



TO **David Ellis**
OF IHP
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CC As per email distribution list

FROM **Joseph Hardy**
NO. OF PAGES 10 (with 450 pages of appended documents)

DATE 30 November 2021
FILE REF PRP-BDP-Z01-XX-CO-YA-6012 P02

SUBJECT **PATERSON REDEVELOPMENT PROJECT**
Review of external plant noise egress in relation to Planning Condition 17

1. Introduction

We are writing to provide a summary of our review of external plant noise egress, specifically in relation to Planning Condition 17, stated below:

"In accordance with the mitigation identified in paragraph 8.118 of the Environmental Statement, externally mounted ancillary plant, equipment and servicing shall be selected and/or acoustically treated in accordance with a scheme designed so as to achieve a rating level of 5 dB (LAeq) below the typical background level (LA90) level at the nearest noise sensitive location. The scheme shall be submitted to and approved in writing by the City Council as Local Planning Authority and the approved scheme shall be completed before the building is first occupied."

The purpose of this review is to determine if the proposed building service design strategy, in relation to externally mounted plant, equipment, servicing and associated noise attenuation measures, is capable of complying with the noise emission limits specified in Planning Condition 17.

A glossary of acoustic terms is appended to this correspondence.

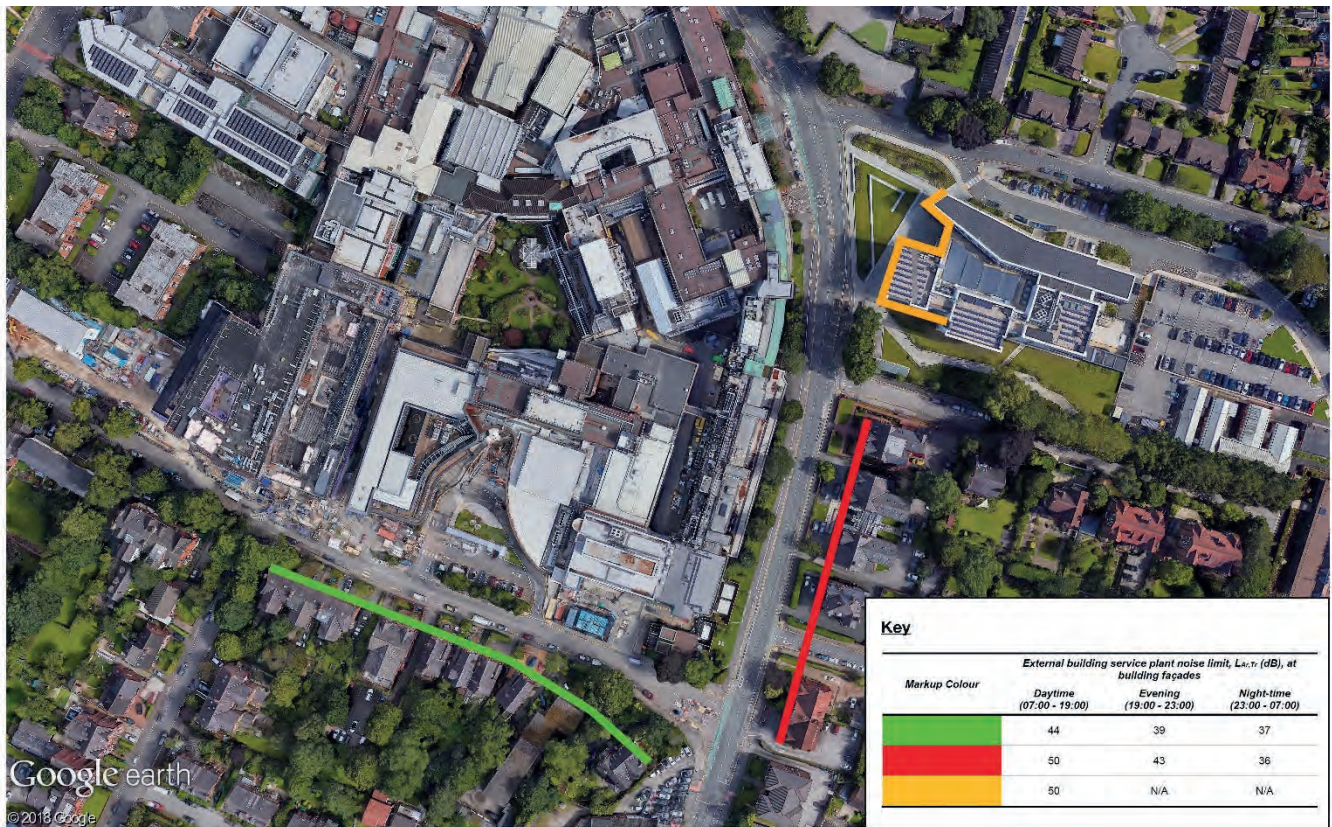
2. Baseline external noise survey

In order to determine the absolute external plant noise emission criteria (refer to Section 3) to enable compliance with Planning Condition 17, the baseline external noise survey information documented in Volume 3 Appendix 8.1 of the project Environmental Statement has been referenced.

3. External plant noise emission criteria

Figure 1 presents the external plant noise emission criteria that applies at the noise sensitive receptors identified in the project Environmental Statement, in order for the external plant noise rating level ($L_{A,Tf}$) to be no greater than 5 dB below the background level (L_{A90}).

Figure 1: Planning Condition 17 external plant noise emission criteria at the noise sensitive receptors identified in the project Environmental Statement



4. External plant noise modelling

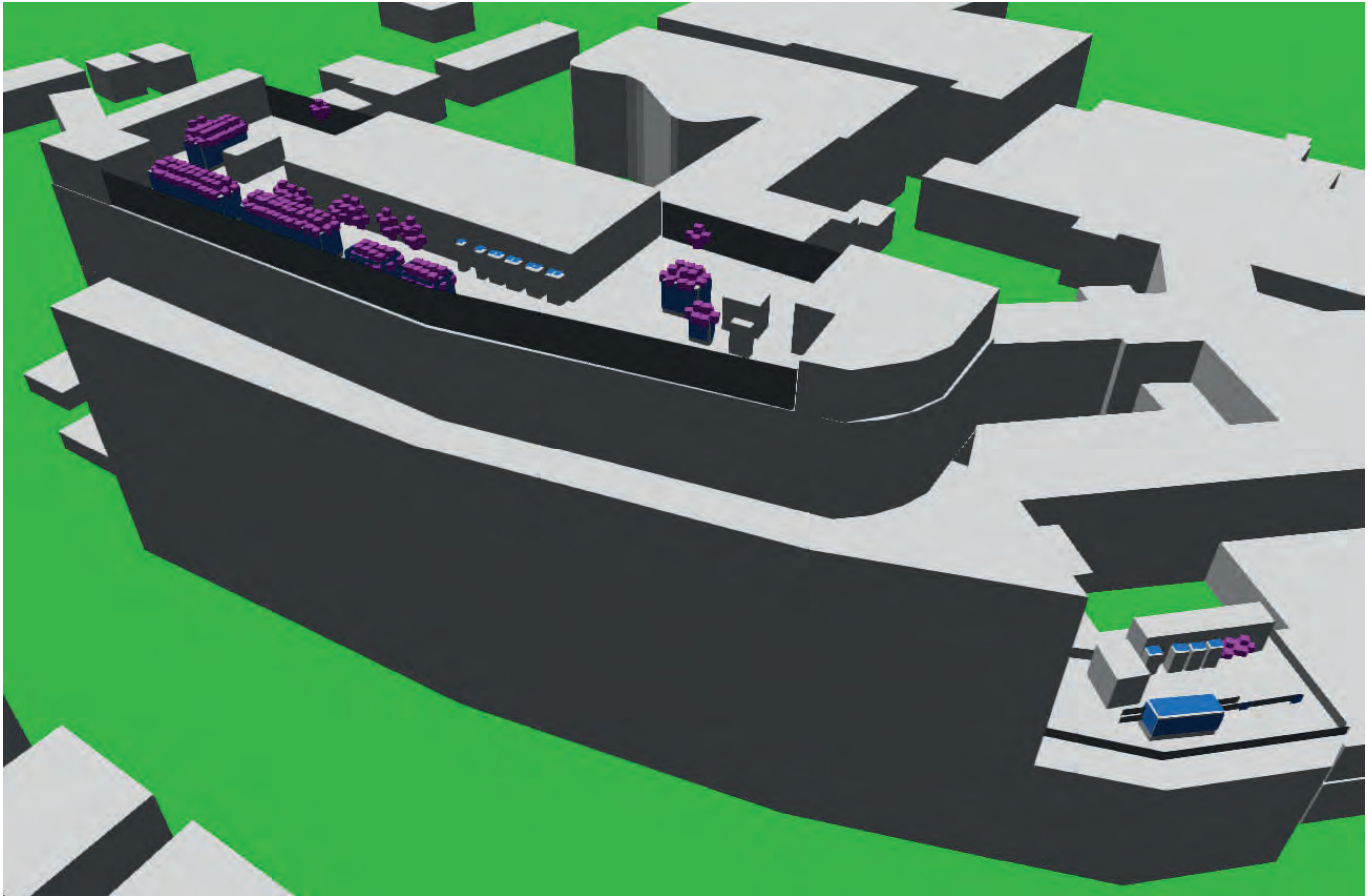
External plant noise egress resulting from the operation of proposed externally mounted plant, equipment and servicing has been predicted using CadnaA environmental noise modelling software.

CadnaA is an internationally recognised software package for calculation and assessment of environmental noise resulting from industrial and traffic sources. From input of calibrated noise sources, topographical data and building locations, a 3D model of an area can be produced. The propagation of noise from user defined sources can then be evaluated, taking into account height data and building locations. Noise levels at specific locations (such as a particular building façade) can then be calculated. The standard outdoor noise propagation model used in the CadnaA program is in accordance with ISO 9613 Parts 1 & 2: 1996 'Attenuation of sound during propagation outdoors'.

Key design information, building service equipment selections and assumptions used to inform the model are appended to this correspondence.

A screenshot from the model is presented in Figure 2.

Figure 2: Screenshot from CadnaA environmental noise model (pink crosses and blue areas identify modelled plant locations)



5. Modelling results

Figure 3 presents a further screen shot of the CadnaA model indicating the predicted noise levels at the facades of the nearest noise sensitive receptors, resulting from the operation of proposed externally mounted plant, equipment and servicing. It can be seen from Figure 3 that the noise levels are predicted to achieve the external noise level criteria presented in Section 3.

Our review therefore indicates that the proposed building service design strategy, in relation to externally mounted plant, equipment, servicing and associated noise attenuation measures, is capable of complying with the noise emission limits specified in Planning Condition 17.

Figure 3: CadnaA model screen shot indicating the predicted plant noise levels ($L_{A,Tr}$ dB) at the facades of the nearest noise sensitive receptors



6. Summary

- The purpose of this review is to determine if the proposed building service design strategy, in relation to externally mounted plant, equipment, servicing and associated noise attenuation measures, is capable of complying with the noise emission limits specified in Planning Condition 17.
- In order to determine the applicable external plant noise emission criteria to enable compliance with Planning Condition 17, the baseline external noise survey information documented in Volume 3 Appendix 8.1 of the project Environmental Statement has been referenced.
- External plant noise egress resulting from the operation of proposed externally mounted plant, equipment and servicing, inclusive of proposed noise attenuation measures, has been predicted using CadnaA environmental noise modelling software. Key design information, building service equipment selections and assumptions used to inform the CadnaA model are appended to this correspondence.
- Our review indicates that the proposed building service design strategy, in relation to externally mounted plant, equipment, servicing and associated noise attenuation measures, is capable of complying with the noise emission limits specified in Planning Condition 17.

Please do not hesitate to contact us should you have any queries.

Yours sincerely
for BDP Acoustics



Joseph Hardy
Acoustic Associate
joseph.hardy@bdp.com

Glossary of acoustic terms

A-Weighting

Normal hearing covers the frequency range from approximately 20Hz to 20kHz but sensitivity is greatest between about 500Hz and 8kHz. The “A-Weighting” is an electronic filters network incorporated in sound level meters which approximately corresponds to the frequency response of the ear. The unit of measurement of A-weighted sound level is dBA or dB(A).

Equivalent Continuous Sound Level L_{eq} or L_{Aeq}

The continuous equivalent sound level, L_{Aeq} is a notional sound level. It is the sound level, which, if maintained for a given length of time, would produce the same acoustic energy as a fluctuating noise over the same time period. (The formula for the above is implemented electronically in all good sound level meters and it is customary to measure rather than calculate the equivalent continuous sound level.) L_{Aeq} (A-weighted L_{eq}) is widely used to measure any environmental noise which varies considerably with time.

Rating Level, $L_{Ar,Tr}$

The specific sound level plus any adjustment for the characteristic features of the sound, as described in BS 4142:2019.

Reference time interval, T_r

Specified interval over which the specific sound level is determined.

Note: This is 1h during the day from 07:00h to 23:00h and a shorter period of 15 min at night from 23:00 to 07:00h.

Specific sound level, $L_s=L_{Aeq,Tr}$

Equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location over a given referenced time interval.

Statistical Level L_{90} or L_{A90}

Sound pressure level that is exceeded for 90% of the measurement time. Consequently it is indicative of the general background noise level in the absence of any higher level short duration events that occur during the period.

Further details of assessment referenced information and assumptions

Externally mounted plant, equipment, servicing assessed

The following externally mounted plant (including atmospheric terminations), equipment and servicing has been assessed, due to being identified as a contributing source of external noise egress:

- Chillers
- VRF and DX units
- Heat pumps
- Condensers
- Strobic fans
- AHU 1 to 18
- Extract Fan 04
- Toilet Extract Fan 01

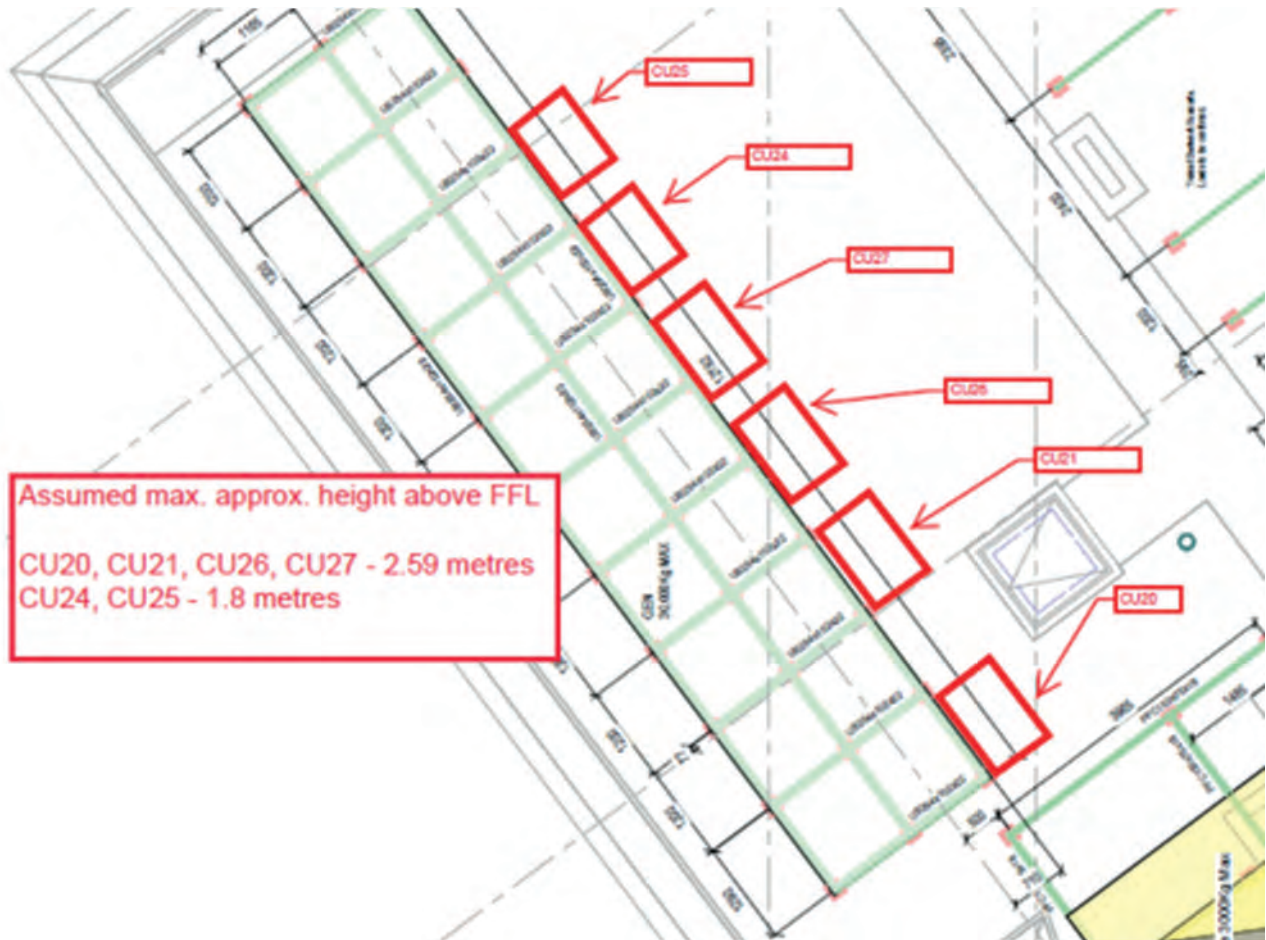
Modelling assumptions

Our external plant noise emission model is based on the assumptions and information presented in the following subsections.

Plant layout information referenced

- With exception of the third floor roof top VRF units, plant layouts and atmospheric terminations have been based on the locations presented in the appended layout drawings.
- IHP have advised that third floor roof top VRF unit layout drawings have yet to be finalised. We have therefore assumed the third floor roof top VRF units will be located in the position indicated in Figure 4. This assumption has been discussed with the project contractor (IHP).

Figure 4: Assumed location of third floor roof top VRV units



Plant noise data referenced

- We have referenced the plant noise data and attenuator insertion loss data presented in the appended data sheets.
- The project building service contractor (Imtech) have confirmed that extract fan EF04 will include room side and atmospheric side attenuators that achieve the same insertion loss performance as project attenuator reference ATT/069.
- With referenced to the referenced strobic fan noised data, we have only deducted the quoted insertion losses for the nozzle silencer from the quoted strobic fan sound power level, in order that we could assume that the additional outlet silencers are not present and therefore the strobic fan heights will be 4.226 metres (as quoted in the strobic fan drawings included in 'RDD – Strobic Fan Technical Submission 6th May 2021').
- The strobic fan noise data only quotes outlet data. We have assumed that any noise from the casing or bypass inlets are 10 dBA or lower than the outlet data and this is why only outlet data is provided. Directivity information for the outlet noise break-out propagation has not been provided so we have modelled the outlet noise break-out as a point source; this could be a conservative assumption if the majority of the outlet noise propagates upwards.

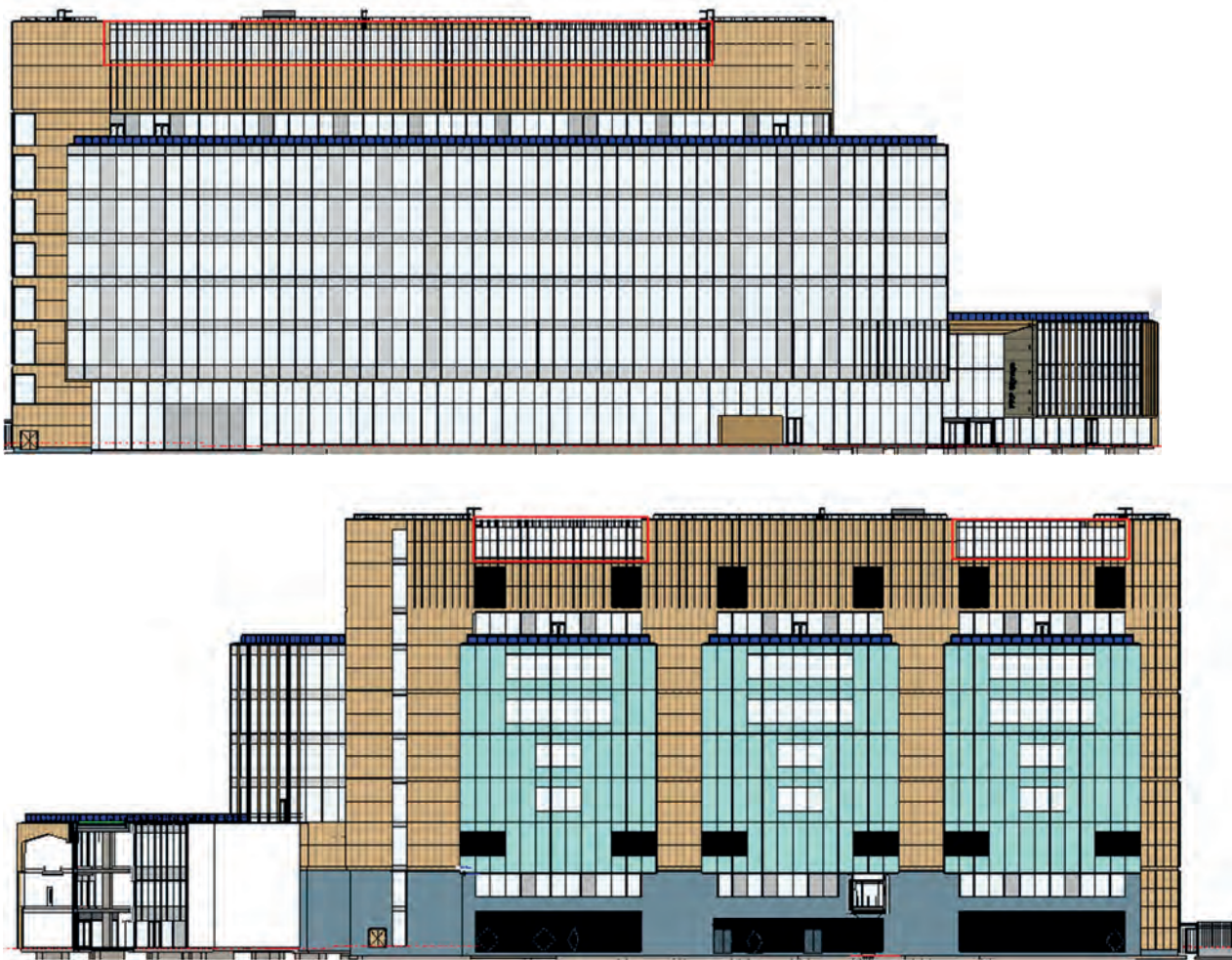
Plant operation assumptions

- We understand from discussions with the project building service engineers (Imtech) that the assessed roof top plant will operate at evening and night time periods, albeit some of the cooling plant will operate at lower duties at evening and night time periods. Other than Daikin RZAG units, the noise data provided does not include data for different operational duties, so we have assumed that the data provided is for the typical maximum or greater operational duty of the units.
- As advised by the project building service engineers, for the BRU strobic fan set, only two fans are assumed to be operational at any time period.
- As advised by the project building service engineers, for the general strobic fan, only one fan is assumed to be operational at any time period.
- As advised by the project building service engineers, we have assumed that only one of the two BRU chillers, HPC chillers and Process chillers will be operational at any time period.
- In relation to future plant equipment which may be installed, for example a further general strobic fan or other equipment associated with potential future fit-out of the proposed shell spaces, we have assumed that future design of this plant will include sufficient noise attenuation measures to prevent the cumulative noise from all project plant exceeding the plant noise emission criteria.

Acoustic screen assumptions

- As advised by the project architects (BDP) we have assumed acoustic screens will be located as indicated in the architectural model screenshots presented in Figure 5.
- As advised by the project build service engineers, we have assumed the acoustic screens will be a maximum of 1.122 metres lower than the top of the strobic fans and a minimum of 0.6 metres higher than the top of all other plant equipment referenced in this review.
- As advised by the project main contractor (IHP), we have assumed the 50 mm version of the SPS Acoustic Screen presented in the appended datasheet will form the acoustic screen, installed in accordance with the appended installation details. We have also assumed that the “acoustic skirt” referred to on the installation details is the Acoustic Curtain T100 referred to in the appended data sheet.

