BAB V

KESIMPULAN DAN SARAN

5.1 Kesimpulan

Berdasarkan hasil analisis dan perhitungan yang telah dilakukan, penelitian ini berhasil mengkaji secara komprehensif sistem tata udara pada ruang restoran indoor Penthouse Hotel X. Analisis mencakup estimasi beban pendinginan, evaluasi kebutuhan kapasitas pendingin, serta pemilihan sistem pengondisian udara yang efisien dan sesuai dengan karakteristik bangunan.

Untuk menjawab tujuan penelitian yang telah ditetapkan, diperoleh kesimpulan sebagai berikut:

1. Berdasarkan hasil analisis termal terhadap ruang restoran indoor Penthouse Hotel X dengan volume ruangan sebesar 713 m^3, diperoleh total beban pendinginan sebesar 25,003 kW atau 33,504 HP. Nilai ini mencakup beban sensible dan beban laten yang bersumber dari radiasi matahari, transmisi panas melalui atap dan dinding, ventilasi, infiltrasi, penggunaan peralatan elektronik, pencahayaan, serta aktivitas penghuni. Komponen terbesar berasal dari infiltrasi udara luar dan radiasi melalui jendela, yang menunjukkan pentingnya pengendalian panas dari luar bangunan.
2. Hasil evaluasi menunjukkan bahwa kapasitas pendinginan yang diperlukan harus mampu merespons perubahan beban secara dinamis, baik dari fluktuasi jumlah penghuni, penggunaan peralatan, maupun kondisi cuaca. Oleh karena itu, sistem tata udara harus dirancang dengan mempertimbangkan fleksibilitas kapasitas dan respon adaptif terhadap beban aktual, agar kenyamanan termal dapat tercapai secara optimal sepanjang waktu operasional restoran.

3. Berdasarkan pertimbangan teknis dan ekonomi, sistem AC VRF (Variable Refrigerant Flow) direkomendasikan sebagai solusi utama. Teknologi ini mampu mengatur kapasitas pendinginan secara otomatis sesuai kebutuhan aktual ruangan, sehingga mengurangi konsumsi energi, menekan biaya operasional, dan meningkatkan efisiensi sistem secara keseluruhan. Sistem ini terbukti menjadi alternatif yang lebih unggul dibanding sistem konvensional dalam mendukung operasional restoran yang nyaman dan berkelanjutan.

5.2 Saran

Berdasarkan hasil penelitian "Analisa Sistem Pengkondisian Udara Pada Indoor Resto Penthouse Hotel X Dengan Volume Ruang 713 m³", terdapat beberapa aspek yang dapat ditingkatkan agar sistem pendinginan lebih optimal dan efisien antara lain :

1. **Perhitungan Beban Kalor yang Lebih Detail**

   Disarankan agar perhitungan beban kalor ke depan mempertimbangkan beban sensibel dan laten secara terpisah, serta memperhitungkan posisi dan orientasi ruangan terhadap sinar matahari untuk hasil yang lebih akurat.

2. **Optimalisasi Efisiensi Energi**

   Penggunaan isolasi termal pada dinding dan atap, serta pemasangan kaca film atau tirai pada jendela, dapat membantu mengurangi beban kalor dari luar dan meningkatkan efisiensi sistem pendingin.

3. **Pemeliharaan Sistem Pendingin**

   Dilakukan perawatan rutin seperti pembersihan filter dan pengecekan refrigeran agar sistem tetap beroperasi secara optimal dan hemat energi.

4. **Penerapan Teknologi Cerdas**

   Implementasi sistem kontrol otomatis seperti smart thermostat dapat meningkatkan efisiensi penggunaan energi dengan menyesuaikan suhu berdasarkan aktivitas dan kebutuhan ruangan.

5. **Evaluasi Beban Kalor Internal**

   Penggunaan peralatan hemat energi dan pencahayaan LED dianjurkan untuk menekan beban kalor dari dalam ruangan. Sistem pengkondisian udara yang dirancang tidak hanya akan lebih efisien dan hemat energi, tetapi juga mampu meningkatkan kenyamanan.

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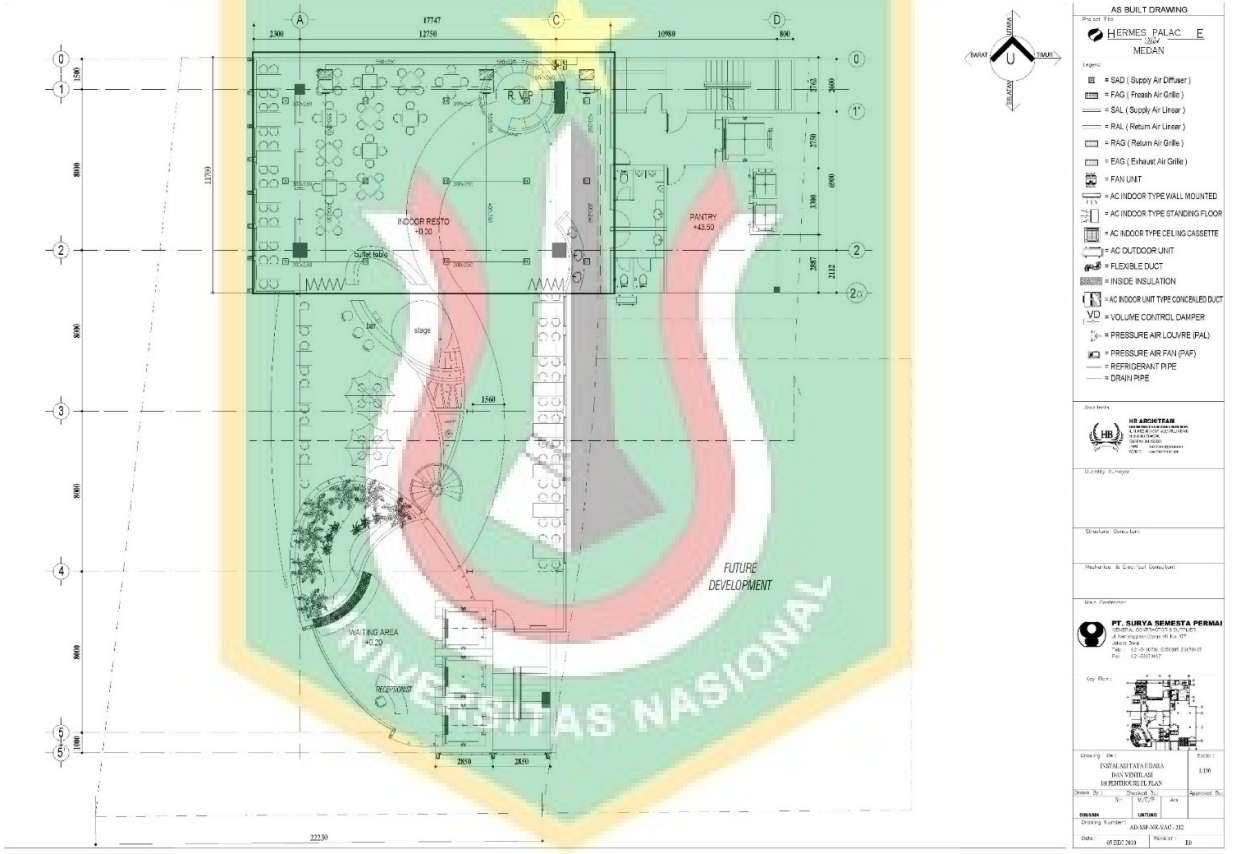
LAMPIRAN

