6
								F59	VRV at the roof of St. Teresa Hospital (Staff Quarter)	70	70	837161	820817	0.0	2	1	100.0%	100.0%	124	-49.9	0	0	0	0	0	3	3	26.1	26.1
								F60	VRV at the roof of St. Teresa Hospital (Staff Quarter)	72	72	837161	820820	0.0	2	1	100.0%	100.0%	123	-49.8	0	0	0	0	0	3	3	27.7	27.7
								F61	VRV at the roof of St. Teresa Hospital (Staff Quarter)	72	72	837164	820819	0.0	2	1	100.0%	100.0%	121	-49.6	0	0	0	0	0	3	3	27.9	27.9
								F62	VRV at the roof of St. Teresa Hospital (Staff Quarter)	72	72	837166	820820	0.0	2	1	100.0%	100.0%	119	-49.5	0	0	0	0	0	3	3	28.0	28.0
								F63	VRV at the roof of St. Teresa Hospital (Staff Quarter)	72	72	837158	820823	0.0	2	1	100.0%	100.0%	125	-49.9	0	0	0	0	0	3	3	27.6	27.6
								F64	VRV at the roof of St. Teresa Hospital (Staff Quarter)	70	70	837158	820825	0.0	2	1	100.0%	100.0%	124	-49.8	0	0	0	0	0	3	3	26.2	26.2
								F65	VRV at the roof of St. Teresa Hospital (Staff Quarter)	70	70	837160	820825	0.0	2	1	100.0%	100.0%	122	-49.7	0	0	0	0	0	3	3	26.3	26.3
								F66	VRV at the roof of St. Teresa Hospital (Staff Quarter)	72	72	837162	820822	0.0	2	1	100.0%	100.0%	121	-49.6	0	0	0	0	0	3	3	27.9	27.9
								F67	VRV at the roof of St. Teresa Hospital (Staff Quarter)	70	70	837164	820823	0.0	2	1	100.0%	100.0%	119	-49.5	0	0	0	0	0	3	3	26.5	26.5
								F68	Chiller at the roof of Hong Kong Eye Hospital	97	97	837029	820680	0.0	2	1	100.0%	100.0%	312	-57.9	0	0	0	-10	0	3	3	35.1	35.1
								F69	Chiller at the roof of Hong Kong Eye Hospital	97	97	837034	820681	0.0	2	1	100.0%	100.0%	307	-57.7	0	0	0	-10	0	3	3	35.3	35.3
								F70	Chiller at the roof of Hong Kong Eye Hospital	96	96	837043	820652	0.0	2	1	100.0%	100.0%	319	-58.1	0	0	0	-10	0	3	3	33.9	33.9
								F71	Cooling Tower at the roof of Kowloon City Law Courts Building	92	OFF	837139	820699	0.0	2	1	100.0%	N.A.	220	-54.9	0	0	N.A.	-5	0	3	3	38.1	N.A.
								F72	Cooling Tower at the roof of Kowloon City Law Courts Building	92	OFF	837140	820697	0.0	2	1	100.0%	N.A.	222	-54.9	0	0	N.A.	-5	0	3	3	38.1	N.A.
								F73	Chiller at the roof of Kowloon City Law Courts Building	94	OFF	837138	820693	0.0	2	1	100.0%	N.A.	227	-55.1	0	0	N.A.	-5	0	3	3	39.9	N.A.
								F74	Chiller at the roof of Kowloon City Law Courts Building	94	OFF	837139	820687	0.0	2	1	100.0%	N.A.	231	-55.3	0	0	N.A.	-5	0	3	3	39.7	N.A.
																											Total =	51	47

Prediction of Fixed Noise Source Impact on Planned NSR

NSR Labels	Nature of Use	Existing/ Planned Uses	Location		ASR	Noise Criteria (ANL), L_{eq} (30 min)		Noise Source ID	Description of Noise Sources	SWL, dB(A), L_{eq} (30 min)		Source Location			Directivity Factor (Q)	No. of Plant	% on-time within 30min (Daytime Peak)	% on-time within 30min (Night-time Peak)	Distance to NSR, d (m)	Correction for, dB(A)								Noise Impact at NSR, dB(A)	
			X	Y		Daytime & Evening Time (0700-2300)	Nighttime (2300-0700)			Daytime & Evening Time (0700-2300)	Nighttime (2300-0700)	X	Y	Z, mPD						Distance	No.	% on time (Daytime)	% on time (Night-time)	Screening by Features [1]	Silencer	Tonality	Facade	Daytime & Evening Period	Night-time
FN02	Residential	Planned	837272	820867	B	65	55	F36	Cooling Tower at the roof of St.Teresa Hospital (North Wing)	OFF	OFF	837057	820850	0.0	2	1	N.A.	N.A.	215	-54.7	0	N.A.	N.A.	-10	0	3	3	N.A.	N.A.
								F37	Cooling Tower at the roof of St.Teresa Hospital (North Wing)	86	OFF	837065	820851	0.0	2	1	100.0%	N.A.	207	-54.3	0	0	N.A.	-10	0	3	3	27.7	N.A.