Figure 5: Screenshots of architectural model indicating acoustic screen locations (outlined in red)



Strobic Air Corporation
A Cincinnati Fan Company
140 W Orvilla Rd.
Lansdale, PA 19446
Phone: (215) 723-4700 | Fax: (215) 723-7401
www.choosetrystack.com | www.strobicair.com

Project: PRP - Fan Reference: PEF-01 Mar2021
Fans: 2 (operating) / 1 (redundant)

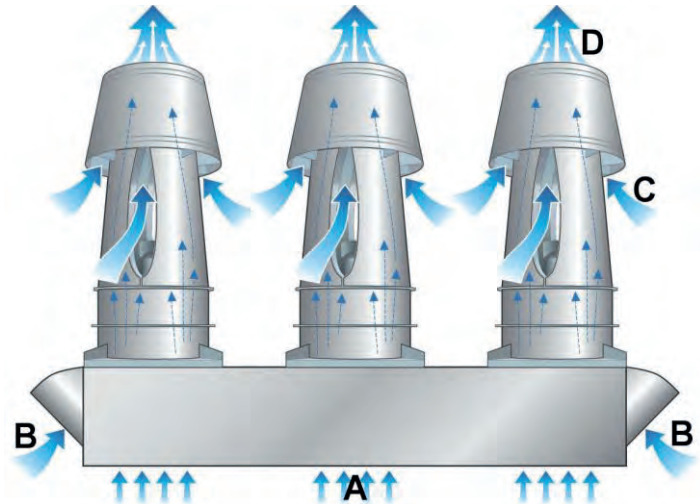
Tri-Stack™

A: Inlet Flow
15.42 m³/s

B: Bypass Flow
0.218 m³/s

C: Entrained Flow
6.256 m³/s

D: Total System Flow
21.894 m³/s



Operating Conditions

Inlet Static Pressure: 660 Pa
Inlet Air Temperature: 21 deg C
Inlet Air Density: 1.201 kg/m³

Inlet Flow per Fan: 7.71 m³/s
Ambient Air Temp.: 21 deg C
Ambient Air Dens: 1.201 kg/m³

Inlet Flow Total: 15.42 m³/s
Altitude at Site: 0 m
Operating Frequency: 44 Hz

Fan Performance Data - (single fan)

Fan Model: TS2L220C15M

Fan Flow Rate: 7.819 m³/s
Total Flow: 10.947 m³/s
Operating Speed: 1298 rpm
Dilution Ratio: 142 %

Nozzle Velocity: 30 m/s
Wind Band Area: 0.9 sq. m
Min. Motor Hp: 22 kW
Corrected BHP: 13.02 kW

Effective Stack Height:
16 kph Wind: 20 m
24 kph Wind: 15 m

Altitude and Temperature Corrections

Mixed Air Density:
1.201 kg/m³

Mixed Air Temperature:
21 deg C

Corrected Static Pressure:
660 Pa

Comments

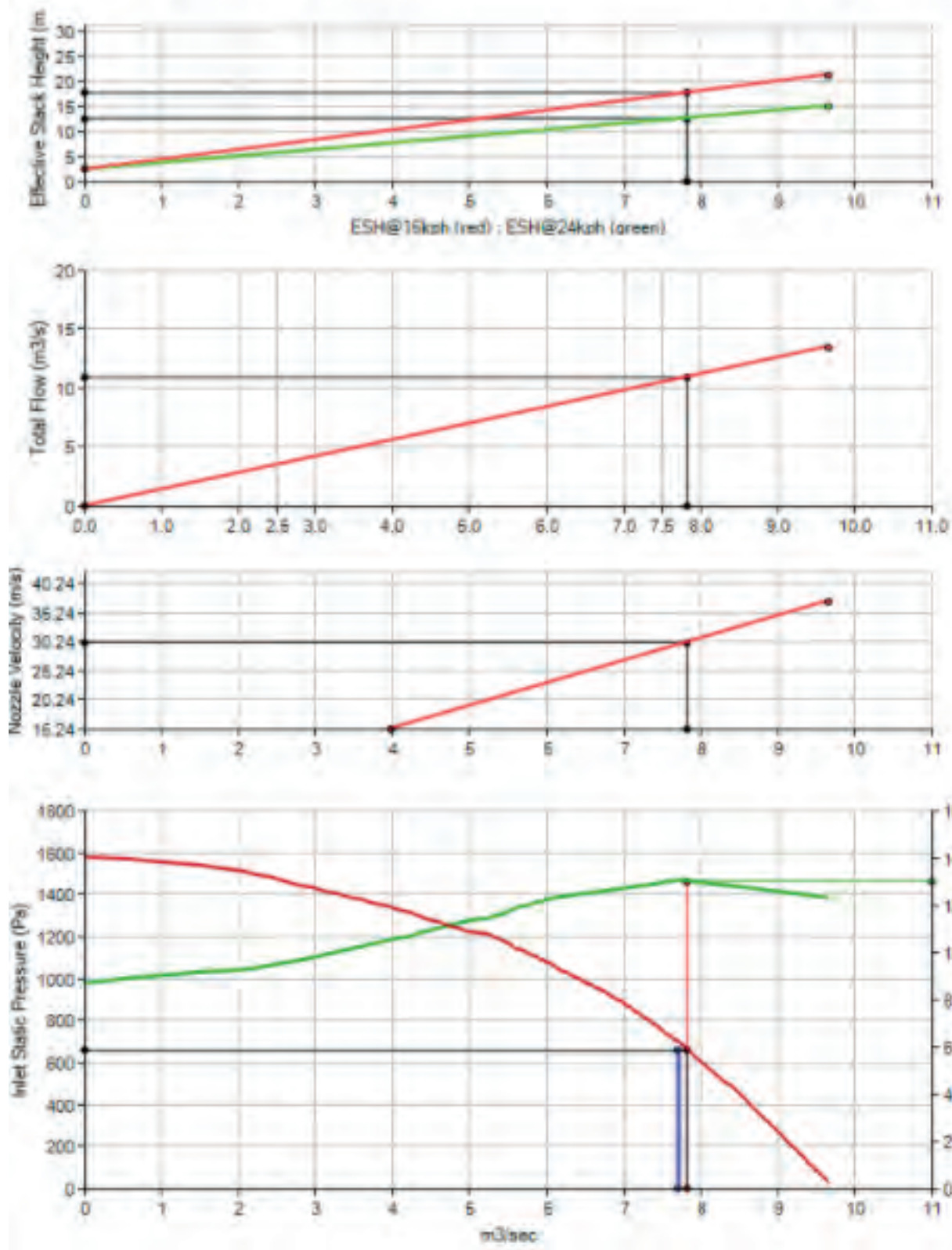
1. Number of fans running does not include redundant fan.
2. Inlet static pressure had been derated for discharge nozzle, windband, airfoil isolation damper, and outlet silencer
3. Inlet static pressure had been derated for system effects through the mixing box, based on the factory-recommended duct configurations.
4. Consult factory for additional derations when duct configurations do not meet factory guidelines.
5. Add an additional 37 pa. static pressure for gravity isolation dampers (usable on single fan mixing boxes only).
6. Effective stack height from roof line is given for fan without a mixing box, mounted on a .5 m high curb.
7. Stack height calculated using Briggs equation, per ASHRAE Fundamentals (1997).



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Fan Model: TS2L220C15M
Reference: PEF-01 Mar2021

Speed: 1298 RPM
Mixed Air Density: 1.201 kg/m³



Inlet Static Pressure has been Derated for Discharge Nozzle, Windband, Airfoil Isolation Damper, and Outlet Silencer, as well as System Effects Based on Factory-Recommended Duct Configurations. Add an additional 37 pa. for Gravity Isolation Dampers (On Single Fan Plenums Only).
Consult Factory for Additional Deration for Duct Configurations that do not meet Factory Guidelines.
Effective Stack Height at Stated Wind Speed from Roof Line for Fan w/o Mixing Box, mounted on a .5 m high curb. Add height of mixing box.

Fan Outlet Sound Data For Fan Model TS2L220C15M.
Number of Fans Running: 2 - Silencer Nozzle, Plus 2 x 1.3m Outlet Silencer, at 44Hz

Frequency	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
Outlet Sound Power Levels	88	93	91	89	87	83	76	69
Corrections for 2 Fans Running	3	3	3	3	3	3	3	3
Dynamic Insertion Loss for nozzle silencer	0	-4	-9	-11	-12	-13	-9	-4
Dynamic Insertion Loss for outlet silencer	-4	-4	-4	-4	-4	-4	-4	-4
Attenuations - Additional Outlet Silencer	--4	--4	--4	--4	--4	--4	--4	--4
Corrected Outlet Sound Power Levels	83	84	77	73	70	65	62	60

Corrections for 3 m Distance	-17	-17	-17	-17	-17	-17	-17	-17
Sound Levels (3 m)	66	67	60	56	53	48	45	43
'A' Scale Corrections	-26	-16	-9	-3	0	1	1	-1
dB'A' Spectrum (3 m)	40	51	51	53	53	49	46	42

Net Sound Level at 3 m: 59dB'A' (at 50Hz) / 56dB'A' (at 44Hz)

Frequency	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
Outlet Sound Power Levels	88	93	91	89	87	83	76	69
Corrections for 2 Fans Running	3	3	3	3	3	3	3	3
Dynamic Insertion Loss for nozzle silencer	0	-4	-9	-11	-12	-13	-9	-4
Dynamic Insertion Loss for outlet silencer	-4	-4	-4	-4	-4	-4	-4	-4
Attenuations - Additional Outlet Silencer	--4	--4	--4	--4	--4	--4	--4	--4
Corrected Outlet Sound Power Levels	83	84	77	73	70	65	62	60

Corrections for 15 m Distance	-31	-31	-31	-31	-31	-31	-31	-31
Sound Levels (15 m)	52	53	46	42	39	34	31	29
'A' Scale Corrections	-26	-16	-9	-3	0	1	1	-1
dB'A' Spectrum (15 m)	26	37	37	39	39	35	32	28

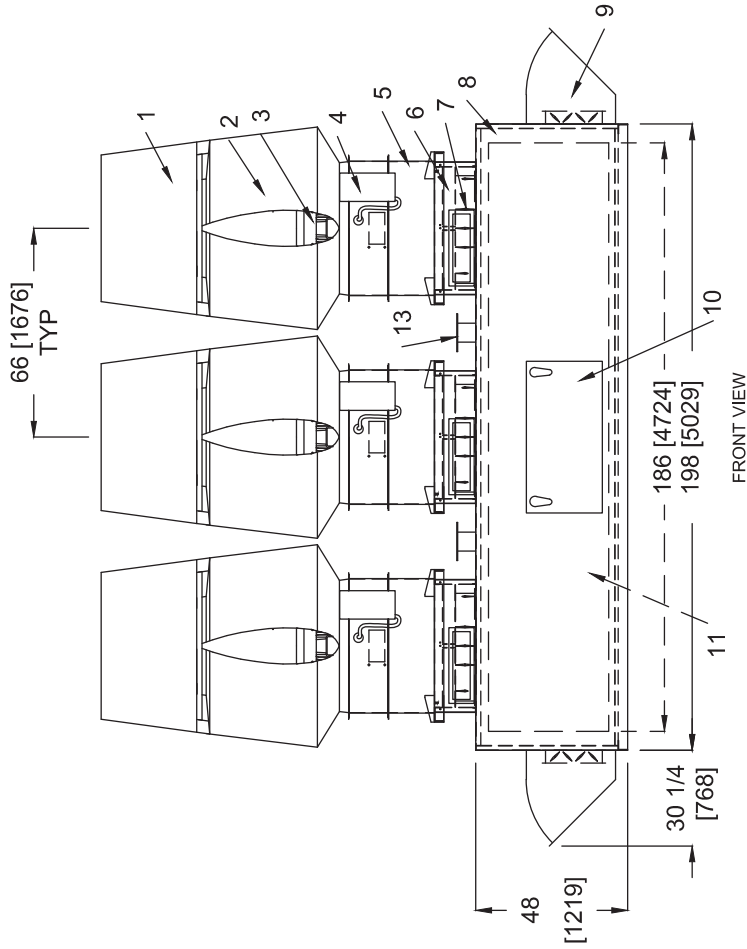
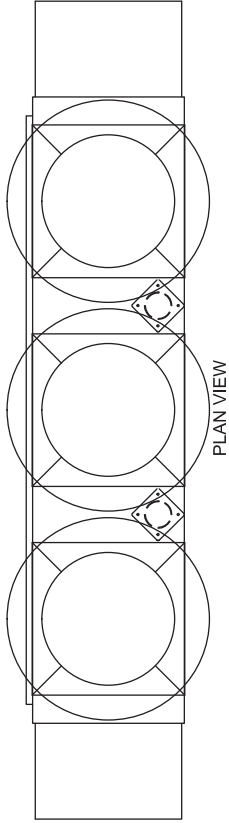
Net Sound Level at 15 m: 45dB'A' (at 50Hz) / 42dB'A' (at 44Hz)

Not all inline and silencer nozzle combinations have been tested in conjunction with each other for sound performance. The results of the additional attenuation of both sets of silencers in this arrangement is conservatively estimated based off of similar applications. Please contact Strobic Air for additional information regarding sound values.

Last revised date October, 2015

REVISION

LTR.	DESCRIPTION	DATE	APPROVED
A	PLENUM 42"H (OLD36"H)	2/3/04	ECA
B	NOTE "D" ADDED	7/2/04	ECA
C	PLENUM DIMS CHANGED	3/2/04	KHM
D	REVISED DAMPER BOX LOCATION	7/16/12	JCN
E	CHANGED TOTAL WEIGHT	2/26/15	ARM



NOTES:

1. ACOUSTICAL WINDBAND•• (TYP-3)
2. TRI-STACK (TM) SILENCER NOZZLE (TYP-3)
3. MOTOR (TYP-3)
4. DISCONNECT SWITCH (TYP-3)
5. FAN HOUSING (TYP-3)
6. VORTEX BREAKER (TYP-3) (OPTIONAL)
7. ISOLATION DAMPER (TYP-3)
8. DOUBLE-WALLED MIXING PLENUM
9. BYPASS DAMPER WITH RAINHOOD (TYP-2)
10. ACCESS DOOR
11. 186"L X 38"H DUCT OPENING
12. ISOLATION DAMPER ACTUATOR (TYP-3)
13. JIB CRANE SOCKET (OPTIONAL)

TOTAL WEIGHT: 7,482 LBS. [3,394 KG]

DIMENSIONS GIVEN IN INCHES [MILLIMETERS]

NOTE: BECAUSE WE ARE CONSTANTLY STRIVING TO IMPROVE OUR PRODUCTS, WE RESERVE THE RIGHT TO PROVIDE VERSIONS OF THESE PRODUCTS WITH SLIGHT VARIATIONS FROM THOSE ILLUSTRATED HERE.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE = .XX" = XXX=	CONTRACT NO.		(3) TS-2 FANS SIDE INLET W/ SILENCER NOZZLE				
	APPROVALS	DATE	STROBIC AIR® CORPORATION 700 EMLEN WAY TELFORD, PA. 18969				
	DRAWN	E.C.A.					6/17/03
	CHECKED						
	MATERIAL	LAYOUT		SIZE	CODE IDENT. NO.	DRAWING NO.	
FINISH	U.S. PATENT NO. 6,431,974		B	TS2__3__SL__SN	061703E-6 REV.D		
	U.S. PATENT NO. 6,112,850						
	U.S. PATENT NO. 4,806,706						
	CANADIAN PATENT NO. 1,277,171						
			SCALE: N.T.S.		SHEET 1 OF 1		

- ADDITIONAL NOTES:
- A 3" FLANGE IS ADDED TO THE PERIMETER BASE OF THE PLENUM FOR MOUNTING TO A STRUCTURAL BASE (CONCRETE CURB, STRUCTURAL STEEL, ETC.)
 - STROBIC AIR•• RECOMMENDS THAT DUCT INLET CONDITIONS FOLLOW SMACNA GUIDELINES TO MINIMIZE SYSTEM EFFECT.
 - WEIGHT CALCULATED USING FAN MODEL TS2L150C12. ACTUAL WEIGHTS MAY VARY FROM THIS VALUE.
 - 3/4" COARSE THREAD COUNTERSUNK HOLES PROVIDED FOR LIFTING EYES (SUPPLIED BY OTHERS) TO LIFT PLENUM IN ACCORDANCE WITH STANDARD RIGGING PROCEDURES.

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Project: PRP - Fan Reference: PEF-02. Mar2021
Fans: 1 (operating) / 1 (redundant)

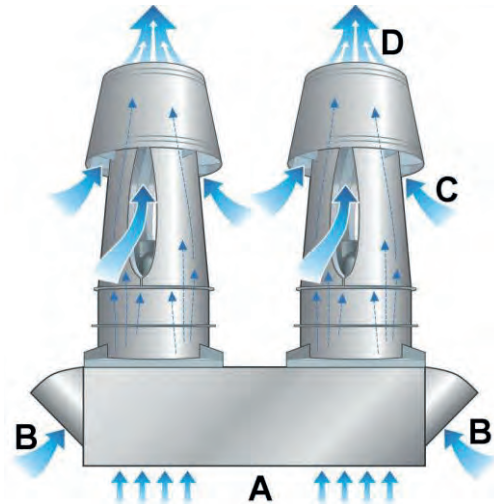
Tri-Stack™

A: Inlet Flow
6.99 m³/s

B: Bypass Flow
0.227 m³/s

C: Entrained Flow
2.887 m³/s

D: Total System Flow
10.104 m³/s



Operating Conditions

Inlet Static Pressure: 590 Pa
Inlet Air Temperature: 21 deg C
Inlet Air Density: 1.201 kg/m³

Inlet Flow per Fan: 6.99 m³/s
Ambient Air Temp.: 21 deg C
Ambient Air Dens: 1.201 kg/m³

Inlet Flow Total: 6.99 m³/s
Altitude at Site: 0 m
Operating Frequency: 41 Hz

Fan Performance Data - (single fan)

Fan Model: TS2L220C15M

Fan Flow Rate: 7.217 m³/s
Total Flow: 10.104 m³/s
Operating Speed: 1210 rpm
Dilution Ratio: 145 %

Nozzle Velocity: 28 m/s
Wind Band Area: 0.9 sq. m
Min. Motor Hp: 22 kW
Corrected BHP: 10.54 kW

Effective Stack Height:
16 kph Wind: 19 m
24 kph Wind: 14 m

Altitude and Temperature Corrections

Mixed Air Density:
1.201 kg/m³

Mixed Air Temperature:
21 deg C

Corrected Static Pressure:
590 Pa

Comments

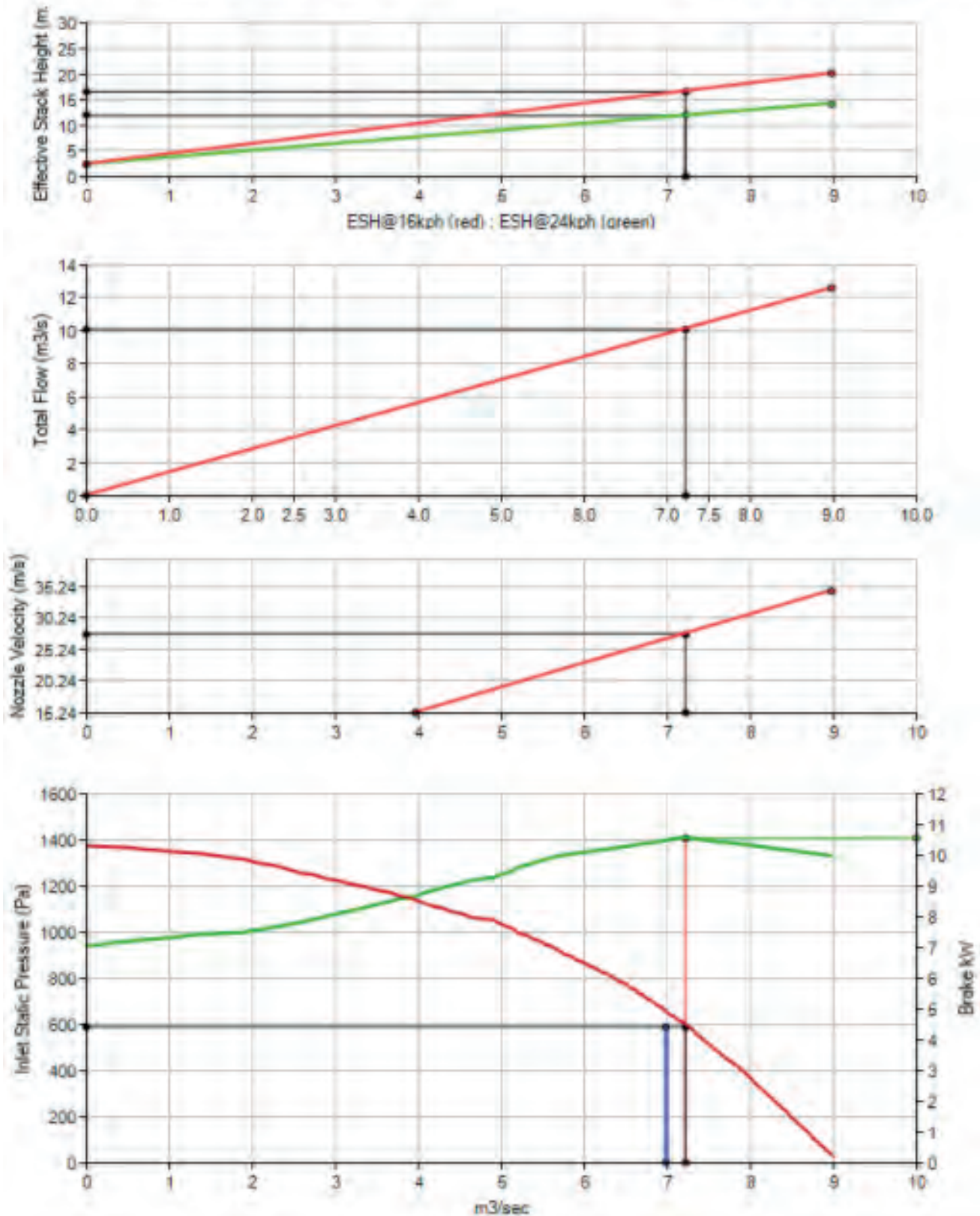
1. Number of fans running does not include redundant fan.
2. Inlet static pressure had been derated for discharge nozzle, windband, airfoil isolation damper, and outlet silencer
3. Inlet static pressure had been derated for system effects through the mixing box, based on the factory-recommended duct configurations.
4. Consult factory for additional derations when duct configurations do not meet factory guidelines.
5. Add an additional 37 pa. static pressure for gravity isolation dampers (usable on single fan mixing boxes only).
6. Effective stack height from roof line is given for fan without a mixing box, mounted on a .5 m high curb.
7. Stack height calculated using Briggs equation, per ASHRAE Fundamentals (1997).



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Fan Model: TS2L220C15M
Reference: PEF-02, Mar2021

Speed: 1210 RPM
Mixed Air Density: 1.201 kg/m³



Inlet Static Pressure has been Derated for Discharge Nozzle, Windband, Airfoil Isolation Damper, and Outlet Silencer, as well as System Effects Based on Factory-Recommended Duct Configurations. Add an additional 37 pa. for Gravity Isolation Dampers (On Single Fan Plenums Only).
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Effective Stack Height at Stated Wind Speed from Roof Line for Fan w/o Mixing Box, mounted on a .5 m high curb. Add height of mixing box.

Fan Outlet Sound Data For Fan Model TS2L220C15M.
Number of Fans Running: 1 - Silencer Nozzle, Plus 2 x 1.3m Outlet Silencer, at 41Hz

Frequency	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
Outlet Sound Power Levels	88	93	91	89	87	83	76	69
Dynamic Insertion Loss for nozzle silencer	0	-4	-9	-11	-12	-13	-9	-4
Dynamic Insertion Loss for outlet silencer	-4	-4	-4	-4	-4	-4	-4	-4
Attenuations - Additional Outlet Silencer	--4	--4	--4	--4	--4	--4	--4	--4
Corrected Outlet Sound Power Levels	80	81	74	70	67	62	59	57

Corrections for 3 m Distance	-17	-17	-17	-17	-17	-17	-17	-17
Sound Levels (3 m)	63	64	57	53	50	45	42	40
'A' Scale Corrections	-26	-16	-9	-3	0	1	1	-1
dB'A' Spectrum (3 m)	37	48	48	50	50	46	43	39

Net Sound Level at 3 m: 56dB'A' (at 50Hz) / 52dB'A' (at 41Hz)

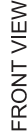
Frequency	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
Outlet Sound Power Levels	88	93	91	89	87	83	76	69
Dynamic Insertion Loss for nozzle silencer	0	-4	-9	-11	-12	-13	-9	-4
Dynamic Insertion Loss for outlet silencer	-4	-4	-4	-4	-4	-4	-4	-4
Attenuations - Additional Outlet Silencer	--4	--4	--4	--4	--4	--4	--4	--4
Corrected Outlet Sound Power Levels	80	81	74	70	67	62	59	57

Corrections for 15 m Distance	-31	-31	-31	-31	-31	-31	-31	-31
Sound Levels (15 m)	49	50	43	39	36	31	28	26
'A' Scale Corrections	-26	-16	-9	-3	0	1	1	-1
dB'A' Spectrum (15 m)	23	34	34	36	36	32	29	25

Net Sound Level at 15 m: 42dB'A' (at 50Hz) / 38dB'A' (at 41Hz)

Not all inline and silencer nozzle combinations have been tested in conjunction with each other for sound performance. The results of the additional attenuation of both sets of silencers in this arrangement is conservatively estimated based off of similar applications. Please contact Strobic Air for additional information regarding sound values.

Last revised date October, 2015



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- TOTAL WEIGHT: 5,088 LBS. [2,308 KG]

NOTE: BECAUSE WE ARE CONSTANTLY STRIVING TO IMPROVE OUR PRODUCTS, WE RESERVE THE RIGHT TO PROVIDE VERSIONS OF THESE PRODUCTS WITH SLIGHT VARIATIONS FROM THOSE ILLUSTRATED HERE.

ADDITIONAL NOTES:

A) A 3" FLANGE IS ADDED TO THE PERIMETER BASE OF THE PLENUM FOR MOUNTING TO A STRUCTURAL BASE (CONCRETE CURB, STRUCTURAL STEEL, ETC.) .

B) STROBIC AIR• RECOMMENDS THAT DUCT INLET CONDITIONS FOLLOW SMACNA GUIDELINES TO MINIMIZE SYSTEM EFFECT.

C) WEIGHT CALCULATED USING FAN MODEL TS2150C/12. ACTUAL WEIGHTS MAY VARY FROM THIS VALUE.

D) 3/4" COARSE THREAD COUNTERSUNK HOLES PROVIDED FOR LIFTING EYES (SUPPLIED BY OTHERS) TO LIFT PLENUM IN ACCORDANCE WITH STANDARD RIGGING PROCEDURES.