Gambar Layout Arsitek Area Lobby Restoran



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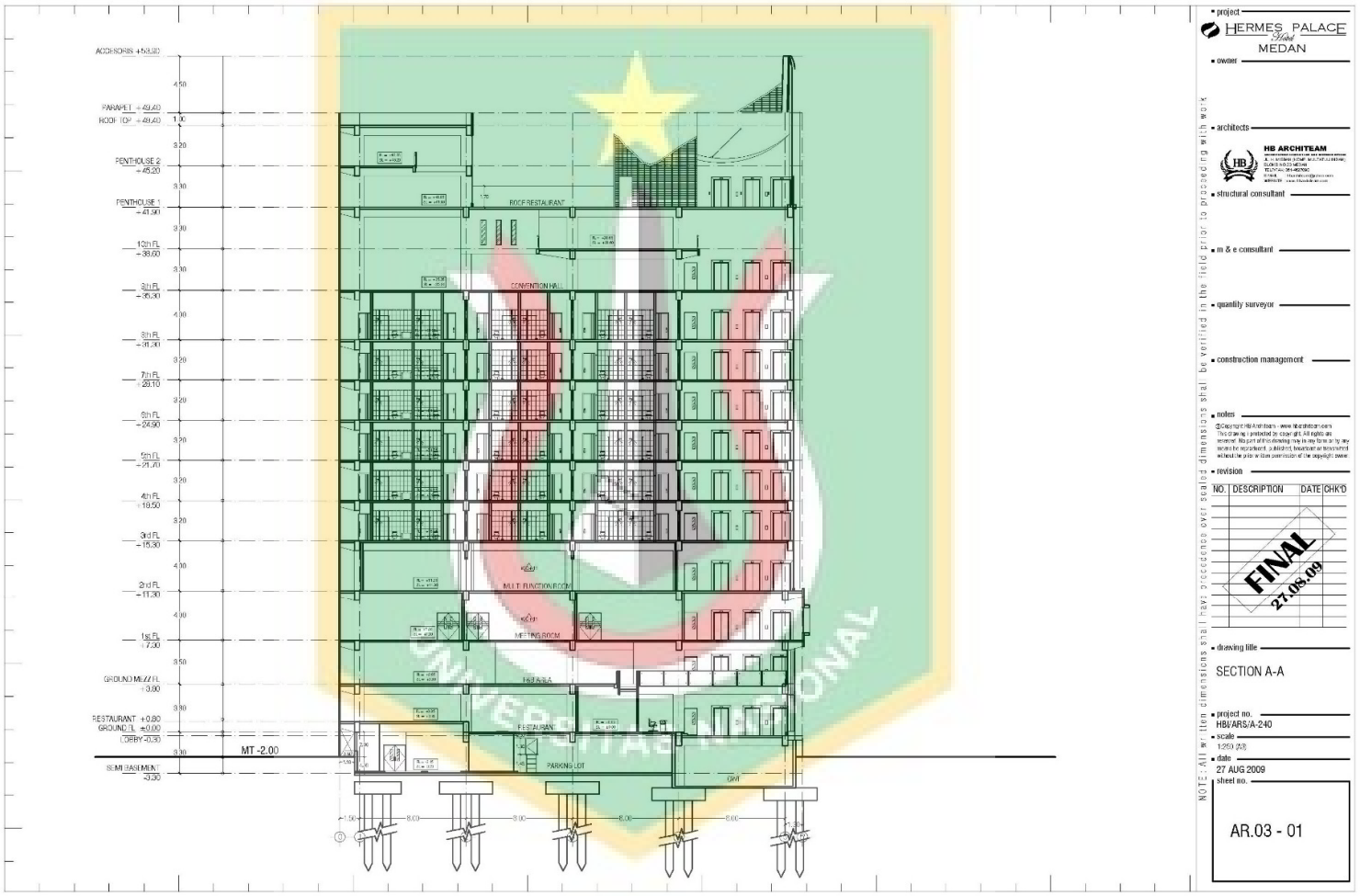
Gambar potomgam Arsitek



DAIKIN

PCVMT174
A

Warning

- Ask a qualified installer or contractor to install this product. Do not try to install the product yourself. Improper installation can result in water or refrigerant leakage, electrical shock, fire or explosion.
- Use only those parts and accessories supplied or specified by Daikin. Ask a qualified installer or contractor to install those parts and accessories. Use of unauthorised parts and accessories or improper installation of parts and accessories can result in water or refrigerant leakage, electrical shock, fire or explosion.
- Read the user's manual carefully before using this product. The user's manual provides important safety instructions and warnings. Be sure to follow these instructions and warnings.

If you have any enquiries, please contact your local importer, distributor and/or retailer.

Cautions on product corrosion

Air conditioners should not be installed in areas where corrosive gases, such as acid gas or alkaline gas, are produced.
If the outdoor unit is to be installed close to the sea shore, direct exposure to the sea breeze should be avoided. If you need to install the outdoor unit close to the sea shore, contact your local distributor.

VRV A SERIES
Cooling Only 50

Dealer

PT. DAIKIN AIRCONDITIONING INDONESIA
HEAD OFFICE :
Wisma KEIAI 18th Floor
Jl. Jendral Sudirman Kav. 3, Jakarta Pusat 10220
Telp : +6221 5724 377
Fax : +6221 5724 366/55
Website : www.daikin.co.id

SERVICE AND SPARE PARTS, Telp. : 021-736 92899 • **Training Center,** Telp. : 021-295 61950 • **Bekasi,** Telp. : 021-2945 0585 **Tangerang,** Telp. : 021-5314 1190 • **Bandung,** Telp. : 022-5225 150 • **Semarang,** Telp. : 024-841 2665 • **Yogyakarta,** Telp. : 0274-551 321 **Surabaya,** Telp. : 031-503 1138 • **Denpasar,** Telp. : 0361-900 5514 • **Makassar,** Telp. : 0411-446 263 • **Palembang,** Telp. : 0711-319 776 **Pekanbaru,** Telp. : 0761-561139

Daikin Contact Center : 0800 1 081 081 (Toll Free)

UNIVERSITAS NASIONAL

Excellent Operational Performance

Comfort

Low operation sound

High efficiency heat exchanger helps to achieve low operation sound.