								F38	Cooling Tower at the roof of St.Teresa Hospital (North Wing)	86	86	837075	820851	0.0	2	1	100.0%	100.0%	197	-53.9	0	0	0	-10	0	3	3	28.1	28.1
								F39	Cooling Tower at the roof of St.Teresa Hospital (North Wing)	86	86	837082	820853	0.0	2	1	100.0%	100.0%	190	-53.6	0	0	0	-10	0	3	3	28.4	28.4
								F40	Chiller at the roof of St.Teresa Hospital (East Wing)	98	OFF	837114	820858	0.0	2	1	100.0%	N.A.	158	-52.0	0	0	N.A.	-10	0	3	3	42.0	N.A.
								F41	Chiller at the roof of St.Teresa Hospital (East Wing)	98	98	837117	820859	0.0	2	1	100.0%	100.0%	155	-51.8	0	0	0	-10	0	3	3	42.2	42.2
								F42	Chiller at the roof of St.Teresa Hospital (East Wing)	OFF	OFF	837116	820854	0.0	2	1	N.A.	N.A.	156	-51.8	0	N.A.	N.A.	-10	0	3	3	N.A.	N.A.
								F43	Chiller at the roof of St.Teresa Hospital (Extension Building)	85	85	837109	820783	0.0	2	1	100.0%	100.0%	183	-53.2	0	0	0	-10	0	3	3	27.8	27.8
								F44	Chiller at the roof of St.Teresa Hospital (Extension Building)	85	85	837110	820778	0.0	2	1	100.0%	100.0%	184	-53.3	0	0	0	-10	0	3	3	27.7	27.7
								F45	Chiller at the roof of St.Teresa Hospital (Extension Building)	85	85	837071	820775	0.0	2	1	100.0%	100.0%	220	-54.9	0	0	0	-10	0	3	3	26.1	26.1
								F46	Chiller at the roof of St.Teresa Hospital (Extension Building)	85	85	837072	820770	0.0	2	1	100.0%	100.0%	221	-54.9	0	0	0	-10	0	3	3	26.1	26.1
								F47	Chiller at the roof of St.Teresa Hospital (Extension Building)	98	98	837074	820743	0.0	2	1	100.0%	100.0%	233	-55.3	0	0	0	-10	0	3	3	38.7	38.7
								F48	Chiller at the roof of St.Teresa Hospital (Extension Building)	98	98	837066	820741	0.0	2	1	100.0%	100.0%	241	-55.6	0	0	0	-10	0	3	3	38.4	38.4
								F49	VRV at the roof of St. Teresa Hospital (Staff Quarter)	72	72	837170	820827	0.0	2	1	100.0%	100.0%	109	-48.8	0	0	0	0	0	3	3	28.7	28.7
								F50	VRV at the roof of St. Teresa Hospital (Staff Quarter)	70	70	837172	820827	0.0	2	1	100.0%	100.0%	107	-48.6	0	0	0	0	0	3	3	27.4	27.4
								F51	VRV at the roof of St. Teresa Hospital (Staff Quarter)	70	70	837173	820823	0.0	2	1	100.0%	100.0%	108	-48.7	0	0	0	0	0	3	3	27.3	27.3
								F52	VRV at the roof of St. Teresa Hospital (Staff Quarter)	70	70	837171	820823	0.0	2	1	100.0%	100.0%	110	-48.8	0	0	0	0	0	3	3	27.2	27.2
								F53	VRV at the roof of St. Teresa Hospital (Staff Quarter)	70	70	837169	820822	0.0	2	1	100.0%	100.0%	111	-48.9	0	0	0	0	0	3	3	27.1	27.1
								F54	VRV at the roof of St. Teresa Hospital (Staff Quarter)	72	72	837170	820820	0.0	2	1	100.0%	100.0%	112	-49.0	0	0	0	0	0	3	3	28.5	28.5
								F55	VRV at the roof of St. Teresa Hospital (Staff Quarter)	72	72	837170	820818	0.0	2	1	100.0%	100.0%	113	-49.0	0	0	0	0	0	3	3	28.5	28.5
								F56	VRV at the roof of St. Teresa Hospital (Staff Quarter)	68	68	837167	820816	0.0	2	1	100.0%	100.0%	117	-49.3	0	0	0	0	0	3	3	24.7	24.7
								F57	VRV at the roof of St. Teresa Hospital (Staff Quarter)	71	71	837164	820816	0.0	2	1	100.0%	100.0%	119	-49.5	0	0	0	0	0	3	3	27.0	27.0
								F58	VRV at the roof of St. Teresa Hospital (Staff Quarter)	72	72	837162	820815	0.0	2	1	100.0%	100.0%	122	-49.7	0	0	0	0	0	3	3	27.8	27.8
								F59	VRV at the roof of St. Teresa Hospital (Staff Quarter)	70	70	837161	820817	0.0	2	1	100.0%	100.0%	121	-49.7	0	0	0	0	0	3	3	26.3	26.3
								F60	VRV at the roof of St. Teresa Hospital (Staff Quarter)	72	72	837161	820820	0.0	2	1	100.0%	100.0%	121	-49.6	0	0	0	0	0	3	3	27.9	27.9
								F61	VRV at the roof of St. Teresa Hospital (Staff Quarter)	72	72	837164	820819	0.0	2	1	100.0%	100.0%	118	-49.4	0	0	0	0	0	3	3	28.1	28.1