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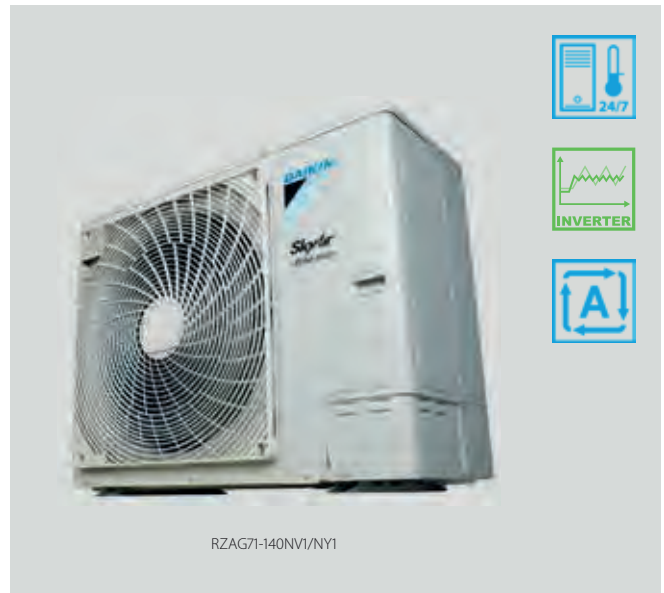
Sky Air Alpha-series

Industry leading technology in the most compact casing ever

- › **NEW** Unique, low-height single fan range
- › **NEW** Compact dimensions allow almost unnoticeable installation
- › **NEW** Market-leading serviceability and handling
- › The perfect balance in efficiency and comfort thanks to Variable Refrigerant Temperature: top seasonal efficiency throughout most of the year and quick reaction speed on the hottest days
- › Suits high sensible, infrastructure cooling applications
- › Replace existing systems with R-32 technology without needing to replace the piping



- › Guarantees operation in both heating and cooling mode down to -20°C
- › Refrigerant cooled PCB guarantees reliable cooling, as it is not influenced by ambient temperature.
- › Maximum piping length up to 85m
- › Outdoor units for pair, twin, triple, double twin application



RZAG71-140NV1/NY1

Combination table

Comfort cooling combination table

		FCAHG-H				FCAG-B				FFA-A9				FDA-A				FDXM-F9				FBA-A(9)				FHA-A(9)				FAA-A				FUA-A				FNA-A9				FVA-A										
capacity class		71	100	125	140	35	50	60	71	100	125	140	35	50	60	71	100	125	140	35	50	60	71	100	125	140	35	50	60	71	100	125	140	35	50	60	71	100	125	140												
RZAG71NV1	RZAG71NY1	P				2			P				2					2			2			P			2			P				2			P				2			P								
RZAG100NV1	RZAG100NY1		P			3	2			P			3	2				3	2		3	2		P			3	2			P				3	2			P				3	2		P						
RZAG125NV1	RZAG125NY1			P		4	3	2			P		4	3	2	P		4	3	2			4	3	2	P			4	3	2			P				4	3	2			P				4	3	2	P		
RZAG140NV1	RZAG140NY1	2			P	4	3	2			P		4	3	2			4	3	2			4	3	2		P		4	3	2			P	2		2			4	3	2			2			P				

P = pair application ; 2/3/4 = twin/triple/double twin application

Infrastructure cooling combination table



		FAA-A					FHA-A(9)					FBA-A(9)					FDXM-F9					FUA-A					FNA-A9					FVA-A					FFA-A9					FCAHG-H					FCAG-B				
capacity class		71	100	35	50	60	71	100	125	140	35	50	60	71	100	125	140	35	50	60	71	100	125	140	35	50	60	71	100	125	140	35	50	60	71	100	125	140	35	50	60	71	100	125	140						
RZAG71NV1	RZAG71NY1		P	3	2						3	2		P				3	2		P				2			P					3	2		P				3	2		P								
RZAG100NV1	RZAG100NY1	2		4	3		2			P	4	3		2			P	4	3		2			P	4	3		2					P	4	3		2			P				P							
RZAG125NV1	RZAG125NY1	2		4	3		2			P	4	3		2			P	4	3		2			P	4	3		2					P	4	3		2			P				P							
RZAG140NV1	RZAG140NY1	2		4	3		2			P	4	3		2			P	4	3		2			P	4	3		2					P	4	3		2			P				P							

P = pair application ; 2/3/4 = twin/triple/double twin application ; For more information on infrastructure cooling options refer to infrastructure cooling catalogue.

Specifications

RZAG-NV1 / NY1



RZAG-NV1



RZAG-NY1

Outdoor unit				RZAG	71NV1	100NV1	125NV1	140NV1	71NY1	100NY1	125NY1	140NY1
Dimensions	Unit	HeightxWidthxDepth		mm	870x1,100x460							
Weight	Unit			kg	81.4	84.5	95.5	95.5	81.4	84.5	95.5	95.5
Sound power level	Cooling			dBA	64	66	69	70	64	66	69	70
Sound pressure level	Cooling	Nom.		dBA	46	47	49	50	46	47	49	50
	Heating	Nom.		dBA	48	50	52		48	50	52	
Operation range	Cooling	Ambient	Min.~Max.	°CDB	-20~-52							
	Heating	Ambient	Min.~Max.	°CWB	-20~-18.0							
Refrigerant	Type/GWP				R-32/675							
	Charge			kg/TCO2Eq	3.20/2.16	3.20/2.16	3.70/2.50	3.70/2.50	3.20/2.16	3.20/2.16	3.70/2.50	3.70/2.50
Piping connections	Liquid/Gas	OD		mm	9.52/15.9							
	Piping	OU - IU	Max.	m	55	85			55	85		
	length	System	Equivalent	m	75	100			75	100		
			Chargeless	m	40							
	Additional refrigerant charge			kg/m	See installation manual							
	Level difference	IU - OU	Max.	m	30.0							
Power supply	Phase/Frequency/Voltage			Hz/V	1~/50/220-240				3~/50/380-415			
Current - 50Hz	Maximum fuse amps (MFA)			A	20	32			16			



PROJECT NAME:
DATE:
CUSTOMER NAME:

PATERSON PROJECT
08/06/2021
IMTECH ENGINEERING SERVICES LTD

PROJECT No:
SCHEDULE No:
ORDER No:

71820
12471820C1
PO05-64628

Item	System Reference	Code	Suffix	DWG	L1	L2/ID	W	H/Dia	Vol	PD	Wt	No. Off.	Performance, dB								
													63	125	250	500	1k	2k	4k	8k	
1	ATT/001 - AHU/01 INT	SP2045	G	A02G	1200		925	900	2.75	30	98	1	IL	6	11	20	32	43	34	30	18
3	ATT/003 - MVHR01 INT	PL	G	A13G	600	400			0.51	5	13	1	IL	2	3	6	15	19	14	13	10
4	ATT/004 - MVHR01 EXH	PL	G	A13G	600	400			0.51	5	13	1	IL	2	3	6	15	19	14	13	10
7	ATT/007 - AHU/02 INT	SP3045	G	A02G	1200		1000	925	3.11	30	117	1	IL	8	13	20	25	33	21	17	11
9	ATT/009 - AHU/03 INT	SP2045	G	A02G	1200		1300	1250	5.49	30	164	1	IL	6	11	20	32	43	34	30	18
11	ATT/011 - AHU/04 INT	SP2045	G	A02G	1200		1300	1250	5.49	30	164	1	IL	6	11	20	32	43	34	30	18
13	ATT/013 - AHU/05 INT	SP2045	G	A02G	1200		1300	1250	5.49	30	164	1	IL	6	11	20	32	43	34	30	18
15	ATT/019 - AHU/09 INT	SP2045	G	A02G	1200		1300	1150	4.61	25	155	1	IL	6	11	20	32	43	34	30	18
16	ATT/020 - AHU/09 EXH	SP2045	G	A02G	1200		1300	1150	4.5	25	155	1	IL	6	11	20	32	43	34	30	18
19	ATT/023 - AHU/06 INT	SP2045	G	A02G	1200		1175	1150	4.17	25	152	1	IL	6	11	20	32	43	34	30	18
20	ATT/024 - AHU/06 EXH	SP2043	G	A02G	1200		1150	1125	3.98	25	147	1	IL	6	12	20	33	47	37	32	19
23	ATT/027 - AHU/10 INT	SP3045	G	A02G	1500		1525	1475	6.7	25	271	1	IL	9	15	24	29	39	25	21	13
24	ATT/028 - AHU/10 EXH	SP3043	G	A02G	1200		1225	1250	4.61	25	191	1	IL	8	14	20	27	36	23	19	12
27	ATT/031 - AHU/07 INT	SP3043	G	A02G	1200		1225	1150	4.62	25	179	1	IL	8	14	20	27	36	23	19	12
28	ATT/032 - AHU/07 EXH	SP3040	G	A02G	900		1000	850	2.65	25	89	1	IL	7	11	17	22	30	21	17	11
31	ATT/035 - AHU/11 INT	SP2045	G	A02G	1200		1250	1150	4.45	25	154	1	IL	6	11	20	32	43	34	30	18
32	ATT/036 - AHU/11 EXH	SP2045	G	A02G	1200		1200	1150	4.25	25	152	1	IL	6	11	20	32	43	34	30	18
35	ATT/039 - AHU/08 INT	SP2040	G	A02G	900		850	850	2.24	25	75	1	IL	5	9	17	27	40	33	28	17
36	ATT/040 - AHU/08 EXH	SP2040	G	A02G	900		850	750	2.02	25	68	1	IL	5	9	17	27	40	33	28	17
39	ATT/045 - AHU/12 INT	SP3043	G	A02G	900		950	850	2.53	25	88	1	IL	7	10	16	21	28	19	15	10
40	ATT/046 - AHU/12 EXH	SP3045	G	A02G	900		1000	850	2.69	25	89	1	IL	6	10	16	20	27	17	13	9
43	ATT/049 - AHU/16 INT	SP3045	G	A02G	1500		1525	1450	6.17	25	268	1	IL	9	15	24	29	39	25	21	13
44	ATT/050 - AHU/16 EXH	SP3043	G	A02G	1200		1500	1225	5.62	25	196	1	IL	8	14	20	27	36	23	19	12
47	ATT/053 - AHU/14 INT	SP3043	G	A02G	1200		1500	1150	5.32	25	187	1	IL	8	14	20	27	36	23	19	12
48	ATT/054 - AHU/14 EXH	SP3045	G	A02G	1200		1475	1150	5.2	25	186	1	IL	8	13	20	25	33	21	17	11
51	ATT/057 - AHU/17 INT	SP3045	G	A02G	1200		1425	1375	6.22	25	210	1	IL	8	13	20	25	33	21	17	11
52	ATT/058 - AHU/17 EXH	SP3045	G	A02G	1200		1525	1150	5.27	25	188	1	IL	8	13	20	25	33	21	17	11
55	ATT/061 - AHU/15 INT	SP3043	G	A02G	1500		1475	1450	6.35	25	266	1	IL	10	16	24	31	41	28	24	14
56	ATT/062 - AHU/15 EXH	SP3043	G	A02G	1200		1400	1375	5.93	25	209	1	IL	8	14	20	27	36	23	19	12
59	ATT/065 - AHU/18 INT	SP2043	G	A02G	900		1150	800	2.75	25	95	1	IL	5	9	16	26	37	30	26	16
60	ATT/066 - AHU/18 EXH	SP2043	G	A02G	900		1150	675	2.48	25	85	1	IL	5	9	16	26	37	30	26	16
63	ATT/069 - TEF/01 EXH	SP3040	G	A02G	1200		900	625	1.74	30	89	1	IL	8	14	21	29	38	26	22	13

NOTES

LABEL WITH ITEM NO. & SYSTEM REF.



PROJECT NAME: PATERSON PROJECT
DATE: 08/06/2021
CUSTOMER NAME: IMTECH ENGINEERING SERVICES LTD

PROJECT No: 71820
SCHEDULE No: 12471820C1
ORDER No: PO05-64628

IL = INSERTION LOSS (dB)

G - SELF FINISH PRE-GALVANISED STEEL CONSTRUCTION.

Z - ATTENUATOR SUPPLIED IN MODULAR SECTIONS INDICATED. REFER TO DATA SHEET A09H & A20H.

SELECTIONS ARE BASED ON THE ARUP SCHEDULE NO. 263083 REV P01 DATED FEB-20.

* LOOSE ACOUSTIC SPLITTERS FOR FITTING INTO FIRE RATED CASINGS BY OTHERS

ATTENUATORS DELIVERED WITH POLYTHENE BLOCKED ENDS

Hardy, Joseph

Subject: FW: SDX Model Locations on Roof
Attachments: PRP-IES-Z01-09-DR-N-5110 IES VRF MARK UP (JG roof condensers markup).pdf;
PRP-IES-Z01-09-DR-N-5111 IES VRF MARK UP (JG roof condensers markup).pdf

From: Grice, Jonathan <Jonathan.Grice@vinciconstruction.co.uk>

Sent: 24 November 2021 18:12

To: Hardy, Joseph <joseph.hardy@bdp.com>

Subject: SDX Model Locations on Roof

Joe,

Find attached – hopefully these make sense against the key plan/ list of types:

1 x KDS266/2PAL050L3 1000mm x 400 x 1164 – 122kg - 40dba @10m
2 x KDS096/1PAL015M1 1000mm x 400 x 815 - 91kg - 32dba @10m
2 x KDS261/1PAL040L3 1000mm x 400 x 865 - 108kg - 39dba @10m
2 x KDS101/1PAL020M1 1000mm x 400 x 815 - 91kg - 32dba @10m
1 x KDS256/1PAL035L3 1000mm x 400 x 865 - 97kg - 39dba @10m
3 x KDS113/1PAL030M1 1000mm x 400 x 865 - 97kg - 39dba @10m

11no total.

If there were any issues with these, i.e a couple of noisier ones together. I'd suggest there's some opportunity to move around if needed but hopefully that's not the case.

Regards,
Jon

1. Leaves are shown for information only. Refer to the Architects documentation for the leave properties.
2. Linear gilles downstream of fan coil units to be provided with integral valve control.

[illegible][illegible]

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Manchester
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www.inteltronic

DATE: 12-12-2011	P0541002	AS	1:50	22.04.21	C01
Paterson Redevelopment Project Level 00 Ventilation Layout Sheet 1					
DATE: 12-12-2011	PRP-ES-201-00-DR-M-5701	AS	1:50	22.04.21	C01

2. Linear grilles downstream of fan coil units to be provided with additional louvers as required.

[illegible][illegible]

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PROJECT NAME	Paterson Redevelopment Project		
PROJECT NO.	P05-41002	DATE	A5
DESCRIPTION	Level 00 Ventilation Layout Sheet 2	SCALE	1:50
DATE		DATE	22.04.21
PROJECT NO.	RP-IES-201-00-DR-M-5702	DATE	C01

1. Leaves are shown for information only. Refer to the ArizTeads documentation for the leaves properties.
2. Linear styles downstream of linear units to be provided with

- LEGEND**
- Exhaust Air - General
- Return Air - General
- Fresh Air - General

Extend Air - Smoke	Extend Air - Toilet	Fan Coil Unit	Linear grille - Supply	Linear grille - Return	Dampers	Attenuator	Variable Air Volume Unit	Heater Battery	Attenuator	Heater Battery	Variable Air Volume Unit
Extend Air - Smoke	Extend Air - Toilet	Fan Coil Unit	Linear grille - Supply	Linear grille - Return	Dampers	Attenuator	Variable Air Volume Unit	Heater Battery	Attenuator	Heater Battery	Variable Air Volume Unit

[illegible]

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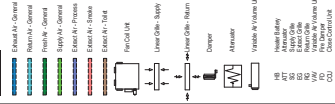


DATE: 12-12-2011	P0541002	AS	1:50	22.04.21	C01
Paterson Redevelopment Project Level 02 Ventilation Layout Sheet 1					
DATE: 12-12-2011	PRP-ES-2011-02-DR-M-5701	AS	1:50	22.04.21	C01

- 1 Louvers are shown for information only. Refer to the Architects documentation for the louvre properties.
- 2 Linear grilles downstream of fan coil units to be provided with

- ### LEGEND

LEGEND

[illegible]

Founded by:

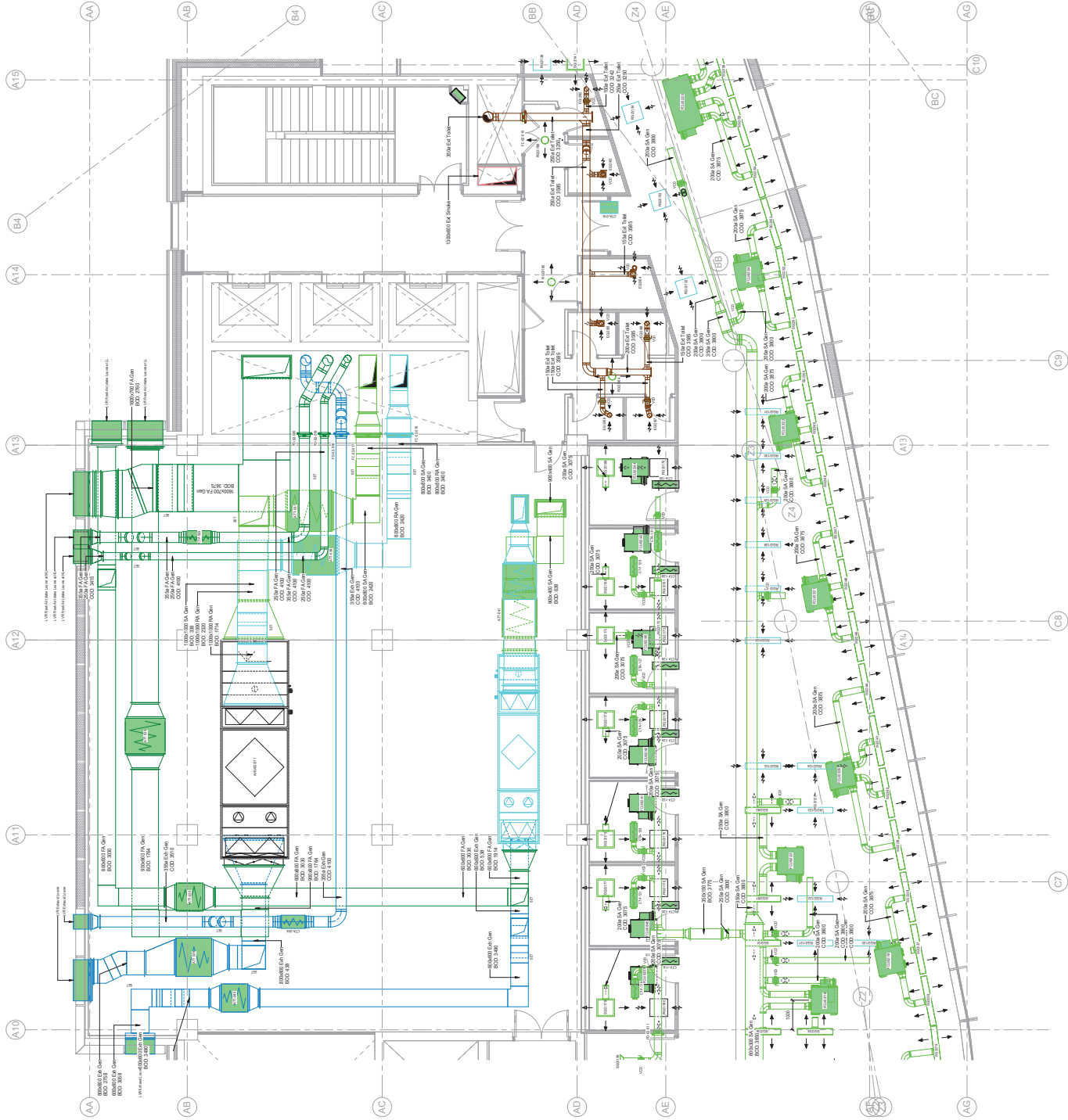


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T: 0161 661 999000

DATE: 12-12-2011	P0541002	AS	1:50	22.04.21	C01
Paterson Redevelopment Project Level 02 Ventilation Layout Sheet 2					
DATE: 12-12-2011	PRP-ES-2011-02-DR-M-5702				

- 1 Louvers are shown for information only. Refer to the Architectural documentation for the louvre properties.
- 2 Linear grilles downstream of fan coil units to be provided with infill panels, which are a credit.

- ### LEGEND

[illegible][illegible]

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[illegible]

Paterson Redevelopment Project

P0541002	A5
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Level 02

Ventilation Layout

Sheet 3 22.04.2

000 REC 301 02 00 M E702

2016-W-07-20107-CE-JN

1. Louvers are shown for information only. Refer to the Architects documentation for the louvers properties.
2. Linear grilles downstream of fan coil units to be provided with internal volume control.

- ### LEGEND

[illegible][illegible]

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DATE: 11/1/11	Patterson Redevelopment Project	DATE: 11/1/11	A5
P05-41002	Level 02 Ventilation Layout Sheet 4	DATE: 11/1/11	1:50
		DATE: 11/1/11	22.04.21
DATE: 11/1/11	PRP-ES-201.02-DR-M-5704	DATE: 11/1/11	C01

1. Louvers are shown for information only. Refer to the Architects' document set for the louvre properties.
2. Linear grilles downstream of fan coil units to be provided with

[illegible][illegible]

Project No. P-22	P0541002	AS	1:50	22.04.21	C01
Project Name	Level 03 Ventilation Layout Sheet 4	AS	1:50	22.04.21	C01

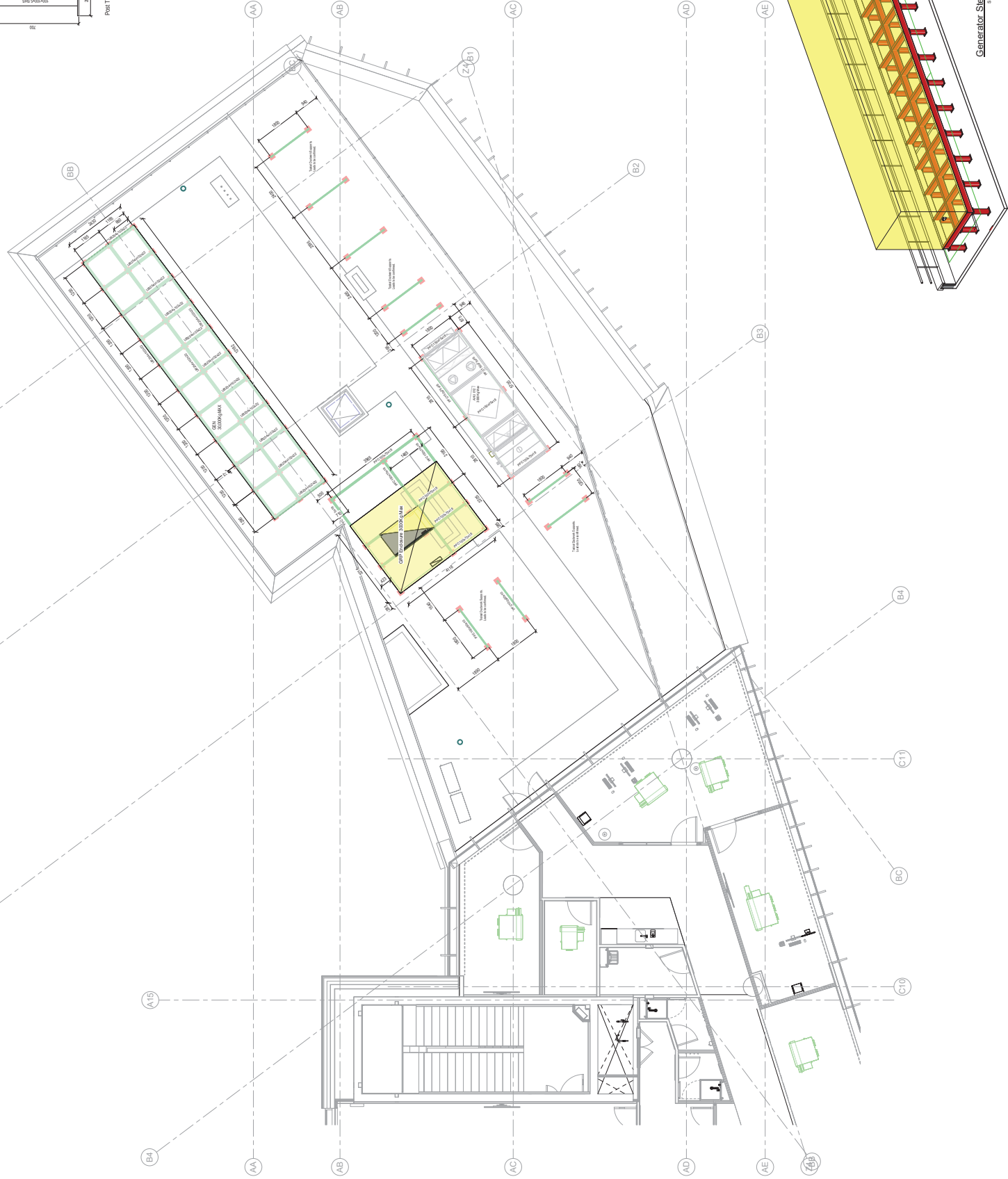
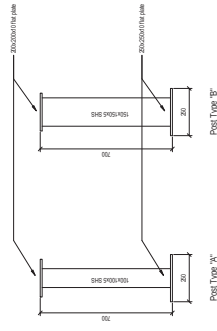
SOURCE REFERENCES

NOTES

- [illegible]

[illegible]

PROJECT	Paterson Redevelopment Project		
PROJECT NO.	P0541002	DATE	11-24
DESCRIPTION	Level 03 Roof Steelwork Layout Sheet 4	BY	S3
DATE		APPROVED BY	As indicated
		DATE	25/03/21
PROJECT NO.	PRP-JES-01-03-DR-N-5114	PROJECT NO.	P01



Generator Steelwork Details

- ## LEGEND

1. Louvers are shown for information only. Refer to the Architects documentation for the louvers expertise.
2. Linear grilles downstream of fan coil units to be provided with

- LEGEND**
- | | |
|--|--------------------------|
| | Exhaust Air - General |
| | Return Air - General |
| | Fresh Air - General |
| | Supply Air - General |
| | Exhaust Air - Process |
| | Exhaust Air - Storage |
| | Exhaust Air - Toilet |
| | Fan Coil Unit |
| | Linear Cable - Supply |
| | Linear Cable - Return |
| | Compressor |
| | Alternator |
| | Variable Air Volume Unit |
- US
ATT
BT
EG
VAV
FD
Per Cent

[illegible]

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P0541002	S3
Level 08 Ventilation Layout Sheet 2	1:50 22/04/21
PRP-IES-Z01.08-DR-M-5702	P01





1. Louvers are shown for information only. Refer to the Architects documentation for the louvre properties.
2. Linear gilles downstream of fan coil units to be provided with information on the gilles.

Exhaust Air - General
Return Air - General
Fresh Air - General
Supply Air - General
Exhaust Air - Shop
Exhaust Air - Total

Fan Coil Unit

Linear grille - Supply

Linear grille - Return

Damp

Attenuator

Variable Air Volume

Exhaust Air - General
Return Air - General
Supply Air - General
Exhaust Air - Shop
Exhaust Air - Total

[illegible]

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P05-41002	Level 09 Ventilation Layout Sheet 1	DATE 22.04.21	BY P01
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1. Louvers are shown for information only. Refer to the Architects documentation for the louvre properties.
2. Linear grilles downstems of fan coil units to be provided with individual controls.