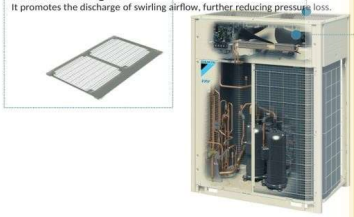
Sound level(dB(A))

	6/8 HP	10 HP	12 HP	14/16 HP
VRV A SERIES	56	57	59	60

Large airflow, high static pressure and quiet technology

Advanced analytic technologies are utilised to optimise fan design and increase airflow rate and high external static pressure.

Streamlined air grille
It promotes the discharge of swirling airflow, further reducing pressure loss.



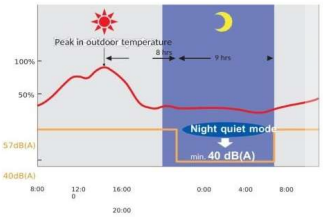
Streamlined scroll fan
The curvature of each fan blade edge reduces both vibration and pressure loss.

Nighttime quiet operation function

For areas with stringent restrictions placed on outdoor sound levels, the outdoor unit can be set for low operation sound during the nighttime to meet sound restrictions.

The automatic night quiet mode will initiate 8 hours*1 after the peak temperature is reached in the daytime, and normal operation will resume 9 hours*2 after that.

*1. Initial setting is 8 hours. Can be selected from 6, 8 and 10 hours.
*2. Initial setting is 9 hours. Can be selected from 8, 9 and 10 hours.
*3. In case of 10 HP outdoor unit.



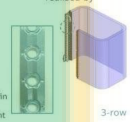
Note:
· This function is available in setting at site.
· The operating sound in quiet operation mode is the actual value

Compact design with high performance

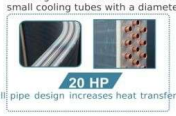
Highly integrated heat exchanger

The unique 4-sided all round heat exchanger ensures sufficient surface area for the heat exchanger.
This improves the heat exchanger performance without increasing the footprint.

4-sided heat exchanger realised by



High efficiency heat exchanger is reducing airflow resistance with adoption small cooling tubes with a diameter of Φ7.

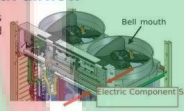


3-row small pipe design increases heat transfer efficienc

Waffle Fin
A waffled-shaped fin with fin pitch of 1.4 mm was adopted to realise sufficient heat exchanger area for optimum unit efficiency.

Optimised inner design to ensure smooth airflow

Electric components were downsized and positioned in the dead space of the bell mouth side to decrease airflow resistance.

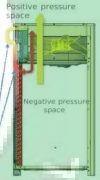


Easy maintenance

The electrical components are strategically located on the top which eases the maintenance process. Moreover, the heat exchanger on the front side can be used effectively to improve its performance.

Sufficient cooling for electrical components

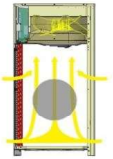
The *VRV* A series is designed with the electrical box strategically positioned between a region of positive and negative pressure. This design allows large airflow from negative pressure to positive pressure due to the high pressure difference.



*High pressure since air enters near the fan blower inlet

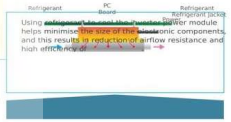
Eliminate suction resistance issue

Without affecting the fan volume, the electric components are designed to be at the top and this ulitises dead space. This eliminates the problem of suction resistance.



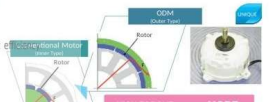
High reliability at high ambient temperatures

It is possible to keep operation stable even at high ambient temperatures by cooling the inverter power module. This helps maintain air-conditioning capacity and reduces failure ratio.



Outer Rotor DC Motor (ODM)

Only Daikin has adapted an ODM with the feature of stable rotation and volumetric efficiency



Advantages of ODM

VRV A Series Outdoor Units

New

The outdoor unit capacity is up to 60 HP (168 kW) in increment of 2 HP.

- *VRV* A series outdoor unit offers a high capacity of up to 60 HP, responding to the needs of large-sized building. The single outdoor unit has only 2 shape and dimensions, not only simplifying the design process, but also bringing the system flexibility to a new level.
- With the outdoor unit capacity increased in increment of 2 HP, customers' needs can be precisely met.

Lineup

	HP	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60
VRV A SERIES	Single module	●	●	●	●	●	●	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	Multi type	–	–	–	–	–	–	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Single Outdoor Units

6, 8, 10, 12 HP14, 16, 18, 20 HP

RXQ6AY14
RXQ8AY14
RXQ10AY14
RXQ12AY14

RXQ14AY14
RXQ16AY14
RXQ18AY14
RXQ20AY14

Double Outdoor Units

18, 20, 22, 24 HP

RXQ18AMY14
RXQ20AMY14
RXQ22AMY14
RXQ24AMY14

26, 28, 30 HP

RXQ26AMY14
RXQ28AMY14
RXQ30AMY14

32, 34, 36, 38, 40 HP

RXQ32AMY14
RXQ34AMY14
RXQ36AMY14
RXQ38AMY14
RXQ40AMY14

Triple Outdoor Units

42, 44 HP

RXQ42AMY14
RXQ44AMY14

46, 48, 50, 52, 54, 56, 58, 60 HP

RXQ46AMY14
RXQ48AMY14
RXQ50AMY14
RXQ52AMY14

RXQ54AMY14
RXQ56AMY14
RXQ58AMY14
RXQ60AMY14

VRV X SERIES

Cooling Only 6 HP–60 HP

Preliminary Information

New Heights in Energy Efficiency During Actual Operation

The VRV X series features new models specially developed for high efficiency.
All compressors used in outdoor units are new scroll compressors designed to enhance energy efficiency.

New

RXSQ-A

Lineup

	HP	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60
VRV X SERIES	Single module	●	●	●	●	●	●	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	Multi type	–	–	–	–	–	–	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Note: *1. Only single outdoor unit (RXQ6-20AY1) can be connected.
*2. Total capacity index of connected indoor units must be 50%-130% of the capacity index of the outdoor unit.