								F62	VRV at the roof of St. Teresa Hospital (Staff Quarter)	72	72	837166	820820	0.0	2	1	100.0%	100.0%	116	-49.3	0	0	0	0	0	3	3	28.2	28.2
								F63	VRV at the roof of St. Teresa Hospital (Staff Quarter)	72	72	837158	820823	0.0	2	1	100.0%	100.0%	122	-49.7	0	0	0	0	0	3	3	27.8	27.8
								F64	VRV at the roof of St. Teresa Hospital (Staff Quarter)	70	70	837158	820825	0.0	2	1	100.0%	100.0%	121	-49.7	0	0	0	0	0	3	3	26.3	26.3
								F65	VRV at the roof of St. Teresa Hospital (Staff Quarter)	70	70	837160	820825	0.0	2	1	100.0%	100.0%	119	-49.5	0	0	0	0	0	3	3	26.5	26.5
								F66	VRV at the roof of St. Teresa Hospital (Staff Quarter)	72	72	837162	820822	0.0	2	1	100.0%	100.0%	118	-49.4	0	0	0	0	0	3	3	28.1	28.1
								F67	VRV at the roof of St. Teresa Hospital (Staff Quarter)	70	70	837164	820823	0.0	2	1	100.0%	100.0%	116	-49.3	0	0	0	0	0	3	3	26.7	26.7
								F68	Chiller at the roof of Hong Kong Eye Hospital	97	97	837029	820680	0.0	2	1	100.0%	100.0%	307	-57.7	0	0	0	-10	0	3	3	35.3	35.3
								F69	Chiller at the roof of Hong Kong Eye Hospital	97	97	837034	820681	0.0	2	1	100.0%	100.0%	302	-57.6	0	0	0	-10	0	3	3	35.4	35.4
								F70	Chiller at the roof of Hong Kong Eye Hospital	96	96	837043	820652	0.0	2	1	100.0%	100.0%	313	-57.9	0	0	0	-10	0	3	3	34.1	34.1
								F71	Cooling Tower at the roof of Kowloon City Law Courts Building	92	OFF	837139	820699	0.0	2	1	100.0%	N.A.	214	-54.6	0	0	N.A.	0	0	3	3	43.4	N.A.
								F72	Cooling Tower at the roof of Kowloon City Law Courts Building	92	OFF	837140	820697	0.0	2	1	100.0%	N.A.	215	-54.7	0	0	N.A.	0	0	3	3	43.3	N.A.
								F73	Chiller at the roof of Kowloon City Law Courts Building	94	OFF	837138	820693	0.0	2	1	100.0%	N.A.	220	-54.8	0	0	N.A.	0	0	3	3	45.2	N.A.
								F74	Chiller at the roof of Kowloon City Law Courts Building	94	OFF	837139	820687	0.0	2	1	100.0%	N.A.	224	-55.0	0	0	N.A.	0	0	3	3	45.0	N.A.
																											Total =	53	47
FN03	Residential	Planned	837273	820860	B	65	55	F01	VRV at the roof of Kowloon Ling Liang Church	71	OFF	837213	820947	0.0	2	1	100.0%	N.A.	106	-48.5	0	0	N.A.	0	0	3	3	28.5	N.A.
								F02	VRV at the roof of Kowloon Ling Liang Church	71	OFF	837215	820947	0.0	2	1	100.0%	N.A.	104	-48.4	0	0	N.A.	0	0	3	3	28.6	N.A.
								F03	VRV at the roof of Kowloon Ling Liang Church	71	OFF	837217	820947	0.0	2	1	100.0%	N.A.	103	-48.3	0	0	N.A.	0	0	3	3	28.7	N.A.
								F04	VRV at the roof of Kowloon Ling Liang Church	71	OFF	837215	820945	0.0	2	1	100.0%	N.A.	103	-48.2	0	0	N.A.	0	0	3	3	28.8	N.A.
								F05	VRV at the roof of Kowloon Ling Liang Church	71	OFF	837217	820945	0.0	2	1	100.0%	N.A.	102	-48.1	0	0	N.A.	0	0	3	3	28.9	N.A.
								F06	VRV at the roof of Kowloon Ling Liang Church	71	OFF	837216	820943	0.0	2	1	100.0%	N.A.	101	-48.1	0	0	N.A.	0	0	3	3	28.9	N.A.
								F07	VRV at the roof of Kowloon Ling Liang Church	66	OFF	837212	820945	0.0	2	1	100.0%	N.A.	104	-48.4	0	0	N.A.	0	0	3	3	23.6	N.A.
								F08	VRV at the roof of Kowloon Ling Liang Church	66	OFF	837212	820943	0.0	2	1	100.0%	N.A.	103	-48.2	0	0	N.A.	0	0	3	3	23.8	N.A.
								F09	Condensing Unit at the roof of Kowloon Ling Liang Church	57	OFF	837211	820940	0.0	2	1	100.0%	N.A.	101	-48.1	0	0	N.A.	0	0	3	3	14.9	N.A.
								F10	Condensing Unit at the roof of Kowloon Ling Liang Church	57	OFF	837213	820940	0.0	2	1	100.0%	N.A.	100	-48.0	0	0	N.A.	0	0	3	3	15.0	N.A.
								F11	VRV at the roof of Kowloon Ling Liang Church	68	OFF	837214	820940	0.0	2	1	100.0%	N.A.	99	-47.9	0	0	N.A.	0	0	3	3	26.1	N.A.
								F12	VRV at the roof of Kowloon Ling Liang Church	58	OFF	837219	820937	0.0	2	1	100.0%	N.A.	94	-47.5	0	0	N.A.	0	0	3	3	16.5	N.A.