The diagram illustrates the proposed system architecture. It consists of several interconnected components: Exhaust Air - General, Return Air - General, Fresh Air - General, Supply Air - General, Exhaust Air - Process, Exhaust Air - Stride, Exhaust Air - Toilet, Fan Coil Unit, Lower Galle - Supply, Lower Galle - Return, Compressor, Attenuator, Variable Air Volume Unit, Heat Recovery, Return Galle, Supply Galle, Return Galle, Variable Air Volume Unit, and Clean Control Unit. The components are connected in a loop, with arrows indicating the flow of air and energy.

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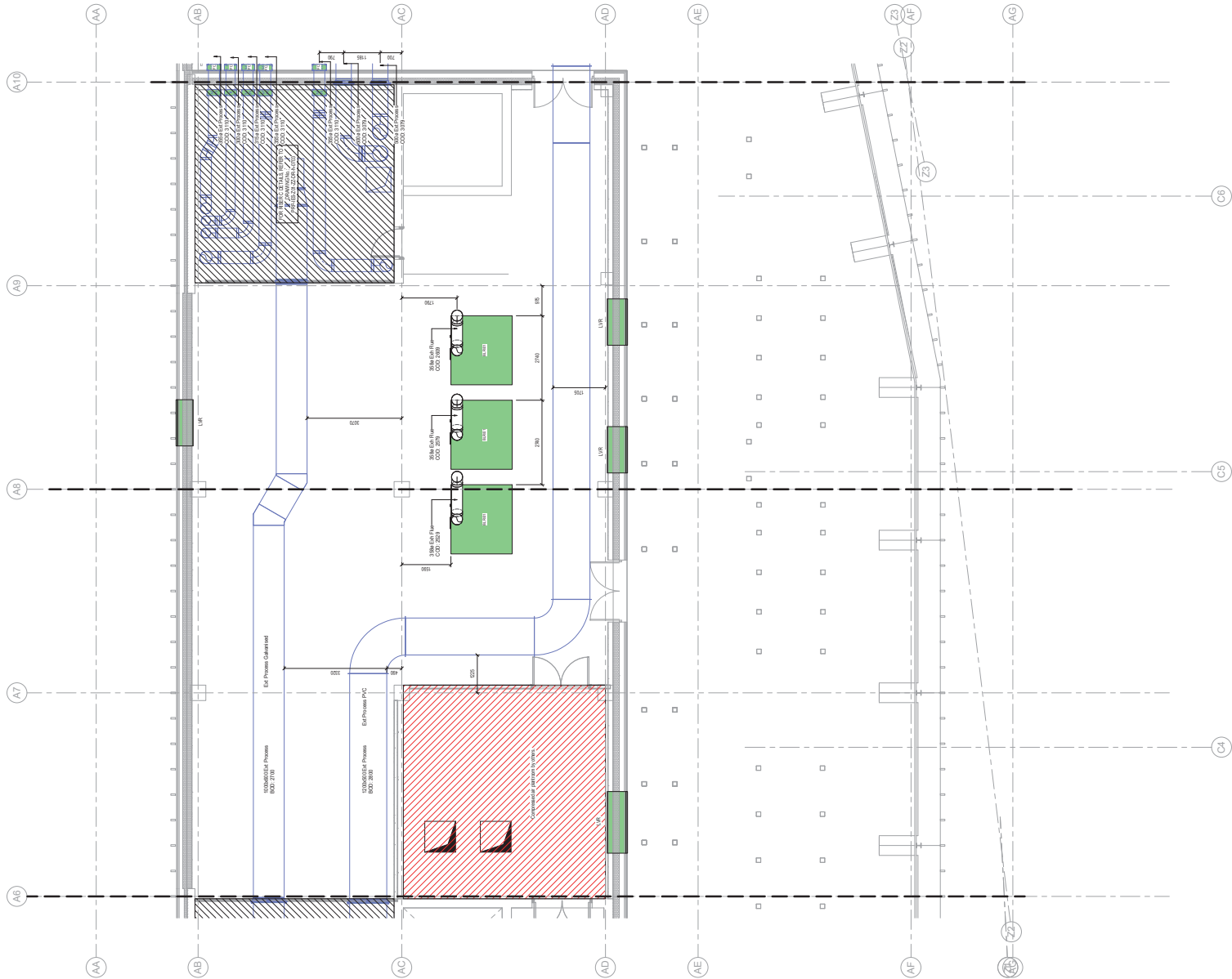
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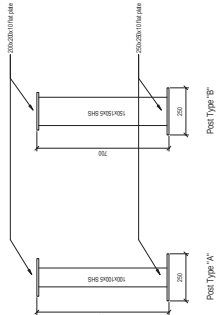


† This decision is intended for males, not females and will not be

Ref. No.	Author(s)	Year	Journal
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1. This drawing is intended for costing purposes only and shall not be used for manufacture or installation. Please refer to main contractor and steelwork specialist drawings for final details of any structural steelwork requirements.

[illegible]

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Christie Paterson Redevelopment

DX / VRV Technical Submission

9th November 2021

Compiled	Checked	Revision	Date	Notes
CB	AL	P02	09/11/21	Second Issue

Paterson Redevelopment Project

Equipment:	Ref:	Date:
DX / VRV	PRP-IES-Z01-ZZ-TS-M-0054	09/11/2021

Drawing Ref:	Specification Ref:
15 Series Heating & Cooling Drawings	PRP-ARUP-Z01-ZZ-SH-M-1203 & PRP-ARUP-Z01-ZZ-SH-M-1203 P03

The Information Enclosed Within This Technical Submission Is Issued for:				
Tender	Information	Comment	Procurement	Construction
☐	☒	☒	☒	☐

Issued to (where applicable):					
Main Contractor	BMS Specialist	Drawing Coordinator	O&M Technical Author	ARUP	Other.....
☒	☐	☐	☐	☒	☐

Information provided encompasses the following elements (where applicable)					
Building Work Requirements	Drainage Requirements	Electrical Requirements	Mechanical Requirements	BMS Requirements	Asset Register / Maintenance Required
☐	☐	☒	☒	☐	☒
Sample	Install Info	Co-ordination Info	O&M Info	Acoustic Info	Other.....
☐	☐	☒	☒	☐	☐

Technical Submission:

Introduction:

Skyline Selection Report Based on ARUP Specifications, Skyline have selected the specified Daikin DX Split Systems and VRV products and haven't offered an alternative. It should be noted that an HPC redesign instruction was received during compiling of this technical submission. Due to a number of design queries the CU26 & CU27 systems for the HPC area will be issued under a separate cover.

Proposed product list:

RYYQ-U (VRV IV Continuous Heating), FXAQ-A - Wall mounted unit, FXFQ-B - Round Flow Round flow cassette, FXHQ-A - Ceiling suspended unit, Refnet branch piping kit, Intelligent Touch Manager, BACnet Interface - integrated control system connecting VRV system with BMS system, Outdoor unit multi connection piping kit for 2 modules and Remote controllers (white).

Please provide your comments on the following proposals:

Please note that the use of N2XH Cable Externally is proposed only with the use of Armorduct containment with trunking lid for protection from UV.

Documents 'Enclosed':

Associated ARUP Schedules
Skyline Installation Specification
VRV Selection Report
Proposed N2XH Cable Product Sheet

Compliance/VE statement(s):

Add / delete as required

The equipment 'detailed' above is specification/ER's compliant and there are no cost (£nil) implications associated with this proposal.

Notes:

- Please be advised that in the absence of a response by the 'due date' stated below, it is our intention to proceed with the ordering/installation of the materials/equipment/systems in accordance with the enclosed technical details/quotation(s)/drawings/catalogue pages/sample(s).
- We believe that we have provided sufficient information for you to fully appraise our proposal(s), however, should you require anything further or would like to meet to discuss/review the enclosed details then please contact us.

Response required by:	23/11/2021	Raised By:	Charlie Barrett
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Response: (Please Feel Free To Mark Up Drawings With Any Comments)		
A) No Comments	B) Minor Comments, Proceed	C) Rejected
☐	☐	☐

Response Date:	Completed By:	Signed:

Response to ARUP Document Comment/Observation

ARUP Comment:

"All the Fan Coil Units appear to have an internal cooling temperature of 26°C, typically the freezer spaces are 24°C."

Skyline & Daikin Response:

The condition is the room return air onto the fan coil, which theoretically should be higher than the set point in cooling.

Basically if this is lowered for a particular fan coil, say from 26 °C to 24.5 °C on coil - then the available capacity of that fan coil reduces together with the available capacity at the outdoor, however, we see an increase in the indoor required as we have increased the DeltaT.

For example if all the freezer unit indoors (4 off) are set to 24.5 °C return air, the capacity of the indoor unit falls marginally - see example screen shots below

Indoors @ 26 °C Return

No results										
Name	FCU	Tmp C [°C]	Rq TC [kW]	Rv TC [kW]	Max TC [kW]	Rq SC [kW]	Max SC [kW]	T evap [°C]	T disch [°C]	
CU 14 MER 54-00-064/00-022	RYYQ24U	35.0						6.0		
CU 15 MER 54-00-064/00-022	RYYQ24U	35.0						6.0		
CU 16 South IT Hubs Level 1-7, North IT Hubs Level 1-7	RYYQ16U	35.0						6.0		
CU 17 South IT Hubs Level 1-7, North IT Hubs Level 1-7	RYYQ16U	35.0						6.0		
CU 18 South IT Hubs Level 1-7, North IT Hubs Level 1-7	RYYQ16U	35.0						6.0		
CU 19 South IT Hubs Level 1-7, North IT Hubs Level 1-7	RYYQ16U	35.0						6.0		
CU20 Freezer Room / Freezer Store	RYYQ16U	35.0						6.0		
CU21 Freezer Room / Freezer Store	RYYQ16U	35.0						6.0		
DXI21-01	FXHQ100A	26.0/50%	0.0	9.6	11.0	6.3	7.0	6.0	14.4	
DXI21-02	FXAQ63A	26.0/50%	0.0	6.1	7.0	4.6	5.0	6.0	12.7	
DXI21-03A	FXFQ100B	26.0/50%	0.0	10.2	11.0	7.1	7.5	6.0	12.9	
DXI21-03B	FXFQ100B	26.0/50%	0.0	10.2	11.0	7.1	7.5	6.0	12.9	

Total indoor required capacity 36.1kw, outdoor available capacity 41.4kw

Indoor loads@24.5°C

Name	FCU	Tmp C [°C]	Rq TC [kW]	Rv TC [kW]	Max TC [kW]	Rq SC [kW]	Max SC [kW]	T evap [°C]	T disch [°C]	
CU 14 MER 54-00-064/00-022	RYYQ24U	35.0						6.0		
CU 15 MER 54-00-064/00-022	RYYQ24U	35.0						6.0		
CU 16 South IT Hubs Level 1-7, North IT Hubs Level 1-7	RYYQ16U	35.0						6.0		
CU 17 South IT Hubs Level 1-7, North IT Hubs Level 1-7	RYYQ16U	35.0						6.0		
CU 18 South IT Hubs Level 1-7, North IT Hubs Level 1-7	RYYQ16U	35.0						6.0		
CU 19 South IT Hubs Level 1-7, North IT Hubs Level 1-7	RYYQ16U	35.0						6.0		
CU20 Freezer Room / Freezer Store	RYYQ16U	35.0						6.0		
CU21 Freezer Room / Freezer Store	RYYQ16U	35.0						6.0		
DXI21-01	FXHQ100A	24.5/50%	0.0	9.4	10.1	6.3	6.6	6.0	13.5	
DXI21-02	FXAQ63A	24.5/50%	0.0	6.1	6.4	4.6	4.7	6.0	11.8	
DXI21-03A	FXFQ100B	24.5/50%	0.0	10.0	10.1	7.1	7.2	6.0	11.9	
DXI21-03B	FXFQ100B	24.5/50%	0.0	10.0	10.1	7.1	7.2	6.0	11.9	

Total indoor required capacity 37.3kw, outdoor available capacity 35.5kw

External Unit Reference	Location	Serving	Manufacturer's Reference	Capacity		Dimensions			Weight per unit [kg]	Electrical Requirements		Internal Unit		Notes		
				Total Cooling [kW]	Sensible Cooling [kW]	Heating [kW]	L [mm]	W [mm]		H [mm]	Voltage [V/Ph/Hz]	Running Current [A]	Reference		Type	
CU01	Level 9 External Plant Area	Standard Lab Freezer Room S4-05-033	Daikin	13.6	9.3	-	1100	460	870	17	230/1/50	27.5	DXK01	Ceiling Suspended	9.3	Split system. Space provided with full run/standby cooling.
CU02	Level 9 External Plant Area	Standard Lab Freezer Room S4-05-033	Daikin	13.6	9.3	-	1100	460	870	17	230/1/50	27.5	DXK02	Ceiling Suspended	9.3	Split system. Space provided with full run/standby cooling.
CU03	Level 9 External Plant Area	Freezer Store S4-04-098	Daikin	10.8	7.44	-	1100	460	870	17	230/1/50	26.4	DXK03	Wall Mounted	7.44	Split system. Space provided with full run/standby cooling.
CU04	Level 9 External Plant Area	Freezer Store S4-04-098	Daikin	10.8	7.44	-	1100	460	870	17	230/1/50	26.4	DXK04	Wall Mounted	7.44	Split system. Space provided with full run/standby cooling.
CU05	Level 9 External Plant Area	BioMarker Regulatory Freezer Park 2 S4-03-060	Daikin	13.6	9.3	-	1100	460	870	17	230/1/50	26.4	DXK05	Ceiling Suspended	9.3	Split system. Space provided with full run/standby cooling.
CU06	Level 9 External Plant Area	BioMarker Regulatory Freezer Park 2 S4-03-060	Daikin	13.6	9.3	-	1100	460	870	17	230/1/50	26.4	DXK06	Ceiling Suspended	9.3	Split system. Space provided with full run/standby cooling.
CU07	Level 9 External Plant Area	Standard Lab Freezer Room S4-05-075	Daikin	13.6	9.3	-	1100	460	870	17	230/1/50	27.5	DXK07	Ceiling Suspended	9.3	Split system. Space provided with full run/standby cooling.
CU08	Level 9 External Plant Area	Standard Lab Freezer Room S4-05-075	Daikin	13.6	9.3	-	1100	460	870	17	230/1/50	27.5	DXK08	Ceiling Suspended	9.3	Split system. Space provided with full run/standby cooling.
CU09	Level 9 External Plant Area	Standard Lab Freezer Room S4-06-058	Daikin	13.6	9.3	-	1100	460	870	17	230/1/50	27.5	DXK09	Ceiling Suspended	9.3	Split system. Space provided with full run/standby cooling.
CU10	Level 9 External Plant Area	Standard Lab Freezer Room S4-06-058	Daikin	13.6	9.3	-	1100	460	870	17	230/1/50	27.5	DXK10	Ceiling Suspended	9.3	Split system. Space provided with full run/standby cooling.
CU11	Level 9 External Plant Area	Removed from design														
CU12		Removed from design														
CU13		Removed from design														
CU14		MER S4-00-064, MER S4-00-022	Daikin	-	39.2	-	1240	765	1685	378	400/3/50	26.9	DXK14	Ceiling Suspended	6.5	VRV System. Spaces provided with full run/standby cooling.
CU15	Level 9 External Plant Area	MER S4-00-064, MER S4-00-022	Daikin	-	39.2	-	1240	765	1685	378	400/3/50	26.9	DXK15	Ceiling Suspended	6.5	VRV System. Spaces provided with full run/standby cooling.
CU16	Level 9 External Plant Area	South IT Hubs L1-17	Daikin	-	36.1	-	1240	765	1685	378	400/3/50	26.9	DXK16-01 DXK16-02	Wall Mounted Wall Mounted	3.8 4.7	VRV System. Spaces provided with 50% redundancy.
CU17	Level 9 External Plant Area	South IT Hubs L1-17	Daikin	-	36.1	-	1240	765	1685	378	400/3/50	20.8	DXK17-01 DXK17-02	Wall Mounted Wall Mounted	3.8 4.7	VRV System. Spaces provided with 50% redundancy.
CU18	Level 9 External Plant Area	North IT Hubs L1-17	Daikin	-	36.1	-	1240	765	1685	378	400/3/50	20.8	DXK18-01 DXK18-02	Wall Mounted Wall Mounted	3.8 4.7	VRV System. Spaces provided with 50% redundancy.
CU19	Level 9 External Plant Area	North IT Hubs L1-17	Daikin	-	36.1	-	1240	765	1685	378	400/3/50	20.8	DXK19-01 DXK19-02	Wall Mounted Wall Mounted	3.8 4.7	VRV System. Spaces provided with 50% redundancy.
CU20	Level 3 External Plant Area	Freezer Room S4-00-073, Freezer Store S4-00-211	Daikin	-	35.6	-	1240	765	1685	378	400/3/50	20.8	DXK20-01 DXK20-02 DXK20-03	Ceiling Suspended Wall Mounted Ceiling Cassette	6.5 4.7 7.1	VRV System. Spaces provided with full run/standby cooling.
CU21	Level 3 External Plant Area	Freezer Room S4-00-073, Freezer Store S4-00-211	Daikin	-	35.6	-	1240	765	1685	378	400/3/50	20.8	DXK21-01 DXK21-02 DXK21-02	Ceiling Suspended Wall Mounted Ceiling Cassette	6.5 4.7 7.1	VRV System. Spaces provided with full run/standby cooling.
CU22	Level 9 External Plant Area	Biomarker Regulatory Freeze Room S4-03-059	Daikin	10.8	7.44	-	1100	460	870	17	230/1/50	26.4	DXK03	Wall Mounted	7.44	Split System. Space provided with full run/standby cooling.
CU23	Level 9 External Plant Area	Biomarker Regulatory Freeze Room S4-03-059	Daikin	10.8	7.44	-	1100	460	870	17	230/1/50	26.4	DXK03	Wall Mounted	7.44	Split System. Space provided with full run/standby cooling.
CU24	Level 3 External Plant Area	Freezer Store S4-03-094	Daikin	13.6	9.3	-	1100	460	870	17	230/1/50	27.5	DXK22	Wall Mounted	9.3	Split System. Space provided with full run/standby cooling.
CU25	Level 3 External Plant Area	Freezer Store S4-03-094	Daikin	13.6	9.3	-	1100	460	870	17	230/1/50	27.5	DXK22	Wall Mounted	9.3	Split System. Space provided with full run/standby cooling.
CU26	Level 3 External Plant Area	HPC Data Centre	Daikin	-	28.6	-	1240	765	1685	17	400/3/50	20.8	DXK26-01 DXK26-02 DXK26-03	Wall Mounted	11.3 11.3 6	VRV System. Spaces provided with full run/standby cooling.
CU27	Level 3 External Plant Area	HPC Data Centre	Daikin	-	28.6	-	1240	765	1685	17	400/3/50	20.8	DXK27-01 DXK27-02 DXK27-03	Wall Mounted	11.3 11.3 6	VRV System. Spaces provided with full run/standby cooling.

Notes:

1. This datasheet should be read in conjunction with all other datasheets, drawings and documentation
2. Condenser units shall be selected to operate at 100% duty with an outside external temperature of 35°C db and 22°C wb
3. Condenser units shall be selected to achieve the ambient noise criteria set out by the acoustician
4. All gases to be provided with a room controller

External Unit Reference	Location	Serving	Manufacturer's Reference	Capacity			Dimensions			Weight per unit [kg]	Electrical Requirements			Internal Unit		Notes
				Total Cooling kW	Sensible Cooling kW	Heating kW	L [mm]	W [mm]	H [mm]		Voltage [V/PH/Hz]	Running Current [A]	Reference	Type	Sensible Cooling Capacity kW	
CU01	Level 9 External Plant Area	Standard Lab Freezer Room 54-05-053	Daikin	13.6	9.3	-	1100	460	870	17	230/1/50	27.5	DX103	Ceiling Suspended	9.3	Split system. Space provided with full run/standby cooling
CU02	Level 9 External Plant Area	Standard Lab Freezer Room 54-05-053	Daikin	13.6	9.3	-	1100	460	870	17	230/1/50	27.5	DX102	Ceiling Suspended	9.3	Split system. Space provided with full run/standby cooling
CU03	Level 9 External Plant Area	Freezer Store 54-04-098	Daikin	10.8	7.44	-	1100	460	870	17	230/1/50	26.4	DX103	Wall Mounted	7.44	Split system. Space provided with full run/standby cooling
CU04	Level 9 External Plant Area	Freezer Store 54-04-098	Daikin	10.8	7.44	-	1100	460	870	17	230/1/50	26.4	DX104	Wall Mounted	7.44	Split system. Space provided with full run/standby cooling
CU05	Level 9 External Plant Area	BioMarker Regulatory Freezer Park 2 54-09-060	Daikin	13.6	9.3	-	1100	460	870	17	230/1/50	26.4	DX105	Ceiling Suspended	9.3	Split system. Space provided with full run/standby cooling
CU06	Level 9 External Plant Area	BioMarker Regulatory Freezer Park 2 54-09-060	Daikin	13.6	9.3	-	1100	460	870	17	230/1/50	26.4	DX106	Ceiling Suspended	9.3	Split system. Space provided with full run/standby cooling
CU07	Level 9 External Plant Area	Standard Lab Freezer Room 54-05-075	Daikin	13.6	9.3	-	1100	460	870	17	230/1/50	27.5	DX107	Ceiling Suspended	9.3	Split system. Space provided with full run/standby cooling
CU08	Level 9 External Plant Area	Standard Lab Freezer Room 54-05-075	Daikin	13.6	9.3	-	1100	460	870	17	230/1/50	27.5	DX108	Ceiling Suspended	9.3	Split system. Space provided with full run/standby cooling
CU09	Level 9 External Plant Area	Standard Lab Freezer Room 54-06-058	Daikin	13.6	9.3	-	1100	460	870	17	230/1/50	27.5	DX109	Ceiling Suspended	9.3	Split system. Space provided with full run/standby cooling
CU10	Level 9 External Plant Area	Standard Lab Freezer Room 54-06-058	Daikin	13.6	9.3	-	1100	460	870	17	230/1/50	27.5	DX110	Ceiling Suspended	9.3	Split system. Space provided with full run/standby cooling
CU11		Removed from design														
CU12		Removed from design														
CU13		Removed from design														
CU14	Level 9 External Plant Area	MER 54-00-064, MER 54-00-022	Daikin	-	39.2	-	1240	765	1685	378	400/3/50	26.9	DX114	Ceiling Suspended	6.5	VRV System. Spaces provided with full run/standby cooling.
CU15	Level 9 External Plant Area	MER 54-00-064, MER 54-00-022	Daikin	-	39.2	-	1240	765	1685	378	400/3/50	26.9	DX115	Ceiling Suspended	6.5	VRV System. Spaces provided with full run/standby cooling.
CU16	Level 9 External Plant Area	South IT Hubs L1-L7	Daikin	-	36.1	-	1240	765	1685	378	400/3/50	26.9	DX116-01 DX116-02	Wall Mounted Wall Mounted	3.8 4.7	VRV System. Spaces provided with 50% redundancy.
CU17	Level 9 External Plant Area	South IT Hubs L1-L7	Daikin	-	36.1	-	1240	765	1685	378	400/3/50	26.8	DX117-01 DX117-02	Wall Mounted Wall Mounted	3.8 4.7	VRV System. Spaces provided with 50% redundancy.
CU18	Level 9 External Plant Area	North IT Hubs L1-L7	Daikin	-	36.1	-	1240	765	1685	378	400/3/50	20.8	DX118-01 DX118-02	Wall Mounted Wall Mounted	3.8 4.7	VRV System. Spaces provided with 50% redundancy.
CU19	Level 9 External Plant Area	North IT Hubs L1-L7	Daikin	-	36.1	-	1240	765	1685	378	400/3/50	20.8	DX119-01 DX119-02	Wall Mounted Wall Mounted	3.8 4.7	VRV System. Spaces provided with 50% redundancy.
CU20	Level 3 External Plant Area	Freezer Room 54-00-073, Freezer Store 54-00-211	Daikin	-	35.6	-	1240	765	1685	378	400/3/50	20.8	DX120-01 DX120-02 DX120-03	Ceiling Suspended Wall Mounted Ceiling Cassette	6.5 4.7 7.1	VRV System. Spaces provided with full run/standby cooling.
CU21	Level 3 External Plant Area	Freezer Room 54-00-073, Freezer Store 54-00-211	Daikin	-	35.6	-	1240	765	1685	378	400/3/50	20.8	DX121-01 DX121-02	Ceiling Suspended Ceiling Cassette	6.5 4.7 7.1	VRV System. Spaces provided with full run/standby cooling.
CU22	Level 9 External Plant Area	BioMarker Regulatory Freeze Room 54-09-059	Daikin	10.8	7.44	-	1100	460	870	17	230/1/50	26.4	DX103	Wall Mounted	7.44	Split System. Space provided with full run/standby cooling
CU23	Level 9 External Plant Area	BioMarker Regulatory Freeze Room 54-09-059	Daikin	10.8	7.44	-	1100	460	870	17	230/1/50	26.4	DX103	Wall Mounted	7.44	Split System. Space provided with full run/standby cooling
CU24	Level 3 External Plant Area	Freezer Store 54-03-094	Daikin	13.6	9.3	-	1100	460	870	17	230/1/50	27.5	DX122	Wall Mounted	9.3	Split System. Space provided with full run/standby cooling
CU25	Level 3 External Plant Area	Freezer Store 54-03-094	Daikin	13.6	9.3	-	1100	460	870	17	230/1/50	27.5	DX122	Wall Mounted	9.3	Split System. Space provided with full run/standby cooling

- Notes:
- This datasheet should be read in conjunction with all other datasheets, drawings and documentation
 - Condenser units shall be selected to operate at 100% duty with an outside external temperature of 35°C db and 22°C wb
 - Condenser units shall be selected to achieve the ambient noise criteria set out by the acoustician
 - All spaces to be provided with a room controller

VRV Selection

Project Report

Report details

Produced on: 8/17/2021

Application version: 2021.7.27.1

Project details

Project name: Paterson Redevelopment Project (Skyline Selections)

Solution name: Daikin DX Split Systems & VRV

Client Name:

Customer reference:

Quotation reference:

Project number: 825030/1000940

The output of the VRV Xpress software is based on Daikin-genuine capacity tables that relate to the Japanese Industry Standard. The VRV Xpress software provides a selection of outdoor and indoor units with optimal efficiency to fit cooling and heating load requirements.