Outdoor Unit Combinations

For connection of *VRV* indoor units

HP	kW	Capacity index	Model name	Combination	Outdoor unit multi connection piping kit*1	Total capacity index of connectable indoor units*2	Maximum number of connectable indoor units*2
6 HP	16.0	150	RXQ6A	RXQ6A	–	75 to 195 (300)	9 (15)
8 HP	22.4	200	RXQ8A	RXQ8A	–	100 to 260 (400)	13 (20)
10 HP	28.0	250	RXQ10A	RXQ10A	–	125 to 325 (500)	16 (25)
12 HP	33.5	300	RXQ12A	RXQ12A	–	150 to 390 (600)	19 (30)
14 HP	40.0	350	RXQ14A	RXQ14A	–	175 to 455 (700)	22 (35)
16 HP	45.0	400	RXQ16A	RXQ16A	–	200 to 520 (800)	26 (40)
18 HP	50.0	450	RXQ18A	RXQ18A	–	225 to 585 (900)	29 (45)
20 HP	56.0	500	RXQ20A	RXQ20A	–	250 to 650 (1,000)	32 (50)
18 HP	50.4	450	RXQ18AM	RXQ8A + RXQ10A	BHFP22P100	225 to 585 (720)	29 (36)
20 HP	55.9	500	RXQ20AM	RXQ8A + RXQ12A		250 to 650 (800)	32 (40)
22 HP	61.5	550	RXQ22AM	RXQ10A + RXQ12A		275 to 715 (880)	35 (44)
24 HP	67.0	600	RXQ24AM	RXQ12A × 2		300 to 780 (960)	39 (48)
26 HP	73.5	650	RXQ26AM	RXQ12A + RXQ14A		325 to 845 (1,040)	42 (52)
28 HP	78.5	700	RXQ28AM	RXQ12A + RXQ16A		350 to 910 (1,120)	45 (56)
30 HP	83.5	750	RXQ30AM	RXQ12A + RXQ18A		375 to 975 (1,200)	48 (60)
32 HP	90.0	800	RXQ32AM	RXQ14A + RXQ18A		400 to 1,040 (1,280)	52 (64)
34 HP	95.0	850	RXQ34AM	RXQ16A + RXQ18A		425 to 1,105 (1,360)	55 (64)
36 HP	100	900	RXQ36AM	RXQ18A × 2		450 to 1,170 (1,440)	58 (64)
38 HP	106	950	RXQ38AM	RXQ18A + RXQ20A		475 to 1,235 (1,520)	61 (64)

Note: *1. For multiple connection, the outdoor unit multi connection piping kit (separately sold) is required.
*2. Values inside brackets are based on connection of indoor units rated at maximum capacity, 200% for single outdoor units, 160% for double outdoor units, and 130% for triple outdoor units.

VRV A SERIES

For mixed combination of *VRV* and residential indoor units or connection of residential indoor units only

Model name*1	kW	HP	Capacity index	Total capacity index of connectable indoor units*2 Combination (%)*2			Maximum number of connectable indoor units
				50%	100%	130%	
RXQ6AY14	16.0	6	150	75	150	195	9
RXQ8AY14	22.4	8	200	100	200	260	13
RXQ10AY14	28.0	10	250	125	250	325	16
RXQ12AY14	33.5	12	300	150	300	390	19
RXQ14AY14	40.0	14	350	175	350	455	22
RXQ16AY14	45.0	16	400	200	400	520	26
RXQ18AY14	50.0	18	450	225	450	585	29
RXQ20AY14	56.0	20	500	250	500	650	32

VRV A Series Outdoor Units

RXQ-A





MODEL			RXQ6AY14	RXQ8AY14	RXQ10AY14	RXQ12AY14	RXQ14AY14	RXQ16AY14	RXQ18AY14	RXQ20AYM	RXQ18AMY14	RXQ20AMY14	RXQ22AMY14	RXQ24AMY14	RXQ26AMY14	RXQ28AMY14	RXQ30AMY14
Combination units			—	—	—	—	—	—	—	—	RXQ8AY14	RXQ8AY14	RXQ10AY14	RXQ12AY14	RXQ12AY14	RXQ12AY14	RXQ12AY14
			—	—	—	—	—	—	—	—	RXQ10AY14	RXQ12AY14	RXQ12AY14	RXQ12AY14	RXQ14AY14	RXQ16AY14	RXQ18AY14
Power supply			3 phase 4-wire system, 380-415V, 50Hz							3 phase 4-wire system, 380-415V, 50Hz							
Cooling capacity		Btu/h	54,600	76,400	95,500	114,000	136,000	154,000	171,000	191,000	172,000	191,000	210,000	229,000	251,000	268,000	285,000
		kW	16.0	22.4	28.0	33.5	40.0	45.0	50.0	56.0	50.4	55.9	61.5	67.0	73.5	78.5	83.5
Power consumption		kW	3.38	5.17	6.84	8.70	10.7	12.9	15.3	17.7	12.0	13.9	15.5	17.4	19.4	21.6	24.0
Capacity Control		%	25-100	20-100	13-100	12-100	11-100	10-100	10-100	7-100	7-100	7-100	6-100	6-100	6-100	5-100	5-100
Casing colour			Ivory white (5Y7.5/1)							Ivory white (5Y7.5/1)							
Compressor	Type		Hermetically sealed scroll type							Hermetically sealed scroll type							
	Motor Output×Number of Units	kW	2.3×1	3.4×1	4.5×1	5.6×1	6.4×1	(3.5×1)+(3.5×1)	(4.0×1)+(4.0×1)	(3.8×1)+(6.3×1)	(3.4×1)+(4.5×1)	(3.4×1)+(5.6×1)	(4.5×1)+(5.6×1)	(5.6×1)+(5.6×1)	(5.6×1)+(6.4×1)	(5.6×1)+(3.5×1)+(3.5×1)	(5.6×1)+(4.0×1)+(4.0×1)
Airflow rate		m³/min	119	178		191	257			297	178+178	178+191		191+191	191+257		
Dimensions (H×W×D)		mm	1,657×930×765				1,657×1,240×765			1,657×1,240×765	(1,657×930×765)+(1,657×930×765)				(1,657×930×765)+(1,657×1,240×765)		
Machine weight		kg	175		185		215	260		285	175+185		185+185		185+215	185+260	
Sound level		dB(A)	56		57	59	60		61	65	60	61		62	63		
Operation range		℃DB	10 to 49							10 to 49							
Refrigerant	Type		R-410A							R-410A							
	Charge	kg	5.9		6.7	6.8	7.4	8.2	8.4	11.8	5.9+6.7	5.9+6.8	6.7+6.8	6.8+6.8	6.8+7.4	6.8+8.2	6.8+8.4
Piping connections	Liquid	mm	Φ9.5 (Brazing)			Φ12.7 (Brazing)			Φ15.9 (Brazing)	Φ15.9 (Brazing)					Φ19.1 (Brazing)		
	Gas	mm	Φ19.1 (Brazing)		Φ22.2 (Brazing)	Φ28.6 (Brazing)				Φ28.6 (Brazing)				Φ34.9 (Brazing)			