								F13	Condensing Unit at the roof of Kowloon Ling Liang Church	57	OFF	837224	820942	0.0	2	1	100.0%	N.A.	95	-47.6	0	0	N.A.	0	0	3	3	15.4	N.A.
								F14	Condensing Unit at the roof of Kowloon Ling Liang Church	57	OFF	837226	820941	0.0	2	1	100.0%	N.A.	94	-47.5	0	0	N.A.	0	0	3	3	15.5	N.A.
								F15	Air Conditioner at the roof of Kowloon Ling Liang Church	67	OFF	837234	820941	0.0	2	1	100.0%	N.A.	90	-47.1	0	0	N.A.	0	0	3	3	25.9	N.A.
								F16	VRV at the roof of Kowloon Ling Liang Church	68	OFF	837239	820944	0.0	2	1	100.0%	N.A.	91	-47.1	0	0	N.A.	0	0	3	3	26.9	N.A.
								F17	VRV at the roof of Kowloon Ling Liang Church	68	OFF	837239	820947	0.0	2	1	100.0%	N.A.	93	-47.3	0	0	N.A.	0	0	3	3	26.7	N.A.
								F18	VRV at the roof of Kowloon Ling Liang Church	68	OFF	837237	820947	0.0	2	1	100.0%	N.A.	93	-47.4	0	0	N.A.	0	0	3	3	26.6	N.A.
								F36	Cooling Tower at the roof of St.Teresa Hospital (North Wing)	OFF	OFF	837057	820850	0.0	2	1	N.A.	N.A.	216	-54.7	0	N.A.	N.A.	-10	0	3	3	N.A.	N.A.
								F37	Cooling Tower at the roof of St.Teresa Hospital (North Wing)	86	OFF	837065	820851	0.0	2	1	100.0%	N.A.	208	-54.4	0	0	N.A.	-10	0	3	3	27.6	N.A.
								F38	Cooling Tower at the roof of St.Teresa Hospital (North Wing)	86	86	837075	820851	0.0	2	1	100.0%	100.0%	198	-53.9	0	0	0	-10	0	3	3	28.1	28.1
								F39	Cooling Tower at the roof of St.Teresa Hospital (North Wing)	86	86	837082	820853	0.0	2	1	100.0%	100.0%	191	-53.6	0	0	0	-10	0	3	3	28.4	28.4
								F40	Chiller at the roof of St.Teresa Hospital (East Wing)	98	OFF	837114	820858	0.0	2	1	100.0%	N.A.	159	-52.0	0	0	N.A.	-10	0	3	3	42.0	N.A.
								F41	Chiller at the roof of St.Teresa Hospital (East Wing)	98	98	837117	820859	0.0	2	1	100.0%	100.0%	156	-51.9	0	0	0	-10	0	3	3	42.1	42.1
								F42	Chiller at the roof of St.Teresa Hospital (East Wing)	OFF	OFF	837116	820854	0.0	2	1	N.A.	N.A.	157	-51.9	0	N.A.	N.A.	-10	0	3	3	N.A.	N.A.
								F43	Chiller at the roof of St.Teresa Hospital (Extension Building)	85	85	837109	820783	0.0	2	1	100.0%	100.0%	181	-53.2	0	0	0	-10	0	3	3	27.8	27.8
								F44	Chiller at the roof of St.Teresa Hospital (Extension Building)	85	85	837110	820778	0.0	2	1	100.0%	100.0%	182	-53.2	0	0	0	-10	0	3	3	27.8	27.8
								F45	Chiller at the roof of St.Teresa Hospital (Extension Building)	85	85	837071	820775	0.0	2	1	100.0%	100.0%	219	-54.8	0	0	0	-10	0	3	3	26.2	26.2
								F46	Chiller at the roof of St.Teresa Hospital (Extension Building)	85	85	837072	820770	0.0	2	1	100.0%	100.0%	220	-54.8	0	0	0	-10	0	3	3	26.2	26.2
								F47	Chiller at the roof of St.Teresa Hospital (Extension Building)	98	98	837074	820743	0.0	2	1	100.0%	100.0%	231	-55.3	0	0	0	-10	0	3	3	38.7	38.7
								F48	Chiller at the roof of St.Teresa Hospital (Extension Building)	98	98	837066	820741	0.0	2	1	100.0%	100.0%	239	-55.6	0	0	0	-10	0	3	3	38.4	38.4
								F49	VRV at the roof of St. Teresa Hospital (Staff Quarter)	72	72	837170	820827	0.0	2	1	100.0%	100.0%	108	-48.7	0	0	0	0	0	3	3	28.8	28.8
								F50	VRV at the roof of St. Teresa Hospital (Staff Quarter)	70	70	837172	820827	0.0	2	1	100.0%	100.0%	106	-48.5	0	0	0	0	0	3	3	27.5	27.5
								F51	VRV at the roof of St. Teresa Hospital (Staff Quarter)	70	70	837173	820823	0.0	2	1	100.0%	100.0%	107	-48.6	0	0	0	0	0	3	3	27.4	27.4
								F52	VRV at the roof of St. Teresa Hospital (Staff Quarter)	70	70	837171	820823	0.0	2	1	100.0%	100.0%	108	-48.7	0	0	0	0	0	3	3	27.3	27.3
								F53	VRV at the roof of St. Teresa Hospital (Staff Quarter)	70	70	837169	820822	0.0	2	1	100.0%	100.0%	110	-48.8	0	0	0	0	0	3	3	27.2	27.2
								F54	VRV at the roof of St. Teresa Hospital (Staff Quarter)	72	72	837170	820820	0.0	2	1	100.0%	100.0%	111	-48.9	0	0	0	0	0	3	3	28.6	28.6
								F55	VRV at the roof of St. Teresa Hospital (Staff Quarter)	72	72	837170	820818	0.0	2	1	100.0%	100.0%	111	-48.9	0	0	0	0	0	3	3	28.6	28.6