Material list

Model	Quantity	Description
RYYQ12U	2	RYYQ-U (VRV IV Continuous Heating)
RYYQ16U	2	RYYQ-U (VRV IV Continuous Heating)
RYMQ16U	2	RYYQ-U (VRV IV Continuous Heating)
RYMQ8U	2	RYYQ-U (VRV IV Continuous Heating)
FXAQ50A	4	FXAQ-A - Wall mounted unit
FXAQ63A	6	FXAQ-A - Wall mounted unit
FXFQ100B	3	FXFQ-B - Round Flow Round flow cassette
FXHQ100A	15	FXHQ-A - Ceiling suspended unit
KHRQ22M20T	5	Refnet branch piping kit
KHRQ22M29T9	5	Refnet branch piping kit
KHRQ22M64T	10	Refnet branch piping kit
KHRQ22M75T	2	Refnet branch piping kit
DCM601A51	1	Intelligent Touch Manager
DMS502A51	1	BACnet Interface - integrated control system connecting VRV system with BMS system
BHFQ22P1007	2	Outdoor unit multi connection piping kit for 2 modules
BRC1H52W	12	Remote controller (white)
BYCQ140E	3	Standard decoration panel

Indoor unit details

Table of abbreviations

Abbreviation	Description
Name	Logical name of the device
FCU	Device model name
Tmp C	Indoor conditions in cooling
Rq TC	Required total cooling capacity
Rv TC	Revised total cooling capacity (asked from outdoor)
Max TC	Available total cooling capacity
Rq SC	Required sensible cooling capacity
Tevap	Evaporating temperature of indoor unit coil
Tdis C	Indoor unit discharge air temperature in cooling based on maximum capacities
Max SC	Available sensible cooling capacity
PIC	Power input in cooling mode @ 50Hz
Tmp H	Indoor temperature in heating
Rq HC	Required heating capacity
Max HC	Available heating capacity
Tdis H	Indoor unit discharge air temperature in heating based on maximum capacities
PIH	Power input in heating mode @ 50Hz
Sound	Sound pressure level low and high
PS	Power supply (voltage and phases)
MCA	Minimum Circuit Amps
MOP	Maximum Overcurrent Protection
WxHxD	WidthxHeightxD
Weight	Weight of the device
Min coil	Minimum coil volume
Max coil	Maximum coil volume
Air Flow Rate	Air Flow Rate

CU14 - RYYQ24U = RYMQ16U + RYMQ8U

Capacity data at conditions and connection ratio (100) as entered

Name	FCU	Cooling								
		Tmp C	Rq TC	Rv TC	Max TC	Rq SC	Tevap	Tdis C	Max SC	PIC
		°C (DBT/RH)	kW	kW	kW	kW	°C	°C	kW	kW
DXI14A	FXHQ100A	26.0/50%	0.0	10.0	11.0	6.5	6.0	14.4	7.0	0.237
DXI14B	FXHQ100A	26.0/50%	0.0	10.0	11.0	6.5	6.0	14.4	7.0	0.237
DXI14C	FXHQ100A	26.0/50%	0.0	10.0	11.0	6.5	6.0	14.4	7.0	0.237
DXI14D	FXHQ100A	26.0/50%	0.0	10.0	11.0	6.5	6.0	14.4	7.0	0.237
DXI14E	FXHQ100A	26.0/50%	0.0	10.0	11.0	6.5	6.0	14.4	7.0	0.237
DXI14F	FXHQ100A	26.0/50%	0.0	10.0	11.0	6.5	6.0	14.4	7.0	0.237
			0.0							

Name	FCU	Heating					Min coil	Max coil	Air Flow Rate
		Tmp H	Rq HC	Max HC	Tdis H	PIH			
		°C	kW	kW	°C	kW			
DXI14A	FXHQ100A	20.0	n/a	12.5	40.7	0.237	n/a	n/a	491.67
DXI14B	FXHQ100A	20.0	n/a	12.5	40.7	0.237	n/a	n/a	491.67
DXI14C	FXHQ100A	20.0	n/a	12.5	40.7	0.237	n/a	n/a	491.67
DXI14D	FXHQ100A	20.0	n/a	12.5	40.7	0.237	n/a	n/a	491.67
DXI14E	FXHQ100A	20.0	n/a	12.5	40.7	0.237	n/a	n/a	491.67
DXI14F	FXHQ100A	20.0	n/a	12.5	40.7	0.237	n/a	n/a	491.67
			n/a						

Name	Room	Sound	PS	MCA	MOP	WxHxD	Weight
		dBA		A		mm	kg
DXI14A	MER 54-00-064/00-022	34 - 44	220V 1ph	1.7	Factory Std	1,590 x 235 x 690	39.0
DXI14B	MER 54-00-064/00-022	34 - 44	220V 1ph	1.7	Factory Std	1,590 x 235 x 690	39.0
DXI14C	MER 54-00-064/00-022	34 - 44	220V 1ph	1.7	Factory Std	1,590 x 235 x 690	39.0
DXI14D	MER 54-00-064/00-022	34 - 44	220V 1ph	1.7	Factory Std	1,590 x 235 x 690	39.0
DXI14E	MER 54-00-064/00-022	34 - 44	220V 1ph	1.7	Factory Std	1,590 x 235 x 690	39.0
DXI14F	MER 54-00-064/00-022	34 - 44	220V 1ph	1.7	Factory Std	1,590 x 235 x 690	39.0

Remarks

Outdoor vs. indoor position

Outdoor unit placed at the same level as the indoor units.

CU15 - RYYQ24U = RYMQ16U + RYMQ8U

Capacity data at conditions and connection ratio (100) as entered

Name	FCU	Cooling								
		Tmp C	Rq TC	Rv TC	Max TC	Rq SC	Tevap	Tdis C	Max SC	PIC
		°C (DBT/RH)	kW	kW	kW	kW	°C	°C	kW	kW
DXI15A	FXHQ100A	26.0/50%	0.0	10.0	11.0	6.5	6.0	14.4	7.0	0.237
DXI15B	FXHQ100A	26.0/50%	0.0	10.0	11.0	6.5	6.0	14.4	7.0	0.237
DXI15C	FXHQ100A	26.0/50%	0.0	10.0	11.0	6.5	6.0	14.4	7.0	0.237
DXI15D	FXHQ100A	26.0/50%	0.0	10.0	11.0	6.5	6.0	14.4	7.0	0.237
DXI15E	FXHQ100A	26.0/50%	0.0	10.0	11.0	6.5	6.0	14.4	7.0	0.237
DXI15F	FXHQ100A	26.0/50%	0.0	10.0	11.0	6.5	6.0	14.4	7.0	0.237
			0.0							

Name	FCU	Heating							Min coil	Max coil	Air Flow Rate
		Tmp H	Rq HC	Max HC	Tdis H	PIH					
		°C	kW	kW	°C	kW		m³			
DXI15A	FXHQ100A	20.0	n/a	12.5	40.7	0.237		n/a	n/a	n/a	491.67
DXI15B	FXHQ100A	20.0	n/a	12.5	40.7	0.237		n/a	n/a	n/a	491.67
DXI15C	FXHQ100A	20.0	n/a	12.5	40.7	0.237		n/a	n/a	n/a	491.67
DXI15D	FXHQ100A	20.0	n/a	12.5	40.7	0.237		n/a	n/a	n/a	491.67
DXI15E	FXHQ100A	20.0	n/a	12.5	40.7	0.237		n/a	n/a	n/a	491.67
DXI15F	FXHQ100A	20.0	n/a	12.5	40.7	0.237		n/a	n/a	n/a	491.67
			n/a								

Name	Room	Sound	PS	MCA	MOP	WxHxD	Weight
		dBA		A		mm	
DXI15A	MER 54-00-064/00-022	34 - 44	220V 1ph	1.7	Factory Std	1,590 x 235 x 690	39.0
DXI15B	MER 54-00-064/00-022	34 - 44	220V 1ph	1.7	Factory Std	1,590 x 235 x 690	39.0
DXI15C	MER 54-00-064/00-022	34 - 44	220V 1ph	1.7	Factory Std	1,590 x 235 x 690	39.0
DXI15D	MER 54-00-064/00-022	34 - 44	220V 1ph	1.7	Factory Std	1,590 x 235 x 690	39.0
DXI15E	MER 54-00-064/00-022	34 - 44	220V 1ph	1.7	Factory Std	1,590 x 235 x 690	39.0
DXI15F	MER 54-00-064/00-022	34 - 44	220V 1ph	1.7	Factory Std	1,590 x 235 x 690	39.0

Remarks

Outdoor vs. indoor position

Outdoor unit placed 80.0m above the indoor units.

CU16 / CU18 - RYYQ12U

Capacity data at conditions and connection ratio (75) as entered

Name	FCU	Cooling								
		Tmp C	Rq TC	Rv TC	Max TC	Rq SC	Tevap	Tdis C	Max SC	PIC
		°C (DBT/RH)	kW	kW	kW	kW	°C	°C	kW	kW
DXI16-01	FXAQ50A	26.0/50%	0.0	5.1	5.5	3.8	6.0	12.5	4.0	0.030
DXI16-02	FXAQ63A	26.0/50%	0.0	6.3	7.0	4.7	6.0	12.7	5.0	0.050

Name	FCU	Cooling								
		Tmp C	Rq TC	Rv TC	Max TC	Rq SC	Tevap	Tdis C	Max SC	PIC
		°C (DBT/RH)	kW	kW	kW	kW	°C	°C	kW	kW
DXI18-01	FXAQ50A	26.0/50%	0.0	5.1	5.5	3.8	6.0	12.5	4.0	0.030
DXI18-02	FXAQ63A	26.0/50%	0.0	6.3	7.0	4.7	6.0	12.7	5.0	0.050
			0.0							

Name	FCU	Heating							
		Tmp H	Rq HC	Max HC	Tdis H	PIH	Min coil	Max coil	Air Flow Rate
		°C	kW	kW	°C	kW	m³	m³	l/s
DXI16-01	FXAQ50A	20.0	n/a	6.3	41.3	0.040	n/a	n/a	240.00
DXI16-02	FXAQ63A	20.0	n/a	8.0	41.3	0.060	n/a	n/a	305.00
DXI18-01	FXAQ50A	20.0	n/a	6.3	41.3	0.040	n/a	n/a	240.00
DXI18-02	FXAQ63A	20.0	n/a	8.0	41.3	0.060	n/a	n/a	305.00
			n/a						

Name	Room	Sound	PS	MCA	MOP	WxHxD	Weight
		dBA		A		mm	kg
DXI16-01	South IT Hubs	36 - 41	230V 1ph	0.5	Factory Std	1,050 x 290 x 269	15.0
DXI16-02	South IT Hubs	39 - 47	230V 1ph	0.7	Factory Std	1,050 x 290 x 269	15.0
DXI18-01	North IT Hubs	36 - 41	230V 1ph	0.5	Factory Std	1,050 x 290 x 269	15.0
DXI18-02	North IT Hubs	39 - 47	230V 1ph	0.7	Factory Std	1,050 x 290 x 269	15.0

Remarks

Outdoor vs. indoor position

Outdoor unit placed 80.0m above the indoor units.

CU17 / CU19 - RYYQ12U

Capacity data at conditions and connection ratio (75) as entered

Name	FCU	Cooling								
		Tmp C	Rq TC	Rv TC	Max TC	Rq SC	Tevap	Tdis C	Max SC	PIC
		°C (DBT/RH)	kW	kW	kW	kW	°C	°C	kW	kW
DXI17-01	FXAQ50A	26.0/50%	0.0	5.1	5.5	3.8	6.0	12.5	4.0	0.030
DXI17-02	FXAQ63A	26.0/50%	0.0	6.3	7.0	4.7	6.0	12.7	5.0	0.050
DXI19-01	FXAQ50A	26.0/50%	0.0	5.1	5.5	3.8	6.0	12.5	4.0	0.030
DXI19-02	FXAQ63A	26.0/50%	0.0	6.3	7.0	4.7	6.0	12.7	5.0	0.050
			0.0							

Name	FCU	Heating							
		Tmp H	Rq HC	Max HC	Tdis H	PIH	Min coil	Max coil	Air Flow Rate
		°C	kW	kW	°C	kW	m³	m³	l/s
DXI17-01	FXAQ50A	20.0	n/a	6.3	41.3	0.040	n/a	n/a	240.00
DXI17-02	FXAQ63A	20.0	n/a	8.0	41.3	0.060	n/a	n/a	305.00

Name	FCU	Heating					Min coil	Max coil	Air Flow Rate
		Tmp H	Rq HC	Max HC	Tdis H	PIH			
		°C	kW	kW	°C	kW			
DXI19-01	FXAQ50A	20.0	n/a	6.3	41.3	0.040	n/a	n/a	240.00
DXI19-02	FXAQ63A	20.0	n/a	8.0	41.3	0.060	n/a	n/a	305.00
			n/a						

Name	Room	Sound	PS	MCA	MOP	WxHxD	Weight
		dBA		A		mm	kg
DXI17-01	South IT Hubs	36 - 41	230V 1ph	0.5	Factory Std	1,050 x 290 x 269	15.0
DXI17-02	South IT Hubs	39 - 47	230V 1ph	0.7	Factory Std	1,050 x 290 x 269	15.0
DXI19-01	North IT Hubs	36 - 41	230V 1ph	0.5	Factory Std	1,050 x 290 x 269	15.0
DXI19-02	North IT Hubs	39 - 47	230V 1ph	0.7	Factory Std	1,050 x 290 x 269	15.0

Remarks

Outdoor vs. indoor position

Outdoor unit placed 80.0m above the indoor units.

CU20 - RYYQ16U

Capacity data at conditions and connection ratio (91) as entered

Name	FCU	Cooling								
		Tmp C	Rq TC	Rv TC	Max TC	Rq SC	Tevap	Tdis C	Max SC	PIC
		°C (DBT/RH)	kW	kW	kW	kW	°C	°C	kW	kW
DXI20-01A	FXHQ100A	26.0/50%	0.0	10.0	11.0	6.5	6.0	14.4	7.0	0.237
DXI20-01A	FXHQ100A	26.0/50%	0.0	10.0	11.0	6.5	6.0	14.4	7.0	0.237
DXI20-02	FXAQ63A	26.0/50%	0.0	6.3	7.0	4.7	6.0	12.7	5.0	0.050
DXI20-03	FXFQ100B	26.0/50%	0.0	10.2	11.0	7.1	6.0	12.3	7.5	0.120
			0.0							

Name	FCU	Heating					Min coil	Max coil	Air Flow Rate
		Tmp H	Rq HC	Max HC	Tdis H	PIH			
		°C	kW	kW	°C	kW			
DXI20-01A	FXHQ100A	20.0	n/a	12.5	40.7	0.237	n/a	n/a	491.67
DXI20-01A	FXHQ100A	20.0	n/a	12.5	40.7	0.237	n/a	n/a	491.67
DXI20-02	FXAQ63A	20.0	n/a	8.0	41.3	0.060	n/a	n/a	305.00
DXI20-03	FXFQ100B	20.0	n/a	12.5	43.0	0.120	n/a	n/a	441.67
			n/a						

Name	Room	Sound	PS	MCA	MOP	WxHxD	Weight
		dBA		A		mm	kg
DXI20-01A	Freezer Room / Freezer Store	34 - 44	220V 1ph	1.7	Factory Std	1,590 x 235 x 690	39.0
DXI20-01A	Freezer Room / Freezer Store	34 - 44	220V 1ph	1.7	Factory Std	1,590 x 235 x 690	39.0

Name	Room	Sound	PS	MCA	MOP	WxHxD	Weight
		dBA		A		mm	kg
DXI20-02	Freezer Room / Freezer Store	39 - 47	230V 1ph	0.7	Factory Std	1,050 x 290 x 269	15.0
DXI20-03	Freezer Room / Freezer Store	30 - 43	220V 1ph	0.8	Factory Std	840 x 246 x 840	24.0

Remarks

Outdoor vs. indoor position

Outdoor unit placed 80.0m above the indoor units.

CU21 - RYYQ16U

Capacity data at conditions and connection ratio (91) as entered

Name	FCU	Cooling								
		Tmp C	Rq TC	Rv TC	Max TC	Rq SC	Tevap	Tdis C	Max SC	PIC
		°C (DBT/RH)	kW	kW	kW	kW	°C	°C	kW	kW
DXI21-01	FXHQ100A	26.0/50%	0.0	10.0	11.0	6.5	6.0	14.4	7.0	0.237
DXI21-02	FXAQ63A	26.0/50%	0.0	6.3	7.0	4.7	6.0	12.7	5.0	0.050
DXI21-03A	FXFQ100B	26.0/50%	0.0	10.2	11.0	7.1	6.0	12.3	7.5	0.120
DXI21-03B	FXFQ100B	26.0/50%	0.0	10.2	11.0	7.1	6.0	12.3	7.5	0.120
			0.0							

Name	FCU	Heating							
		Tmp H	Rq HC	Max HC	Tdis H	PIH	Min coil	Max coil	Air Flow Rate
		°C	kW	kW	°C	kW	m³	m³	l/s
DXI21-01	FXHQ100A	20.0	n/a	12.5	40.7	0.237	n/a	n/a	491.67
DXI21-02	FXAQ63A	20.0	n/a	8.0	41.3	0.060	n/a	n/a	305.00
DXI21-03A	FXFQ100B	20.0	n/a	12.5	43.0	0.120	n/a	n/a	441.67
DXI21-03B	FXFQ100B	20.0	n/a	12.5	43.0	0.120	n/a	n/a	441.67
			n/a						

Name	Room	Sound	PS	MCA	MOP	WxHxD	Weight
		dBA		A		mm	kg
DXI21-01	Freezer Room / Freezer Store	34 - 44	220V 1ph	1.7	Factory Std	1,590 x 235 x 690	39.0
DXI21-02	Freezer Room / Freezer Store	39 - 47	230V 1ph	0.7	Factory Std	1,050 x 290 x 269	15.0
DXI21-03A	Freezer Room / Freezer Store	30 - 43	220V 1ph	0.8	Factory Std	840 x 246 x 840	24.0
DXI21-03B	Freezer Room / Freezer Store	30 - 43	220V 1ph	0.8	Factory Std	840 x 246 x 840	24.0

Remarks

Outdoor vs. indoor position

Outdoor unit placed 80.0m above the indoor units.

Outdoor unit details

Table of abbreviations

Abbreviation	Description
Name	Logical name of the device
Model	Device model name
CR	Connection ratio
Tmp C	Outdoor conditions in cooling
WFR per module	Water flow per outdoor unit module
CC	Available cooling capacity
Rq CC	Required cooling capacity
PIC	Power input in cooling mode
InC	Water inlet temperature in cooling mode
OutC	Water outlet temperature in cooling mode
Tmp H	Outdoor conditions in heating (dry bulb temp. / RH)
HC	Available heating capacity (integrated heating capacity)
Rq HC	Required heating capacity
PIH	Power input in heating mode
InH	Water inlet temperature in heating mode
OutH	Water outlet temperature in heating mode
Piping	Largest distance from indoor unit to outdoor unit
Bse Refr	Standard factory refrigerant charge (16.4ft actual piping length) excluding extra refrigerant charge. For calculation of extra refrigerant charge refer to the databook
Ex Refr	Extra refrigerant charge
PS	Power supply (voltage and phases)
MCA	Minimum Circuit Amps
MOP	Maximum Overcurrent Protection
FLA	Fan Motor Input
RLA	Nominal Running Amps
WxHxD	WidthxHeightxD
Weight	Weight of the device
EER	EER value at nominal condition
IEER	IEER value at nominal condition
COP47	COP value at nominal condition and at ambient temperature of 8°C
COP17	COP value at nominal condition and at ambient temperature of -8°C

Outdoor details

Name	Model	CR	Cooling			Heating			Piping
			Tmp C	CC	Rq CC	Tmp H	HC	Rq HC	
		%	°C	kW	kW	°C (DBT/RH)	kW	kW	m
CU14	RYYQ24U	100.0	35.0	65.9	60.0	0.0/86%	57.2	0.0	7.5
CU15	RYYQ24U	100.0	35.0	65.2	60.0	0.0/50%	56.2	0.0	7.5
CU16 / CU18	RYYQ12U	75.0	35.0	28.5	22.7	0.0/86%	25.6	0.0	100.0
CU17 / CU19	RYYQ12U	75.0	35.0	28.5	22.7	0.0/86%	25.6	0.0	100.0
CU20	RYYQ16U	90.6	35.0	39.0	36.5	0.0/86%	34.9	0.0	100.0
CU21	RYYQ16U	90.6	35.0	39.0	36.7	0.0/86%	34.9	0.0	100.0

Name	Model	PS	MCA	MOP	RLA	FLA	WxHxD	Weight
			A	A	A	A	mm	kg
CU14	RYYQ24U	400V 3Nph						
A	- RYMQ16U		31.0	40.0	18.0		1,240 x 1,685 x 765	275.0
B	- RYMQ8U		16.1	20.0	7.2		930 x 1,685 x 765	198.0
CU15	RYYQ24U	400V 3Nph						
A	- RYMQ16U		31.0	40.0	18.0		1,240 x 1,685 x 765	275.0
B	- RYMQ8U		16.1	20.0	7.2		930 x 1,685 x 765	198.0
CU16 / CU18	RYYQ12U	400V 3Nph	24.0	32.0	12.7		930 x 1,685 x 765	252.0
CU17 / CU19	RYYQ12U	400V 3Nph	24.0	32.0	12.7		930 x 1,685 x 765	252.0
CU20	RYYQ16U	400V 3Nph	31.0	40.0	18.0		1,240 x 1,685 x 765	319.0
CU21	RYYQ16U	400V 3Nph	31.0	40.0	18.0		1,240 x 1,685 x 765	319.0

Seasonal Efficiency

Name	Model	η _{s,h} heating	η _{s,c} cooling	SCOP	SEER	CSPF
		%	%			
CU14	RYYQ24U	167.0	269.9	4.30	6.80	-
CU15	RYYQ24U	167.0	269.9	4.30	6.80	-
CU16 / CU18	RYYQ12U	161.4	247.8	4.10	6.30	-
CU17 / CU19	RYYQ12U	161.4	247.8	4.10	6.30	-

Name	Model	$\eta_{s,h}$ heating	$\eta_{s,c}$ cooling	SCOP	SEER	CSPF
		%	%			
CU20	RYYQ16U	157.8	236.5	4.00	6.00	-
CU21	RYYQ16U	157.8	236.5	4.00	6.00	-

For more information go to: <https://energylabel.daikin.eu/>.

Refrigerant information

Name	Model	Refrigerant type	GWP	Base charge kg	Extra charge kg	TCO2 equivalent
CU14	RYYQ24U	R410A	2087.5	17.2	unknown	35.9
CU15	RYYQ24U	R410A	2087.5	17.2	unknown	35.9
CU16 / CU18	RYYQ12U	R410A	2087.5	6.3	unknown	13.2
CU17 / CU19	RYYQ12U	R410A	2087.5	6.3	unknown	13.2
CU20	RYYQ16U	R410A	2087.5	10.4	unknown	21.7
CU21	RYYQ16U	R410A	2087.5	10.4	unknown	21.7

The system(s) contain fluorinated greenhouse gases.

When extra refrigerant charge requirements are not calculated, TCO2 equivalent is calculated only considering the base refrigerant charge. Depending on the field pipe length extra refrigerant needs to be added which will increase the TCO2 equivalent.

CU14 - RYYQ24U = RYMQ16U + RYMQ8U

Model	Quantity	Description
RYMQ16U	1	RYYQ-U (VRV IV Continuous Heating)
RYMQ8U	1	RYYQ-U (VRV IV Continuous Heating)
FXHQ100A	6	FXHQ-A - Ceiling suspended unit
KHRQ22M29T9	1	Refnet branch piping kit
KHRQ22M64T	3	Refnet branch piping kit
KHRQ22M75T	1	Refnet branch piping kit
BHFQ22P1007	1	Outdoor unit multi connection piping kit for 2 modules
BRC1H52W	2	Remote controller (white)

Refrigerant information

Refrigerant type	GWP	Base charge kg	Extra charge kg	TCO2 equivalent
R410A	2087.5	17.2	unknown	35.9

The system(s) contain fluorinated greenhouse gases.

Pipe capacities

Maximum Connection Index	Diameters
149.9	9.5mmx15.9mm
199.9	9.5mmx19.1mm
289.9	9.5mmx22.2mm
419.9	12.7mmx28.6mm
639.9	15.9mmx28.6mm
919.9	19.1mmx34.9mm
> 919.9	19.1mmx41.3mm
Main pipe size up	19.1mmx34.9mm

Remarks

Sufficient distance should be respected between the modules according to the service & operation space rules as mentioned in the databook.

Piping limitations

Description	Value
Maximum total length	1,000.0m
Maximum longest actual length	165.0m
Maximum longest equivalent length	190.0m
Maximum main pipe length (size up of main pipe required if longer)	-
Maximum length first branch to indoor unit(size up of intermediate pipes required if longer)	40.0m
Maximum length first branch to indoor unit	90.0m
Maximum length of indoor units to nearest branch	40.0m
Maximum length difference between longest and shortest distance to indoor units	40.0m
Maximum height difference, outdoor unit below indoor units	90.0m
Minimum connection ratio, outdoor unit below indoor units	-
Maximum height difference, outdoor unit above indoor units	90.0m
Minimum connection ratio, outdoor unit above indoor units	-
Maximum height difference in technical cooling, outdoor unit below indoor units	90.0m
Maximum height difference in technical cooling, outdoor unit above indoor units	90.0m
Maximum height difference between indoor units	30.0m
Connection ratio range	50.0% - 130.0%
Refrigerant pipe diameters	19.1mm (liquid) x 34.9mm (gas)
Maximum equivalent length from BP unit or VRV indoor to VRV REFNET (size up of intermediate pipes required if longer)	-
Maximum equivalent length from BP unit or VRV indoor to VRV REFNET	90.0m
Maximum actual length between CM and HM	-
Maximum height difference between CM and HM	-

$$\text{CU15 - RYYQ24U} = \text{RYMQ16U} + \text{RYMQ8U}$$

Model	Quantity	Description
RYMQ16U	1	RYYQ-U (VRV IV Continuous Heating)
RYMQ8U	1	RYYQ-U (VRV IV Continuous Heating)
FXHQ100A	6	FXHQ-A - Ceiling suspended unit
KHRQ22M29T9	1	Refnet branch piping kit
KHRQ22M64T	3	Refnet branch piping kit
KHRQ22M75T	1	Refnet branch piping kit
BHFQ22P1007	1	Outdoor unit multi connection piping kit for 2 modules
BRC1H52W	2	Remote controller (white)

Refrigerant information

Refrigerant type	GWP	Base charge kg	Extra charge kg	TCO2 equivalent
R410A	2087.5	17.2	unknown	35.9

The system(s) contain fluorinated greenhouse gases.