MODEL			RXQ32AMY14	RXQ34AMY14	RXQ36AMY14	RXQ38AMY14	RXQ40AMY14	RXQ42AMY14	RXQ44AMY14	RXQ46AMY14	RXQ48AMY14	RXQ50AMY14	RXQ52AMY14	RXQ54AMY14	RXQ56AMY14	RXQ58AMY14	RXQ60AMY14
Combination units			RXQ14AY14	RXQ16AY14	RXQ18AY14	RXQ18AY14	RXQ20AY14	RXQ12AY14	RXQ12AY14	RXQ14AY14	RXQ14AY14	RXQ14AY14	RXQ16AY14	RXQ18AY14	RXQ18AY14	RXQ18AY14	RXQ20AY14
			RXQ18AY14	RXQ18AY14	RXQ18AY14	RXQ20AY14	RXQ20AY14	RXQ12AY14	RXQ12AY14	RXQ14AY14	RXQ16AY14	RXQ18AY14	RXQ18AY14	RXQ18AY14	RXQ18AY14	RXQ20AY14	RXQ20AY14
			—	—	—	—	—	RXQ18AY14	RXQ20AY14	RXQ18AY14	RXQ18AY14	RXQ18AY14	RXQ18AY14	RXQ18AY14	RXQ20AY14	RXQ20AY14	RXQ20AY14
Power supply			3 phase 4-wire system, 380-415V, 50Hz							3 phase 4-wire system, 380-415V, 50Hz							
Cooling capacity		Btu/h	307,000	324,000	341,000	362,000	382,000	399,000	420,000	444,000	461,000	478,000	495,000	512,000	532,000	553,000	573,000
		kW	90.0	95.0	100	106	112	117	123	130	135	140	145	150	156	162	168
Power consumption		kW	26.0	28.2	30.6	33.0	35.4	32.7	35.1	36.7	38.9	41.3	43.5	45.9	48.3	50.7	53.1
Capacity Control		%	5-100	5-100	5-100	4-100	3-100	4-100	3-100	3-100	3-100	3-100	3-100	3-100	3-100	2-100	2-100
Casing colour			Ivory white (5Y7.5/1)							Ivory white (5Y7.5/1)							
Compressor	Type		Hermetically sealed scroll type							Hermetically sealed scroll type							
	Motor Output×Number of Units	kW	(6.4×1)+(4.0×1)+(4.0×1)	(3.5×1)+(3.5×1)+(4.0×1)+(4.0×1)	(4.0×1)+(4.0×1)+(4.0×1)+(4.0×1)	(4.0×1)+(4.0×1)+(3.8×1)+(6.3×1)	(3.8×1)+(6.3×1)+(3.8×1)+(6.3×1)	(5.6×1)+(5.6×1)+(4.0×1)+(4.0×1)	(5.6×1)+(5.6×1)+(3.8×1)+(6.3×1)	(6.4×1)+(6.4×1)+(4.0×1)+(4.0×1)	(6.4×1)+(3.5×1)+(3.5×1)+(4.0×1)+(4.0×1)	(6.4×1)+(4.0×1)+(4.0×1)+(4.0×1)+(4.0×1)	(3.5×1)+(3.5×1)+(4.0×1)+(4.0×1)+(4.0×1)+(4.0×1)	(4.0×1)+(4.0×1)+(4.0×1)+(4.0×1)+(4.0×1)+(4.0×1)	(4.0×1)+(4.0×1)+(4.0×1)+(4.0×1)+(3.8×1)+(6.3×1)	(4.0×1)+(4.0×1)+(4.0×1)+(3.8×1)+(6.3×1)+(3.8×1)	(3.8×1)+(6.3×1)+(3.8×1)+(6.3×1)+(3.8×1)+(6.3×1)
Airflow rate		m³/min	257+257			257+297	297+297	191+191+257	191+191+297	257+257+257					257+257+297	257+297+297	297+297+297
Dimensions (H×W×D)		mm	(1,657×1,240×765)+(1,657×1,240×765)					(1,657×930×765)+(1,657×930×765)+(1,657×1,240×765)		(1,657×1,240×765)+(1,657×1,240×765)+(1,657×1,240×765)							
Machine weight		kg	215+260	260+260		260+285	285+285	185+185+260	185+185+285	215+215+260	215+260+260		260+260+260		260+260+285	260+285+285	285+285+285
Sound level		dB(A)	64			66	68	65	67	65				66	68	69	70
Operation range		℃DB	10 to 49							10 to 49							
Refrigerant	Type		R-410A							R-410A							
	Charge	kg	7.4+8.4	8.2+8.4	8.4+8.4	8.4+11.8	11.8+11.8	6.8+6.8+8.4	6.8+6.8+11.8	7.4+7.4+8.4	7.4+8.2+8.4	7.4+8.4+8.4	8.2+8.4+8.4	8.4+8.4+8.4	8.4+8.4+11.8	8.4+11.8+11.8	11.8+11.8+11.8
Piping connections	Liquid	mm	Φ19.1 (Brazing)							Φ19.1 (Brazing)							
	Gas	mm	Φ34.9 (Brazing)		Φ41.3 (Brazing)					Φ41.3 (Brazing)							

Indoor Unit Lineup

Enhanced range of choices

A mixed combination of ***VRV*** indoor units and residential indoor units is enabled all in one system, opening the door to stylish and quiet indoor units.

VRV indoor units

New lineup | VRT Indoor units subject | Indoor units subject

Type	Model Name	Capacity index	20	25	32	40	50	63	80	100	125	140	200	250	400	500
											HP4	HP5	HP6			
Ceiling Mounted Cassette (Round Flow with Sensing)	FXFSQ-AV4 VRT															
Ceiling Mounted Cassette (Round Flow)	FXFQ-AV4															
Ceiling Mounted Cassette (Compact Multi Flow)	FXZQ-MVE4 VRT															
Ceiling Mounted Cassette (Double Flow)	FXCQ-MVE4 VRT															
Ceiling Mounted Cassette (Single Flow)	FXEQ-AV36 VRT															
Slim Ceiling Mounted Duct (Standard Series)	FXDQ-PDVE4 VRT (with drain pump)	(700mm width type)														
	FXDQ-PDVET4 VRT (without drain pump)															
	FXDQ-NDVE4 VRT (with drain pump)	(900/ 1,100mm width type)														
	FXDQ-NDVET4 VRT (without drain pump)															
Slim Ceiling Mounted Duct (Compact Series)	FXDQ-SPV14 VRT															
Middle Static Pressure Ceiling Mounted Duct	FXSQ-PAV4 VRT															
Ceiling Mounted Duct	FXMQ-PAV4 VRT															
	FXMQ-MVE4 VRT															
Outdoor-Air Processing Unit	FXMQ-MFV7															
4-Way Flow Ceiling Suspended	FXUQ-AVEB															
Ceiling Suspended	FXHQ-MAV7 VRT															
Wall Mounted	FXAQ-PVE4 VRT															
Floor Standing	FXLQ-MAVE4 VRT															
Concealed Floor Standing	FXNQ-MAVE4 VRT															
Floor Standing Duct	FXVQ-NY14 VRT															
Clean Room Air Conditioner	FXBQ-PVE4 VRT															
	FXBPQ-PVE4 VRT															
Heat Reclaim Ventilator with DX-Coil and Humidifier	VKM-GA(M)V1	Airflow rate 500-1000 m³/h														

Residential indoor units with connection to BP units

Type	Model Name	Rated Capacity (kW)	25	35	50	60	71
		Capacity Index	25	35	50	60	71
Slim Ceiling Mounted Duct	FDKS-EVMB4 VRT	(700 mm width type)	●	●			
	FDKS-CVMB4 VRT	(900/1,100 mm width type)	●	●	●	●	
Wall Mounted	FTKJ-NVM4W VRT		●	●	●		
	FTKJ-NVM4S VRT		●	●	●		
	FTKS-DVM4 VRT		●	●			
	FTKS-BVM4 VRT				●		
	FTKS-FVM4 VRT				●	●	●

Note: BP units are necessary for residential indoor units. Only single outdoor unit (RXQ6-20AYM) can be connected.