								F56	VRV at the roof of St. Teresa Hospital (Staff Quarter)	68	68	837167	820816	0.0	2	1	100.0%	100.0%	115	-49.2	0	0	0	0	0	3	3	24.8	24.8
								F57	VRV at the roof of St. Teresa Hospital (Staff Quarter)	71	71	837164	820816	0.0	2	1	100.0%	100.0%	117	-49.4	0	0	0	0	0	3	3	27.1	27.1
								F58	VRV at the roof of St. Teresa Hospital (Staff Quarter)	72	72	837162	820815	0.0	2	1	100.0%	100.0%	120	-49.6	0	0	0	0	0	3	3	27.9	27.9
								F59	VRV at the roof of St. Teresa Hospital (Staff Quarter)	70	70	837161	820817	0.0	2	1	100.0%	100.0%	120	-49.6	0	0	0	0	0	3	3	26.4	26.4
								F60	VRV at the roof of St. Teresa Hospital (Staff Quarter)	72	72	837161	820820	0.0	2	1	100.0%	100.0%	119	-49.5	0	0	0	0	0	3	3	28.0	28.0
								F61	VRV at the roof of St. Teresa Hospital (Staff Quarter)	72	72	837164	820819	0.0	2	1	100.0%	100.0%	116	-49.3	0	0	0	0	0	3	3	28.2	28.2
								F62	VRV at the roof of St. Teresa Hospital (Staff Quarter)	72	72	837166	820820	0.0	2	1	100.0%	100.0%	114	-49.2	0	0	0	0	0	3	3	28.3	28.3
								F63	VRV at the roof of St. Teresa Hospital (Staff Quarter)	72	72	837158	820823	0.0	2	1	100.0%	100.0%	121	-49.7	0	0	0	0	0	3	3	27.8	27.8
								F64	VRV at the roof of St. Teresa Hospital (Staff Quarter)	70	70	837158	820825	0.0	2	1	100.0%	100.0%	120	-49.6	0	0	0	0	0	3	3	26.4	26.4
								F65	VRV at the roof of St. Teresa Hospital (Staff Quarter)	70	70	837160	820825	0.0	2	1	100.0%	100.0%	118	-49.5	0	0	0	0	0	3	3	26.5	26.5
								F66	VRV at the roof of St. Teresa Hospital (Staff Quarter)	72	72	837162	820822	0.0	2	1	100.0%	100.0%	117	-49.4	0	0	0	0	0	3	3	28.1	28.1
								F67	VRV at the roof of St. Teresa Hospital (Staff Quarter)	70	70	837164	820823	0.0	2	1	100.0%	100.0%	115	-49.2	0	0	0	0	0	3	3	26.8	26.8
								F68	Chiller at the roof of Hong Kong Eye Hospital	97	97	837029	820680	0.0	2	1	100.0%	100.0%	304	-57.6	0	0	0	-10	0	3	3	35.4	35.4
								F69	Chiller at the roof of Hong Kong Eye Hospital	97	97	837034	820681	0.0	2	1	100.0%	100.0%	299	-57.5	0	0	0	-10	0	3	3	35.5	35.5
								F70	Chiller at the roof of Hong Kong Eye Hospital	96	96	837043	820652	0.0	2	1	100.0%	100.0%	310	-57.8	0	0	0	-10	0	3	3	34.2	34.2
								F71	Cooling Tower at the roof of Kowloon City Law Courts Building	92	OFF	837139	820699	0.0	2	1	100.0%	N.A.	209	-54.4	0	0	N.A.	0	0	3	3	43.6	N.A.
								F72	Cooling Tower at the roof of Kowloon City Law Courts Building	92	OFF	837140	820697	0.0	2	1	100.0%	N.A.	211	-54.5	0	0	N.A.	0	0	3	3	43.5	N.A.
								F73	Chiller at the roof of Kowloon City Law Courts Building	94	OFF	837138	820693	0.0	2	1	100.0%	N.A.	215	-54.7	0	0	N.A.	0	0	3	3	45.3	N.A.
								F74	Chiller at the roof of Kowloon City Law Courts Building	94	OFF	837139	820687	0.0	2	1	100.0%	N.A.	219	-54.8	0	0	N.A.	0	0	3	3	45.2	N.A.
																											Total =	53	47

Prediction of Fixed Noise Source Impact on Planned NSR

NSR Labels	Nature of Use	Existing/ Planned Uses	Location		ASR	Noise Criteria (ANL), L_{eq} (30 min)		Noise Source ID	Description of Noise Sources	SWL, dB(A), L_{eq} (30 min)		Source Location			Directivity Factor (Q)	No. of Plant	% on-time within 30min (Daytime Peak)	% on-time within 30min (Night-time Peak)	Distance to NSR, d (m)	Correction for, dB(A)							Noise Impact at NSR, dB(A)	
			X	Y		Daytime & Evening Time (0700-2300)	Nighttime (2300-0700)			Daytime & Evening Time (0700-2300)	Nighttime (2300-0700)	X	Y	Z, mPD						Distance	No.	% on time (Daytime)	% on time (Night-time)	Screening by Features [1]	Silencer	Tonality	Facade	Daytime & Evening Period	Night-time
FN04	Residential	Planned	837277	820843	B	65	55	F36	Cooling Tower at the roof of St.Teresa Hospital (North Wing)	OFF	OFF	837057	820850	0.0	2	1	N.A.	N.A.	220	-54.8	0	N.A.	N.A.	-10	0	3	3	N.A.	N.A.