Pipe capacities

Maximum Connection Index	Diameters
149.9	9.5mmx15.9mm
199.9	9.5mmx19.1mm
289.9	9.5mmx22.2mm
419.9	12.7mmx28.6mm
639.9	15.9mmx28.6mm
919.9	19.1mmx34.9mm
> 919.9	19.1mmx41.3mm
Main pipe size up	19.1mmx34.9mm

Remarks

Sufficient distance should be respected between the modules according to the service & operation space rules as mentioned in the databook.

Piping limitations

Description	Value
Maximum total length	1,000.0m
Maximum longest actual length	165.0m
Maximum longest equivalent length	190.0m
Maximum main pipe length (size up of main pipe required if longer)	-
Maximum length first branch to indoor unit(size up of intermediate pipes required if longer)	40.0m
Maximum length first branch to indoor unit	90.0m
Maximum length of indoor units to nearest branch	40.0m
Maximum length difference between longest and shortest distance to indoor units	40.0m
Maximum height difference, outdoor unit below indoor units	90.0m
Minimum connection ratio, outdoor unit below indoor units	90.0%
Maximum height difference, outdoor unit above indoor units	90.0m
Minimum connection ratio, outdoor unit above indoor units	-
Maximum height difference in technical cooling, outdoor unit below indoor units	90.0m
Maximum height difference in technical cooling, outdoor unit above indoor units	90.0m
Maximum height difference between indoor units	30.0m
Connection ratio range	50.0% - 130.0%
Refrigerant pipe diameters	19.1mm (liquid) x 34.9mm (gas)
Maximum equivalent length from BP unit or VRV indoor to VRV REFNET (size up of intermediate pipes required if longer)	-
Maximum equivalent length from BP unit or VRV indoor to VRV REFNET	90.0m
Maximum actual length between CM and HM	-
Maximum height difference between CM and HM	-

CU16 / CU18 - RYYQ12U

Model	Quantity	Description
RYYQ12U	1	RYYQ-U (VRV IV Continuous Heating)
FXAQ50A	2	FXAQ-A - Wall mounted unit
FXAQ63A	2	FXAQ-A - Wall mounted unit
KHRQ22M20T	2	Refnet branch piping kit
KHRQ22M64T	1	Refnet branch piping kit
BRC1H52W	2	Remote controller (white)

Refrigerant information

Refrigerant type	GWP	Base charge kg	Extra charge kg	TCO2 equivalent
R410A	2087.5	6.3	unknown	13.2

The system(s) contain fluorinated greenhouse gases.

Pipe capacities

Maximum Connection Index	Diameters
149.9	9.5mmx15.9mm
199.9	9.5mmx19.1mm
289.9	9.5mmx22.2mm
419.9	12.7mmx28.6mm
639.9	15.9mmx28.6mm
919.9	19.1mmx34.9mm
> 919.9	19.1mmx41.3mm
Main pipe size up	15.9mmx28.6mm

Piping limitations

Description	Value
Maximum total length	1,000.0m
Maximum longest actual length	165.0m
Maximum longest equivalent length	190.0m
Maximum main pipe length (size up of main pipe required if longer)	-
Maximum length first branch to indoor unit(size up of intermediate pipes required if longer)	40.0m
Maximum length first branch to indoor unit	90.0m
Maximum length of indoor units to nearest branch	40.0m
Maximum length difference between longest and shortest distance to indoor units	40.0m
Maximum height difference, outdoor unit below indoor units	90.0m
Minimum connection ratio, outdoor unit below indoor units	90.0%
Maximum height difference, outdoor unit above indoor units	90.0m
Minimum connection ratio, outdoor unit above indoor units	-
Maximum height difference in technical cooling, outdoor unit below indoor units	90.0m
Maximum height difference in technical cooling, outdoor unit above indoor units	90.0m
Maximum height difference between indoor units	30.0m
Connection ratio range	50.0% - 130.0%
Refrigerant pipe diameters	15.9mm (liquid) x 28.6mm (gas)
Maximum equivalent length from BP unit or VRV indoor to VRV REFNET (size up of intermediate pipes required if longer)	-
Maximum equivalent length from BP unit or VRV indoor to VRV REFNET	90.0m
Maximum actual length between CM and HM	-
Maximum height difference between CM and HM	-

CU17 / CU19 - RYYQ12U

Model	Quantity	Description
RYYQ12U	1	RYYQ-U (VRV IV Continuous Heating)
FXAQ50A	2	FXAQ-A - Wall mounted unit
FXAQ63A	2	FXAQ-A - Wall mounted unit
KHRQ22M20T	2	Refnet branch piping kit
KHRQ22M64T	1	Refnet branch piping kit
BRC1H52W	2	Remote controller (white)

Refrigerant information

Refrigerant type	GWP	Base charge kg	Extra charge kg	TCO2 equivalent
R410A	2087.5	6.3	unknown	13.2

The system(s) contain fluorinated greenhouse gases.

Pipe capacities

Maximum Connection Index	Diameters
149.9	9.5mmx15.9mm
199.9	9.5mmx19.1mm
289.9	9.5mmx22.2mm
419.9	12.7mmx28.6mm
639.9	15.9mmx28.6mm
919.9	19.1mmx34.9mm
> 919.9	19.1mmx41.3mm
Main pipe size up	15.9mmx28.6mm

Piping limitations

Description	Value
Maximum total length	1,000.0m
Maximum longest actual length	165.0m
Maximum longest equivalent length	190.0m
Maximum main pipe length (size up of main pipe required if longer)	-
Maximum length first branch to indoor unit(size up of intermediate pipes required if longer)	40.0m
Maximum length first branch to indoor unit	90.0m
Maximum length of indoor units to nearest branch	40.0m
Maximum length difference between longest and shortest distance to indoor units	40.0m
Maximum height difference, outdoor unit below indoor units	90.0m
Minimum connection ratio, outdoor unit below indoor units	90.0%
Maximum height difference, outdoor unit above indoor units	90.0m
Minimum connection ratio, outdoor unit above indoor units	-
Maximum height difference in technical cooling, outdoor unit below indoor units	90.0m
Maximum height difference in technical cooling, outdoor unit above indoor units	90.0m
Maximum height difference between indoor units	30.0m
Connection ratio range	50.0% - 130.0%
Refrigerant pipe diameters	15.9mm (liquid) x 28.6mm (gas)
Maximum equivalent length from BP unit or VRV indoor to VRV REFNET (size up of intermediate pipes required if longer)	-
Maximum equivalent length from BP unit or VRV indoor to VRV REFNET	90.0m
Maximum actual length between CM and HM	-
Maximum height difference between CM and HM	-

CU20 - RYYQ16U

Model	Quantity	Description
RYYQ16U	1	RYYQ-U (VRV IV Continuous Heating)
FXAQ63A	1	FXAQ-A - Wall mounted unit
FXFQ100B	1	FXFQ-B - Round Flow Round flow cassette
FXHQ100A	2	FXHQ-A - Ceiling suspended unit
KHRQ22M20T	1	Refnet branch piping kit
KHRQ22M29T9	1	Refnet branch piping kit
KHRQ22M64T	1	Refnet branch piping kit
BRC1H52W	2	Remote controller (white)
BYCQ140E	1	Standard decoration panel

Refrigerant information

Refrigerant type	GWP	Base charge kg	Extra charge kg	TCO2 equivalent
R410A	2087.5	10.4	unknown	21.7

The system(s) contain fluorinated greenhouse gases.

Pipe capacities

Maximum Connection Index	Diameters
149.9	9.5mmx15.9mm
199.9	9.5mmx19.1mm
289.9	9.5mmx22.2mm
419.9	12.7mmx28.6mm
639.9	15.9mmx28.6mm
919.9	19.1mmx34.9mm
> 919.9	19.1mmx41.3mm
Main pipe size up	15.9mmx31.8mm

Piping limitations

Description	Value
Maximum total length	1,000.0m
Maximum longest actual length	165.0m
Maximum longest equivalent length	190.0m
Maximum main pipe length (size up of main pipe required if longer)	-
Maximum length first branch to indoor unit(size up of intermediate pipes required if longer)	40.0m
Maximum length first branch to indoor unit	90.0m
Maximum length of indoor units to nearest branch	40.0m
Maximum length difference between longest and shortest distance to indoor units	40.0m
Maximum height difference, outdoor unit below indoor units	90.0m
Minimum connection ratio, outdoor unit below indoor units	90.0%
Maximum height difference, outdoor unit above indoor units	90.0m
Minimum connection ratio, outdoor unit above indoor units	-
Maximum height difference in technical cooling, outdoor unit below indoor units	90.0m
Maximum height difference in technical cooling, outdoor unit above indoor units	90.0m
Maximum height difference between indoor units	30.0m
Connection ratio range	50.0% - 130.0%
Refrigerant pipe diameters	15.9mm (liquid) x 31.8mm (gas)
Maximum equivalent length from BP unit or VRV indoor to VRV REFNET (size up of intermediate pipes required if longer)	-
Maximum equivalent length from BP unit or VRV indoor to VRV REFNET	90.0m
Maximum actual length between CM and HM	-
Maximum height difference between CM and HM	-

CU21 - RYYQ16U

Model	Quantity	Description
RYYQ16U	1	RYYQ-U (VRV IV Continuous Heating)
FXAQ63A	1	FXAQ-A - Wall mounted unit
FXFQ100B	2	FXFQ-B - Round Flow Round flow cassette
FXHQ100A	1	FXHQ-A - Ceiling suspended unit
KHRQ22M29T9	2	Refnet branch piping kit
KHRQ22M64T	1	Refnet branch piping kit
BRC1H52W	2	Remote controller (white)
BYCQ140E	2	Standard decoration panel

Refrigerant information

Refrigerant type	GWP	Base charge kg	Extra charge kg	TCO2 equivalent
R410A	2087.5	10.4	unknown	21.7

The system(s) contain fluorinated greenhouse gases.

Pipe capacities

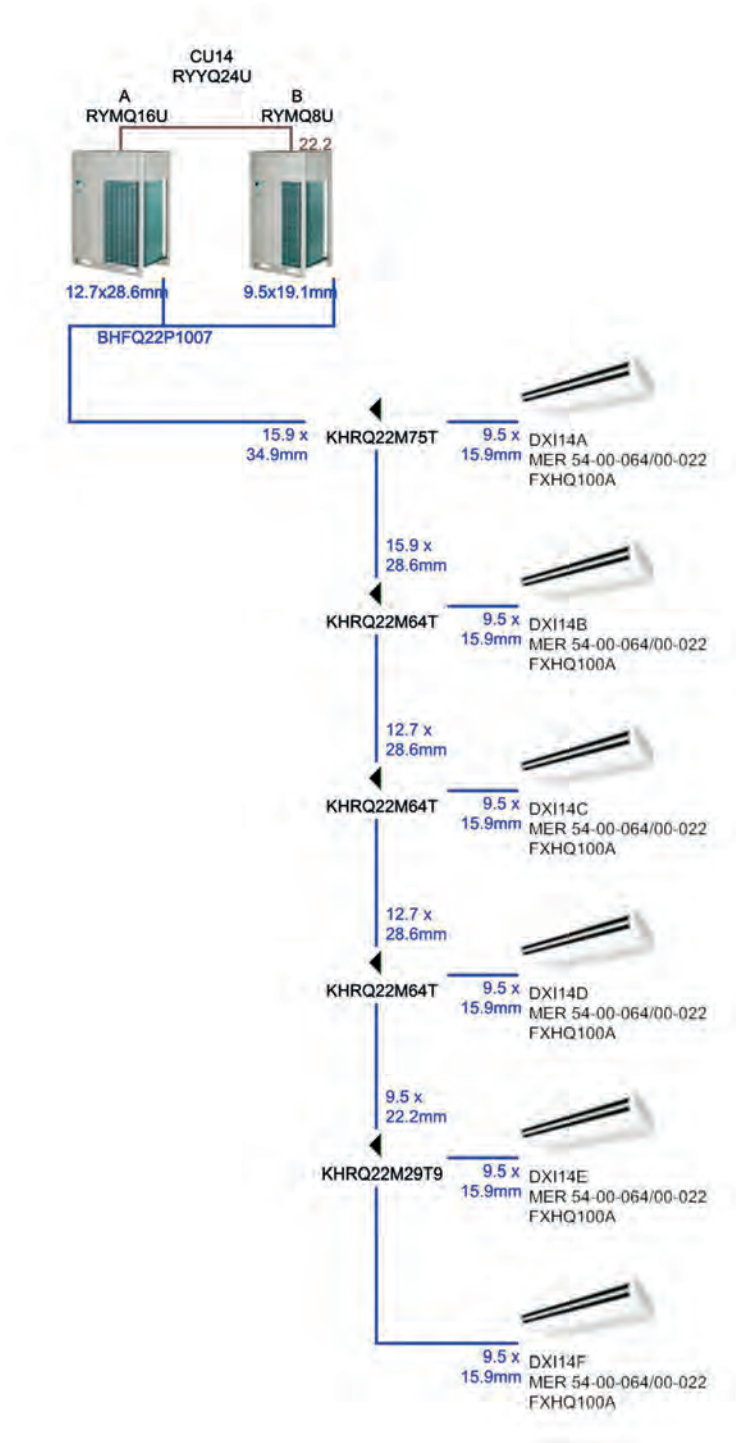
Maximum Connection Index	Diameters
149.9	9.5mmx15.9mm
199.9	9.5mmx19.1mm
289.9	9.5mmx22.2mm
419.9	12.7mmx28.6mm
639.9	15.9mmx28.6mm
919.9	19.1mmx34.9mm
> 919.9	19.1mmx41.3mm
Main pipe size up	15.9mmx31.8mm

Piping limitations

Description	Value
Maximum total length	1,000.0m
Maximum longest actual length	165.0m
Maximum longest equivalent length	190.0m
Maximum main pipe length (size up of main pipe required if longer)	-
Maximum length first branch to indoor unit(size up of intermediate pipes required if longer)	40.0m
Maximum length first branch to indoor unit	90.0m
Maximum length of indoor units to nearest branch	40.0m
Maximum length difference between longest and shortest distance to indoor units	40.0m
Maximum height difference, outdoor unit below indoor units	90.0m
Minimum connection ratio, outdoor unit below indoor units	90.0%
Maximum height difference, outdoor unit above indoor units	90.0m
Minimum connection ratio, outdoor unit above indoor units	-
Maximum height difference in technical cooling, outdoor unit below indoor units	90.0m
Maximum height difference in technical cooling, outdoor unit above indoor units	90.0m
Maximum height difference between indoor units	30.0m
Connection ratio range	50.0% - 130.0%
Refrigerant pipe diameters	15.9mm (liquid) x 31.8mm (gas)
Maximum equivalent length from BP unit or VRV indoor to VRV REFNET (size up of intermediate pipes required if longer)	-
Maximum equivalent length from BP unit or VRV indoor to VRV REFNET	90.0m
Maximum actual length between CM and HM	-
Maximum height difference between CM and HM	-

Piping diagrams

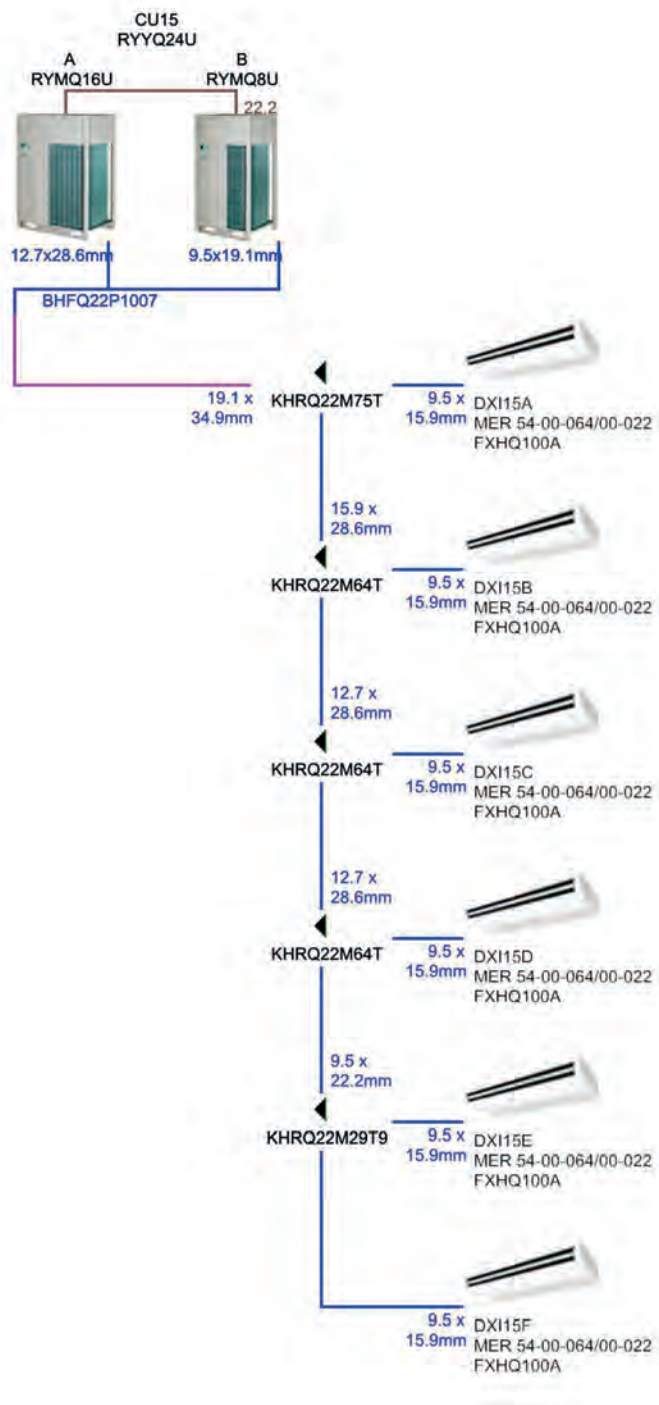
Piping CU14



Piping

Warning: The pipe diameter values are purely indicative. Depending on the required pipe lengths, a different pipe diameter might be required.

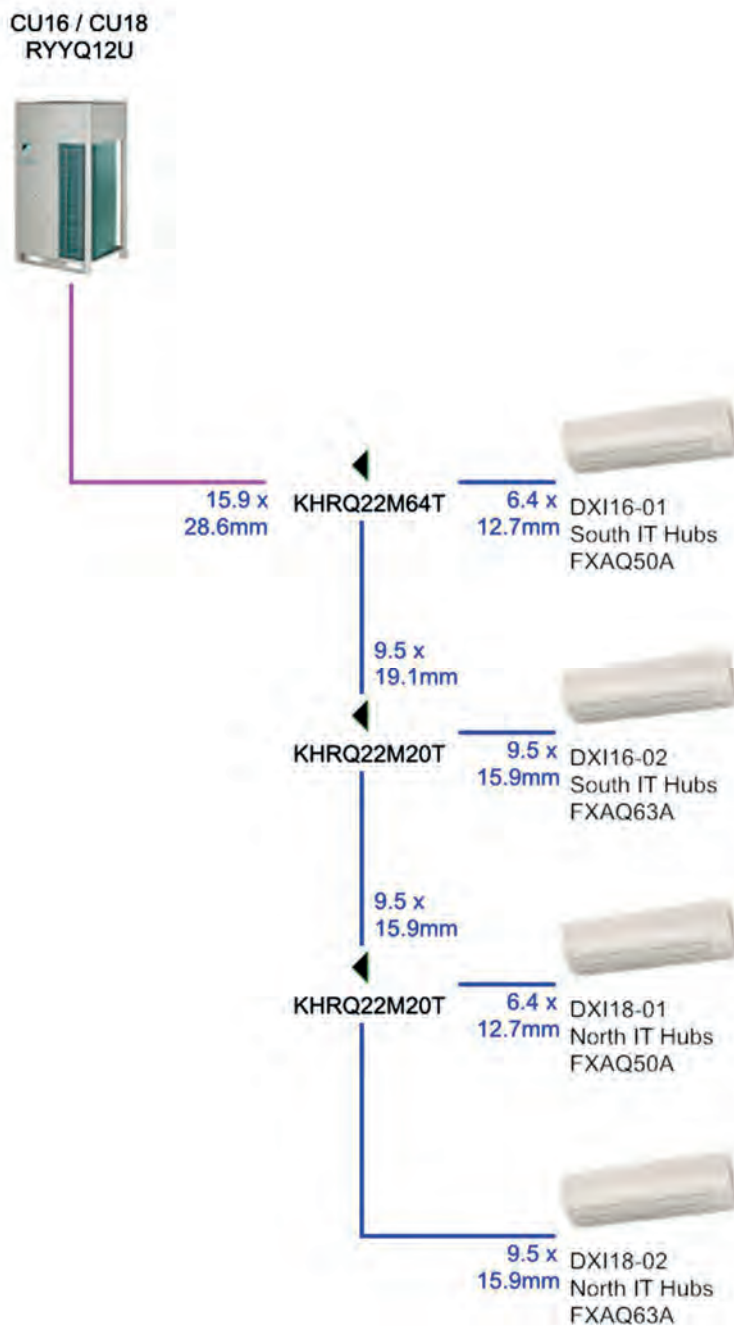
Piping CU15



Piping

Warning: The pipe diameter values are purely indicative. Depending on the required pipe lengths, a different pipe diameter might be required.

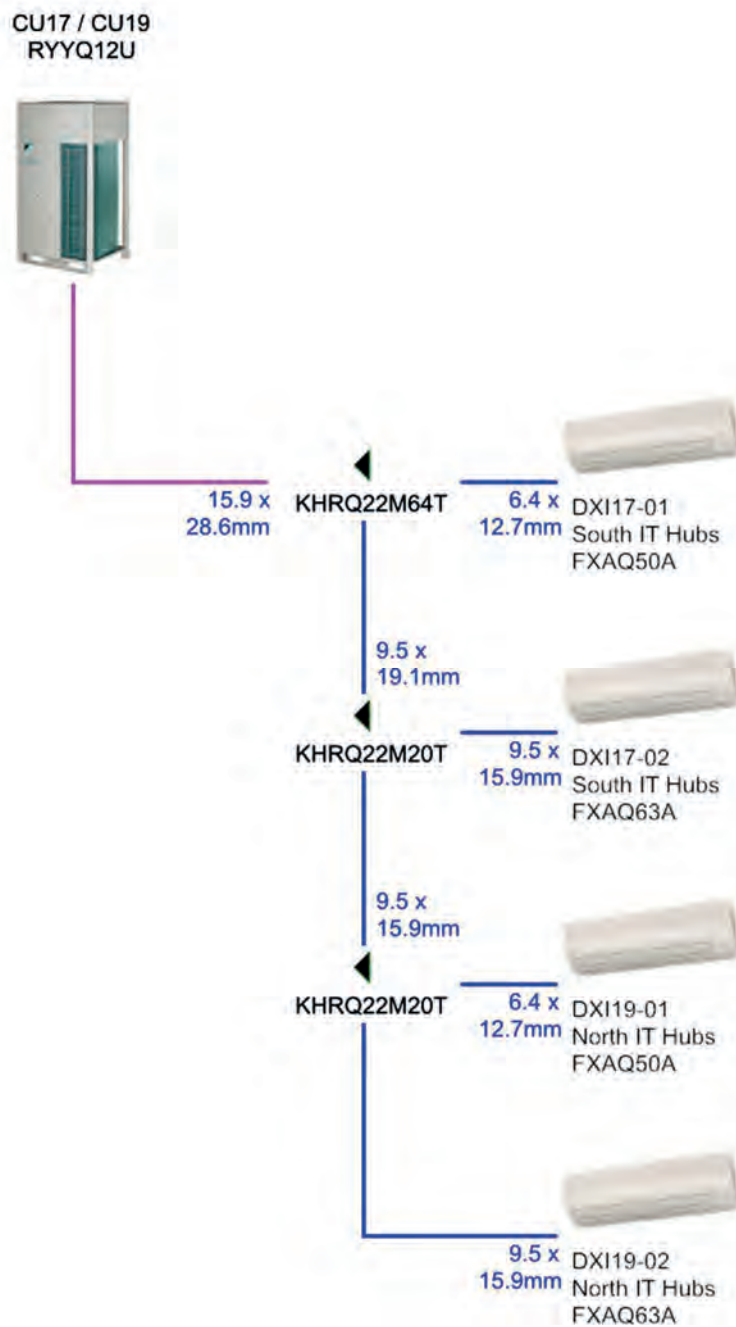
Piping CU16 / CU18



Piping

Warning: The pipe diameter values are purely indicative. Depending on the required pipe lengths, a different pipe diameter might be required.