VRV indoor units combine with residential indoor units in one system.

VRV indoor unit system

VRV indoor units only

Max. 64 indoor units

- If a system has indoor units subject to both VRT smart and VRT control, the system is operated under VRT control.
- If a system has both outdoor-air processing air conditioners and outdoor-air processing type indoor units, VRT smart control and VRT control are disabled.

Mixed residential and *VRV* indoor unit system

Residential indoor units | *VRV* indoor units

Max. 32 indoor units

- BP units are necessary for residential indoor units. Only single outdoor unit (RXQ6-20AYM) can be connected.
- If a system has both residential indoor units and *VRV* indoor units, the system is operated under VRT control.

Residential indoor unit system

Residential indoor units only

Max. 32 indoor units

- BP units are necessary for residential indoor units. Only single outdoor unit (RXQ6-20AYM) can be connected.
- If a system has only residential indoor units, the system is operated under VRT control.

5

Ceiling Mounted Duct Type

New FXMQ-PA / MA

Middle and high static pressure allows for flexible duct design

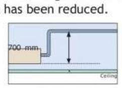
- Using a DC fan motor, the external static pressure can be controlled within a range of 30 Pa* to 200 Pa*.

Set to low static pressure when ducts are short. Set to high static pressure for advanced ne

Comfortable airflow is achieved in accordance with conditions such as duct length.

*30 Pa-100 Pa for FXMQ20P-32PA
*30 Pa-160 Pa for FXMQ40PA
*50 Pa-200 Pa for FXMQ50PA-125PA
*50 Pa-140 Pa for FXMQ140PA

- All models are only 300 mm in height and the weight of the FXMQ40-140PA has been reduced.
- Drain pump is equipped as standard accessory with 700 mm lift.



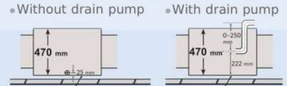
- Control of the airflow rate can be selected from 3-step control and Auto. Auto airflow rate control can be selected with wired remote controller BRC1E63.
- Low operation sound level
- Energy-efficient
  - DC fan motor is used to realise energy-saving operation.
- Easy installation
  - Airflow rate can be controlled using a remote controller during test operation. It is automatically adjusted to the range between approximately ±10% of the rated HH tap airflow for FXMQ20P-125PA.

- Easy maintenance
  Inspection and cleaning is facilitated by separating the drain pipe and inspection opening and by the drain pan maintenance check hole.

- An antibacterial treatment that uses silver ions has been applied to the drain pan, preventing the growth of slime, mould and bacteria that cause blockages and odours. (The lifespan of a silver ion cartridge depends on the usage environment, but should be changed once every two to three years.)

FXMQ200/250MA

- Simplified Static Pressure Control
  External static pressure can be easily adjusted using a change-over switch inside the electrical box to meet the resistance in the duct system.
- Built-in Drain Pump (Option)
  Housing the drain pump inside the unit reduces the space required for installation.