								F37	Cooling Tower at the roof of St.Teresa Hospital (North Wing)	86	OFF	837065	820851	0.0	2	1	100.0%	N.A.	212	-54.5	0	0	N.A.	-10	0	3	3	27.5	N.A.
								F38	Cooling Tower at the roof of St.Teresa Hospital (North Wing)	86	86	837075	820851	0.0	2	1	100.0%	100.0%	202	-54.1	0	0	0	-10	0	3	3	27.9	27.9
								F39	Cooling Tower at the roof of St.Teresa Hospital (North Wing)	86	86	837082	820853	0.0	2	1	100.0%	100.0%	196	-53.8	0	0	0	-10	0	3	3	28.2	28.2
								F40	Chiller at the roof of St.Teresa Hospital (East Wing)	98	OFF	837114	820858	0.0	2	1	100.0%	N.A.	164	-52.3	0	0	N.A.	-10	0	3	3	41.7	N.A.
								F41	Chiller at the roof of St.Teresa Hospital (East Wing)	98	98	837117	820859	0.0	2	1	100.0%	100.0%	161	-52.1	0	0	0	-10	0	3	3	41.9	41.9
								F42	Chiller at the roof of St.Teresa Hospital (East Wing)	OFF	OFF	837116	820854	0.0	2	1	N.A.	N.A.	161	-52.1	0	N.A.	N.A.	-10	0	3	3	N.A.	N.A.
								F43	Chiller at the roof of St.Teresa Hospital (Extension Building)	85	85	837109	820783	0.0	2	1	100.0%	100.0%	178	-53.0	0	0	0	-10	0	3	3	28.0	28.0
								F44	Chiller at the roof of St.Teresa Hospital (Extension Building)	85	85	837110	820778	0.0	2	1	100.0%	100.0%	179	-53.1	0	0	0	-10	0	3	3	27.9	27.9
								F45	Chiller at the roof of St.Teresa Hospital (Extension Building)	85	85	837071	820775	0.0	2	1	100.0%	100.0%	217	-54.7	0	0	0	-10	0	3	3	26.3	26.3
								F46	Chiller at the roof of St.Teresa Hospital (Extension Building)	85	85	837072	820770	0.0	2	1	100.0%	100.0%	217	-54.7	0	0	0	-10	0	3	3	26.3	26.3
								F47	Chiller at the roof of St.Teresa Hospital (Extension Building)	98	98	837074	820743	0.0	2	1	100.0%	100.0%	226	-55.1	0	0	0	-10	0	3	3	38.9	38.9
								F48	Chiller at the roof of St.Teresa Hospital (Extension Building)	98	98	837066	820741	0.0	2	1	100.0%	100.0%	234	-55.4	0	0	0	-10	0	3	3	38.6	38.6
								F49	VRV at the roof of St. Teresa Hospital (Staff Quarter)	72	72	837170	820827	0.0	2	1	100.0%	100.0%	109	-48.7	0	0	0	0	0	3	3	28.8	28.8
								F50	VRV at the roof of St. Teresa Hospital (Staff Quarter)	70	70	837172	820827	0.0	2	1	100.0%	100.0%	106	-48.5	0	0	0	0	0	3	3	27.5	27.5
								F51	VRV at the roof of St. Teresa Hospital (Staff Quarter)	70	70	837173	820823	0.0	2	1	100.0%	100.0%	106	-48.5	0	0	0	0	0	3	3	27.5	27.5
								F52	VRV at the roof of St. Teresa Hospital (Staff Quarter)	70	70	837171	820823	0.0	2	1	100.0%	100.0%	108	-48.7	0	0	0	0	0	3	3	27.3	27.3
								F53	VRV at the roof of St. Teresa Hospital (Staff Quarter)	70	70	837169	820822	0.0	2	1	100.0%	100.0%	110	-48.8	0	0	0	0	0	3	3	27.2	27.2
								F54	VRV at the roof of St. Teresa Hospital (Staff Quarter)	72	72	837170	820820	0.0	2	1	100.0%	100.0%	110	-48.8	0	0	0	0	0	3	3	28.7	28.7
								F55	VRV at the roof of St. Teresa Hospital (Staff Quarter)	72	72	837170	820818	0.0	2	1	100.0%	100.0%	110	-48.8	0	0	0	0	0	3	3	28.7	28.7
								F56	VRV at the roof of St. Teresa Hospital (Staff Quarter)	68	68	837167	820816	0.0	2	1	100.0%	100.0%	114	-49.1	0	0	0	0	0	3	3	24.9	24.9
								F57	VRV at the roof of St. Teresa Hospital (Staff Quarter)	71	71	837164	820816	0.0	2	1	100.0%	100.0%	116	-49.3	0	0	0	0	0	3	3	27.2	27.2
								F58	VRV at the roof of St. Teresa Hospital (Staff Quarter)	72	72	837162	820815	0.0	2	1	100.0%	100.0%	119	-49.5	0	0	0	0	0	3	3	28.0	28.0
								F59	VRV at the roof of St. Teresa Hospital (Staff Quarter)	70	70	837161	820817	0.0	2	1	100.0%	100.0%	119	-49.5	0	0	0	0	0	3	3	26.5	26.5