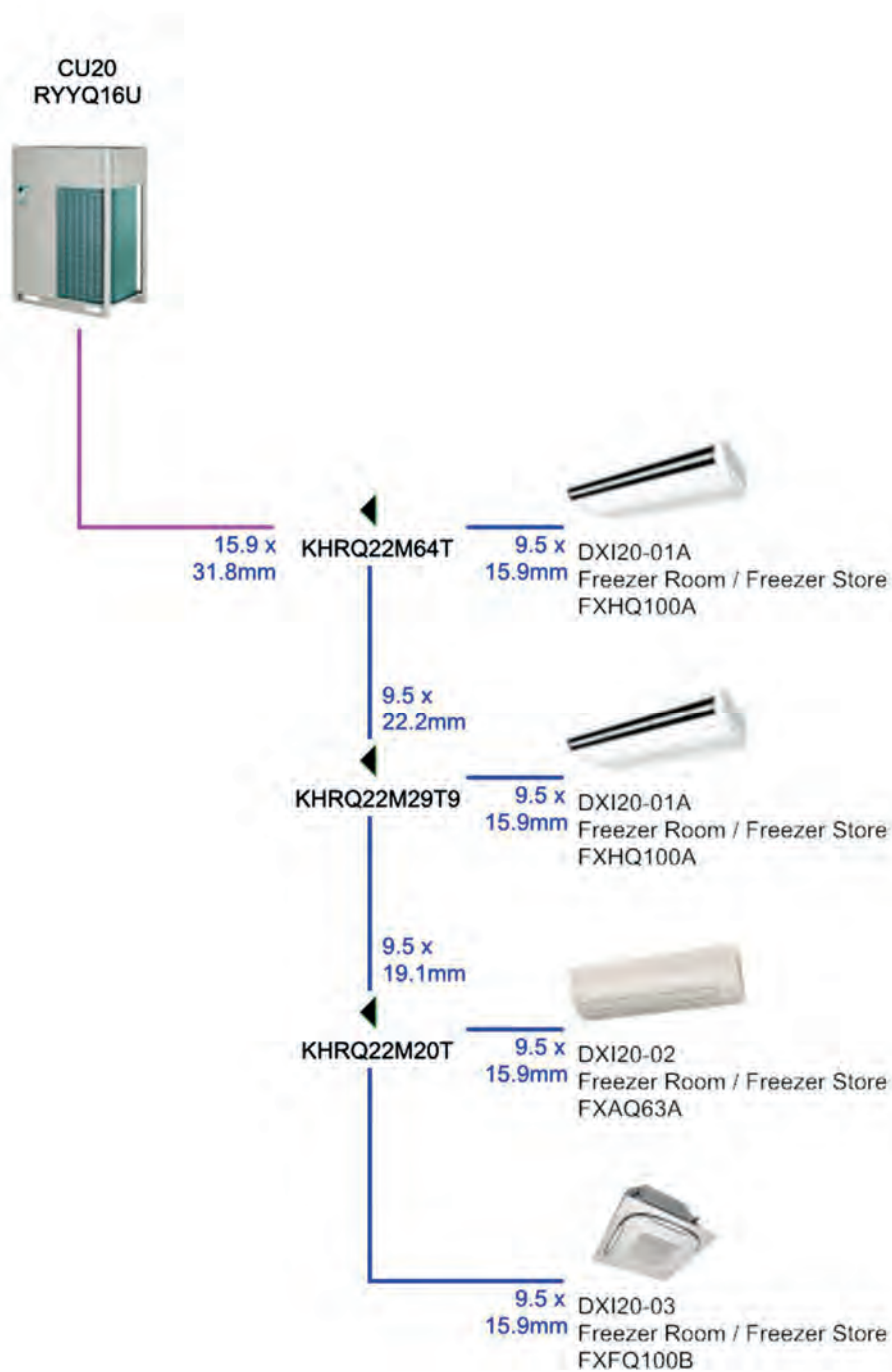
Piping CU17 / CU19



Piping

Warning: The pipe diameter values are purely indicative. Depending on the required pipe lengths, a different pipe diameter might be required.

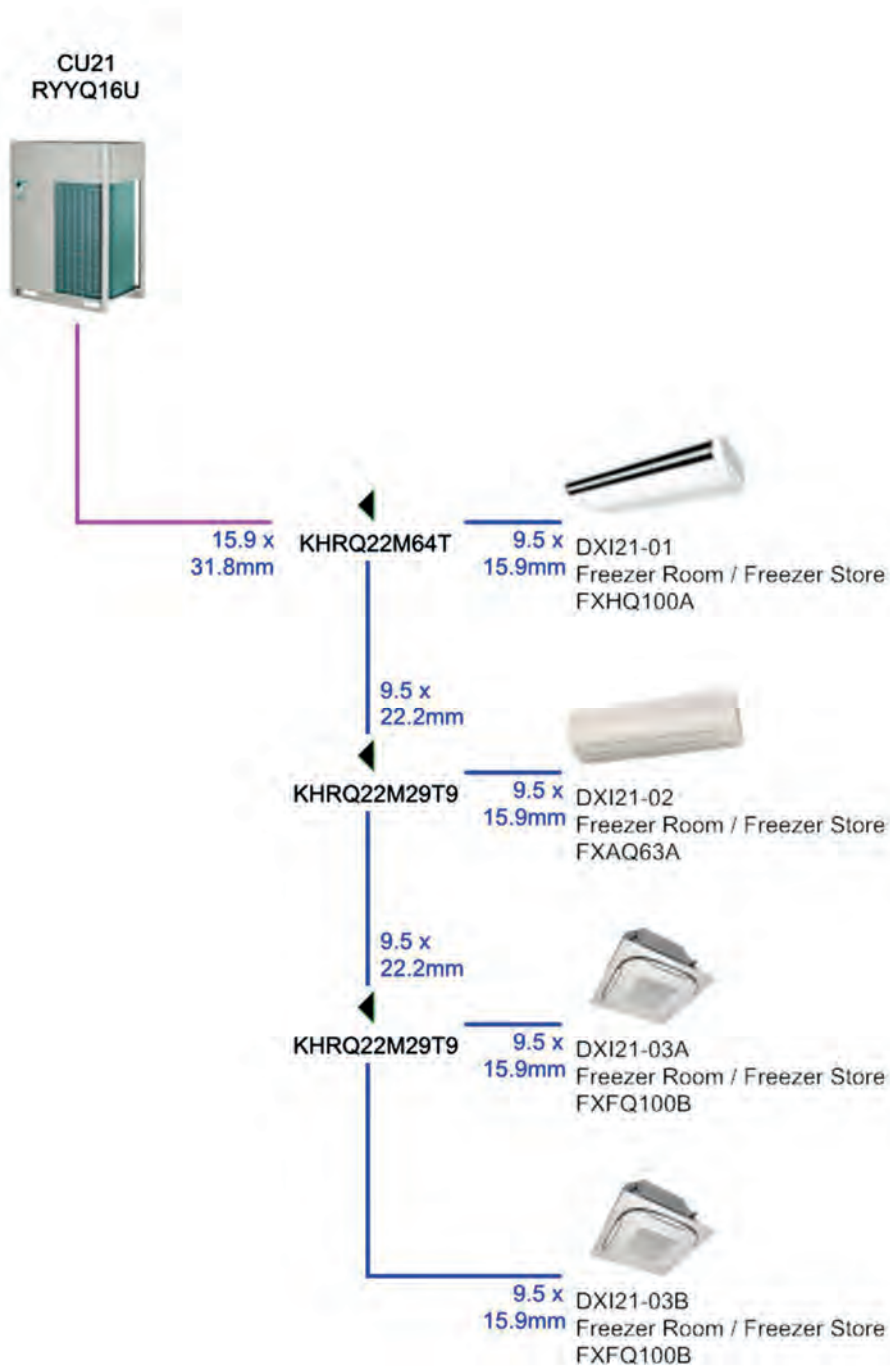
Piping CU20



Piping

Warning: The pipe diameter values are purely indicative. Depending on the required pipe lengths, a different pipe diameter might be required.

Piping CU21

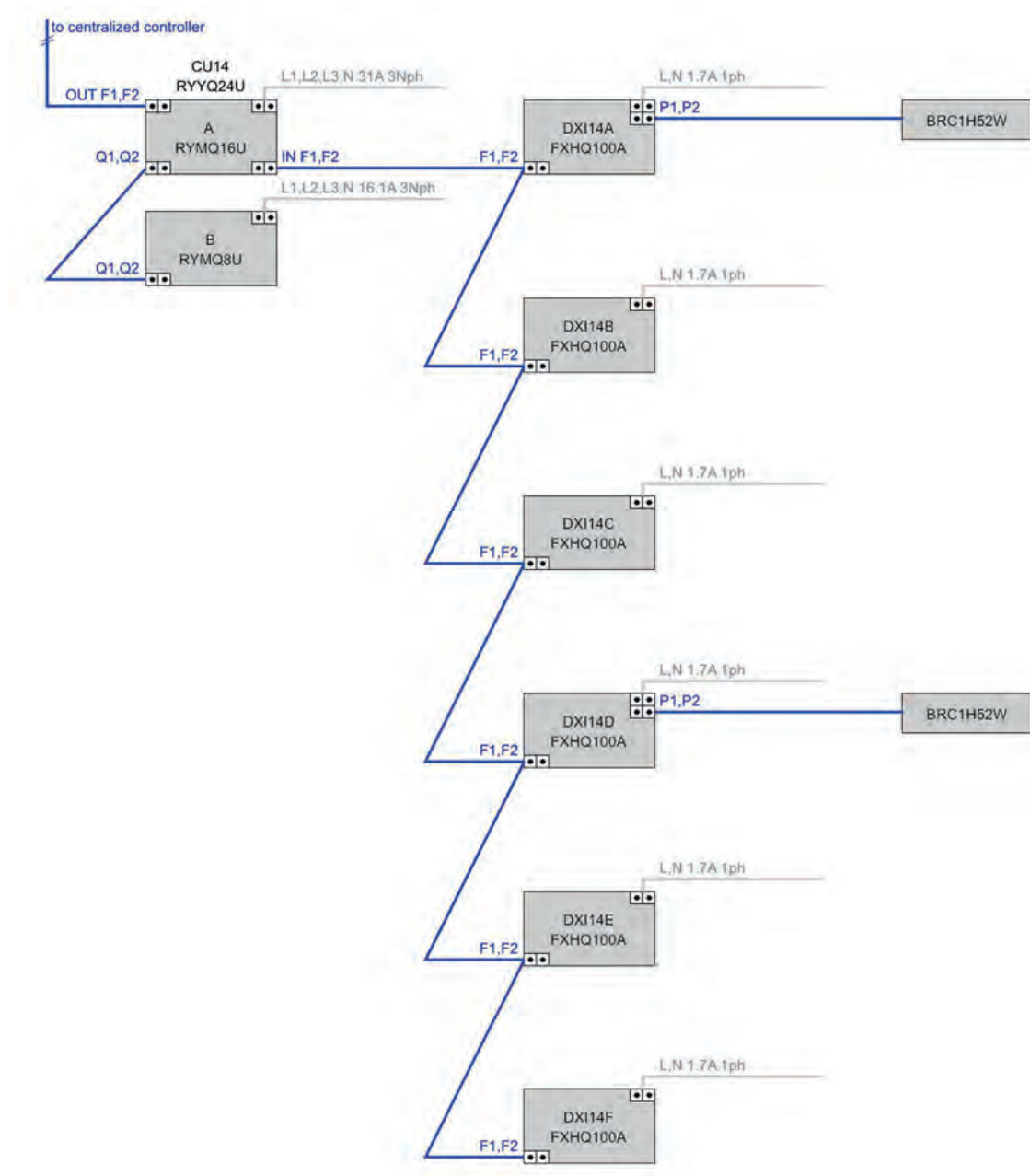


Piping

Warning: The pipe diameter values are purely indicative. Depending on the required pipe lengths, a different pipe diameter might be required.

Wiring diagrams

Wiring CU14



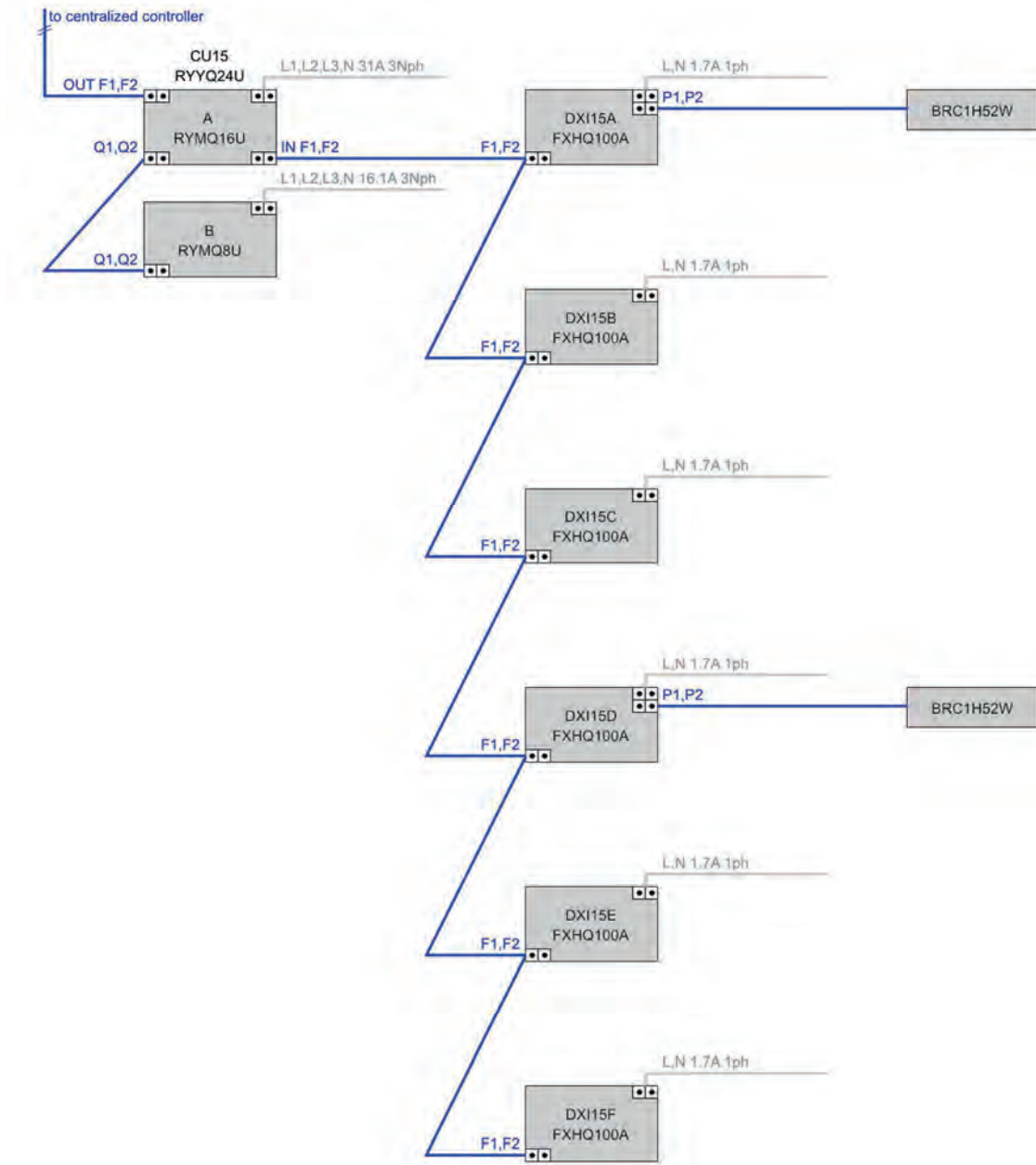
Remarks

P1P2 = AWG 18-2 is required - however always refer to local code for further information.

F1F2 IN/OUT transmission wiring, use 2-core wires of 0,75 to 1,25 mm² size cables, without shield (but shielded cable can be used if required by local regulations and standards).

Note: The shield should only be earthed at outdoor unit side, not at the indoor units!

Wiring CU15



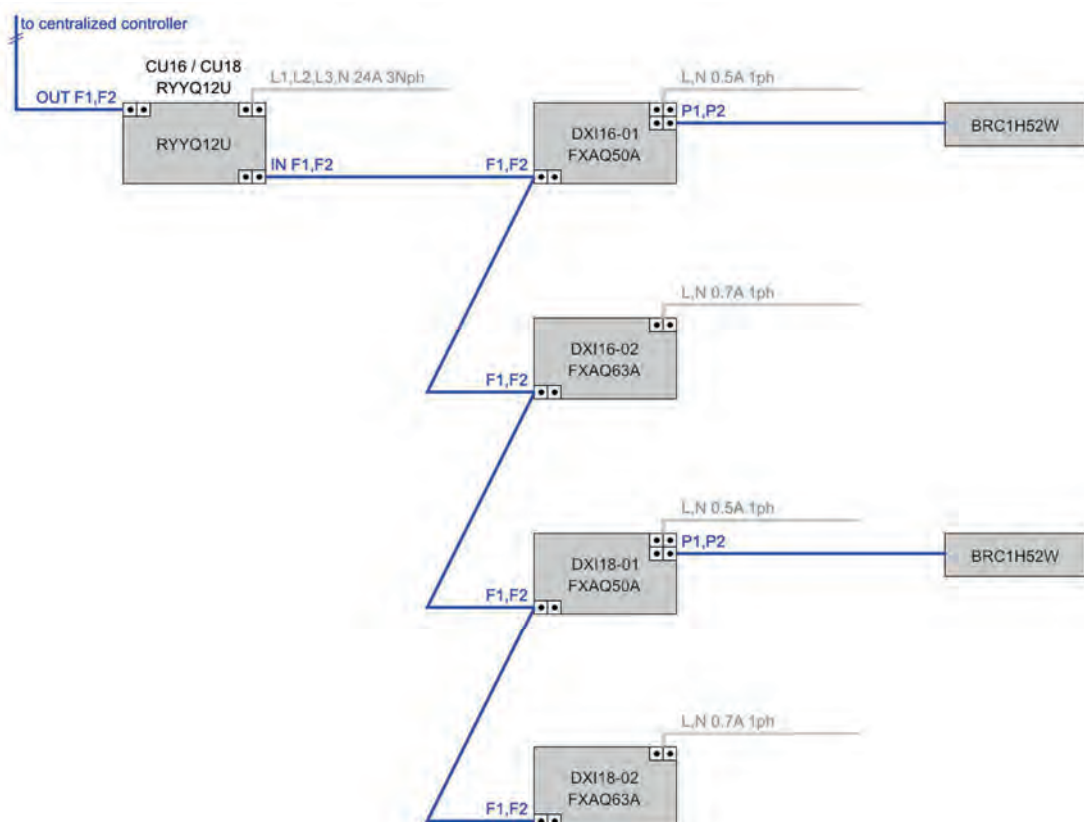
Remarks

P1P2 = AWG 18-2 is required - however always refer to local code for further information.

F1F2 IN/OUT transmission wiring, use 2-core wires of 0,75 to 1,25 mm² size cables, without shield (but shielded cable can be used if required by local regulations and standards).

Note: The shield should only be earthed at outdoor unit side, not at the indoor units!

Wiring CU16 / CU18



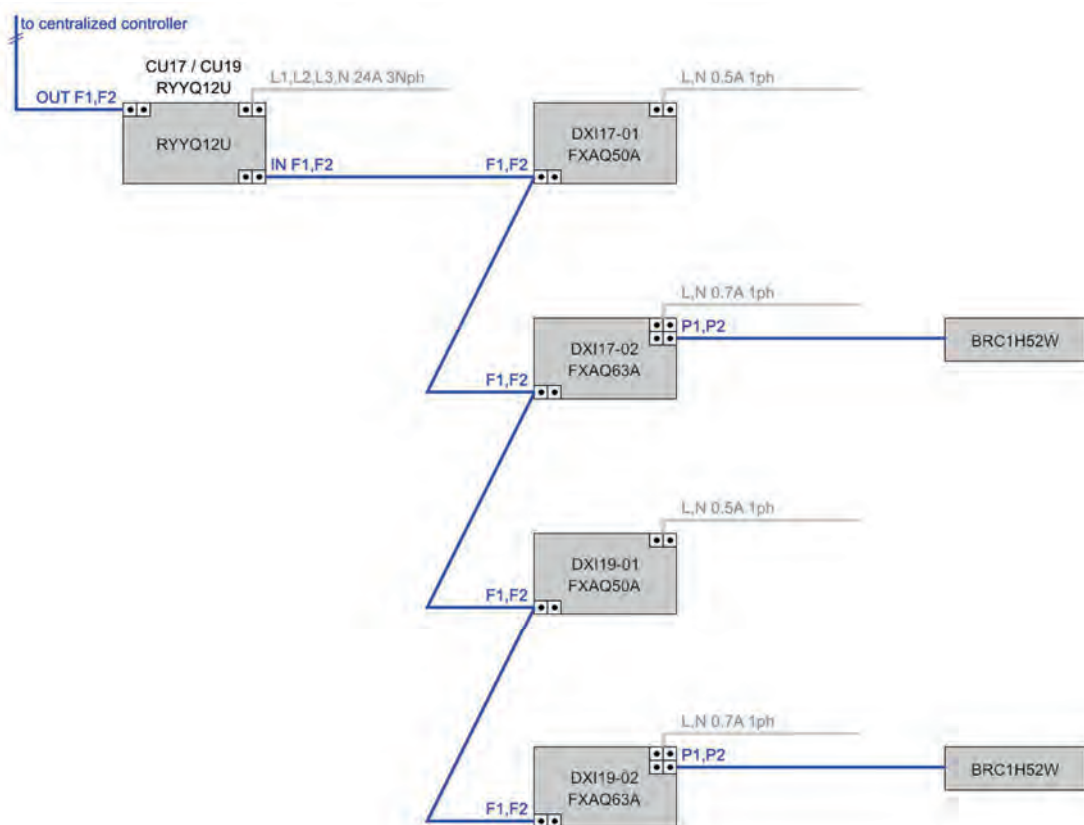
Remarks

P1P2 = AWG 18-2 is required - however always refer to local code for further information.

F1F2 IN/OUT transmission wiring, use 2-core wires of 0,75 to 1,25 mm² size cables, without shield (but shielded cable can be used if required by local regulations and standards).

Note: The shield should only be earthed at outdoor unit side, not at the indoor units!

Wiring CU17 / CU19



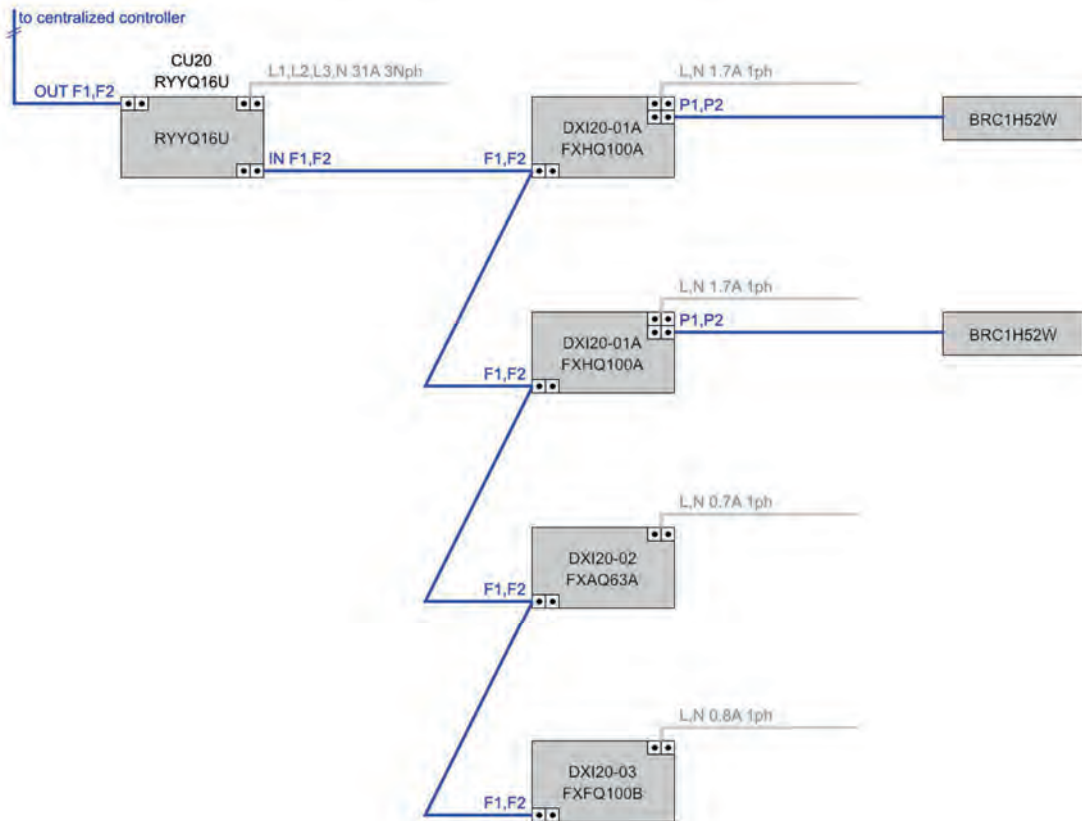
Remarks

P1P2 = AWG 18-2 is required - however always refer to local code for further information.

F1F2 IN/OUT transmission wiring, use 2-core wires of 0,75 to 1,25 mm² size cables, without shield (but shielded cable can be used if required by local regulations and standards).

Note: The shield should only be earthed at outdoor unit side, not at the indoor units!