Specifications

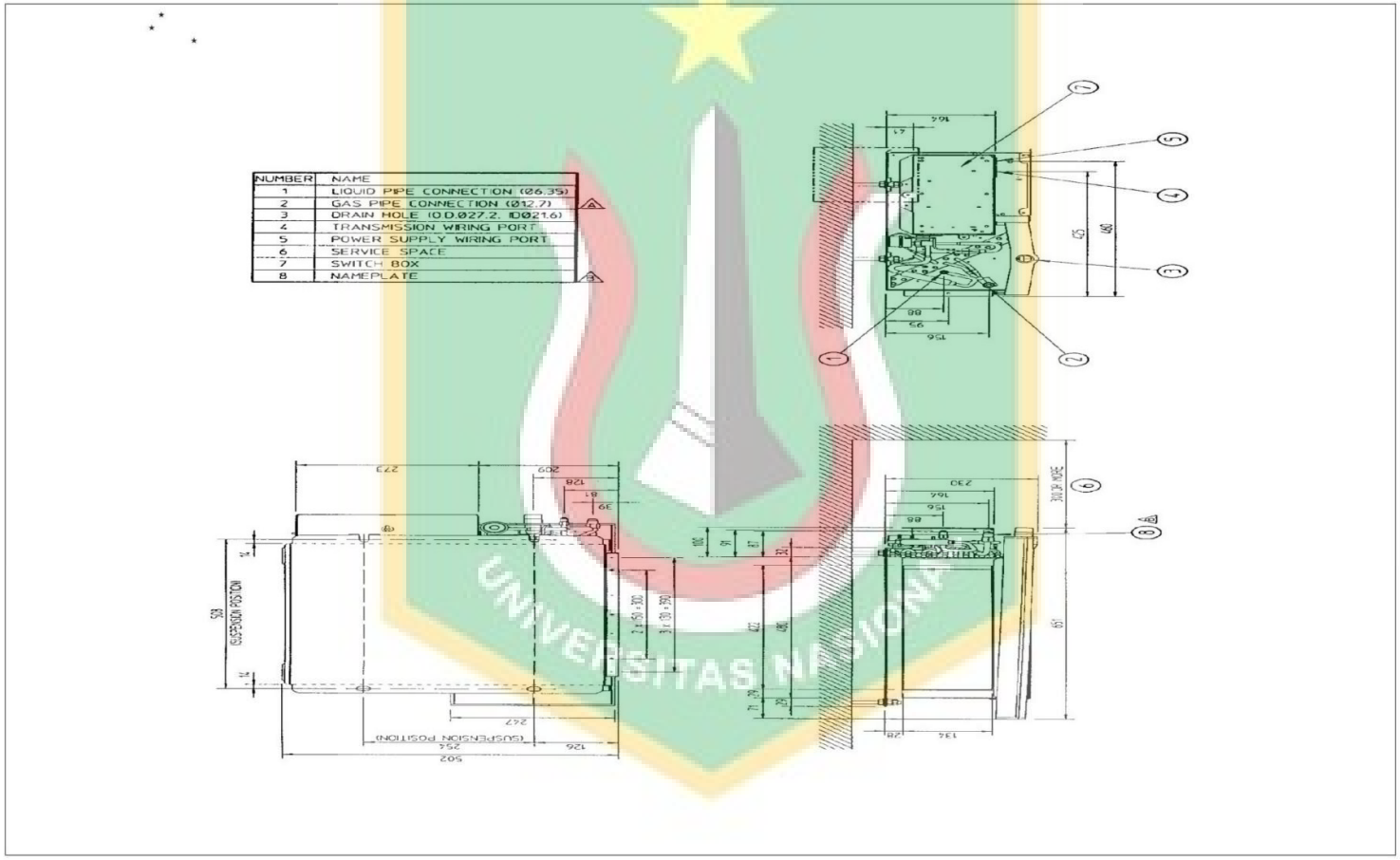
MODEL			FXMQ20PAV4	FXMQ25PAV4	FXMQ32PAV4	FXMQ40PAV4	FXMQ50PAV4
Power supply			1-phase, 220-240 V, 50 Hz				
Cooling capacity		Btu/h	7,500	9,600	12,300	15,400	19,100
		kW	2.2	2.8	3.6	4.5	5.6
Power consumption		kW	0.056*1	0.056*1	0.060*1	0.151*1	0.128*1
Casing			Galvanised steel plate				
Airflow rate (HH/H/L)		m³/min	9/7.5/6.5	9/7.5/6.5	9.5/8/7	16/13/11	18/16.5/15
		cfm	318/265/230	318/265/230	335/282/247	565/459/388	635/582/530
External static pressure		Pa	30-100 (50) 2	30-100 (50) 2	30-100 (50) 2	30-160 (100) 2	50-200 (100) 2
Sound level (HH/H/L)		dB(A)	33/31/29	33/31/29	34/32/30	39/37/35	41/39/37
Dimensions (H×W×D)		mm	300x550x700	300x550x700	300x550x700	300x700x700	300x1,000x700
Machine weight		kg	25	25	25	27	35
Piping connections	Liquid (Flare)	mm	ϕ6.4	ϕ6.4	ϕ6.4	ϕ6.4	ϕ6.4
	Gas (Flare)		12.7	12.7	12.7	12.7	12.7
	Drain		VP25 (External Dia, 32/Internal Dia, 25)				
MODEL			FXMQ63PAV4	FXMQ80PAV4	FXMQ100PAV4	FXMQ125PAV4	FXMQ140PAV4
Power supply			1-phase, 220-240 V, 50 Hz				
Cooling capacity		Btu/h	24,200	30,700	38,200	47,800	54,600
		kW	7.1	9.0	11.2	14.0	16.0
Power consumption		kW	0.138 1	0.185 1	0.215 1	0.284 1	0.405 1
Casing			Galvanised steel plate				
Airflow rate (HH/H/L)		m³/min	19.5/17.5/16	25/22.5/20	32/27/23	39/33/28	46/39/32
		cfm	688/618/565	883/794/706	1,130/953/812	1,377/1,165/988	1,624/1,377/1,130
External static pressure		Pa	50-200 (100) 2	50-200 (100) 2	50-200 (100) 2	50-200 (100) 2	50-140 (100) 2
Sound level (HH/H/L)		dB(A)	42/40/38	43/41/39	43/41/39	44/42/40	46/45/43
Dimensions (H×W×D)		mm	300×1,000×700	300×1,000×700	300×1,400×700	300×1,400×700	300×1,400×700
Machine weight		kg	35	35	45	45	46
Piping connections	Liquid (Flare)	mm	9.5	9.5	9.5	9.5	9.5
	Gas (Flare)		15.9	15.9	15.9	15.9	15.9
	Drain		VP25 (External Dia, 32/Internal Dia, 25)				

Note: Specifications are based on the following conditions;
•Cooling: Indoor temp.: 27°CDB, 19°CWB, Outdoor temp.: 35°CDB, Equivalent piping length: 7.5 m, Level difference: 0 m.
•Capacity of indoor unit is only for reference. Actual capacity of indoor unit is based on the total capacity index. (See Engineering Data Book for details.)
•Sound level: Anechoic chamber conversion value, measured at a point 1.5 m downward from the unit centre.
During actual operation, these values are normally somewhat higher as a result of ambient conditions.
★1: Power consumption values are based on conditions of rated external static pressure.
★2: External static pressure can be modified using a remote controller that offers seven (FXMQ20-32PA), thirteen (FXMQ40PA), fourteen (FXMQ50-125PA) or ten (FXMQ140PA) levels of control. These values indicate the lowest and highest possible static pressures. The standard static pressure is 50 Pa for FXMQ20-32PA and 100 Pa for FXMQ40-140PA.

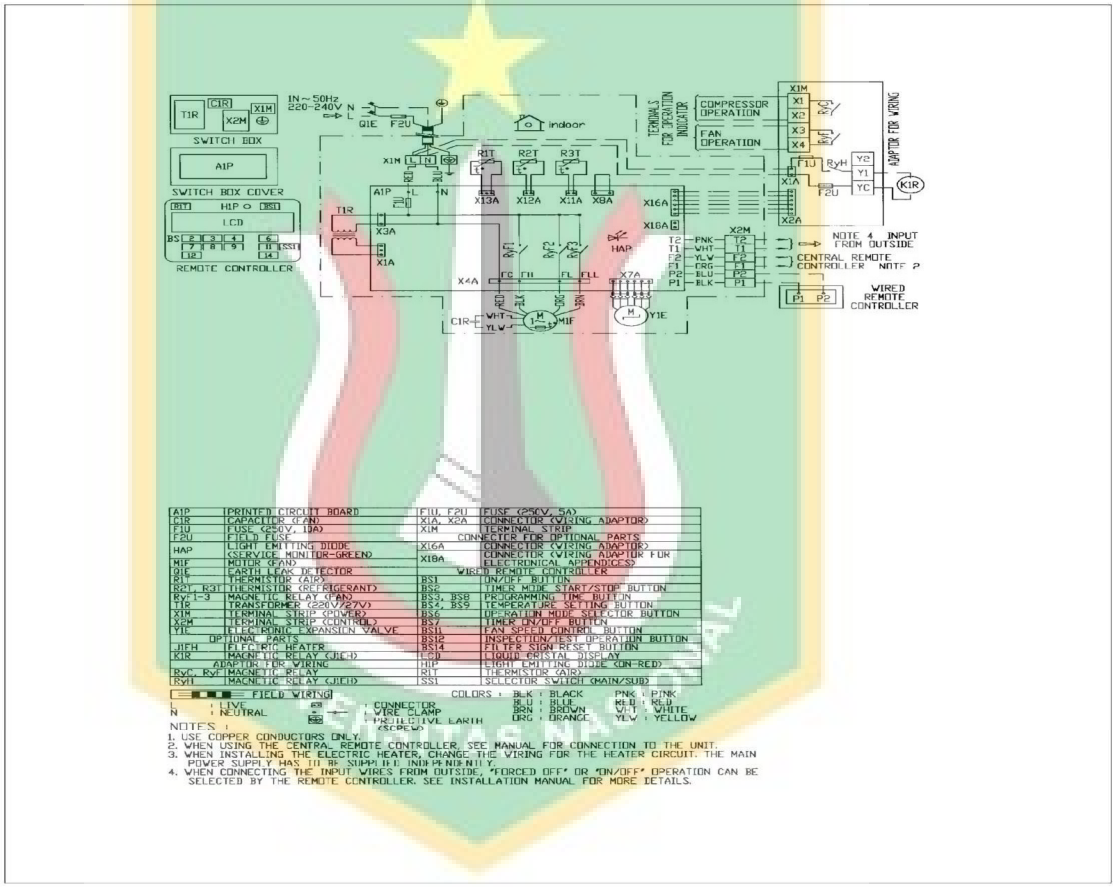
MODEL			FXMQ200MVE4	FXMQ250MVE4
Power supply			1-phase, 220-240 V/220 V, 50/60 Hz	
Cooling capacity		Btu/h	76,400	95,500
		kW	22.4	28.0
Power consumption		kW	1.294 1★	1.465 1★
Casing			Galvanised steel plate	
Airflow rate (H/L)		m³/min	58/50	72/62
		cfm	2,047/1,765	2,542/2,189
External static pressure		Pa	132-221★2	191-270★2
Sound level (H/L)	220 V	dB(A)	48/45	48/45
	240 V		49/46	49/46
Dimensions (H×W×D)		mm	470×1,380×1,100	470×1,380×1,100
Machine weight		kg	137	137
Piping connections	Liquid (Flare)	mm	ϕ9.5	ϕ9.5
	Gas (Brazing)		19.1	22.2
	Drain		PS1B	