								F60	VRV at the roof of St. Teresa Hospital (Staff Quarter)	72	72	837161	820820	0.0	2	1	100.0%	100.0%	119	-49.5	0	0	0	0	0	3	3	28.0	28.0
								F61	VRV at the roof of St. Teresa Hospital (Staff Quarter)	72	72	837164	820819	0.0	2	1	100.0%	100.0%	116	-49.3	0	0	0	0	0	3	3	28.2	28.2
								F62	VRV at the roof of St. Teresa Hospital (Staff Quarter)	72	72	837166	820820	0.0	2	1	100.0%	100.0%	114	-49.1	0	0	0	0	0	3	3	28.4	28.4
								F63	VRV at the roof of St. Teresa Hospital (Staff Quarter)	72	72	837158	820823	0.0	2	1	100.0%	100.0%	121	-49.7	0	0	0	0	0	3	3	27.8	27.8
								F64	VRV at the roof of St. Teresa Hospital (Staff Quarter)	70	70	837158	820825	0.0	2	1	100.0%	100.0%	120	-49.6	0	0	0	0	0	3	3	26.4	26.4
								F65	VRV at the roof of St. Teresa Hospital (Staff Quarter)	70	70	837160	820825	0.0	2	1	100.0%	100.0%	119	-49.5	0	0	0	0	0	3	3	26.5	26.5
								F66	VRV at the roof of St. Teresa Hospital (Staff Quarter)	72	72	837162	820822	0.0	2	1	100.0%	100.0%	117	-49.3	0	0	0	0	0	3	3	28.2	28.2
								F67	VRV at the roof of St. Teresa Hospital (Staff Quarter)	70	70	837164	820823	0.0	2	1	100.0%	100.0%	114	-49.2	0	0	0	0	0	3	3	26.8	26.8
								F68	Chiller at the roof of Hong Kong Eye Hospital	97	97	837029	820680	0.0	2	1	100.0%	100.0%	297	-57.5	0	0	0	-10	0	3	3	35.5	35.5
								F69	Chiller at the roof of Hong Kong Eye Hospital	97	97	837034	820681	0.0	2	1	100.0%	100.0%	292	-57.3	0	0	0	-10	0	3	3	35.7	35.7
								F70	Chiller at the roof of Hong Kong Eye Hospital	96	96	837043	820652	0.0	2	1	100.0%	100.0%	302	-57.6	0	0	0	-10	0	3	3	34.4	34.4
								F71	Cooling Tower at the roof of Kowloon City Law Courts Building	92	OFF	837139	820699	0.0	2	1	100.0%	N.A.	199	-54.0	0	0	N.A.	0	0	3	3	44.0	N.A.
								F72	Cooling Tower at the roof of Kowloon City Law Courts Building	92	OFF	837140	820697	0.0	2	1	100.0%	N.A.	200	-54.0	0	0	N.A.	0	0	3	3	44.0	N.A.
								F73	Chiller at the roof of Kowloon City Law Courts Building	94	OFF	837138	820693	0.0	2	1	100.0%	N.A.	205	-54.2	0	0	N.A.	0	0	3	3	45.8	N.A.
								F74	Chiller at the roof of Kowloon City Law Courts Building	94	OFF	837139	820687	0.0	2	1	100.0%	N.A.	209	-54.4	0	0	N.A.	0	0	3	3	45.6	N.A.
																											Total =	53	47
FN05	Residential	Planned	837282	820844	B	65	55	F43	Chiller at the roof of St.Teresa Hospital (Extension Building)	85	85	837109	820783	0	2	1	100.00%	100.00%	183	-53.3	0	0	0	-10	0	3	3	27.7	27.7
								F44	Chiller at the roof of St.Teresa Hospital (Extension Building)	85	85	837110	820778	0	2	1	100.00%	100.00%	184	-53.3	0	0	0	-10	0	3	3	27.7	27.7
								F45	Chiller at the roof of St.Teresa Hospital (Extension Building)	85	85	837071	820775	0	2	1	100.00%	100.00%	222	-54.9	0	0	0	-10	0	3	3	26.1	26.1
								F46	Chiller at the roof of St.Teresa Hospital (Extension Building)	85	85	837072	820770	0	2	1	100.00%	100.00%	222	-54.9	0	0	0	-10	0	3	3	26.1	26.1
								F47	Chiller at the roof of St.Teresa Hospital (Extension Building)	98	98	837074	820743	0	2	1	100.00%	100.00%	231	-55.3	0	0	0	-10	0	3	3	38.7	38.7
								F48	Chiller at the roof of St.Teresa Hospital (Extension Building)	98	98	837066	820741	0	2	1	100.00%	100.00%	239	-55.6	0	0	0	-10	0	3	3	38.4	38.4
								F49	VRV at the roof of St. Teresa Hospital (Staff Quarter)	72	72	837170	820827	0	2	1	100.00%	100.00%	113	-49.1	0	0	0	0	0	3	3	28.4	28.4
								F50	VRV at the roof of St. Teresa Hospital (Staff Quarter)	70	70	837172	820827	0	2	1	100.00%	100.00%	111	-48.9	0	0	0	0	0	3	3	27.1	27.1