Wiring CU20



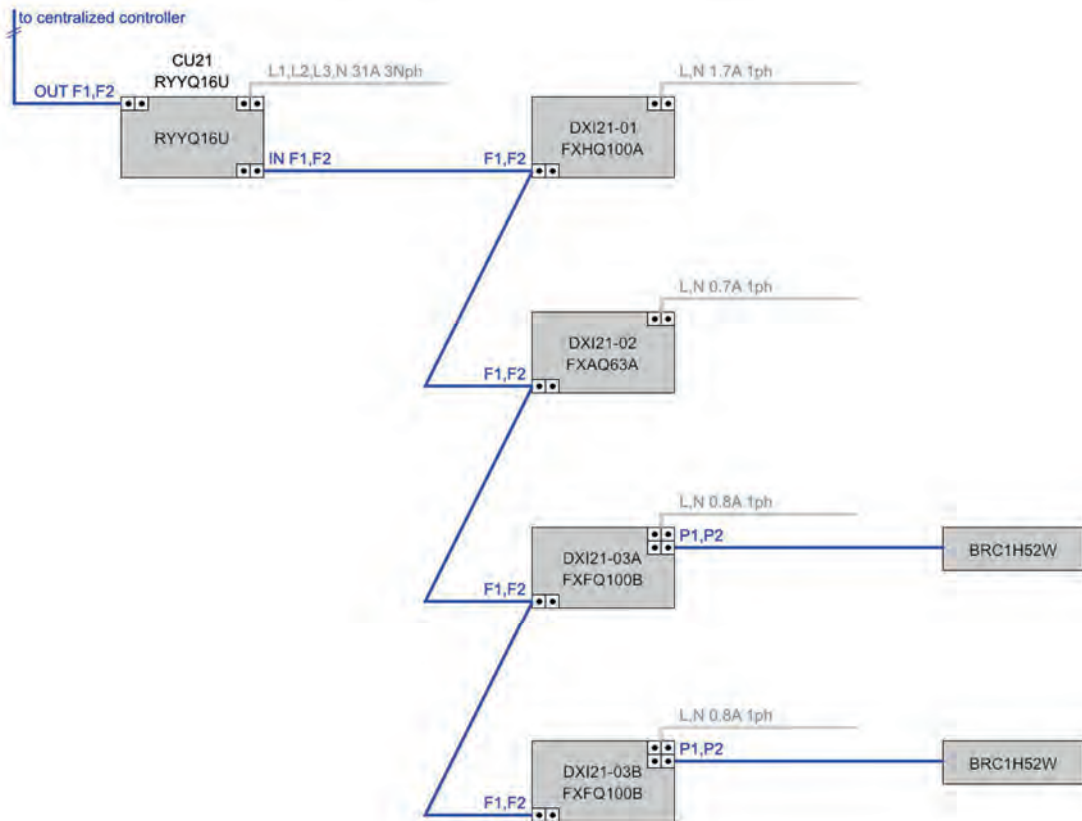
Remarks

P1P2 = AWG 18-2 is required - however always refer to local code for further information.

F1F2 IN/OUT transmission wiring, use 2-core wires of 0,75 to 1,25 mm² size cables, without shield (but shielded cable can be used if required by local regulations and standards).

Note: The shield should only be earthed at outdoor unit side, not at the indoor units!

Wiring CU21



Remarks

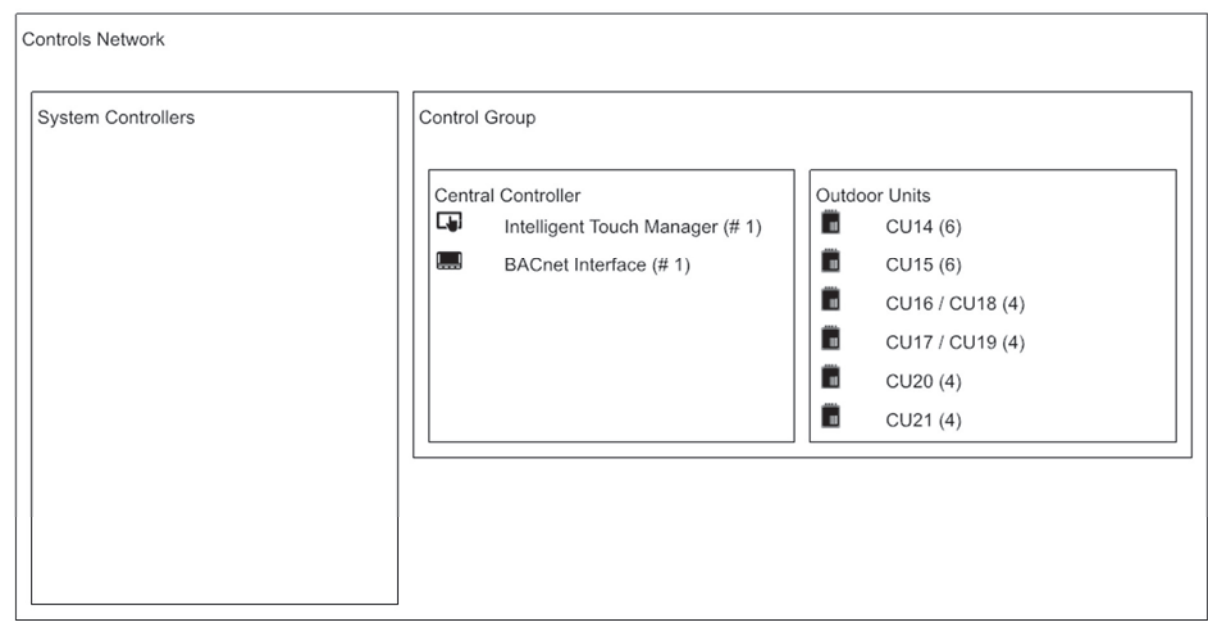
P1P2 = AWG 18-2 is required - however always refer to local code for further information.

F1F2 IN/OUT transmission wiring, use 2-core wires of 0,75 to 1,25 mm² size cables, without shield (but shielded cable can be used if required by local regulations and standards).

Note: The shield should only be earthed at outdoor unit side, not at the indoor units!

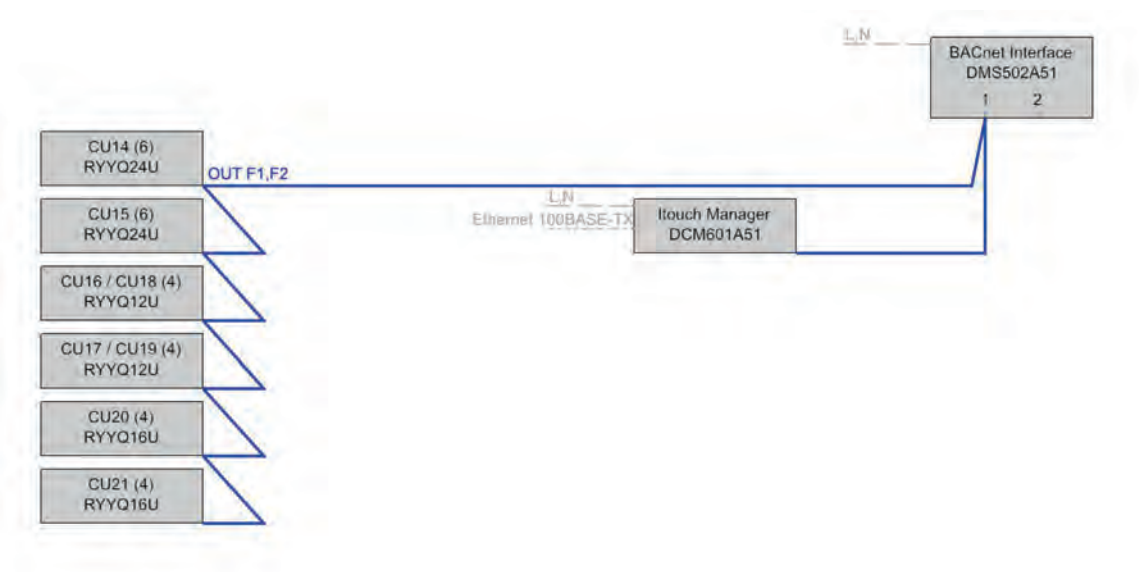
Centralized controllers

Concept



Controller wiring diagrams

Control Group



Best Practices

Residual Current Circuit Breaker

For better protection of installations against the risk of fire, power supply of indoor and outdoor units must be protected with a Residual Current Circuit Breaker. For protection against fire, we recommend a sensitivity of 300mA. The selected RCCB should be of the type B, suitable for inverter devices and indicated by the symbols here below. Further electrical characteristics of the RCCB must be selected in accordance with local regulation.



For a complete list of all required safety precautions, warnings and attention points, please consult the “general safety precautions manual” delivered with the unit.

Paterson Redevelopment AC Systems Equipment Schedule

Cond. Ref	FCU Ref	FCU Type	FCU Model No	Room/Location	Remote Controller	Sensible Ctg Req'd (watts)	Sensible Ctg Available (watts)	SPL dB(A)	FCU Elec Requirements	Condenser Model No	Condenser Dimensions	Weight	SPL	Elec Supply	Rec Fuse Size			
CU14	DX114A	Under Cig	FXHQ100A	MER 54-00-064/00-022	1 x BRC1H52W	6500	6500	34-37-44	6 x 6Amp Fused Spurs	RYYQ24U (RYMQ16U + RYM8QU)	1685H x 2170W x 7.65D	473Kg	63dBA	3-Ph	1 x 20A & 1 X 40a			
	DX114B	Under Cig	FXHQ100A			6500	6500	34-37-44										
	DX114C	Under Cig	FXHQ100A			6500	6500	34-37-44										
	DX114D	Under Cig	FXHQ100A			6500	6500	34-37-44										
	DX114E	Under Cig	FXHQ100A			6500	6500	34-37-44										
	DX114F	Under Cig	FXHQ100A			6500	6500	34-37-44										
CU15	DX115A	Under Cig	FXHQ100A	MER 54-00-064/00-022	1 x BRC1H52W	6500	6500	34-37-44	6 x 6Amp Fused Spurs	RYYQ24U (RYMQ16U + RYM8QU)	1685H x 2170W x 7.65D	473Kg	63dBA	3-Ph	1 x 20A & 1 X 40a			
	DX115B	Under Cig	FXHQ100A			6500	6500	34-37-44										
	DX115C	Under Cig	FXHQ100A			6500	6500	34-37-44										
	DX115D	Under Cig	FXHQ100A			6500	6500	34-37-44										
	DX115E	Under Cig	FXHQ100A			6500	6500	34-37-44										
	DX115F	Under Cig	FXHQ100A			6500	6500	34-37-44										
CU16 / CU18	DX116-01	Wall Mtd	FXAQ30A	South IT Hubs	1 x BRC1H52W	3800	3700	35.5-41	4 x 6Amp Fused Spurs	RYYQ12U	1685H x 930W x 7.65D	252Kg	61dBA	3-Ph	1 x 32A			
	DX116-02	Wall Mtd	FXAQ63A			4700	4600	38.5-46.5										
	DX118-01	Wall Mtd	FXAQ30A	North IT Hubs	1 x BRC1H52W	3800	3700	35.5-41								4700	4600	38.5-46.5
	DX118-02	Wall Mtd	FXAQ63A			4700	4600	38.5-46.5										
CU17 / CU19	DX117-01	Wall Mtd	FXAQ30A	South IT Hubs	1 x BRC1H52W	3800	3700	35.5-41	4 x 6Amp Fused Spurs	RYYQ12U	1685H x 930W x 7.65D	252Kg	61dBA	3-Ph	1 x 32A			
	DX117-02	Wall Mtd	FXAQ63A			4700	4600	38.5-46.5										
	DX119-01	Wall Mtd	FXAQ30A	North IT Hubs	1 x BRC1H52W	3800	3700	35.5-41								4700	4600	38.5-46.5
	DX119-02	Wall Mtd	FXAQ63A			4700	4600	38.5-46.5										
CU20	DX120-01A	Under Cig	FXHQ100A	Freezer Room / Freezer Store	1 x BRC1H52W	6500	6500	34-37-44	4 x 6Amp Fused Spurs	RYYQ16U	1685H x 1240W x 7.65D	319Kg	63dBA	3-Ph	1 x 40A			
	DX120-01A	Under Cig	FXHQ100A			6500	6500	34-37-44										
	DX120-02	Wall Mtd	FXAQ63A			4700	4600	38.5-46.5										
	DX120-03	Cassette	FXFG100B			7100	7100	30-37-43										
CU21	DX121-01	Under Cig	FXHQ100A	Freezer Room / Freezer Store	1 x BRC1H52W	6500	6500	34-37-44	4 x 6Amp Fused Spurs	RYYQ16U	1685H x 1240W x 7.65D	319Kg	63dBA	3-Ph	1 x 40A			
	DX121-02	Wall Mtd	FXAQ63A			4700	4600	38.5-46.5										
	DX121-03A	Cassette	FXFG100B			7100	7100	30-37-43										
	DX121-03B	Cassette	FXFG100B			7100	7100	30-37-43										
CU01	DX101	Under Cig	FHA125A	Standard Lab Freezer 54-05-053	1 x BRC1H52W	9300	9300	37-41-44	By SACL	RZAG125NV1	870H x 1100W x 460D	92Kg	69dBA	1-Ph	1 x 32A			
CU02	DX102	Under Cig	FHA125A	Standard Lab Freezer 54-05-053	1 x BRC1H52W	9300	9300	37-41-44	By SACL	RZAG125NV1	870H x 1100W x 460D	92Kg	69dBA	1-Ph	1 x 32A			
CU03	DX103	Wall Mtd	FAA100A	Freezer Store 54-04-098	1 x BRC1H52W	7440	7440	41-45-49	By SACL	RZAG100NV1	870h x 1100W x 460D	92Kg	66dBA	1-Ph	1 x 32A			
CU04	DX104	Wall Mtd	FAA100A	Freezer Store 54-04-098	1 x BRC1H52W	7440	7440	41-45-49	By SACL	RZAG100NV1	870h x 1100W x 460D	92Kg	66dBA	1-Ph	1 x 32A			
CU05	DX105	Under Cig	FHA125A	Bio Marker Reg Freezer Park 2	1 x BRC1H52W	9300	9300	37-41-44	By SACL	RZAG125NV1	870H x 1100W x 460D	92Kg	69dBA	1-Ph	1 x 32A			
CU06	DX106	Under Cig	FHA125A	Bio Marker Reg Freezer Park 2	1 x BRC1H52W	9300	9300	37-41-44	By SACL	RZAG125NV1	870H x 1100W x 460D	92Kg	69dBA	1-Ph	1 x 32A			
CU07	DX107	Under Cig	FHA125A	Standard Lab Freezer 54-05-075	1 x BRC1H52W	9300	9300	37-41-44	By SACL	RZAG125NV1	870H x 1100W x 460D	92Kg	69dBA	1-Ph	1 x 32A			
CU08	DX108	Under Cig	FHA125A	Standard Lab Freezer 54-05-075	1 x BRC1H52W	9300	9300	37-41-44	By SACL	RZAG125NV1	870H x 1100W x 460D	92Kg	69dBA	1-Ph	1 x 32A			
CU09	DX109	Under Cig	FHA125A	Standard Lab Freezer 54-06-058	1 x BRC1H52W	9300	9300	37-41-44	By SACL	RZAG125NV1	870H x 1100W x 460D	92Kg	69dBA	1-Ph	1 x 32A			
CU10	DX110	Under Cig	FHA125A	Standard Lab Freezer 54-06-058	1 x BRC1H52W	9300	9300	37-41-44	By SACL	RZAG125NV1	870H x 1100W x 460D	92Kg	69dBA	1-Ph	1 x 32A			
CU22	DX103?	Wall Mtd	FAA100A	Bio Marker Reg Freeze Room 54-03-059	1 x BRC1H52W	7440	7440	41-45-49	By SACL	RZAG100NV1	870h x 1100W x 460D	92Kg	66dBA	1-Ph	1 x 32A			
CU23	DX103?	Wall Mtd	FAA100A	Bio Marker Reg Freeze Room 54-03-059	1 x BRC1H52W	7440	7440	41-45-49	By SACL	RZAG100NV1	870h x 1100W x 460D	92Kg	66dBA	1-Ph	1 x 32A			
CU24	DX122	Under Cig	FHA125A	Freezer Store 54-03-094	1 x BRC1H52W	9300	9300	37-41-44	By SACL	RZAG125NV1	870H x 1100W x 460D	92Kg	69dBA	1-Ph	1 x 32A			
CU25	DX122?	Under Cig	FHA125A	Freezer Store 54-03-094	1 x BRC1H52W	9300	9300	37-41-44	By SACL	RZAG125NV1	870H x 1100W x 460D	92Kg	69dBA	1-Ph	1 x 32A			

Central Controller / BMS Interface

DCM601A51 Touchscreen centralised controller c/w DMS502A51 BACnet Gateway

Skyline Air Conditioning Ltd

Standard Installation Specification

GENERAL

The installation will comprise all indoor and outdoor VRF/DX equipment as per the equipment schedules and particular project specification. All interconnecting refrigerant pipe-work, condensate pipe-work together with associated interconnecting control / power wiring and containment between indoor and outdoor units, remote controls and central control panel. On completion of installation each system shall be tested and commissioned.

PIPEWORK

Refrigerant piping installation shall comply with BS EN 378 3:2000. The pipe-work shall be constructed from best refrigerant quality seamless drawn copper tubes to BS2871 Part 2 Material C106.

All pipe-work shall be installed in both soft copper coils and hard drawn straight 3 or 6 metre lengths.

All copper tubing shall be delivered to site internally degreased and cleaned, stored in a clean, dry condition with sealed ends until required for installation.

Brazed Joints - Brazed connections shall be complete and have an adequate collar of braze around the joint to assure a sound connection. Inspection mirrors shall be used to check all blind spots. Cut pipe and flared joints shall be de-burred and be of the correct pipe diameter.

All joints other than flared connections to equipment, where possible, shall be brazed using an oxyacetylene dual bottle soldering set incorporating flame arrestor and housed in a stand. Solder would be ready fluxed and of the SF1 type.

All pipe connections shall be by expanding one tube end using a non-clamped type-expanding tool and the connecting pipe shall be inserted into the formed expanded joint. Couplings shall be avoided where practical.

Oxygen free nitrogen shall be purged through all pipework during the brazing process to prevent oxides from forming within the pipework.

Bends shall be formed using pipe benders with care taken to avoid rippled / flat backed formed bends. The use of elbow fittings should be avoided to minimise the possibility of leaks where practical.

Dirt and moisture shall be excluded at all times, including during fixing operations, by sealing or use of end caps.

Cold Jointing – Only approved jointing systems such as Zoomlock and Maxi-Pro shall be used. In every case the fittings manufacturers approved pressing tools shall be used by operatives trained / certified in their use. The correct and calibrated tools shall be used at all times.

Pipework shall be fully inserted into the fitting to ensure a complete seal is formed. Cut pipe and flared joints shall be de-burred and be of the correct pipe diameter. Dirt and moisture shall be excluded at all times, including during fixing operations, by sealing or use of end caps.

PIPEWORK / PIPEWORK SUPPORT

Pipe-work will be run on either:

- A: Unistrut type or similar channel and fixed with insulated pipe clamps or rapid positioning type clips. Pipe support spacing shall be in accordance with BSEN378-2 standards
- B: Cable tray with loosely tied wraps every 300mm to secure the insulated pipe-work down. Cable tray supports should be every 500mm with Unistrut type or similar channel. Vertical pipework must be fixed with insulated pipe clamps Hydrasorb or equivalent.

The fixing of bracketry to the building structure will be by the most appropriate mechanical method using site approved fixings and methods.

INSULATION

All pipe-work shall be thermally insulated and vapour sealed with Class O Armaflex, or equal, to a minimum thickness of 13 mm and in accordance with the particular project specification. Vapour seal by glued joints / insulation tape or similar. Exposed external insulation shall be UV resistant or mechanically protected / covered using hot-dipped galvanised cable tray.

IDENTIFICATION

All pipework and equipment shall be clearly identified with the relevant system numbers / colours at 6m intervals.

DRAINAGE

Condensate from the fan coil units shall where possible be via gravity to a trapped tundish (supplied by others) before discharging in to a RWP / sink trap or other suitable position. Gravity drains are the most effective and efficient way of removing condensate water from the unit so where possible gravity drains are to be installed.

All gravity drains shall have at least a 1 in 100 fall to the discharge point. The drain will be supported at 1.2m centres by adequate bracketing system using pipe clips secured to drop rod. Gravity condensate shall be run in UPVC solvent weld pipe. The condensate network will be 'commoned' as practical. When a gravity drain cannot be utilised a condensate pump shall be used. Vent tees and rodding eyes shall be included as necessary. On completion the entire system shall be flood tested with water volumes in/out recorded in the test data.

PROTECTION

The equipment will be protected using original packaging where possible during installation. Any physical damage caused by others will incur extra costs to rectify which will only be repaired following receipt of costed site instruction.

WIRING

The interconnecting power and data wiring for the VRF/DX systems shall be carried out strictly in accordance with the manufacturer's recommendations of sizes, maximum lengths etc, and using SACL approved cable types.

All internal cabling shall be LSZH and additionally external cable shall be UV stable. External power cabling shall be SWA.

All cabling shall be run with the pipework associated with the system on appropriate containment for the operating environment.

TESTING

Pressure testing and in accordance with the manufacturer's recommendations.

On completion of the pipework installation each system shall be strength and pressure tested with Oxygen free Nitrogen to the method and pressures as specified by the equipment manufacturer.

The engineer's pressure gauges will be checked throughout the duration of the test.

The date and time of the pressurisation test will be recorded. 48 hours' notice will be provided for witness attendance. Should the witness engineer fail to attend we reserve the right to accept the signature of an independent party and continue with testing.

Prior to commencement the time, date and ambient temperature will be recorded. The system will first be brought up to strength test pressure and held for a minimum of 30 minutes before being reduced to soak test pressure to be held for a minimum 12 hours (where permitted overnight). On completion of the soak test the pressure shall be recorded together with time, date and ambient temperature.

In situations where commissioning of the equipment does not directly follow pressure testing the system will be left pressurised with OFN at 50 PSI approx. 3.5 Bar.

The pressure left in the system will be recorded in order that the Commissioning Engineer will be aware of the pressure on commencement of the commissioning procedure.

No refrigerant will be introduced into the system at this stage until the separate commissioning procedure commences.

COMMISSIONING PROCEDURE

Commissioning shall be carried by competent personnel only in accordance with CIBSE Commissioning Code-series R-Refrigeration Systems and in accordance with manufacturer recommendations.

Upon commencement of the commissioning procedure, the nitrogen system pressure will be recorded and compared with the previously logged standing pressure to verify system integrity.

Interconnecting and mains wiring will then be checked for completion, the system will be checked to ensure that all final connections have been made, that all connections are tight and that power continuity exists between each indoor unit and its relevant outdoor unit.

All electrical connections and safety devices on all equipment shall be checked and recorded. These electrical integrity tests are to be conducted jointly with the site electrician. The electrical integrity certificate shall be written out by the site electrician and the systems made live.

The nitrogen holding charge shall be safely released and the systems evacuated in accordance with the manufacturers requirements / a minimum triple vacuum sequence to remove all traces of moisture that form within the system. Evacuation pump of the correct size CFM shall be used with oil check valve and suitably calibrated torr gauge. When the target vacuum is achieved the torr gauge pressure shall be recorded. If the evacuation process is to be witnessed 48 hours' notice will be provided for attendance of the client's representative.

Following evacuation, the system will be charged with the calculated refrigerant charge through the service port on the suction valve of the outdoor unit. The refrigerant charge will be calculated using the Manufacturer's recommendations and the total charge recorded on the commissioning logs and F Gas documents.

SUPERVISION

A senior installation/service engineer who will be permanently in attendance on site and engaged in the installation will also supervise and coordinate the installation teams and give weekly Tool Box Talks.

LOGS

All site reports, snagging, QA and SHE documents will be kept by SACL Project Manager and offered to the client for inclusion in the Operation and Maintenance manual.

HEALTH AND SAFETY

All working methods and tasks as identified in approved RAMS will be followed at all times. The SACL Project Manager will make regular site visits to check on progress, give relevant topic Tool Box Talks and issue visit reports to site management team. Additional regular site attendance will be made to monitor Health & Safety procedures H&S advisor and Director.

PPE

All site personnel will wear PPE in accordance with specific site rules and as required for particular tasks as set out in approved RAMS.



N2XH Enhanced Flex FRNC-LSZH KEMA Approved Power Cable



APPLICATION

These power cables are used for electricity supply in low voltage installation system. They are well adapted to underground use in industrial applications with an additional mechanical protection. These cables can be fixed on cable trays, within conduits or fixed to walls and are suitable for duct installation.

CHARACTERISTICS

Voltage Rating (U₀/U)
0.6/1kV

Test Voltage
3.5kV

Temperature Rating
Fixed: -40°C to +90°C

Minimum Bending Radius
Fixed: 6x overall diameter

CONSTRUCTION

Conductor
Class 5 Fine Stranded Copper

Insulation
XLPE (Cross-Linked Polyethylene)

Bedding
LSZH-FRNC (Low Smoke Zero Halogen - Flame Retardant Non-Corrosive)

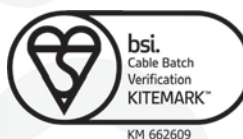
Sheath
LSZH-FRNC (Low Smoke Zero Halogen - Flame Retardant Non-Corrosive)

Core Identification

- 1 core: ● Black
2 core: ● Blue ● Brown
3 core including earth: ● Blue ● Brown ● Green/Yellow
4 core including earth: ● Brown ● Black ● Grey ● Green/Yellow
5 core including earth core: ● Brown ● Black ● Grey
● Green/Yellow ● Blue

Sheath Colour
● Black

BSI KITEMARK™ TESTED



Cables are tested and verified by The Cable Lab[®] to confirm they meet the quality standards required of the BSI Cable Batch Verification Kitemark™

CABLE THIRD-PARTY ACCREDITATION



Cables are tested and approved by KEMA Laboratories in The Netherlands to KEMA K42C-1-5

*applicable only for sizes 35mm² to 300mm² inclusive

STANDARDS

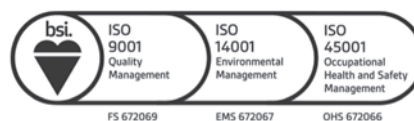
VDE 0274 Part 604, VDE0276 Part 604, HD 604 S1, IEC 60364, BS EN 60228, BS EN 62230, DIN VDE 0100, CEI 20-60, NEN 1010, NF C15-100

Flame Retardant according to IEC 60332-3-24, IEC 60332-1-2
Low Smoke Density / Halogen free according to IEC 61034-1/2, IEC 60754-1/2

UV Resistant / UV stable. Ozone Resistant - EN 50396
Abrasion Resistant - EN 60229-4.1

ISO/IEC 17025 LABORATORY TESTED

This product is subject to the Quality Assurance protocols of The Cable Lab[®], a UKAS accredited ISO 17025 cable testing laboratory. Testing includes vertical flame, conductor resistance, tensile & elongation, and dimensional consistency, verified to published standards and approved product drawings.



REGULATORY COMPLIANCE

This cable is compliant with European Regulation EN 50575, the Construction Products Regulation.



This cable meets the requirements of the Low Voltage Directive 2014/35/EU and the RoHS Directive 2011/65/EU. RoHS compliance has been tested and confirmed by The Cable Lab[®] as meeting the requirements of the BSI RoHS Trusted Kitemark™.