Note: Specifications are based on the following conditions;
•Cooling: Indoor temp.: 27°CDB, 19°CWB, Outdoor temp.: 35°CDB, Equivalent piping length: 7.5 m, Level difference: 0 m.
•Capacity of indoor unit is only for reference. Actual capacity of indoor unit is based on the total capacity index. (See Engineering Data Book for details.)
•Sound level: (FXMQ-MA) Anechoic chamber conversion value, measured at a point 1.5 m downward from the unit centre.
During actual operation, these values are normally somewhat higher as a result of ambient conditions.
★1: Power consumption values are based on conditions of standard external static pressure.
★2: External static pressure is changeable to change over the connectors inside electrical box, this pressure means "Standard-High static pressure".

- **FXMQ80PAV4**


NUMBER NAME
1 LIQUID PIPE CONNECTION (Ø6.35)
2 GAS PIPE CONNECTION (Ø12.7)
3 DRAIN HOLE (O.D.Ø27.2, I.DØ21.6)
4 TRANSMISSION WIRING PORT
5 POWER SUPPLY WIRING PORT
6 SERVICE SPACE
7 SWITCH BOX
8 NAMEPLATE
(SUSPENSION POSITION)

- **FXMQ80PAV4**


SWITCH BOX
SWITCH BOX COVER
REMOTE CONTROLLER
COMPRESSOR OPERATION
FAN OPERATION
TERMINALS FOR OPERATION INDICATOR
ADAPTOR FOR WIRING
NOTE 4 INPUT FROM OUTSIDE
CENTRAL REMOTE CONTROLLER NOTE 2
WIRED REMOTE CONTROLLER
A1P PRINTED CIRCUIT BOARD
C1R CAPACITOR (FAN)
F1U FUSE (250V, 10A)
F2U FIELD FUSE
HAP LIGHT EMITTING DIODE (SERVICE MONITOR-GREEN)
M1F MOTOR (FAN)
Q1E EARTH LEAK DETECTOR
R1T THERMISTOR (AIR)
R2T, R3T THERMISTOR (REFRIGERANT)
Ry1-3 MAGNETIC RELAY (FAN)
T1R TRANSFORMER (220V/22V)
X1M TERMINAL STRIP (POWER)
X2M TERMINAL STRIP (CONTROL)
Y1E ELECTRONIC EXPANSION VALVE
OPTIONAL PARTS
H1H ELECTRIC HEATER
K1R MAGNETIC RELAY (HEATER)
ADAPTOR FOR WIRING
Ry4, Ry5 MAGNETIC RELAY
Ry11 MAGNETIC RELAY (HEATER)
F1U, F2U FUSE (250V, 5A)
X1A, X2A CONNECTOR (WIRING ADAPTOR)
X1M TERMINAL STRIP
CONNECTER FOR OPTIONAL PARTS
X16A CONNECTOR (WIRING ADAPTOR)
X18A CONNECTOR (WIRING ADAPTOR FOR ELECTRONICAL APPENDICES)
WIRED REMOTE CONTROLLER
BS1 ON/OFF BUTTON
BS2 TIMER MODE START/STOP BUTTON
BS3, BS8 PROGRAMMING TIME BUTTON
BS4, BS9 TEMPERATURE SETTING BUTTON
BS6 OPERATION MODE SELECTOR BUTTON
BS7 TIMER ON/OFF BUTTON
BS11 FAN SPEED CONTROL BUTTON
BS12 INSPECTION/TEST OPERATION BUTTON
BS14 FILTER SIGN RESET BUTTON
E20 LIQUID CRYSTAL DISPLAY
HAP LIGHT EMITTING DIODE (SERVICE MONITOR-RED)
R1T THERMISTOR (AIR)
SS1 SELECTOR SWITCH (MAIN/SUB)
FIELD WIRING
: LIVE
: NEUTRAL
: CONNECTOR
: WIRE CLAMP
: PROTECTIVE EARTH (SCREW)
COLORS : BLK : BLACK PNK : PINK
BLU : BLUE RED : RED
BRN : BROWN WHT : WHITE
ORG : ORANGE YLW : YELLOW
NOTES :
1. USE COPPER CONDUCTORS ONLY.
2. WHEN USING THE CENTRAL REMOTE CONTROLLER, SEE MANUAL FOR CONNECTION TO THE UNIT.
3. WHEN INSTALLING THE ELECTRIC HEATER, CHANGE THE WIRING FOR THE HEATER CIRCUIT. THE MAIN POWER SUPPLY HAS TO BE SUPPLIED INDEPENDENTLY.
4. WHEN CONNECTING THE INPUT WIRES FROM OUTSIDE, "FORCED OFF" OR "ON/OFF" OPERATION CAN BE SELECTED BY THE REMOTE CONTROLLER. SEE INSTALLATION MANUAL FOR MORE DETAILS.