								F51	VRV at the roof of St. Teresa Hospital (Staff Quarter)	70	70	837173	820823	0	2	1	100.00%	100.00%	111	-48.9	0	0	0	0	0	3	3	27.1	27.1
								F52	VRV at the roof of St. Teresa Hospital (Staff Quarter)	70	70	837171	820823	0	2	1	100.00%	100.00%	113	-49.0	0	0	0	0	0	3	3	27.0	27.0
								F53	VRV at the roof of St. Teresa Hospital (Staff Quarter)	70	70	837169	820822	0	2	1	100.00%	100.00%	114	-49.2	0	0	0	0	0	3	3	26.8	26.8
								F54	VRV at the roof of St. Teresa Hospital (Staff Quarter)	72	72	837170	820820	0	2	1	100.00%	100.00%	114	-49.2	0	0	0	0	0	3	3	28.3	28.3
								F55	VRV at the roof of St. Teresa Hospital (Staff Quarter)	72	72	837170	820818	0	2	1	100.00%	100.00%	115	-49.2	0	0	0	0	0	3	3	28.3	28.3
								F56	VRV at the roof of St. Teresa Hospital (Staff Quarter)	68	68	837167	820816	0	2	1	100.00%	100.00%	118	-49.5	0	0	0	0	0	3	3	24.5	24.5
								F57	VRV at the roof of St. Teresa Hospital (Staff Quarter)	71	71	837164	820816	0	2	1	100.00%	100.00%	121	-49.6	0	0	0	0	0	3	3	26.9	26.9
								F58	VRV at the roof of St. Teresa Hospital (Staff Quarter)	72	72	837162	820815	0	2	1	100.00%	100.00%	124	-49.8	0	0	0	0	0	3	3	27.7	27.7
								F59	VRV at the roof of St. Teresa Hospital (Staff Quarter)	70	70	837161	820817	0	2	1	100.00%	100.00%	124	-49.8	0	0	0	0	0	3	3	26.2	26.2
								F60	VRV at the roof of St. Teresa Hospital (Staff Quarter)	72	72	837161	820820	0	2	1	100.00%	100.00%	124	-49.8	0	0	0	0	0	3	3	27.7	27.7
								F61	VRV at the roof of St. Teresa Hospital (Staff Quarter)	72	72	837164	820819	0	2	1	100.00%	100.00%	121	-49.6	0	0	0	0	0	3	3	27.9	27.9
								F62	VRV at the roof of St. Teresa Hospital (Staff Quarter)	72	72	837166	820820	0	2	1	100.00%	100.00%	118	-49.5	0	0	0	0	0	3	3	28.0	28.0
								F63	VRV at the roof of St. Teresa Hospital (Staff Quarter)	72	72	837158	820823	0	2	1	100.00%	100.00%	126	-50.0	0	0	0	0	0	3	3	27.5	27.5
								F64	VRV at the roof of St. Teresa Hospital (Staff Quarter)	70	70	837158	820825	0	2	1	100.00%	100.00%	125	-50.0	0	0	0	0	0	3	3	26.0	26.0
								F65	VRV at the roof of St. Teresa Hospital (Staff Quarter)	70	70	837160	820825	0	2	1	100.00%	100.00%	123	-49.8	0	0	0	0	0	3	3	26.2	26.2
								F66	VRV at the roof of St. Teresa Hospital (Staff Quarter)	72	72	837162	820822	0	2	1	100.00%	100.00%	121	-49.7	0	0	0	0	0	3	3	27.8	27.8
								F67	VRV at the roof of St. Teresa Hospital (Staff Quarter)	70	70	837164	820823	0	2	1	100.00%	100.00%	119	-49.5	0	0	0	0	0	3	3	26.5	26.5
								F68	Chiller at the roof of Hong Kong Eye Hospital	97	97	837029	820680	0	2	1	100.00%	100.00%	302	-57.6	0	0	0	-10	0	3	3	35.4	35.4
								F69	Chiller at the roof of Hong Kong Eye Hospital	97	97	837034	820681	0	2	1	100.00%	100.00%	296	-57.4	0	0	0	-10	0	3	3	35.6	35.6
								F70	Chiller at the roof of Hong Kong Eye Hospital	96	96	837043	820652	0	2	1	100.00%	100.00%	306	-57.7	0	0	0	-10	0	3	3	34.3	34.3
								F71	Cooling Tower at the roof of Kowloon City Law Courts Building	92	OFF	837139	820699	0	2	1	100.00%	N.A.	203	-54.1	0	0	N.A.	0	0	3	3	43.9	N.A.
								F72	Cooling Tower at the roof of Kowloon City Law Courts Building	92	OFF	837140	820697	0	2	1	100.00%	N.A.	204	-54.2	0	0	N.A.	0	0	3	3	43.8	N.A.
								F73	Chiller at the roof of Kowloon City Law Courts Building	94	OFF	837138	820693	0	2	1	100.00%	N.A.	209	-54.4	0	0	N.A.	0	0	3	3	45.6	N.A.
								F74	Chiller at the roof of Kowloon City Law Courts Building	94	OFF	837139	820687	0	2	1	100.00%	N.A.	212	-54.5	0	0	N.A.	0	0	3	3	45.5	N.A.
																											Total =	52	46